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COAL MINE HEALTH AND SAFETY

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HEARINGS

BEFORE THE

SUBCOMMITTEE ON LABOR

OF THE

COMMITTEE ON
OR AND PUBLIC WELFARE
UNITED STATES SENATE

NINETY-FIRST CONGRESS

FIRST SESSION

ON

S. 355, S. 467, S. 1094, S. 1178, S. 1300, S. 1907, S. 2118, and S. 2284

BILLS TO IMPROVE THE HEALTH AND SAFETY CONDITIONS OF PERSONS WORKING IN THE COAL MINING INDUSTRY OF THE UNITED STATES

PART 2

FEBRUARY 27, MARCH 7, 12, 13, 14, 18, 20, 26, AND MAY 2, 1969

Printed for the use of the
Committee on Labor and Public Welfare

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CONTENTS

Page
Text of S. 2118 914

CHRONOLOGICAL LIST OF WITNESSES

March 12, 1969

Dunn, Stephen F., president, National Coal Association 541
Corcoran, John, president, Consolidation Coal Co., and chairman, board of the National Coal Association 544
Farmer, Guy, Washington attorney, and former chairman of the National Labor Relations Board 561
Garvey, James R., vice president, National Coal Association, and president, Bituminous Coal Research, Inc 571
Talman, Woods G., chief inspector, coal operations, United States Steel Corp 599

March 13, 1969

Murphy, Hon. George, a U.S. Senator from the State of California 629
Buff, Dr. I. E., chairman, Committee of Physicians for Miners Health and Safety, Charleston, W. Va 634
Rasmussen, Dr. Donald L., chief, pulmonary section, Appalachian Regional Hospital, Beckley, W. Va 657
Wells, Dr. Hawey A., coordinator, Conemaugh Valley Memorial Hospital, Johnstown, Pa.; accompanied by George A. Daugherty, attorney, Weaver & Daugherty, Charleston, W. Va 661

March 14, 1969

Kerr, Dr. Lorin E., assistant to the executive medical officer of the United Mine Workers of America Welfare and Retirement Fund 669
Laqueur, Dr. Werner A., director of laboratories, Appalachian Regional Hospital, Beckley, W. Va 694

March 18, 1969

Moss, Hon. Frank E., a U.S. Senator from the State of Utah 709
Stewart, Dr. William H., surgeon general, Public Health Service: accompanied by Dr. Keith Morgan, chief, Appalachian Laboratory for Occupational Respiratory Diseases, Morgantown, W. Va.; Dr. Marcus M. Key, Acting Director, Bureau of Occupational Safety and Health; Vernon Mackenzie, special assistant to the Administrator, Consumer Protection Environmental Health, Public Health Service 718
Hunter, Dr. Murray B., Fairmont Clinic, Fairmont, W. Va 743

March 20, 1969

Flood, Hon. Daniel J., a Representative in Congress from the State of Pennsylvania 751
Gross, Dr. Paul, research professor of pathology of industrial diseases and director of industrial hygiene research, Department of Occupational Health at Graduate School of Public Health, University of Pittsburgh, Pittsburgh, Pa 757
Rice, James K., president, Cyrus W. Rice & Co., Pittsburgh, Pa 765
Hechler, Hon. Ken, a Representative in Congress from the State of West Virginia 772
Kaznoski, Mrs. Sara Lee, cochairman of the widows mine disaster committee, Barrackville, W. Va 773

Page
Snyder, Mrs. Nora, member, widows of the Farmington disaster, Mannington, W. Va — 776
Rogers, Mrs. Mary Kay, member, widows of the Farmington disaster, Mannington, W. Va — 776
Osborn, Dr. Lawrence, Bureau of Occupational Health and Safety, U.S. Public Health Service, Department of Health, Education, and Welfare — 777
Bailey, Huda, former coal miner, Mount Gay, W. Va — 779
Mann, Henry, former coal miner, Amherstdale, W. Va — 781
Ratliff, Otis, former coal miner, Davin, W. Va — 783
Nelson, Robert R., member of the legislature of the State of West Virginia — 784
Wolford, Elijah, coal miner, Morgantown, W. Va — 787
Yocum, Elmer, coal miner, Jere, W. Va — 798

March 26, 1969

Byrd, Hon. Robert C., a U.S. Senator from the State of West Virginia — 815
Kennedy, Hon. Edward M., a U.S. Senator from the State of Massachusetts — 826
Cornely, Dr. Paul, president-elect, American Public Health Association; professor and head, Department of Preventive Medicine and Public Health, Howard University College of Medicine — 830
Higgins, Dr. Ian, School of Public Health, University of Michigan, Ann Arbor, Mich — 836
Hunter, Dr. Murray B., Fairmount Clinic, Fairmont, W. Va., resumed — 847
Cander, Dr. Leon, chairman, Department of Medicine, University of Texas Medical School, San Antonio, Tex — 854
Hannon, Dr. J. W. G., FCCP, Washington, Pa — 865
Cook, Hon. Marlow W., a U.S. Senator from the State of Kentucky — 876
McDowell, Cloyd D., president, Harlan County Coal Operators' Association, Harlan, Ky — 880
Bailey, Rufus B., safety director, Harlan County Coal Operators' Association, Harlan, Ky — 884
Van Meter, Horace C., superintendnet and general manager, Jewel Smokeless, Coal Corp., Grundy, Va — 897
Hunter, Louis, executive secretary, National Independent Coal Operators Organization — 908

STATEMENTS

Bailey, Huda, former coal miner, Mount Gay, W. Va — 779
Bailey, Rufus B., safety director, Harlan County Coal Operators' Association, Harlan, Ky — 884
Buff, Dr. I. E., chairman, Committee of Physicians for Miners Health and Safety, Charleston, W. Va — 634
Byrd, Hon. Robert C., a U.S. Senator from the State of West Virginia — 815
Cander, Dr. Leon, chairman, Department of Medicine, University of Texas Medical School, San Antonio, Tex — 854
Cook, Hon. Marlow W., a U.S. Senator from the State of Kentucky — 876
Corcoran, John, president, Consolidation Coal Co., and chairman, board of the National Coal Association — 544
Cornely, Dr. Paul, president-elect, American Public Health Association; professor and head, Department of Preventive Medicine and Public Health, Howard University College of Medicine — 830
  Prepared statement — 830
Dunn, Stephen F., president, National Coal Association — 541
Farmer, Guy, Washington attorney, and former chairman of the National Labor Relations Board — 561
  Prepared statement — 565
Flood, Hon. Daniel J., a Representative in Congress from the State of Pennsylvania — 751
Garvey, James R., vice president, National Coal Association, and president, Bituminous Coal Research, Inc — 571
  Prepared statement — 585
Gross, Dr. Paul, research professor of pathology of industrial diseases and director of industrial hygiene research, Department of Occupational Health at Graduate School of Public Health, University of Pittsburgh, Pittsburgh, Pa — 757

Page

- Hannon, Dr. J. W. G., FCCP, Washington, Pa 865
- Hechler, Hon. Ken, a Representative in Congress from the State of West Virginia 772
  - Prepared statement 805
- Higgins, Dr. Ian, School of Public Health, University of Michigan, Ann Arbor, Mich 836
- Hunter, Louis, executive secretary, National Independent Coal Operators Organization 908
- Hunter, Dr. Murray B., Fairmont Clinic, Fairmont, W. Va ....., 743, 847
- Kaznoski, Mrs. Sara Lee, cochairman of the Widows Mine Disaster Committee, Barrackville, W. Va 773
- Kennedy, Hon. Edward M., a U.S. Senator from the State of Massachusetts 826
- Kerr, Dr. Lorin E., assistant to the executive medical officer of the United Mine Workers of America Welfare and Retirement Fund 669
- Laquer, Dr. Werner A., director of laboratories, Appalachian Regional Hospital, Beckley, W. Va 694
  - Prepared statement 694
- Mann, Henry, former coal miner, Amherstdale, W. Va 781
- McDowell, Cloyd D., president, Harlan County Coal Operators' Association, Harlan, Ky 880
- Moss, Hon. Frank E., a U.S. Senator from the State of Utah 709
- Murphy, Hon. George, a U.S. Senator from the State of California 629
- Nelson, Robert R., member of the legislature of the State of West Virginia 784
- Osborn, Dr. Lawrence, Bureau of Occupational Health and Safety, U.S. Public Health Service, Department of Health, Education, and Welfare 777
- Rasmussen, Dr. Donald L., chief, pulmonary section, Appalachian Regional Hospital, Beckley, W. Va 657
  - Prepared statement 658
- Ratliff, Otis, former coal miner, Davin, W. Va 783
- Rice, James K., president, Cyrus W. Rice & Co., Pittsburgh, Pa 765
- Rogers, Mrs. Mary Kay, member, Widows of the Farmington Disaster, Mannington, W. Va 776
- Snyder, Mrs. Nora, member, Widows of the Farmington Disaster, Mannington, W. Va 776
- Stewart, Dr. William H., Surgeon General, Public Health Service; accompanied by Dr. Keith Morgan, chief, Appalachian Laboratory for Occupational Respiratory Diseases, Morgantown, W. Va.; Dr. Marcus M. Key, Acting Director, Bureau of Occupational Safety and Health; Vernon Mackenzie, special assistant to the Administrator, Consumer Protection Environmental Health, Public Health Service 718
- Talman, Woods G., chief inspector, coal operations, United States Steel Corp 599
  - Prepared statement, with attachments 600
- Van Meter, Horace C., superintendent and general manager, Jewel Smokeless Coal Corp., Grundy, Va 897
- Wells, Dr. Hawey A., coordinator, Conemaugh Valley Memorial Hospital, Johnstown, Pa.; accompanied by George A. Daugherty, attorney, Weaver & Daugherty, Charleston, W. Va 661
  - Prepared statement 663
- Wolford, Elijah, coal miner, Morgantown, W. Va 787
  - Prepared statement 811
- Yocum, Elmer, coal miner, Jere, W. Va 798

ADDITIONAL INFORMATION

Articles, publications, etc., entitled:

- " 'Black Lung' Toll No More Than 16,000, Coalman Says," from the Johnstown Tribune-Democrat, March 13, 1969 596
- "Coal Mine Health and Safety," by Senator Robert C. Byrd, from the Congressional Record, February 28, 1969 817

Biographical sketch of Woods G. Talman, chief inspector, coal operations, United States Steel Corp., Pittsburgh, Pa 599

Communications to:

- Bennett, Hon. Wallace F., a U.S. Senator from the State of Utah, from John Helco, Huntington Canyon, Utah, February 18, 1969 713
- Committee on Labor and Public Welfare, from Raymond R. Richards, treasurer, Koehler Manufacturing Co., Marlborough, Mass., March 17, 1969 627

Communications to—Continued

- Williams, Hon. Harrison A., Jr., a U.S. Senator from the State of New Jersey, from:
  - Page
  - Aughenbaugh, William E., vice president, Vansant Coal Corp., Vansant, Va., April 14, 1969 ... 874
  - Bailey, Rufus J., safety director, Harlan County Coal Operators' Association, Harlan, Ky., April 1, 1969 ... 893
  - Block, Dr. D. L., president, Industrial Medical Association, Chicago, Ill., May 1, 1969 ... 878
  - Buff, Dr. I. E., chairman, Physician's Committee for Miner's Health and Safety, Charleston, W. Va., April 15, 1969 ... 874
  - Bunn, Omer M., president, Southwestern Coal Corp., Grundy, Va. April 14, 1969 ... 874
  - Carroll, Terence E., director, National Institutes on Rehabilitation & Health Services, Washington, D.C., April 1, 1969 ... 871
  - Corcoran, John, Consolidation Coal Co., Inc., Pittsburgh, Pa. April 29, 1969 ... 878
  - Creany, Eugene A., District No. 2, United Mine Workers of America, Ebensburg, Pa.:
    - March 14, 1969 ... 596
    - April 24, 1969 ... 875
  - Dearing, Dr. W. P., executive director, Group Health Association of America, Inc., Washington, D.C., March 28, 1969 ... 869
  - Dunn, Stephen F., National Coal Association, Washington, D.C., April 24, 1969 ... 875
  - Garvey, James R., president and director of research, Bituminous Coal Research, Inc., Pittsburgh, Pa.:
    - March 17, 1969 ... 655
    - March 17, 1969 ... 584
  - Golden, Benjamin I., M.D., Memorial General Hospital, Elkins, W. Va., March 31, 1969 ... 870
  - Harman, Kendris, Dorothy Mae Coal Co., Keen Mountain, Va., April 16, 1969 ... 874
  - Jessee, Robert I., Universal Coal Co., Inc., Oakwood, Va., April 11, 1969 ... 874
  - Perkins, James E., managing edirctor, National Tuberculosis and Respiratory Disease Association, New York, N.Y., April 2, 1969 ... 872
  - Rasmussen, Dr. D. L., Beckley Appalachian Regional Hospital, Beckley, W. Va., April 11, 1969 ... 873
  - Talman, Woods G., chief inspector, coal operations, United States Steel Corp., Pittsburgh, Pa., April 28, 1969 ... 877
  - Todd, George H., assistant vice president, Armco Steel Corp., Middletown, Ohio, March 17, 1969, with attachment ... 656
  - Wolford, Elijah, Morgantown, W. Va., April 28, 1969 ... 877
  - Yocum, Elmer W., Jere, W. Va.:
    - March 24, 1969 ... 814
    - April 21, 1969 ... 875

Diagram of Mine No. 9, Mountaineer Coal Co., Division of Consolidation Coal Co ... 881

Infractions of mines, supplied by Elijah Wolford, coal miner, Morgantown, W. Va ... 792

Memorandum to Hon. Harrison A. Williams, Jr., a U.S. Senator from the State of New Jersey, from H. Wells, M.D ... 873

Selected charts and tables:

- Best estimate of the total pouplation of working miners in the U.S.A., 1963–65 ... 844
- Concerning mine fatalities:
  - 5,243 mines—1966 ... 912
  - 5,243 underground bituminous coal mines ... 913
- Percentage incidence of pneumoconiosis in:
  - Working miners by age ... 843
  - Working miners by years underground ... 844
  - Inactive miners by age ... 844
- PHS analyses of National Coal Board data ... 750

Suggested alternate to section 17(b) of S. 1094, by George A. Daugherty, attorney, Weaver & Daugherty, Charleston, W. Va ... 662

COAL MINE HEALTH AND SAFETY

WEDNESDAY, MARCH 12, 1969

U.S. Senate,
Subcommittee on Labor of the
Committee on Labor and Public Welfare,
Washington, D.C.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 4232, New Senate Office Building, Senator Harrison A. Williams, Jr. (chairman of the subcommittee) presiding.

Present: Senators Williams, Randolph, Pell, Eagleton, Javits, Saxbe, Bellmon, and Schweiker.

Committee staff members present: Robert O. Harris, staff director; Frederick R. Blackwell, counsel to the subcommittee; and Eugene Mittelman, minority counsel.

Senator Williams. We will begin the hearings and continue on the legislation that is before this subcommittee on the coal miners' health and safety.

We welcome back before the committee Mr. Stephen F. Dunn, president of the National Coal Association. Under arrangements made with Mr. Dunn a couple of weeks ago, you have colleagues that you will present, I understand, Mr. Dunn, and there are visual aspects of your presentation this morning.

STATEMENT OF STEPHEN F. DUNN, PRESIDENT, NATIONAL COAL ASSOCIATION

Mr. Dunn. Yes, sir.

Senator Williams. Does that come before, during, or after the oral statements?

Mr. Dunn. Mr. Chairman, I intend first to introduce a film which is a 10-minute film. Then the witnesses will follow immediately thereafter.

Senator Williams. Very good. Do you have anything further to say?

Mr. Dunn. Yes, sir. I would like to make a few preliminary remarks.

Senator Williams. Before that; Senator Randolph, do you have a statement?

Senator Randolph. No, Mr. Chairman. I am sure we will be wisely informed by the witnesses who are here today as we discuss further the important legislation which is pending in this subcommittee.

Mr. Dunn. Thank you, gentlemen.

Senator Williams. Will that film be shown on the screen behind us?

Mr. Dunn. Yes, sir. We have made arrangements after I make these few preliminary remarks to introduce the witnesses. Possibly the Senators would like to sit in the front row.

Senator Williams. We will move down so that we can see it. Isn't the National Coal Association gathered in convention?

Mr. Dunn. The National Coal Policy Conference had an all-day meeting yesterday, Mr. Chairman.

Senator Williams. I hope you had a little free time to relax last evening. Did you?

Mr. Dunn. Yes, we had a very fine occasion but these witnesses were still burning the midnight oil.

The testimony of the witnesses today will be in behalf of the National Coal Association, Bituminous Coal Operators Association, the Anthracite Institute, and the American Mining Congress.

As you pointed out, Mr. Chairman, you kindly granted our request also to show the film. This morning I will first introduce the film and then introduce each of the four gentlemen who will testify immediately thereafter.

Our 28-minute film, "The Invisible Power of Coal" has won all the top awards for its type. The 10-minute stripped-down version, which you will see, not only contains safety and health sequences, such as roof bolting and rock dusting, but it also contains information about the many contributions made by the modern coal industry to our domestic and international economy.

The first of our witnesses after the film showing will be Mr. John Corcoran, chairman of National Coal Association and president of Consolidation Coal Co.

Mr. Corcoran was elected president of Consol in September 1966. He worked his way up to this position after joining the company's legal department in 1950 as assistant vice president.

Prior to 1950, he represented important coal interests as a Washington lawyer.

Consolidation Coal Co. is the second largest coal producer in the world. It has always been a very progressive company with a remarkable record for safety. This was publicly recognized at the time of the unfortunate mine disaster in Farmington, W. Va., last November 20.

Mr. Corcoran's conduct at that time and his appearance as a volunteer witness today indicate the abiding interest of top management in mine safety and health.

Mr. Corcoran stayed at the scene of the disaster continuously up to the time it became necessary to close the mine. He personally advised the families of this decision. As stated in the Philadelphia Evening Bulletin of last December 2:

> In the occasional way of big companies, Mr. Corcoran could have retreated behind a screen of subordinates and publicists to issue his final order to plug the mine with concrete * * * when he went to a Mannington church to announce his decision to the entombed miners' wives * * * He was, he said, making good on his promise to be with you when "the time came * * * that time has now come * * * every human effort to save the men has been made * * *"
>
> * * * it did demonstrate a sensitivity which, to reporters, he had already shown in his forthrightness under questioning and his concern over what had happened to the men who worked for him, their wives, and children.

Mr. Corcoran's statement will deal generally with the most effective approach to mine safety and health legislation.

Mr. Corcoran will be followed by Mr. Guy Farmer, a Washington lawyer and former Chairman of the National Labor Relations Board.

Mr. Farmer has had a wide experience in the representation of coal interests and is regarded as an expert in administrative law. He will testify as to the procedural and administrative aspects of the pending legislation.

After Mr. Farmer, the next witness will be Mr. James R. Garvey, vice president, NCA, and president of our affiliate, Bituminous Coal Research, Inc.

Mr. Garvey has been associated with the coal industry since 1941. He joined Bituminous Coal Research in 1946. BCR has primary responsibility for the development and execution of the cooperative research program of coal and related industries.

His wide experience includes research on equipment to minimize dust in underground mining. He has devoted considerable time and thought to this field and his testimony as to dust standards and coal workers' pneumoconiosis should be very helpful.

Our final witness today will be Mr. Woods G. Talman, chief inspector, coal operations, United States Steel Corp. United States Steel is universally known for its fine program on mine safety and health.

Mr. Talman has devoted his life to production and safety, and is regarded as the dean of all experts.

In addition to serving as United States Steel's chief inspector for coal operations since 1958, he has held a number of other important posts.

He has been very active in the coal section of the National Safety Council and served as the section's general chairman in 1966–67. For 5 years he served as chairman of the American Mining Congress Coal Safety Committee.

Our witnesses will point out how a new law may be made to work both as to health and safety standards. For example, out of the safety provisions of the bills proposed by the Johnson and Nixon administrations, I calculated from Mr. Talman's press release that industry endorses, at least in principle, a total of 94 out of 101. Where they do not endorse they have constructive alternatives to suggest.

However, some of the bills before this committee have been introduced very recently, and our witnesses may feel that they have not had a chance to study them adequately.

For example, the numerous and complex electrical standards in the most recent bill, S. 1300.

Therefore, I respectfully request that before the record is closed our witnesses be granted permission to amend their statements, if necessary, to supplement testimony and to clarify questions that may be raised by the committee and other witnesses.

Thank you, Mr. Chairman. Thank you for permitting us to make these presentations.

As I said, immediately after the film is shown Mr. Corcoran will proceed.

Now if you are ready for the film I think the equipment is all set up to show it.

(Film presentation.)

Senator WILLIAMS. That was an impressive film that we just observed, shown to us by the National Coal Association.

Mr. John Corcoran, chairman of the National Coal Association and president of the Consolidated Coal Co., has been introduced.

Mr. Corcoran, the forum is yours.

STATEMENT OF JOHN CORCORAN, PRESIDENT, CONSOLIDATION COAL CO. AND CHAIRMAN OF THE BOARD OF THE NATIONAL COAL ASSOCIATION

Mr. CORCORAN. Thank you, sir. My name is John Corcoran. I am president of the Consolidation Coal Co. and chairman of the board of National Coal Association.

When I appeared before the Secretary of the Interior's Conference on Coal Mine Safety on December 12, 1968, I stated:

> There can be no question that the health and safety of employees in the coal mining industry must be given first priority. On humanitarian grounds alone this should be self-evident.
>
> If this is not enough, enlightened self-interest will lead us to the same inescapable conclusion.
>
> Our trained and experienced employees constitute our most valuable resource and the protection of their health and safety is an absolute prerequisite to the successful and continued operation of our business * * * In the regulatory area, we favor and will support any meaningful and constructive changes in laws and regulations that will improve coal mine safety.

I wholeheartedly reaffirm that position today.

Today the coal industry is operating at virtually full capacity, primarily because of the needs of the electric utility industry for coal to generate power.

I seriously doubt that the American public in the Eastern and Midwestern States realizes that without today's modern coal industry most of their homes and offices would be completely without electric power.

Perhaps, because the demands of our utility customers are greater today than ever before, we are faced, time and again, with the charge that the coal industry places production and profits ahead of safety.

Even if we are as calloused or as unconcerned about safety as this charge would imply, the plain fact is that production, profits, and safety are so closely interrelated that one is impossible without the other.

Each accident, in addition to producing human suffering, adversely affects both production and profits, and the more severe the accident the greater the loss of production and the greater the reduction in profits.

I am quite sure that the records would show that the commercial coal companies with the best profit records also have the best safety records.

While the coal industry's safety record has improved in recent years, there is no question that further improvement is needed.

In 1967, the accident frequency rate—that is, accidents per million man-hours of exposure—for the entire bituminous coal industry was 41.7 as contrasted with a frequency rate of 48.6 in 1950.

For those companies represented by the Bituminous Coal Operators Association, the accident frequency rate was 31.7 in 1967.

For comparative purposes I am advised that the preliminary 1967 frequency rate figure for all manufacturing is approximately 14.0.

The tragedy at Farmington occurred at a time when those of us responsible for the management of Consolidation Coal Co. felt that we had made significant progress toward eliminating mine accidents and mine fatalities.

Indeed, the record of our company over the preceding years reflected that progress. In 1950, our accident frequency record was 29.8; by 1967, it had dropped to 12.04, somewhat below the national average for all manufacturing in the same year.

While I do not have the corresponding figures for other individual companies, I do know that there are a number of companies whose records are equal to or even better than our own.

I cite our own experience because it points up to the fact that safety records comparable to those for manufacturing are achievable in coal mining. It also points up the unfortunate fact that disasters can occur even in those mines with better than average safety records. From this we must conclude that our efforts to date have not been adequate, even though we do not yet know why or how our efforts failed us.

I would therefore suggest that in addition to reexamining our safety laws and practices, there is an urgent need to undertake more research in the area of coal mine safety.

The bituminous coal industry is an extremely fragmented one. In 1967, approximately 5,100 companies operated 5,900 mines to produce 553 million tons. Effective implementation and coordination of research activities in such an industry is quite difficult, and Government participation in this area would therefore appear to be essential.

Industry should increase its own efforts, but greater participation in research activities by the Bureau of Mines and Office of Coal Research is needed.

Many of our own research efforts in Consol have long been directed to finding safety methods of mining coal. The Farmington disaster has both broadened and accelerated these efforts.

Various projects that we now have under active investigation are rock dust barriers or similar devices to prevent the propagation of dust explosions; scientific analyses of roof stresses to enable us to devise better roof control procedures; methane gas drainage studies to minimize the risks of methane accumulations; an explosion-proof underground-to-surface communication system; systems for remotely detecting mine fires; the use of hypervelocity pulsed water jets for cutting the coal at the face in order to eliminate face ignitions and minimize dust; face dust collection systems and more effective water spray systems to minimize the dust problem at the face.

All of these research efforts offer some promise of success, and I would urge that expanded research in these and similar areas be vigorously pursued by all those interested in coal mine safety.

The bills before this committee are intended to achieve greater safety in our mines.

As indicated earlier, I wholeheartedly support this objective. However, in considering specific changes, we should be certain that they are meaningful and constructive and that they truly will improve safety for it is sometimes quite easy to allow the emotion of a Farmington disaster to cloud our judgment and cause us to accept proposals that might not achieve the results all of us are seeking.

It is with this thought in mind that I would like to direct my remarks to certain general principles that are common to most of the proposed legislation, although variously expressed in the different bills.

Most of the bills before this committee provide for interim safety standards, with the right in the Secretary of the Interior to promulgate additional standards and to revise them from time to time.

I believe it would be preferable that the standards set by Congress should be mandatory, not interim, standards, and that they should continue in effect until amended by the Congress. This would insure a separation of the legislative and enforcement functions, and in the area of safety regulation, I believe this separation is important.

However, if the Congress should choose to delegate its legislative functions, I would certainly question the desirability of delegating such sweeping powers to any one individual without adequate review provisions.

In some of the proposed legislation there is not even any appeal from a standard set by the Secretary, however unreasonable or unworkable it may appear to be.

It is true that a coal operator could refuse to comply with a standard set by the Secretary under this provision, thus subjecting himself to an appealable order and having the standard reviewed in such a proceeding.

But if our objective is to see that reasonable and workable standards are set, it seems highly inappropriate, that a coal operator must deliberately violate the standard in order to have its reasonableness and lawfulness properly tested.

There is now in existence a Coal Mine Safety Board of Review, a group composed of knowledgeable coal mining experts, representing the public, the men working in the mines, and the operators. This Board is already performing valuable functions under the existing law.

I would strongly recommend that it be given authority to review any proposed standards set by the Secretary before they become effective. In this way the desirability for quick action can be maintained and at the same time the propriety of proposed standards could be subjected to the scrutiny of an expert tribunal.

In addition any standards, however promulgated, should be subject to judicial review in the event their propriety is questioned.

The second basic principle to which I would direct your attention is the matter of penalties for alleged violations of safety standards. Unfortunately, except for those few who are familiar with coal mining, there is a complete misunderstanding with respect to these safety violations.

I would like to try to put this matter in proper perspective for I believe it is important to understand the nature and the real meaning of these alleged violations.

One should keep in mind that a large modern mine covers a vast area—indeed, it will be as large as many of our large cities.

The No. 9 mine in which the tragedy occurred was actually as large as Manhattan Island. Such a mine contains many hundreds of miles of haulageways, entries, and working sections. Scores of pieces of equipment are located throughout its vast working areas.

Equally important is the fact that the mine is always on the move as working sections advance, with the result that conditions in the mine are constantly changing. Even mined-out areas constantly change as earth pressures may cause both the bottom and top to shift in varying degrees.

A Federal inspection of such a mine will require as much as 3 or 4 weeks; conditions are thus changing daily during the very progress of the inspection itself.

It is also important to keep in mind that in such a mine the repeated Federal and State inspections are such that in any given year some inspector is in the mine at least 50 percent of the days the mine is in operation.

During the course of a Federal inspection, the inspector is looking primarily for two things: He is looking first for hazards that are of such a nature that they create an imminent danger. If he finds a hazard of this type, he has the right—and, indeed, the obligation—to shut the mine down immediately.

He is also looking for situations where conditions have so changed that in his judgment corrective action must be taken in order to prevent an imminent danger from developing. These constitute by far most of the violations for which the coal operators are cited and about which the public has heard a great deal in recent months.

The important consideration is that these violations do not involve an imminent danger; they are a determination by the inspector—often a matter of judgment on his part—that conditions have so changed at a given location that corrective action is needed if that portion of the mine is to remain in a safe condition.

I hope that my comments on this subject will not be misunderstood. I have no desire to condone any violation; I would hope we could achieve as near perfect conditions in our mines as our talents and our knowledge will permit.

To this end, our own supervisors and inspectors are constantly examining the mine for such changing conditions and taking the necessary corrective action to continue the mine in a safe condition, but in view of the many inspection periods to which a mine is subjected, and very properly so, and the area which the mine covers, one should expect that some of these changing conditions will be detected in the first instance by a Federal or State inspector.

Most of the bills before this subcommittee impose penalties on both the miners and the coal operators for any violation of the safety standards irrespective of the nature of the violation and irrespective of whether it could have been foreseen or prevented.

In the light of what I have already stated, I believe such a provision is grossly inequitable and quite unnecessary to achieve effective safety performance.

Certainly no penalties should be assessed against the men in the mine if violations do occur. Basically, the responsibility of seeing that the mines are operated safely and that safety violations do not occur is a responsibility of management.

As a part of that responsibility it is incumbent on the management to exercise the necessary disciplinary action if a particular individual is deserving of censure.

By far the best safety protection for our mines is the development of a proper attitude on the part of both our supervisors and our miners, working together, in promoting and carrying out safe mining practices.

Branding these individuals as criminals by imposing fines on them for alleged violations of the safety standards does not appear to me to be a sound method of encouraging the development of such an attitude.

Senator **Williams**. Does that include smoking in the mine where the presence of gas is known? Isn't that an individual matter? Maybe he is smoking and no one sees it.

Mr. **Corcoran**. We have that situation on rare occasions today, Senator. We would discharge such an employee if he were caught smoking and we have done so.

This is the disciplinary action to which I referred. In an extreme case of that sort, yes; extreme measures must be taken and we have, and we do discharge such an employee.

Incidentally, may I add to that, Senator, that the union and the mine workers wholly support this type of disciplinary action where a miner engages in such a wanton disregard of safety practices.

After all, their lives are at stake, too.

Senator **Randolph**. At that point, Mr. Chairman, what Mr. Corcoran has said in reference to the United Mine Workers of America was strongly indicated by Mr. Boyle, the president, when he appeared before our subcommittee. He covered this point and quite in depth.

Mr. **Corcoran**. Thank you, sir.

In providing penalties against coal operators for alleged violations, certain important considerations should also be recognized. Of perhaps greatest significance is the fact that the bills impose penalties for alleged violations even though no fault can be attributed to the operator or to anyone in the mine.

Let us assume that a haulageway has been properly rock dusted. A roof fall, wholly unforeseen, suddenly occurs. At that moment it is quite likely that a violation of the rock dusting standard has occurred since the roof fall undoubtedly caused the amount of incombustibles at that point to be less than 65 percent, as the law now requires.

Admittedly, the situation should be corrected as soon as it is discovered and penalties could properly be applied if remedial action is not taken, but it is certainly improper to apply penalties where no fault exists, and where the violation involves no lack of due care on the part of anyone in the mine.

The section I am referring to also provides that the Secretary may compromise any penalty and that in either assessing or compromising a penalty, he shall take into account the size of the business and the effect on the operator's ability to continue in business. Since our objective is the promotion of safety in all mines, I cannot subscribe to this approach.

I realize that penalties for minor infractions of the code could be a severe burden to any operator, but where dangers are involved that may threaten lives, and penalties may in a given situation be appropriate, I cannot accept the premise that size or financial condition should be given the slightest consideration in the enforcement of a safety law.

In order to meet all of these problems relating to penalties against coal operators, I would recommend that where a violation involves an imminent danger and neglect or fault, in the sense that the violation should have been reasonably foreseen or prevented by the operator, a specific penalty be imposed, but where these factors are not present, an opportunity to correct the situation be afforded prior to inflicting a penalty.

I would also suggest that all penalties be made public in the interest of uniform and vigorous enforcement.

With respect to the interim safety and health standards contained in the various bills, I have only one brief comment. Let me assure you again that we do support the basic goals which these standards seek to achieve.

But I would also point out that in arriving at any achievable safety or health goal, even the best of experts may differ as to how best to reach that goal. Since I am not technically qualified to discuss these standards, I will leave this subject to the technical experts who will appear before this subcommittee.

But I would urge that their testimony be given careful consideration, for I believe we will find that some of the proposed standards are not necessarily helpful in achieving safe working conditions for our employees, and that some of the suggested alternatives will actually improve the technical features of the proposed legislation.

Thank you very much, Mr. Chairman.

Senator WILLIAMS. Thank you very much, Mr. Corcoran.

Are there any questions?

Senator RANDOLPH. Yes, Mr. Chairman.

Mr. Corcoran, you are, I presume, informed as to statements made by the Senators who have introduced the several bills that are before the subcommittee.

The statements by the sponsors that even though they are introducing legislation they were presenting it generally as a base of study and consideration in these hearings.

I know of no individual sponsoring any piece of legislation who has indicated that the provisions of the measure introduced were nailed down, as it were, to that language and not subject to change.

Are you cognizant that the men have made these statements?

Mr. CORCORAN. Yes, I am, Senator. This, of course, is exactly why we want to present our views on some of the technical provisions. We honestly think we can improve some of the standards that have been suggested to this committee.

Senator RANDOLPH. Mr. Chairman, for the record, I would indicate that in the Senate, when Senators Javits and Cooper discussed the so-called Nixon administration proposal, they made it very clear that they reserved the right, as they studied this legislation, as it goes through the process of hearing, to think not in terms of just the language in that measure but what might best come out of this subcommittee.

I have said the same things a dozen times, perhaps, in connection with the introduction of S. 355.

Mr. Corcoran, you said that in addition to the State and Federal inspections under the coal mine safety laws the coal companies conduct their own internal inspections. I would hope that at this point you should emphasize or perhaps expand on that discussion.

Mr. CORCORAN. I would like to, Senator. We do, of course, a number of things.

First, and this one I have not touched on particularly in my statement but I would emphasize it, and that is the matter of training, the matter of safety education, and training of the men itself.

The Bureau does some of this. In our own company we do a great deal of it. We spend almost $2 million a year just in safety programs, training and education.

Senator WILLIAMS. What was your figure again, Mr. Corcoran?

Mr. CORCORAN. Just under $2 million a year in training and safety education.

We have every week before a section begins work, and this is every section in every mine, the foreman takes time out—it is on company time, the men are being paid for it.

Senator WILLIAMS. Is that for your coal company?

Mr. CORCORAN. For our company, sir. We spend some part of that first shift, whether it is the shift going in Sunday night or the shift going in Monday morning, or every shift, in every section, we take time out for some safety procedure, training the men.

We have other classes for supervisors and we spend a great deal of time in this area to train and educate the men on safety because, as I pointed out in my statement, as far as I am concerned, we can pass all the laws we want but if we do not develop the right attitude the laws are going to be rather meaningless. We must develop the right attitude.

Now on inspections, in our company, we are now in the process of completing some new mines and when they are completed we will have 53 coal mines. We have two division inspectors who cover the whole company.

In addition to those, we have 26 inspectors who spend full time inspecting our own coals mines. I think when you relate our performance to the fact that the Federal Bureau of Mines, I think, has only 250 inspectors, we have 26 plus two division inspectors in our own company.

They do a constant job of inspecting our own mines. Of course this is one of the factors, if I may say so, that has permitted us to maintain a record in spite of our recent tragedy, that is actually better than the safety record of manufacturing generally.

Senator RANDOLPH. Mr. Corcoran, how many are employed in the Consolidation Coal Co. and its affiliates in the State of West Virginia?

Mr. CORCORAN. We have 10,000 employees in the production of coal throughout our whole company and about half of these, a little better than half, would be in the State of West Virginia.

Senator RANDOLPH. Mr. Corcoran, you have had broad experience in coal mining. I realize you referred to the experts who accompany you this morning, but I wonder if you would, for the record, emphasize what you, yourself, as a practical coal executive, would do to improve the safety record?

Mr. **Corcoran.** I think we need four things, Senator. I think first we do need a new law, we need a strong law. But equally important, we need to see that that law is uniformily and vigorously enforced.

I emphasize again that the law should apply to all coal mines. I think this is part of the problem today, the fact that many mines are not subject to the rigorous inspection that this proposed law would entail.

So, I strongly recommend a law applying to all mines. I urge that the law be such that it will be vigorously and uniformly enforced.

Third, I would recommend, as I suggested in my statement, that we have much broader and more effective research in the area of safety.

As I indicated with the coal industry as fragmented as it is, while a few of us are able to do research on our own, the industry as a whole is not in a position to do this without Government assistance.

I would urge that the Bureau of Mines and that the Office of Coal Research get further into coal mine safety.

Fourth, again having mentioned this earlier, I emphasize it and it is terribly important, that we do more training, we do more education and we develop a better attitude toward safety in our coal operations.

I think those four things, Senator, would go a long way to improve the industry's record.

Senator **Randolph.** Mr. Corcoran, you talk of training, and we are reminded that there is need for additional coal miners in West Virginia and in the other States.

The coal miner who comes in, let us say, without technical knowledge of the industry, wishes to work for the first time. He probably has only a certain amount of general knowledge of the area, and perhaps members of his family have been employed there. What do you do to place such a man under training?

Mr. **Corcoran.** No. 1, we do test all of our applicants to make sure that they have the aptitude and the ability to work underground.

Having tested them and found those whom we feel have the opportunity to be a coal miner, and bear in mind, the coal miners today must have dexterity, they must have skills, they must be able to exercise judgment, in my opinion, it is a very skilled job as compared to what it was 20 years ago, we then have initial training programs where we show films, somewhat similar to what you saw this morning but, obviously, more oriented to showing what specific jobs entail.

Then we take the men underground to see whether they can adjust to working underground and put them with an experienced miner. They are never on their own.

We put them with an experienced miner for a number of months. During that period, those who we find can't adjust to the work, of course, withdraw.

Then after an initial period of several months while they are actually working with an experienced miner, we continue, of course, in training them in whatever field they seem to be interested, whether it is going in as a mechanic or learning to run one of the machines that you saw in the film earlier.

So that for the first several months they are undergoing an extensive training program, both through practical experience, by working with an experienced miner, and by attending the courses that we give them.

Senator RANDOLPH. Thank you, Mr. Corcoran.

What is the estimated need for miners at the present time?

Mr. CORCORAN. I would estimate over the next 10 years we are going to need about 30,000 additional coal miners.

Senator RANDOLPH. Is this caused by the miners becoming older?

Mr. CORCORAN. There are many retiring, plus the fact, as you are aware, that our production is increasing. Last year, we produced 545 million tons. This is increasing at a very substantial rate because of the tremendous growth in the electric power generation.

The utilities are still quite dependent on coal. I made a statement recently that by 1980, I visualize the coal industry having a capacity, a working capacity, usable capacity, of 700 million tons.

There is a tremendous growth here in the industry primarily because of the increased demand for electric power. We do need a great many skilled miners to be brought into the industry.

Senator RANDOLPH. Thank you, sir.

Mr. Chairman, I have two more questions. I appreciate the privilege of questioning but I do not want to attempt to take too much time.

You have mentioned the electric utilities, Mr. Corcoran. You have stressed the need in that part of the economy.

I have had some experience with conferences in reference to the long-term contracts for the purchase of coal, especially by electric utilities.

Would those contracts inhibit or perhaps prevent the coal industry from incurring the added cost of improving occupational health and safety in the mines?

Mr. CORCORAN. I would certainly hope not, Senator. Of course, I am not familiar with the contracts that other companies have. I am quite familiar with our own.

As to our own, some do provide that if we incur increased cost through abiding by new laws we can escalate the price. Others do not. But I think the public today is aware of the fact that the industry does have a problem that must be resolved and to some degree this resolution is going to cost money.

Knowing the utilities as I think I do, and the executives of the utilities, and knowing their interest in the sound development of the coal industry, and unless we have a safer industry we are not going to have a sound industry, I would hope and expect that the public would approve of the fact that if coal prices must go up, so must the utility rates go up, and this is the price we all must pay for a safe and sound coal industry that is so vital to the energy problems today.

Senator RANDOLPH. Mr. Corcoran, this final question: I wonder if you and your associates can give us this morning, or provide for the hearing record at a later date the comparisons of the investments made by the Federal Government, not State governments but by the Federal Government, on research.

First, on safety in nuclear energy, especially, I would say, as it relates to nuclear power.

Then secondly, for coal mine safety. I think that these figures would be helpful to our records.

Mr. Corcoran. I would like to confirm these figures, Senator, but offhand, I think the figures are these: It is my understanding that the Atomic Energy appropriations run in the neighborhood of $200 million a year for civilian atomic power. It has been over $2 billion for that purpose since the program started. Of that $200 million a year, it is my understanding that $35 million goes in directly to health and safety research.

Now as far as coal is concerned, talking strictly of the Government, the Office of Coal Research has a budget of about $13 million. Not one penny of that, not one penny of that, goes into health and safety research.

Senator Williams. What was that again?

Mr. Corcoran. Office of Coal Research.

Senator Williams. It is for product research.

Mr. Corcoran. Yes, it is engaged in researching new markets for coal and similar things but it has never been appropriated one nickel by Congress to get into the field of health and safety.

Now the Bureau of Mines does spend some money on health and safety research. Again, I would like to confirm these figures but my offhand recollection is that their budget for health and safety alone—I am not talking about the other things that the Bureau does such as inspection, but for research alone I think their budget is somewhere between $1 million and $2 million.

So, in Government funds we are talking, Senator, about something less than $2 million for coal.

Senator Williams. What is your company's figure on research, Mr. Corcoran?

Mr. Corcoran. May I just finish the first statement?

Senator Williams. Yes.

Mr. Corcoran. In coal, we are looking at Government funds of less than $2 million; in atomic energy, something in excess of $35 million in safety and health research.

Now, as to our own company it is difficult for me, and I am not trying to avoid the question, it is difficult for me to put a precise figure on it in the sense of exactly what are research expenditures for this reason and let me explain. When we develop a new mine, and a new mine today, say, will cost anywhere from $8 to $10 per annual ton, so a new mine producing 2 million tons a year will cost in the neighborhood of $20 million—as we design that mine all of our engineering work, much of our engineering work is in a sense research, because each time we build a new mine we try to devise better ventilation methods, each time we buy new equipment we are trying to find machinery that is safer.

We have in Columbus, Ohio, a division whose sole function is to take existing equipment and try to make it better and safer, or to develop new equipment that is better and safer than that which is now on the market.

The budget for that division is $216,000 a year. In addition to that, we have our own research division that is doing some of the things I pointed to earlier, such as developing hydraulic mining and so forth.

So it is difficult, Senator, to put a figure on research per se, but I will say that taking into account safety training, safety research, and safety practices, we spend about 50 cents a ton.

Last year, we mined just under 60 million tons of coal. So we spend a lot of money on safety.

Senator WILLIAMS. Is your projection to increase that figure for research within your own company?

Mr. CORCORAN. In research we are; yes, sir.

Senator WILLIAMS. Why couldn't the National Coal Association pool resources for research?

Mr. CORCORAN. They already are, Senator, to a degree. Mr. Garvey is here. He is president of Bituminous Coal Research. Up to not too long ago, the industry had no research effort as in industry.

Senator WILLIAMS. Until when?

Mr. GARVEY. Actually, our new laboratories were established in 1962.

Mr. CORCORAN. In the early 1960's. At that time we were able to convince the industry that research was an important factor if the industry was to survive, and Bituminous Coal Research built what is now a very fine research laboratory outside of Pittsburgh.

Mr. Garvey is president of the research arm. Sure, it is not enough. We must do more and we will do more, I hope, but it has been difficult because of this fragmented nature of the industry to secure the kind of support that is needed for industry research.

Bear in mind, as I mentioned earlier, that there are some 5,100 companies in the coal industry.

The National Coal Association, I think, only represents——

Mr. DUNN. Around 200, but 65 are now more or less merged.

Mr. CORCORAN. Less than 200 of these 5,100 companies. These are mostly small family companies. This is part of our problem. We do have an effective research arm today.

I would be the first to admit that we ought to be doing more.

Senator WILLIAMS. I am sure that any breakthrough you make, any findings in research, you would communicate to the industry.

Mr. CORCORAN. Yes, there is great cooperation within the industry on safety matters. Mr. Talman here, representing this group, who is going to touch on the technical problems involved, his company, for example, and ours, work very closely together, as do all the companies who are working in the safety area.

We have no secrets. If one of us develops something that looks like it is feasible and workable we very readily exchange information and try to see that it is adopted.

And also, sir, we make certain that the Bureau of Mines is aware of what we are doing and we exchange information and ideas with the Bureau.

We jointly work on projects with them that seem to have some hope of success.

Senator WILLIAMS. In other words, better safety is not a competitive area?

Mr. CORCORAN. No, sir.

Senator **Williams**. It is a cooperative area.

Mr. **Corcoran**. It is a very cooperative area, and we work very closely again in this area with the United Mine Workers because, after all, these are the people who are directly affected.

So in this one area our relationship with everybody in the industry is quite good.

Senator **Williams**. Gentlemen, have you any questions?

Senator **Bellmon**. Mr. Corcoran, you just mentioned that the companies work closely with the United Mine Workers on safety.

Actually, what role do the unions play in setting or enforcing safety standards?

Mr. **Corcoran**. They play a very important role. No. 1, in working with the Bureau of Mines on any revised legislation such as is before this committee, our own experts meet with the experts of the United Mine Workers of America and exchange views as to the best standard that can be suggested.

In the union mines, in every union mine there is a safety committee that actually has the authority to shut the mine down if they find a condition which they feel makes the mine unsafe.

I have found from our own experience that working with these people has been a great benefit in the sense that by working with them, encouraging them to carry out their obligations, I find that they do accept those obligations and do help us in improving the safety conditions in the mine.

So they do perform an important part.

Senator **Bellmon**. Mr. Boyle, in his testimony before the subcommittee last week, stated that if the miners safety committees objected to conditions, sometimes they lost their jobs as a result.

Mr. **Corcoran**. That has not been my experience; no, sir.

Senator **Bellmon**. The companies, in your opinion, do respect the suggestions of these safety committees?

Mr. **Corcoran**. Well, on this particular item, I would have to admit that I am not in a position to speak for other companies.

I only know what we do, we work closely with them, we cooperate with them because their lives are at stake, and they are the ones that should have a say on what is done and what is not done.

I have found in so many areas if you share that responsibility you find that they do respond and act responsibly.

Our experience has been quite good.

Senator **Bellmon**. How are these mine safety committees organized?

Mr. **Corcoran**. They are elected by the locals at that time.

Senator **Bellmon**. Management has no voice in establishing them?

Mr. **Corcoran**. No.

Senator **Bellmon**. If they come to management with a recommendation, is there any requirement that is to be followed?

Mr. **Corcoran**. We, obviously, would look into their suggestions. They do have a right, if it is a very serious nature that would affect the safety and create what is referred to in my testimony as an imminent danger, they would have the right to shut the mine down.

Normally, it is something less than that and in such a case we would sit down and discuss it with them and seek to resolve it by some agreeable solution.

Senator **Bellmon**. Your company operates in many States?

Mr. CORCORAN. Yes, sir.

Senator BELLMON. Do you operate under mining conditions that vary, I suppose, all the way across the industry; you do strip mining and deep mining?

Mr. CORCORAN. That is correct.

Senator BELLMON. You deal, then, with many State safety enforcement agencies?

Mr. CORCORAN. That is correct.

Senator BELLMON. As a general rule, could you tell the subcommittee whether or not the State mine safety laws are adequate or whether they are well enforced?

Mr. CORCORAN. The States in which we operate I think they are quite adequate and I think pretty well enforced within the budgetary limits that they have.

We operate primarily in Pennsylvania, West Virginia, Ohio, and Illinois.

Now we have mines in other States but those are the important ones. Based on my knowledge, I would say the laws there are really quite good and within their budgetary limits are reasonably enforced.

Now we always face the problem, Senator, that many of the smaller mines, because they are back in the hinterlands, do not get as many inspection trips as some of the larger mines.

I do not say this critically but as a matter of fact. This is also one of the prices you pay for lack of budget to have enough inspectors to cover the whole industry.

I think this is part of the Bureau of Mines' problem, that with all the mines we have in this country they have, I think, around 250 inspectors. That sounds like a lot but if the requirement is that you inspect every mine in the country three times a year and you have just about 6,000 mines, 250 people do not go very far.

Senator BELLMON. Is it your judgment that this committee will be able to devise mine safety laws or a law that will equitably apply to a wide variety of mining conditions across the country?

Mr. CORCORAN. Yes, sir; I do think so.

Senator BELLMON. You feel we can?

Mr. CORCORAN. Yes, sir; I do.

Senator BELLMON. You feel this is an area that should not and cannot be left up to the States and local government to control?

Mr. CORCORAN. I think there is some advantage in having uniformity. This is why I think this committee has a better ability to effect a broadened safety posture for the industry than the States would have because there is no question, some State laws are stronger and more vigorously enforced than others, whereas, Congress could apply a uniform law that I would hope then would be uniformly enforced.

Senator BELLMON. If we write such a law will it, of necessity, be a specific law or be a broad law and might it have the effect of making mining impossible under such conditions? Is this a danger?

Mr. CORCORAN. Yes, I think there are some dangers, obviously. I would like to point up, and Mr. Garvey will testify to this a little more, as I read this bill there are three categories of provisions.

One is those things that all of us agree should be done regardless of what it might cost. There are safety standards that are sound, realistic, entertainable.

Secondly, we will find some provisions in this bill as Mr. Talman will testify, that while they sound good they really won't improve safety, and I think you would want to take a serious look as to whether those things should be adopted.

In the third category, and, unfortunately, there are some in the third category, there are some provisions in this bill that in all honesty I think will do more harm than good, and I think this subcommittee should take an awful good look at some of these things.

Let me give you an example. There is a provision in this bill that says the face areas should be adequately illuminated. Now, on paper this sounds like a wonderful thing to have miners working in a room as well lighted, for example, as this auditorium.

But this is a terribly dangerous thing, actually, because you have men—and we have tried this and the men asked us please take it out—if you have ever driven down a highway on a sunny day and suddenly driven into a tunnel, there is a moment of time when you are literally blinded and you can't see.

If you had a face area illuminated like this room is, you would have men going from the more dimly lighted areas into the bright areas and I would suggest, sir, that this would cause more accidents than it will ever prevent.

Secondly, we are doing everything we know how to do to eliminate ignitions at the face because if you are going to have a disaster you first must have an ignition plus a few other things.

The worst thing in the world is to be bringing more electricity to the face that could conceivably cause another ignition.

Now I merely cite this—there are not many but there are a few like this that Mr. Talman will touch on—that in all honesty we think will do more harm than good. This is a thing that I hope this commitee will take a serious look at and if our objective is, and I know it is, to improve safety, let us be awful sure that we do not adopt some provisions that in all honesty could readily do more harm than good.

Senator BELLMON. Is it your opinion, then, that this committee should be concerned primarily with the broad purposes of assuring mine safety and leaving some of the specifics up to State governments or how do we get to the problem of having adequate safety without making the operations of some mines impossible?

Mr. CORCORAN. I think if this committee would take this bill and recommend to the Congress the many provisions that do genuinely indicate an improvement in safety standards, that that will be a great benefit to the industry and to the public.

It will improve safety, there is no question about it, if the law is uniformly enforced. And I get back to this point, that if the law is passed there also must be uniform and vigorous enforcement if it is to be meaningful.

Senator BELLMON. Thank you, Mr. Chairman.

Senator WILLIAMS. I thought one of your points was the National Congress should be more specific and less willing to delegate its legislative authority to the Bureau?

Mr. CORCORAN. That is right. One reason for that, sir, is the fact that in developing a mine we must plan ahead. We must start today if that mine, for example, is to come into production 2 years hence, so the engineering planning, design, everything that goes with it, both from the standpoint of production and safety, must be done months ahead of the time that the mine comes into production.

I see a great deal of advantage to both the Congress and the industry in having a fixed set of standards that we know we are going to be able to live with so that we can plan ahead.

This is one of the reasons I recommended that the Congress do it. On the other hand, as I suggested, if the Congress chooses to delegate this problem I do think at the very least it should be subject to review by an expert tribunal that can measure with their knowledge whether these provisions are truly going to improve safety.

So the type of thing I mentioned in connection with illumination won't creep into a regulation when I think the experts would pretty well concur that it is not going to help safety, in fact, it may impair safety.

Senator WILLIAMS. Senator Schweiker.

Senator SCHWEIKER. Thank you, Mr. Chairman.

First, I would like to say that I am sorry I was delayed. I was testifying in behalf of my electoral reform bill before the Constitutional Amendments Subcommittee so I could not be here earlier. I do want to ask a few questions.

You mentioned in your testimony about the research efforts of your company. I was wondering, first of all, if it is possible to categorize or classify the kind of accidents that either are most frequent or are most serious in terms of fatalities, the types of accidents that are most often serious in results? Is this possible to do?

Mr. CORCORAN. Yes. Absent a great disaster like Farmington, which, fortunately, does not occur very often, generally speaking, Senator, the majority of accidents are falls of roofs.

Now I do not have the national figures—I am sure they are available—but I do have figures of our own company and since we do operate in as many States as we do and do produce approximately 60 million tons a year, my guess is that our experience is fairly typical of the industry.

During 1968, for example, the No. 1 cause of accidents and fatalities other than the Farmington matter was roof fall at the face, primarily at the face.

Senator SCHWEIKER. Primarily where?

Mr. CORCORAN. At the face.

Senator SCHWEIKER. Now you mentioned several areas of research that you are undertaking. Is there any type of research on this problem?

Mr. CORCORAN. There certainly is. This is one that is a great problem in our company. We are doing both scientific research in the sense of trying to study the cause and result of earth stresses in mines, to find out how better to mine these coals so that these roof falls will not occur.

Also, Mr. Talman will show graphically by pictures and by description some research efforts that have already been put into use in some mines, of facilities, both from the standpoint of roof control and from the standpoint of protecting the men who are running these machines, that if a roof fall does occur they will not suffer serious injury.

Senator SCHWEIKER. Is the Federal Government at this stage in a research program undertaking any roof fall investigations, to your knowledge?

Mr. TALMAN. Yes, sir, they have a section on that, improving the roof support program, mainly oriented to roof bolting.

I believe we will show later that a further extension of that is in the offing and is being extended and I am certain they will get into that as well.

But this small section devotes its time to the roof control program in their research.

Senator SCHWEIKER. Mr. Corcoran, I have one other area of questioning.

In terms of the dust problem, again, this is a little bit looking ahead, perhaps more subjectively than objectively, but in terms of the dust problem, do you think that the answer here lies in a face dust collection system or in the pulse water jet idea of cutting coal?

I mean looking ahead.

Mr. CORCORAN. Looking ahead, I think it could well be a combination of both. As you know, Senator, we have all kinds of coal not only in Pennsylvania but in other States.

Some coal creates a great deal more dust than other seams of coal. I think initially the answer will come, number one, by devices to take the dust away from the face so that the man operating the machine does not incur any serious dust problem.

Incidentally, as Mr. Talman also pointed out, we have machines today that do develop a stream of water at the face that allays a great deal of the dust.

We have in our company, and I know he has in his company, we already have put in, irrespective of the law, already put in separate vents at the face with auxiliary fans to draw off the dust so that the operator of the machine is not subjected to that dust.

In addition, we do issue respirators to all of our men and urge them where there is a dust problem that they wear them.

Now, this is the immediate answer to the problem. Jet sprays at the face, collecting the dust, and the use of respirators.

Long range, I would be very hopeful that the hydraulic mining, for example, could well be an answer and that, of course, would completely eliminate the dust.

Senator SCHWEIKER. You mentioned in your testimony, too, the Mine Safety Board of Review. I wondered if you could briefly explain what present role that plays in this area.

You made suggestions as to what it ought to do in the future but I wonder if you would tell this committee what it presently does in terms of this problem?

Mr. CORCORAN. First, I would like to point out the Board of Review today is composed of representatives of the operators, the men in the mines, mine workers, and the public, so it has the three representations.

Many times the mine is shut down by order of the inspector. Before it can be reopened, it must be approved by the Board of Review. Is that correct?

Mr. TALMAN. If appealed to the Board.

Senator SCHWEIKER. Do they supervise, for example, accident investigation or does this come under some other agency?

Mr. CORCORAN. I think the Bureau does that directly. On accident investigation, the Bureau of Mines works directly.

Senator SCHWEIKER. That is all, Mr. Chairman. Thank you.

Senator BELLMON. May I ask one additional question?

Senator WILLIAMS. Senator Bellmon.

Senator BELLMON. Mr. Corcoran, it occurs to me that as long as we have both the Federal and State responsibility on mine safety, there are two dangers. One is that there is danger of overlapping and; the second is that if we have two authorities responsible it is possible that neither one of them accepts the full responsibility.

Do you see any need for both Federal and State mine safety enforcement agencies?

Mr. CORCORAN. I will answer that this way, Senator. If the States have fairly uniform laws there would not be, but absent that I do see a need for Federal regulations so that there is some uniformity.

Senator BELLMON. There is a tendency, an understandable tendency, for States to make their laws as attractive as possible for the development of their own resources.

The danger is that if one State has a very strict mine safety law this is apt to cause operators perhaps to open new mines in States where the restrictions are less demanding.

Do you feel then that this committee concerning this legislation needs to be very strict in the standards we set up as a Federal law?

Mr. CORCORAN. As I said earlier, yes; I think they need to be strict to the extent they generally will promote safety. I think we must be awful sure that we are not adopting provisions that really are meaningless or in all seriousness would actually impair safety rather than improve it.

But to the extent they will genuinely improve safety, yes, I think we should have a strong law and I again urge it be rigorously and uniformly enforced. I think this is the question.

I think having State inspectors in there as well as Federal is a good thing.

This does not bother me one bit.

Senator BELLMON. Thank you.

Senator WILLIAMS. Just one final question.

You indicated a need in the future for 30,000 additional coal miners working the mines.

Mr. CORCORAN. Yes.

Senator WILLIAMS. In the future?

Mr. CORCORAN. That is right.

Senator WILLIAMS. What period of time did you project? I do not recall.

Mr. CORCORAN. I think that is 10 years, Senator. I would want to verify that figure but I think that is over 10 years.

Senator WILLIAMS. In your judgment, does this represent an industry projection of greater production, more mines opening, and greater activity?

Mr. CORCORAN. Yes; very much so. As I indicated, I think by 1980, we will have a coal production in this country of 700 million tons.

Senator WILLIAMS. Thank you very much. That is a very helpful statement.

Mr. Dunn, do you want to move us along here with your witnesses?

Mr. DUNN. Mr. Farmer will be the next witness. I have already introduced him. Thank you, Mr. Chairman.

Senator WILLIAMS. Mr. Farmer, welcome to the subcommittee.

STATEMENT OF GUY FARMER, WASHINGTON LAWYER AND FORMER CHAIRMAN OF NATIONAL LABOR RELATIONS BOARD

Mr. FARMER. Mr. Chairman and members of the subcommittee, in the interest of conserving the time of the subcommittee I will make my statement quite brief.

My name is Guy Farmer. I live here in Washington. I am a lawyer. However, I grew up in the coal mining areas of West Virginia, McDowell County.

My father, members of my family, worked in and around coal mines.

Senator WILLIAMS. You are appearing here in a representative capacity this morning?

Mr. FARMER. I am appearing here in a representative capacity as part of this group representing the coal association, yes.

Senator WILLIAMS. You are in Washington?

Mr. FARMER. Yes.

Senator WILLIAMS. As we get down to the more technical aspects you are only a phone call away.

Mr. FARMER. Yes.

Senator WILLIAMS. Can we count on later consultation with you?

Mr. FARMER. Yes, Mr. Chairman. I will be more than happy to assist in any way I can.

I have been requested to discuss the procedural aspects of the various bills that have been proposed. I am not going to get into the substantive or technical aspects of what the standards should be at all.

I just want to talk about procedural safeguards which we feel should go into this law and which we do not believe would in any way detract from the effectiveness of the law.

We have no intention of proposing gimmicks or procedural devices or attempt to defeat the effective administration of the law.

Our proposals are all related to what we think are fundamental questions of fairness and due process in the enforcement of the law and which I believe, generally, most people would agree are appropriate and should be in here.

Now in listening to Mr. Corcoran, who not only is knowledgeable about the coal mines but also a very knowledgeable and outstanding lawyer in his own right, I find that he has already covered to a large extent some of the major points that I was going to make on these procedural issues and, therefore, this is an additional reason why I do not think it is necessary for me to belabor these points.

I will just simply state what they are and answer any questions that you might have.

First, we in the industry would prefer that the standards, safety and health standards, be incorporated by Congress into the law.

This would be our preference, the preference of the industry, so that we would know definitely what the standards are and these would be promulgated by Congress.

If, however, Congress does not see fit to take this approach but delegates to the Secretary of Interior the promulgation of standards, then we think two things should be added to the bill.

We think that in the devising of the standards that the Secretary should have all of the help and advice that is available from any area that would be helpful in the development of standards and for this reason we believe that the provisions of the Administrative Procedure Act relating to rulemaking and which apply generally throughout all administrative agencies should be made applicable to the promulgation of safety and health standards.

Now, these provisions are not cumbersome, they do not impose any particular burden on the Secretary. All they would require is that he would give notice of what standards he proposed, publish those in the Federal Register, and then provide for any party who is interested in these standards to make written comments to him within a specified period of time.

Either objecting or agreeing, or proposing different standards, and then would require that there be a hearing, a public hearing, at which these matters could all be considered and discussed.

This is basically what the hearing procedures of the Administrative Procedure Act require and we think it is in the interest of having the best standards that these procedures should apply to the action of the Secretary in devising and promulgating standards.

Second, once the standards are promulgated by him, we believe that these standards, again in the interest of equity and fairness, and in the interest of coming up with the best standards, to avoid anything that is unnecessary or capricious or unduly burdensome, that there should be provisions for the review of these standards.

In none of the pending bills is there provision for review of standards. We think that no one person, the Secretary of the Interior or no other Government person, should have all of this tremendous authority, because this is really a legislative authority that is being delegated to him. This is legislative.

We think that unless Congress is going to legislate, itself, if it is gong to delegate it to the Secretary, then there should be provisions for review.

We are very much concerned with having the review of these standards by the Coal Mine Health and Safety Board which was mentioned by Mr. Corcoran. This is a group of people representative not only of the industry and the employees but also the public, with a background of experience in the industry, in coal mining and safety, and we think we should be in the picture and should have authority to review these standards.

And also, as a final safeguard, while we do not think it would be used hardly at all, we think there should be a provision for appeal to the court if someone thought that a standard was particularly outrageous or unnecessary.

We do not think the court would get into this very much because it is so highly technical but at least as a constitutional safeguard we would like to have that final right of appeal.

Those are our major points.

Now we have one other that we also regard as a major one. Again, this was discussed by Mr. Corcoran and it really is not necessary for me to elaborate very much or even at all.

We do not think that there is a need for these civil penalties or fines in this legislation. It is true that every bill which has been introduced has such a provision which would apply in most of the bills against the operator, against any person in the mine who violated a standard.

We do not think these are necessary or even desirable. We think it puts a coating of criminal conduct on the operators and on the miners, and we do not think this is deserved.

We think it is better to, as Mr. Corcoran so ably pointed out, to try to build on an atmosphere of cooperation and voluntary action in these areas rather than a threat of heavy penalties on someone who may have violated the standard and not even known that it had occurred.

However, if these penalties or fines are going into the legislation and if that is the final judgment of Congress, we have a few other points that we would like to raise.

First, we do not think that the coal miner as already stated should be fined. We think the fine if it is going to fall should fall on the owner of the mine and no one else.

We do not think the fine should be compromised. We do not understand the concept behind compromising a fine. If a fine is deserving and is entered properly, we do not think that compromise should be made because this could cause uneven enforcement of the law.

We do not think individuals ought to be fined unless they are to be given the safeguards that normally surround criminal procedures, which are not provided here.

I say this by no means is without teeth other than these fines. There is a provision that anyone who wilfully violates an order issued by the Secretary under this law is subject to a criminal penalty, fine, and imprisonment.

We do not object to these provisions which I am now discussing, these criminal provisions. There are also provisions for injunction to be obtained by the Secretary in court for anyone violating any standards or any order.

So we think there is plenty of teeth already in this statute. As Mr. Corcoran has pointed out, if a coal miner violates a safety regulation he subjects himself to the ultimate penalty for him of loss of his employment.

We think that is sufficient deterrent in that area.

Passing on quickly, we believe that advisory committees should not be, as they are, discretionary with the Secretary. We think they should be compulsory or mandatory, that he have an advisory committee on the development of safety standards with which he should consult and we think that in addition to public members, technical people, medical people, and so on, that the practical coal operator and the representatives of the employees should also serve on this advisory committee.

On another point on the qualifications for inspectors, our people believe that the minimum qualifications for inspectors in the present law should be maintained which requires a certain number of years of experience in the coal mining industry before they can be named inspector, but we would suggest that anyone with an engineering degree should be given a 2-year credit on the 5 years required in order to qualify as an inspector.

We are concerned with another procedural point here and this is that when an inspector withdraws men from a mine there is an appeal to the Secretary within 30 days.

However, there is no time limitation on the Secretary's action, so he could sit on this appeal for 60 days, 90 days, or 6 months while this mine was closed down in a theoretical case.

While we do not think he would want to do that, we would like to place some time limit on the Secretary's action after an appeal is made to him so as to prevent undue delay in getting rulings on appeals from the actions of inspectors.

The point about State agencies has been brought up. Only one of the bills has any reference to State agencies in it and that is the latest so-called Hickel bill which does incorporate some provisions about cooperation with State agencies.

These provisions are somewhat similar to those which are in the present law under which the Secretary can approve a State plan for mine safety inspection and if he approves such a plan then in effect the provisions of the law are carried out by State people.

This is the way I understand it. Perhaps others know whether any State plan in the past has ever been submitted or approved.

I am not aware of whether that is true or not. But we think that a provision of this kind should be in the bill so that any State like Pennsylvania or West Virginia which wants to remain in the act, Safety Act, and they want to submit a plan for approval, and if they have the manpower to do it, we think they should be permitted to cooperate, and, therefore, we will endorse this particular provision which is in the so-called Hickel bill.

We would also suggest a provision in the bill which would provide that this bill, the Health and Safety bill for the coal mining industry, should be the only safety legislation of a Federal nature in this area so that we do not have duplication of safety regulation by Federal agencies.

We think this bill, if it is going to be a comprehensive bill, should encompass all the Federal safety and health——

Senator WILLIAMS. Who else would duplicate these regulations?

Mr. FARMER. There is, for example, the Secretary of Labor who under the Walsh-Healey Act has the authority to issue safety regulations governing employers who have government contracts and such safety regulations have been issued.

I understand they have also been temporarily suspended. I do not think they have been much of a factor. This is not a major point with us but just to have the thing clear, I think it would be a good thing for the committee to consider providing that this should be the exclusive bill relating to the Federal law governing safety and health.

I have filed a more complete statement. I will ask that that be entered. With that, I think this will complete my statement.

Thank you, Mr. Chairman.

(The prepared statement of Mr. Farmer follows:)

Prepared Statement of Guy Farmer, Washington Lawyer, and Former Chairman, National Labor Relations Board

My name is Guy Farmer. I reside at 3600 Macomb Street, N.W., Washington, D.C. I am a Washington attorney, a member of the firm of Patterson, Belknap, Farmer & Shibley.

I have for some years been counsel for the Bituminous Coal Operators Association and I appear today to discuss some procedural aspects of the coal mine health and safety legislation under consideration by this Committee. My remarks will be directed generally at the various bills pending before the subcommittee on this subject. These include the "Udall" bill (H.R. 4047 and S. 355), the "UMWA" Safety bill (H.R. 7747 and S. 1178), the "Hechler" bill (H.R. 6504 and S. 1094), and the Hickel bill recently submitted by the current administration (H.R. 7976). I will not deal with the substantive aspects of the legislation, but the procedural safeguards which I will propose should in no way detract from the effectiveness of any substantive provisions which the Congress may enact.

Our first proposal relates to provisions of the various bills under consideration (such as section 101 of the Hickel bill and section 7 of the Udall and Hechler bills) which empower the Secretary of Interior (or Labor in the Hechler bill) to promulgate mandatory health and safety standards for the industry.

As you know, the safety bill sponsored by the UMWA makes the safety standards a matter of statute and not one of regulation by the Secretary. The coal industry also supports the concept of statutory health and safety standards.

If, however, the Congress sees fit to follow a different approach and vest the power of promulgation and revision in the Secretary, we submit that Congress should require certain procedural safeguards to insure as far as practicable that this enormous and significant power be exercised with due deliberation and subject to appropriate review procedures.

One; we believe that the rule-making and hearing provisions of the Administrative Procedure Act should be made applicable to the promulgation of standards. There are no provisions for hearings on proposed health or safety standards or procedures for the review of the reasonableness of such standards in the Udall and Hechler bills. The Hickel bill does provide for some participation by the Federal Coal Mine Health and Safety Board of Review prior to the promulgation of any mandatory health and safety standards, but final authority to determine standards rests with the Secretary. This is a tremendous amount of legislative authority to delegate to one official, however well intentioned and conscientious he may be.

The rule-making provisions of the Administrative Procedure Act were enacted by Congress with the intent that they should be generally applicable to all agencies possessing rule-making authority, and certainly there is no justification for dispensing with these simple procedural requirements in the promulgation of industry-wide health and safety standards, which have heretofore been written into the statute itself. The procedures which we propose basically require only that the Secretary publish proposed standards in the Federal Register, and provide an opportunity for interested persons to present evidence, comments and suggestions at a public hearing for his consideration. Utilization of these rule-making procedures should aid the Secretary in developing the most appropriate and effective health and safety standards.

Two; we submit that the power to promulgate and revise safety standards, if vested in the Secretary, is so great and so important to so many people that the reasonableness and adequacy of the standards should be subject to review by the Federal Coal Mine Health and Safety Review Board and by the U.S. Courts of Appeal. Under the various proposed bills, review of standards could possibly be obtained by a refusal to obey an order based on an alleged violation of a health or safety standard, but this is an entirely unsatisfactory method of review and an undesirable one since it would force a mine operator into a posture of a violator of a specific order before he could obtain a review. The Federal Coal Mine Health and Safety Board of Review is a public body composed of representatives of the industry, the workers and public members who can be expected to have a great deal of first hand knowledge and expertise in the field of coal mine health and safety. Their participation in this vital program of developing standards should give added assurance that the standards will be reasonable and effective. We also believe that standards should be subject to judicial review.

We recognize that the Courts would defer to administrative expertise in this field and it would be a rare situation where the Courts would intervene, but we feel that this ultimate safeguard against arbitrary or capricious action should be available.

Turning now to another procedural aspect of the legislation in question we offer some proposals for consideration in connection with proposals to impose civil penalties. Under Section 16(a) of the Udall bill, for example, the Secretary, is given the unreviewable power to assess penalties, ranging from $500 to $10,000 against any mine operator who violates a mandatory standard. The Secretary may also fine any person working in a mine from $25 to $500 for violating a standard. In both cases the amount may be compromised. These fines are made recoverable in the U.S. District Courts, but presumably the validity or propriety of the fine would not be litigable in Court. The UMWA bill is similar to the Udall bill except it exempts miners from any penalties. The Hechler bill is similar to the Udall bill on this point, but it doubles the amount of the proposed penalties against both operators and miners. Under the Section 113(a) of the Hickel bill the Secretary is empowered to impose a civil penalty of up to $10,000 against mine operators for each violation of a health or safety standard. The Secretary is given authority to impose a lesser penalty. Unlike the Udall bill, however, the Hickel bill provides for review of the imposition of the fine and its amount by the Federal Mine Health and Safety Board of Review. However, there is no court review.

In considering these fines by the Secretary for violation of standards, it is pertinent to take into account the strong deterrent effect of provisions in all the proposed bills which provide for injunctions requiring compliance with orders and for stiff criminal penalties for failure or refusal to comply with any order for abatement or mine closure. We do not question these provisions. We do point out, however, that their presence alleviates the necessity for placing unreviewable or partially reviewable authority in the Secretary to impose, without trial or full review, additional fines for violations of standards. Since violation of a standard would normally result in an abatement notice or closure order, these injunctive and criminal sanctions for refusal to obey orders should be fully effective as a deterrent. For this reason, and for the additional reasons cited by Mr. Corcoran, there is an initial serious question of whether or not the proposed legislation should embrace civil penalties to be assessed against either operators or miners. We think it should not.

However, if this power to fine is to be given the Secretary, we submit that in fairness and in the interest of due process, these penalties should be made reviewable by the Federal Mine Health and Safety Review Board as is provided in the Hickel bill, and also by the Courts.

We have three other suggestions as to these fines. First, we do not think the Secretary should be empowered to compromise a fine if it is properly assessable. Second, we suggest that the fines should be restricted to the owner of the mine, who has the ultimate responsibility, and not be imposed on supervisors, foremen or workers. If individuals rather than owners are to be subject to fines, we believe that the individual is entitled to the full safeguards of the law surrounding criminal trials. Third, we believe that the fines should be imposed for knowing and wilful violations only. An abatement notice or withdrawal order seems more appropriate where the violation is unknowing and unintentional.

There are a few other technical or procedural suggestions which we would like to make.

One: we believe that "imminent danger" as defined in Section 3(i) of the Udall, UMWA and Hechler bills and 3(j) of the Hickel bill should be clarified. At present "imminent danger" appears to be related to the existence of a "condition" which could reasonably be expected to cause death or serious injury. For clarity, we suggest that "imminent danger" should be defined as the violation of any mandatory health or safety standard which would reasonably be expected to cause death or serious injury. This has the advantage of utilizing a definite, understood standard as against a vague and indefinite one.

Two: under the various provisions for advisory committees, we propose that the use of such advisory committees by the Secretary be mandatory, and that provision be made for operator and employee representation on these committees, as is the case under present law.

Three: we believe that the provisions of the present law (30 U.S.C. § 569) establishing minimum qualifications for coal mine inspectors be included, recognizing, however, a two-year credit toward the five-year experience requirement for the possession of an engineering degree from a recognized institution.

Four: under the provisions for appeals to the Secretary from orders issued by inspectors, we would propose to place definite time limits on the Secretary's action on appeals from withdrawal orders. The right to appeal can be effectively denied by the Secretary's delay in acting on an appeal of this kind.

Five: we believe that the record keeping provisions in any legislation should contain a provision safeguarding the confidentiality of records and reports provided to the Secretary by mine operators.

Six: we think that the provisions of the present Act regarding cooperation with state agencies and approval of state mine safety plans (30 U.S.C. § 472) should be retained to assure the States a continuing role in this vital area of coal mine health and safety. The Hickel bill does restore these provisions which were omitted in the Udall, UMWA and Hechler bills.

Seven: the industry is of the view that, in order to eliminate confusion and duplication of authority, the Federal Coal Mine Health and Safety Act should be the sole and exclusive legislation concerning this subject.

I wish to thank the Committee for allowing me to present these procedural suggestions.

Senator WILLIAMS. Thank you, Mr. Farmer.

Senator Eagleton.

Senator EAGLETON. Mr. Farmer, I would like to ask you one question which picks up a point raised earlier by Senator Bellmon addressed to Mr. Corcoran; namely, interrelations between Federal inspection and State inspection.

Assume Congress were to enact a strict, meaningful, and enforcible Federal law, and assume further that Congress were to adequately fund such a law so as to provide for frequent and uniform inspection by the U.S. Bureau of Mines, what function then would be served by State inspection under those two assumptions?

Mr. FARMER. I think clearly it would be less meaningful than it might be at the present time. I am not sure that Mr. Corcoran might not have a comment on this, too, but the only thing we are proposing here, actually, is that if a State comes forward with a comprehensive plan which meets Federal standards and they say we would like to have this plan approved and, therefore, administer the safety laws in this State, it would seem that that would be an appropriate type of Federal-State cooperation.

Senator EAGLETON. If my assumptions are valid and, of course, only time will tell on that as to whether the law was strict, or was uniformly enforced, or whether Congress appropriated sufficient money to have enough inspectors to do a thorough, complete uniform job across the board, what would there be for a State inspector to do?

We do not want duplication, we do not want conflict.

Mr. FARMER. Under the particular circumstances you mentioned in that particular State, the State inspectors would in effect be doing what the Federal inspectors would otherwise do.

Senator EAGLETON. Under the Hickel bill?

Mr. FARMER. Yes.

Senator EAGLETON. You were former Chairman of the NLRB. Of course, in the labor field there is the preemption doctrine.

Mr. FARMER. Yes.

Senator EAGLETON. Should not this committee or Congress consider perhaps preempting this field in the interest of uniformity?

Mr. FARMER. I think in effect the Hickel bill does that, because my understanding is the only State operation that would be allowable would be one that would be in complete conformity with Federal law.

It would just be a method under which the State could administer this Federal law in that State.

Senator EAGLETON. So if a State were hell-bent to be in this business and to have people on the State payroll to do the job, under the Hickel bill we would let them do it if that became law.

But if the State wanted to go to the needless expense in terms of appropriating State moneys to do it, then it would be the preemptive resolve the U.S. Bureau of Mines to do it in any event?

Mr. FARMER. Yes.

Senator EAGLETON. Isn't that a preferable way rather than having a whole hodgepodge of safety laws in our States? We are not a coal mining State in Missouri, and I am not sure that such inspection laws we have on the books have been too vigorously enforced in the State of Missouri.

Mr. FARMER. I think you are right. Perhaps some of the other people have had more practical experience.

Senator EAGLETON. Could I ask Mr. Corcoran to comment on that?

Mr. CORCORAN. Again, as I said earlier, I am not technically qualified on the subject but I do say this in all sincerity.

My one concern here is to have a strong workable law that really will promote safety. As long as we have that kind of law and it is uniformly enforced and vigorously enforced, then this certainly will satisfy what I think is the requirement of the industry today.

Senator EAGLETON. Then on your basic assumption which was really my basic assumption as well, if there were such a Federal uniform enforcible, meaningful law, would there be any necessity then for ancillary inspection by State agencies?

Mr. CORCORAN. Only insofar as it might supplement—on the premise you have made, I guess, the answer is no. To the extent it was not uniformly enforced there might be a need for State regulation.

Mr. DUNN. Mr. Chairman, I think Mr. Talman would like to comment further on that. He is an expert in the field.

Senator WILLIAMS. Mr. Talman.

Mr. TALMAN. There is an important point. Many of the State laws today are far more comprehensive than any of these proposed bills insofar as the standards in the law.

It is also true that in many of the States the frequency of inspection is much oftener, by law much oftener than even proposed here.

In the one State that has a State plan, the actual implementing of the plan by the Bureau or Department, although the law did not require it, did result in imposing duplication of effort by requiring that the State and the Federal inspectors inspect together throughout the mine.

Well, that seems hardly desirable. The law was broad enough, that the plan prepared, that the State had to meet, could have called for the qualifications which it should with the two inspectors inspecting a mine at the same time but not necessarily in company with each other every minute.

We do need the expertise and the background of the Bureau. So I see, and I think most mining people do, a very proper State activity and Federal activity. We do feel that if the rules were not written too restrictively to implement the law that this could be done without duplication and would be helpful to all.

Senator WILLIAMS. Senator Saxbe.

Senator SAXBE. Mr. Farmer, do you think there are any mines that are not in interstate commerce?

Mr. FARMER. I would think it is highly doubtful under the current constitutional definition of interstate commerce.

Whether there are any that are not in interstate commerce, whose operations do not affect commerce within the meaning——

Senator SAXBE. How about the captive mines?

Mr. FARMER. I think definitely they are in interstate commerce.

Senator SAXBE. How about the dog hole mines?

Mr. FARMER. There might be some dog hole mines where the coal is all mined and consumed within a State. It is possible, probably is true in most cases.

Senator SAXBE. Where the State would only have the right to intervene, inspect and set rules and regulations?

Mr. FARMER. Yes. I think that would be not a very significant number?

SenatorSAXBE. There are some, though?

Mr. FARMER. Yes.

Senator SAXBE. That is all.

Senator WILLIAMS. Senator Schweiker.

Senator SCHWEIKER. Thank you, Mr. Chairman.

Mr. Farmer, what present fields or areas of industry now use the Administrative Procedure Act?

In other words, you are suggesting that we use it here in this case. What other fields or lines of endeavors are now covered by the Administrative Procedure Act?

Mr. FARMER. It is quite a broad field. For example, it applies to the issuance of licenses, for example, through the FCC, radio, television licenses; to actions of the Civil Aeronautics Board in certificating air carriers, which is not a regulatory or licensing activity.

I am sure that there are others, numerous other agencies whose activities come under this act.

Senator SCHWEIKER. Does the NLRB use it?

Mr. FARMER. The NLRB is partially exempt from the Administrative Procedures Act in its representation cases, in its elections where it holds employee elections.

In those procedures because of the desire, I think, primarily to have a great deal of speed in holding elections, they are exempt.

As to other portions of the act relating to adjudication of cases, however, NLRB is covered by the Administrative Procedures Act.

Senator SCHWEIKER. Your other recommendation that we also tie court procedures into the process would concern me as to whether you would not tie up all the safety regulations pending in an appeal all the way up the line. How would industry know exactly where it stood at any given moment if any or all of these safety regulations would be subject to a complete court review?

Mr. FARMER. It would be our proposal that the regulations would become effective upon issuance, subject only to review, and it would be only if the court decided that that particular regulation was not in accord with the statute, then on the authority of the Secretary would it be set aside.

In other words, it would not be an automatic stay of any such standard pending any court review.

I think court review would be a very, very rare thing where you are dealing with technical standards.

But just a safeguard, a safety valve against what might be some really disastrous exercise of bad judgment by some Secretary of the Interior somewhere down the line.

Senator SCHWEIKER. I think there should be some check or some safety feature. I am not quite convinced that the court is the practical answer in this case.

Can you think of any other industry where you have regulations of this type as considered here that also has the court appeal procedures available to them?

Mr. FARMER. Again, I would cite the same ones I cited before.

The court appeal procedures are provided in all of those areas.

Senator SCHWEIKER. That is all, Mr. Chairman. Thank you.

Senator WILLIAMS. We could raise a question?

It would first go to the Safety Board of Review and be reviewed under the Administrative Procedure Act, and you would still get a court review?

What are we talking about?

Mr. FARMER. We are talking about a standard promulgated by the Secretary, a safety standard.

Senator WILLIAMS. You mean when the Secretary says 3 dust content per cubic meter? What could be the appellate procedure on that standard fixed by the Secretary?

Mr. FARMER. To the Mine Safety Board, which I think is the most meaningful. In fact, one of the bills provides that the Mine Safety Board participate in devising that standard.

We would like to have the Mine Safety Board actually look at it, listen to any arguments by the industry or anyone else, whether the standard is too high or too low, and then make a decision on the standard.

Senator WILLIAMS. That would be the first step on appeal.

Mr. FARMER. And that would normally be it. We are more concerned about that, Mr. Chairman——

Senator WILLIAMS. What are the possibilities under your proposal?

Mr. FARMER. The only other possibility would be to go to the court of appeals.

Senator WILLIAMS. You left out administrative procedure.

Mr. FARMER. No. That is all the Administrative Procedures Act would require.

Senator WILLIAMS. In other words, the fixing of percentage question would go to the Coal Mine Health and Safety Board of Review?

Mr. FARMER. Yes.

Senator WILLIAMS. That is carried in the administration bill. That is a Board that has been in existence and you have always supported it; is that right, as an industry?

Mr. **Corcoran.** Yes.

Senator **Williams.** The appeal goes to that Board. If you are dissatisfied, then does the court review it?

Mr. **Farmer.** Yes.

Senator **Williams.** What is the procedure now?

Mr. **Farmer.** The standards are in the statute; they are fixed by Congress.

Senator **Williams.** We are only talking about those situations where the Congress says to the Department, "You fix the standard; we are not saying 3, you determine," that kind of situation?

Mr. **Farmer.** Yes.

Senator **Williams.** That is as a Board of Review and a court test?

Mr. **Farmer.** Yes. I say I think a court test would be the most rare thing of all. It would begin with the standard and it would be the most extreme case that the court would have any interest in the issue.

We are more concerned with having the Mine Safety Board because these people are safety experts, and there is a provision for adding health experts.

We think it is very meaningful to have them review these standards. Otherwise, we come out with standards made by one individual, the Secretary of the Interior, or under one bill, the Secretary of Labor.

Senator **Williams.** Is there anything further?

Mr. **Dunn.** Mr. Chairman, our next witness is our research expert, Mr. Garvey. His testimony will concentrate on dust, dust standards, coal workers' pneumoconiosis. I think you will find his testimony is very helpful.

STATEMENT OF JAMES R. GARVEY, VICE PRESIDENT OF NATIONAL COAL ASSOCIATION AND PRESIDENT OF BITUMINOUS COAL RESEARCH, INC.

Mr. **Garvey.** My name is James R. Garvey, and I am president and director of research of Bituminous Coal Research, Inc., the research affiliate of the National Coal Association. I am also vice president, engineering and research, of NCA.

I appear today to present the suggestions of the bituminous coal industry in regard to several proposed bills, which would establish standards for concentrations of airborne dust in underground coal mining operations.

Mr. Chairman, I have a prepared statement, which I would like to have included in the record. With your approval, I am not going to read the entire statement. I will brief it and emphasize the main points, if this is satisfactory. May I just brief the statement, sir?

Senator **Williams.** Yes. I thought you asked permission to put it in the record. You are going to put it in the record yourself?

Mr. **Garvey.** I want to put the complete statement in the record, if I may, and let me brief it here so that we can save time.

Senator **Williams.** That is what I was going to suggest. Will you be reading page 14?

Mr. **Garvey.** I will cover every page. What I will do in my brief is adhere to the order of my prepared statement so that those members of the committee who wish to follow me can, but I will not state everything that is on every page.

Senator WILLIAMS. We have the ground rules. The whole statement will be included, and you proceed as you wish.

Mr. GARVEY. As in the case with the other safety standards proposed, as has been discussed here previously by previous witnesses, the coal industry is not opposed to dust standards for the protection of the health of coal miners; we agree they are needed. But we do believe that a constructive and planned program should be the basis for development of such standards rather than a hasty, arbitrary selection of numbers. A planned approach can lead to the development of effective dust standards needed to protect the health of miners, while at the same time enabling industry and government to cooperate in the work necessary, not only in the resolution of such standards but also in the development of methods for control and measurement of airborne dust.

On the other hand, the arbitrary selection of standards, unsupported by substantive evidence and unaccompanied by a definitive description of sampling and measurement techniques, can only lead to confusion in the attainment of the desired health objectives.

Illustrative of such confusion is the recent, near simultaneous proposals for dust standards by the several bills introduced in the Congress, and that related to implementation of the Walsh-Healey Public Contracts Act specified by the Department of Labor in the Federal Register, volume 34, No. 12, dated January 17, 1969. Some of the congressional bills call for a dust limit of 3.0 miligrams per cubic meter of air, while the Federal Register specified 1.6 miligrams.

Admittedly, the numbers in both instances are roughly comparable, the difference being the result of different measurement methods. But the facts (1) that two different numerical standards were proposed at almost the same time, (2) that there are no published data which relate either of these proposed standards to health effects resulting from coal mine dust, and (3) that the measurement devices needed to monitor the dust levels in the manner suggested are not currently in use by the coal industry of this country, are sufficient cause, we believe, for a thorough review of the problems involved.

High concentrations of respirable dust resulting from coal mining may very well be a health hazard, as the available evidence apparently indicates. But the level, above which adverse health effects occur, has not been determined.

It is urged that a dust standard be established in accord with the latest medical or other evidence related to dust exposure and the availability of reliable instrumentation for that dust measurement. Further, it is recommended that current technology for control of the dust generation during mining and for minimizing airborne dust distribution in possibly health-hazardous concentrations to other working places in the coal mine, plus the availability of personal protective devices for prevention of inhalation of potentially hazardous concentrations by the miner, be considered. In other words, we request that any law written take into account all the factors involved in achieving the objective, namely, health protection.

Senator WILLIAMS. You have your conclusion assuming all that? Do you have your conclusion in here?

Mr. GARVEY. Yes, sir; I will come to that. I would like to set a little background for this particular subject because we have to discuss what is the relationship of dust to health.

Now, gentlemen, I want to emphasize that I am an engineer and not a medical doctor. However, if we are to discuss the relationship of coal mine dust to miners' health, we must touch on the medical aspects because they are so important to an understanding of "what dust" we are talking about. But the comments I make on "health," while I believe them to be factual, are based on the reading I have done and the discussions I have had with medical doctors, rather than on any substantive medical expertise of my own.

In most health literature relating to dust and health effects, the medical term "pneumoconiosis" appears. The word is generic, meaning dust in the lungs. Medical evidence indicates that accumulation of excessive amounts of some dusts in the lungs over a period of years may result in development of a disease which is related to the type of dust inhaled.

For example, the accumulation of silica particles may result in a pneumoconiosis disease called silicosis; the accumulation of asbestos particles may result in a pneumoconiosis disease called asbestosis; the accumulation of iron oxide particles may result in a pneumoconiosis disease called siderosis. And more recent medical evidence, resulting from British and American studies, indicates that inhalation of coal dust may result in a pneumoconiosis disease referred to as coalworkers' pneumoconiosis.

But no matter what the form of the dust, it is important to keep in mind that, for a health effect to occur, the dust must be respirable. The fact that the dust is airborne is not sufficient because almost all airborne dust includes a considerable portion, by weight, of particles which are too large to be of interest in the causation of a pneumoconiosis disease.

The reason for the latter is that the respiratory system is an elutriator or filter which separates the inhaled dust into fractions. The coarser fractions are trapped in the nose, trachea, and other portions of the upper respiratory tract, while the finer fractions are carried to and deposited in the pulmonary air spaces (alveoli). Medical evidence of pneumoconiosis may appear as a result of excessive deposition of this finer fraction in the tissue around these minute pulmonary air spaces. This may later result in a disabling disease.

Many researchers have studied the mechanism of pulmonary deposition of dust, and the general conclusions have been well validated.

Senator WILLIAMS. You say you are not a doctor, but this is highly technical in medical terms, isn't it, this part of your testimony?

Mr. GARVEY. This is what I have read and from talking to doctors, not from my own expertise.

Senator WILLIAMS. While you admit you don't qualify as a medical witness, you will concede this is medical testimony that you are offering.

Mr. GARVEY. What I am saying——

Senator Williams. What you are saying is that some dust hurts and some doesn't.

Mr. Garvey. What I am saying is that some types of dust can reach the pulmonary spaces of the lungs, some types cannot, by its size. By "type," I mean size.

I believe, again referring to the medical evidence, which I am sure can be confirmed by medical experts, and we have suggested to the committee that they do get impartial medical experts to testify. A list, I believe, has been provided to the committee.

We would suggest doctors who have no connection whatsoever with the coal industry. We would suggest that this committee do discuss these medical aspects in more detail with those doctors. We have no qualified doctors of our own whom we are going to use in our testimony.

Senator Williams. You will be pleased to know we are going right to the citadel of objectivity, a man who studies and speaks in the interest of better health of the entire Nation, the Surgeon General.

Mr. Garvey. Very good.

Gentlemen, continuing, it has been demonstrated that few particles above 5 microns in size reach the pulmonary air spaces. (A micron is about $1/_{25,000}$ of an inch. As a rough index, bear in mind that a human hair is about 60 to 80 microns in diameter, 12 to 16 times the size of the largest respirable particle.)

Further, not all the inhaled dust particles are retained. One expert (Dr. J. D. Nagelschmidt) concludes from his studies that the highest pulmonary retention is at about 50 percent for particles approximately 0.7 to 1.8 microns in size, drops sharply to 22 percent for 0.25 micron, drops gradually to 18 percent for 5 microns and to zero for 10 microns. Therefore, since from the point of view of a pneumoconiosis risk only those particles which are retained in the terminal air spaces of the lower respiratory system are of concern, our dust problem primarily relates to coal particles in the size range 1 to 5 microns.

Until recently, medical authorities in this country did not recognize that the inhalation of respirable coal dust could result in a pneumoconiosis disease. It was believed that those miners who did develop disease symptoms acquired them as a result of inhalation of silica particles sometimes associated with coal dust. Since, in general, the silica content of coal dust in U.S. bituminous mines is 2 percent or less, considered to be below the value for the development of silicosis, the health problem of most bituminous coal dusts was not considered significant.

However, in the late 1930's, British medical researchers noted the prevalence of pulmonary disabilities in coal miners which was not related to the silica content of coal dust. This resulted in the instigation of a comprehensive study of the subject beginning in 1953 and still continuing.

Although the U.S. Public Health Service suspected health effects from coal dust inhalation as early as 1952, it was not until a prevalence study of coal workers' pneumoconiosis in the miners of the Appalachian region, started in 1963 and completed 2½ years later, that substantive evidence of possible health effects became available. The results of that study covering 4,000 coal miners indicated that for all working miners, 9.5 percent had X-ray evidence of pneumoconiosis, of which 6.5 percent were classified as the simple variety and 3 percent the complicated variety.

It is important to note that the total of all ages in the United States at that time was about the same as the current levels in Great Britain, where much research and study on this problem has been carried out.

I feel I must point out that while we are not attempting to minimize this problem, there has been a great deal of misstatement of facts by both the press and some self-styled experts in regard to the prevalence of coal workers pneumoconiosis in the United States.

Further, the evidence of coal workers pneumoconiosis revealed by the Public Health survey related the prevalence to years of employment in the mine, but it could not be related to coal dust concentration, because data on dust were not available. In other words, we do not know what amount of coal dust exposure causes disease. We do know that if you are exposed by working a number of years in the mine, you do have an effect.

Gentlemen, the coal industry has always been concerned by the coal dust, but until publication of the results of this survey in 1965 the concern was primarily about explosive, not respirable dust concentration. There is a substantial difference.

To prevent explosions, for example, in the presence of 1 percent methane, the dust should not exceed 0.05 of an ounce per cubic foot. It does not sound very much, but if we convert to the metric system, this is the equivalent of 50,000 miligrams per cubic meter.

Now, the disparity between some of the suggested standards of 1.6 or 3 miligrams per cubic meter and this 50,000 miligrams per cubic meter for explosive dust, we believe, is worthy of note. Dust concentrations which exceed the explosive limit are such that actual measurement is not necessary.

The preventative measures which maintain dust levels within the limit required for personal comfort and visibility range insure that the dust content is below the explosive limit.

As I will discuss a little later, the determination of respirable dust concentration is not so simple. We are talking about two different types of dust in terms of size and quantity, and they have little relationship one to another.

Now, some would have us believe that because of new coal mining machinery the exposure of coal miners to respirable dust is increasing. No one knows whether this is so, because there have been no comparable measurements made except some limited studies by the Bureau of Mines and by some coal companies.

The conclusion that the transition to continuous mining machines has caused an increase in exposure to respirable dust in coal mining operations has not been substantiated by the limited data which is available and, quite the contrary, appears to be true.

In the early 1950's the continuous mining machine was introduced in coal mining, and its use has increased ever since. There are several reasons for our belief and the belief by many other experts that such machines actually reduced the respirable dust exposure.

First of all, as has already been mentioned here this morning high-pressure water sprays are standard equipment on almost all continuous miners and are used to allay the dust as the coal is broken from the face.

In addition, with the continuous mining machine it is usually necessary to have greater quantities of air at the face than with past mining practices. This is to dilute and carry away the methane which is liberated in increasing quantities by the more rapid rate of penetration of these machines.

Increasing air flow to control methane also reduces dust concentration by carrying it away from the face and where the men are working. We certainly do not believe that return to former mine practices is justified.

A suggestion made in one of the bills before this Congress "that all coal to be mined should be first under cut, center cut, top cut or sheared" is contrary to what evidence we have on respirable dust exposure.

Gentlemen, I believe it is of interest to note that since it apparently requires, again referring back to my medical reading, 15 to 20 years for medical evidence of pneumoconiosis to appear, at least X-ray evidence, the health data obtained by the Public Health survey in 1963 probably relate to dust concentrations associated with methods of mining prior to the introduction of the continuous miner.

Now, dust in the respirable size range, 5 microns and below, is not visible to the naked eye. So visual observations of the total dust in the air are not adequate indicators of how much dust there is. To determine respirable dust levels, special sampling and measurement devices are necessary.

I think a brief examination or a review of some of these measurement devices used both in this country and in England, where much research has been carried out, is pertinent to this discussion, because they will be appropriately used in connection with any legislation that is enacted.

Now, the standard American instrument for dust measurement is the midget impinger. It is a simple device which draws air through a nozzle into a liquid. The dust is retained in the liquid, a small sample of this liquid dust mixture is placed in a cell, and particles in the size range of 5 microns and below are counted by means of a microscope, and then you get a recording of millions of particles per cubic foot of air sampled.

A somewhat similar instrument in Great Britain is called the thermal precipitator. The dust is collected, this time by means of thermal force. After the samples are collected, they are examined under a microscope, the particles are counted, the dust concentration is recorded as particles per cubic centimer.

Now, despite their widespread use in Great Britain and the United States, these two sample collection and particle-count systems have a number of recognized inherent weaknesses. Most significant of them is probably the fact that the microscopic particle counting for both instruments is a very tedious operation and, because of the variability in viewers' judgments, is subject to large discrepancies in count by two viewers looking at the same slide.These, disregarding the particle count problem, together with the fact that the most recent medical evidence indicates that mass or weight should be the controlling factor, have led to the development of an instrument which records by gravimetric means the sample as it is taken.

One such instrument and one mentioned in a number of the bills before this Congress is the Isleworth or MRE gravimetric sampler developed in England by the National Coal Board. This is a two-stage device which does, in effect, what our respirator system does. It screens out the coarse particles and only collects those fine particles which are referred to as respirable. These are collected in the second stage, the filter, and subsequently weighed and concentrations are expressed in milligrams of dust per cubit meter of air sampled.

There is a second instrument of this gravimetric type developed by the Atomic Energy Commission of the United States. It is also a two-stage device which screens out the coarse particles in the first stage and collects again the finer respirable dust particles on a filter, which is the second stage. This is weighed as a concentration of milligrams of dust per cubic meter.

There have been several other sampling and measurement techniques and instruments tried both in the United States and abroad, but I believe these four I have discussed will suffice to illustrate the type of instrument which is necessary.

Gentlemen, we have been talking about, and it has been mentioned several times, dust concentration in terms of 3 milligrams per cubic meter. I think most of us, including myself, although I am an engineer, have a difficult time recording milligrams in terms of something we can conceive. One milligram is 4/100,000ths of an ounce.

Now, I thought the committee might be interested in seeing what 3 milligrams of coal dust is. I have prepared these tubes, which you may use. Each one of these tubes, if you will tap it and shake it down, I think you will be able to see it, but each one of these tubes contains 3 milligrams of coal dust.

This is a much coarser dust than the respirable dust we are talking about. As the label shows, it is 74 by 110 microns in size. These particles are on the average 50 times as large as respirable particles.

Gentlemen, for the record I want to make it clear I am not attempting to mislead you. What these tubes contain represents the weight of coal which will be collected over one working shift by an MRE sampler, assuming that the dust level at the sampling point is 3 milligrams per cubic meter for that 8-hour period. Actually, the sampler will collect a much finer dust, the respirable dust, 1/50th the size of this dust. The weight will be the same, although it may look like more, because of its fineness, and it will be spread around inside the tube.

I think this is an important point that I want to make, that measurement of coal dust is not analogous to reading a light meter to determine what light intensity is. There is no instrument which will take instantaneous reading of the concentration of coal dust.

Two instruments have been discussed, the MRE is one of them, the one by the AEC is another. The MRE will take 8 hours to get a sample. It will collect that much material. The AEC will collect just a little over half as much of that material.

It should also be emphasized that all methods of dust sampling are empirical and there is considerable variation between the determinations made by the various instruments.

The use of such instruments by trained and skilled personnel is essential if the same results are to be obtained by several operators conducting tests in exactly the same environment. The location in which the sample is taken is also very important. Our interest is in that dust inhaled and retained by the coal miner. If the sampler cannot be readily worn by the worker, it must be so placed near him as to provide a reasonable sample of the inhaled dust.

Further, brief exposures to high dust levels are not of paramount medical importance. What is apparently significant is the average amount of dust inhaled over an extended period of time. In few instances is a coal miner exposed continuously to the same concentration, and these dust concentrations can vary widely throughout a mine.

Therefore, the sampling and measurement devices adopted must take into account the variables in dust exposure and produce a reading of the average exposure at a miner's breathing zone over multiple shifts.

Now, how do the proposed and in use standards relate to measurement methods and dust and inhalation? For the clarification of what may appear to be abundant confusion, I have prepared this table which is appended as the last page of my statement. I have titled this, "Summary of Proposed Standards and Measurement Methods." The following explanation will refer to that table. I will brief the statement that I have in the prepared text.

As you can see by looking at the table, four standards suggested or sponsored by various sources are shown on the left-hand column. The second column describes the method of measurement used in connection with the various standards and relates to the measurement method which I described earlier. The third column describes related dust standards in quantities as determined by that measurement method. And the fourth column is an attempt insofar as it is possible to relate all four standards to a common denominator for comparison.

The first standard listed is that of the American Conference of Governmental Industrial Hygienists, which periodically publish threshold limit values for toxic industrial material. Their latest publication does not specifically list coal dust, but it does include a value for nuisance dust. For this they specify a threshold of 50 million particles per cubic foot for a dust containing no quartz or silica.

Senator WILLIAMS. What does that mean exactly, "nuisance dust"?

Mr. GARVEY. This is the term they use.

Senator WILLIAMS. What does it mean?

Mr. GARVEY. It means just that. They have toxic materials listed for which they specify and recommend threshold limit values. All other materials are under the category of a nuisance. It has no specific health effect defined in the particular publication.

Senator WILLIAMS. It makes the eyes smart and the nose burn and the lips burn a bit, too?

Mr. GARVEY. Yes, rather than having a toxic effect, it has an irritant effect.

Senator WILLIAMS. It just makes you wish you were somewhere else.

Mr. GARVEY. The limit, as I said, is 50 million particles per cubic foot for dust containing no quartz, and for dust containing quartz the limit for silica particles per cubic foot can be derived from the following equation:

$$\frac{250}{\%SiO_2+5}$$

The method of sampling for determining these values is the Midget Impinger, followed by microscopic counting of the particles of less than 5 microns in size.

The second standard is the one the British coal industry utilizes, which is a standard developed by the National Joint Pneumoconiosis Committee of the British Ministry of Power. Using a system of multiple-shirt sampling, their standard ranges from 380 to 700 particles per cubic centimeter. The sample is obtained on a full-shirt basis by a thermal precipitator, and the particle count is again determined microscopically.

You will note in the far right-hand column of the table I have made no attempt to equate this standard, which is recorded in particles per cubic centimeter to particles per cubic foot. This is because it is not possible to relate reliably the particle count obtained by the British method to that by the U.S. Impinger method.

There are several reasons for this: One, the sample is taken some 75 to 575 feet downstream, where the miners are exposed, and, secondly, their method of particle count is very specific.

The third standard is one proposed by several bills introduced in the Congress. It refers to the 3 milligrams per cubic meter of respirable dust, specifically defined in the minus-7 micron size range.

As I pointed out earlier, one instrument which samples and measures this size range is the MRE gravimetric device. This instrument, while it was developed in England and experiments have been carried out with it in that country, it is interesting to note that it is not the instrument which they use for measuring dust concentrations. Their standards for dust control do not at present include its use. They still use the thermal precipitator and particle-count method of analysis.

We can approximately relate this third standard of 3.0 milligrams per cubic meter to 2 million particles per cubic foot as a result of some recent experiments which have been carried out by the Bureau of Mines. They have determined that under a rigid set of conditions for sampling and analysis of samples it is possible to equate this 3.0 by the MRE to approximately 27 million particles per cubic foot by the Impinger.

The Bureau has also found that this relationship is far from precise and variations of plus-or-minus 50 percent have occurred.

The final standard proposed by the Department of Labor in the Federal Register called for 1.6 milligrams per cubic meter of respirable dust. That is defined as a larger size in the minus-9 micron range. It is apparently, although not specifically, pointed out the intent to use the AEC gravimetric sampler, which measures in this size range.

We have also found there is some relationship as a result of the Bureau of Mines studies between the weight of material by the AEC sampler and the impinger; 1.7 milligrams being approximately equivalent to 27 million particles per cubic foot.

Again, they have found wide variations in trying to compare these two instruments.

Now, while there is some approximate correlation between the numerical values obtained by three of these four different standards and related instruments for measurement, it must be emphasized these are based on empirical and somewhat limited data. The manner in which the samples are taken, the point at which the instruments were placed, and subsequent analysis of the sample can have a tremendous effect on the results obtained.

You gentlemen will appreciate, if you realize those tubes contain such types of sample, you have some real problem in measurement and weighing.

Now, in opening this statement I urged that a planned program be the basis for control of coal miner exposure to respirable hazards. I think this quick review—I hope this quick review will illustrate the complexities of this problem, that you will appreciate such a planned program is the better approach. We make several recommendations to provide this planned approach. I would like to read them briefly.

Our first recommendation, Mr. Chairman, is that the Secretary of Interior should appoint an advisory committee on coal mine industry, consisting of representatives of the public, the coal industry, and the union, to advise him on development of standards for respirable dust content in coal mines, the instrument and procedures for measurement, and the frequency at which such measurements should be taken.

As I pointed out in my opening remarks, we believe we should set a standard now. We are not opposing the setting of standards. We think an interim dust standard should be set, one that will result in immediate improvement of dust conditions in coal mines.

Now, any number selected for this standard is going to be an arbitrary one. Since the only recognized basis for the selection of a number in this country is that developed by the American Conference of Governmental Industrial Hygienists, we feel it is appropriate to start with their recommended threshold limit value of 50 million particles per cubic foot measured by the Impinger sampler.

Senator JAVITS. My assistant says you said that this is the only standard, the one you referred to. What about the standard developed by the Public Health Service?

Mr. GARVEY. This has only been suggested. It has not been developed.

Senator JAVITS. In other words, you do not class it as a standard until it is adopted by the Public Health Service, is that right?

Mr. GARVEY. Yes, sir. They have, I believe, suggested a standard, proposed a standard, but I don't believe it has been adopted.

Senator JAVITS. Adopted by whom? Who would have to adopt it for it to qualify?

Mr. GARVEY .To become a regulation or in this case to become a part of the statute. Now their proposed number of 50 million does not include silica content. We feel that if one number is to be designated which will cover most of the bituminous coals in the United States, the selection of a number of 40 million particles per cubic foot would be appropriate. This would, from an empirical Bureau of Mines data, equate to about 2.5 milligrams per cubic meter of respirable dust determined by the AEC instrument or approximately 4.5 milligrams as determined by the MRE sampler.

Senator JAVITS. That is the nub of what you are testifying here, the real issue between the 3-milligram standard and 4½.

Mr. GARVEY. That is right.

Senator JAVITS. The industry contends 4½?

Mr. GARVEY. We are supporting the standard which has been suggested—I believe it is in Senate 1300 bill—which requires 4.5 milligrams per cubic meter standard, although we would have some suggestions as to how this would be measured.

Senator JAVITS. This is an interim standard. It takes effect in 60 days, but it is only an interim standard until we get to the three. Is there any bill here which says 4½ as the final standard?

Mr. GARVEY. No, sir.

I want to again call the committee's attention to the questionable reliability of converting one measurement to another. Whatever the number selected—and I think this is most important—whatever number selected as the standard, it should be related to the exposure of the miner at his breathing zone. It should be measured over some period of time to get a composite average of what he is exposed to.

We would say this should be at least one and probably two working shifts. Not all mines, because of their coal structure, their mining method, and so forth, are going to be able to meet even a 4.5-milligram standard, no matter what preventative action is taken. But there are devices, such as respirators, approved by the Bureau of Mines which remove over 97 percent of the respirable dust from inhaled air and assure complete protection of the health of the miner, even in the most dusty mines.

We think the act should provide that when all possible steps have been taken to comply with the standard, wheher it is set at 4.5 or ultimately at 3.0, and it can't be met, then provision for continuing operation of the mine should be possible by use of such a respirator.

Senator JAVITS. Do you have the respirators here?

Mr. GARVEY. Yes, sir.

Senator JAVITS. What is going to happen with all that on the table? When are we going to see that?

Mr. GARVEY. We are going to show this immediately following Mr. Talman's presentation.

Senator JAVITS. Let us see the respirator. We are not cramped for style. I wore a gas mask in the war. That is why I wanted to take a look at that. I was in the Chemical Corps.

Mr. GARVEY. This is one type of respirator which is currently available today.

Senator JAVITS. Can you put that on?

(Demonstration by Mr. Talman.)

Senator JAVITS. Do the workers object to using that?

Mr. TALMAN. Many of them use it on their own accord in the dustiest exposures.

Mr. GARVEY. Gentlemen, I would like to point out that there are other devices displayed here which are not the respirator type. There has been much research carried out in the development of other devices which will separate the man from the environment. These will be displayed.

Senator WILLIAMS. This is not like the pictures we have. This is self-contained.

Senator JAVITS. Is that an old type?

Mr. TALMAN. No, sir; that is the latest one. This is a different technique.

Senator WILLIAMS. This is just a filter.

Mr. GARVEY. That is right.

Mr. TALMAN. The other one in the picture is delivering absolutely clean air to his breathing zone at 70° temperature. Absolutely clean.

Senator WILLIAMS. This is much more expensive than the screen?

Mr. TALMAN. Yes, sir. One of the reasons is that at present the coal law provides for use of the respirator for intermittent exposure but not regularly. At the time it was written, the respirators were not highly developed. As you used them, it became more difficult to breath through. They have been improved.

This other thing that we will cover later is a means of putting that man in the best air he breathes 7 days a week.

Senator JAVITS. Do the men get any training for this? As I say, this is something within my own experience. I actually commanded troops and used gas masks.

Mr. GARVEY. We found in the field trial on that that the continuous miner operators who field tried it for 60 days, in a minute we did have them come up and select the type of face piece they preferred to wear. They could have this full mask, but this nasal one was the one they preferred.

I think the point we are attempting to make here in connection with this, so far as my testimony is concerned, is to have the legislation so written to provide the possibility of using devices like this in those instances where it is going to be impossible because of current conditions in mines to meet the standards which are being suggested.

Senator JAVITS. In other words, you don't want the legislation to require the use of these devices; or do you?

Mr. GARVEY. We want the legislation to permit their use in those places where by other means of control of dust, either by ventilation or water, you can't possibly get down to the specified limit. We would like to see it a mandatory requirement, possibly, that the man wear such a device when he is in such a place.

Senator JAVITS. In other words, you want it mandated where it is practicable.

Mr. GARVEY. Right.

Senator WILLIAMS. Several of our staff folks went to some of the mines in Pennsylvania yesterday. Were you equipped with any of these respiratory devices?

Mr. BLACKWELL. No; we had the emergency self-rescue unit that protects against smoke for 30 minutes.

Mr. GARVEY. I doubt whether you were at a working face exposed to this respirable dust.

Mr. BLACKWELL. We were pretty close, about 25 to 30 feet.

Mr. GARVEY. The air was probably moving behind you and blowing the dust away from you.

Mr. MITTELMAN. That is right.

Mr. BLACKWELL. This was in a dust problem area that we did view. We watched it developing, and we saw a working face. During the change of shift, there was dust. One of the men accompanying us, who had operated a motorcar, was out of the mines, did state that he had used the screening device during all of his work in the mines for 20 years. This apparently was a matter of individual choice.

Mr. Garvey. Respirators of the type you are looking at there will remove 97 percent of the dust that is respirable, the dust that we are talking about.

Mr. Blackwell. An independent supply of air?

Mr. Garvey. No; that is perfectly clean. The filter will take 97 percent.

Senator Williams. The small device that Senator Bellmon is examining now is the one you are talking about when you say it takes 97 percent of the dust.

Mr. Garvey. I would say the number of up to 97 or more percent. In other words, you could work in a dust concentration at a hundred milligrams per cubic meter of respirable dust, and you would not be breathing more than three.

Believe me, if you are in a room that has a hundred milligrams of respirable dust and it has other dust in it, you can't stay there, anyway. You can't see. This is very effective up to situations that will not be encountered anywhere.

Senator Williams. They are not standard equipment or required equipment for each worker?

Mr. Garvey. Not required.

Senator Williams. Are they available?

Mr. Garvey. They are available in most plants.

Mr. Corcoran. May I say we do issue respirators to all our miners at all our mines? Where there is a high-dust concentration, the miners do wear them.

Senator Javits. Our committee counsel says that that type of mask that we just looked at gums up and you have to wear two or three a shift. Is that correct?

Mr. Garvey. What you have in there is a replaceable filter. Two things happen when you inhale through this type of mask. Obviously, you coat the outside with dust. It can't reach your lungs. It is retained on the outside. Actually, the mask gets more efficient the longer you use it because you are building up a filter cake on the outside, which improves the filter ability of the mask, itself, but the resistance to inhalation becomes greater as this builds up. If you take the mask and tap it, you will knock off most of these particles and return not to one you originally had but to near the condition of breathing that you originally had. But the filter itself is a replaceable, very simply replaceable unit that the man can obtain additional quantities of. When it starts to build up, he can replace the unit and then have practically a brandnew mask.

Mr. Blackwell. Can he keep a supply of these on his person? As we observed the work, this would be possibly a difficult matter.

Mr. Garvey. In plastic basket containers it would be a simple procedure.

Mr. Blackwell. Tied on his belt?

Mr. Garvey. Or have it at an available place.

Mr. Mittelman. Some of them said it was difficult to breathe through the respirator and that was one reason they didn't wear them.

Mr. Garvey. You will have to admit wearing a respirator is an inconvenience. It is uncomfortable. We have found, as Mr. Corcoran pointed out, and I would like to point this out again—I was talking to one of his chief safety inspectors today. He has found since all this publicity on the so-called black lung, he has people wearing these things now who never wore them before, and they are wearing them in places in the mine where there is no dust.

I think it is the same problem we had with hard hats, the same problem we had with safety shoes. We start out with a safety protection device. The shoes are heavy, and the hard hats are uncomfortable. After a period of time everybody takes it for granted.

Senator WILLIAMS. This comes down to the seatbelt in an automobile. First, you have to get used to it.

Mr. CORCORAN. We have to keep that in perspective. A coal mine today is a tremendous area. In the vast majority of the areas in a coal mine there is no significant concentration of dust. Even at the face area, where the dust concentration could be and is frequently a problem, it is not a problem all the time, you see, because it is only a problem as the machinery is running and during a good part of the shift the machinery is not running.

So even where a man is wearing a respirator he would not be under the necessity of having to wear it a hundred percent of the time, even in this areas where dust is a problem.

I think we should keep in mind the dust problem is not peculiar to the entire coal mine. It is isolated in certain very small areas. Even in those areas it is limited to certain periods of time.

Senator RANDOLPH. Mr. Chairman, could I recap for Senator Javits, who was not here earlier today, the fact that Mr. Corcoran explained that the Consolidation Coal Co. mine area where the Farmington disaster took place, covers an area larger than Manhattan Island, just the one mine. That gives an idea of the extent of these underground operations.

Senator JAVITS. I am glad to know that. It is very revealing. It will be revealing to everybody on the committee.

We have a provision in S. 1300 which is mandatory with respect to the wearing of respirators. Will you be kind enough to examine that and write the committee a letter as to whether that does or does not meet the definition which you just gave of mandatory wearing?

Mr. GARVEY. Yes, sir.

Senator JAVITS. I ask unanimous consent that that be placed in the record at this point.

Senator WILLIAMS. Without objection, it is so ordered.

(The information subsequently supplied follows:)

MARCH 17, 1969.

Hon. HARRISON A. WILLIAMS,
Chairman, Subcommittee on Labor, Committee on Labor and Public Welfare,
Senate Office Building, Washington, D.C.

MY DEAR SENATOR: At the time I appeared before your Committee on March 12, 1969, Senator Javits asked that I comment on the provisions in Senate Bill 1300 regarding the mandatory wearing of respirators.

We believe the general provisions of that Bill are appropriate in regard to this subject, but we do suggest that some changes be made to take full advantage of the useability of such personal protective devices. First of all, we do not believe the language should limit such devices to respirators but should include all similar devices approved by the Secretary or his authorized representative. Further, the limiting of the use of such respirators to, as the language of the proposed Bill states, "only short term exposures" may be difficult to interpret.

While we agree with the apparent intent of the language of the proposed Bill to not make respirators and like devices a substitute for improved dust control in the mining operations, we do believe, as I brought out in my testimony, that in those instances where all applicable technology for dust control has been applied and the dust level still exceeds the prescribed standard, a miner may continue to work provided he is protected by approved personal device.

Sincerely yours,

James R. Garvey,
President and Director of Research.

Mr. Garvey. I have a few more points in summarizing our recommendations. I have already brought out the problems in connection with the use of measurement instruments, the techniques which are required and the complications which are involved. We would like to encourage the Bureau of Mines to continue the development of standardization of these instruments and the techniques for their use. We think they are the logical people to take the lead in this, and we think they should be so directed to do so, working with the Coal Mine Advisory Committee, which we mentioned earlier.

We also think the Bureau of Mines should institute training programs in the proper use of these instruments. This type of instrumentation, this type of measurement is not common to coal mines in the United States. Someone is going to have to learn how to do this and be in a position to teach men how to undertake these tests.

Another point that we want to emphasize is this idea of obtaining some correlation of medical evidence on dust exposure so that 10 or 15 years from now we will not be in the same position we are now, not being able to relate the quantity of dust to the health effect.

In connection with this we support the provisions of the several bills, I believe all the bills, which call for an X-ray or some type of medical examination of miners periodically throughout their lifetimes.

We also feel that the Secretary of Interior should, in consultation with the Advisory Committee on Mine Dust and other advisory committees as he may deem necessary, issue information on dust control techniques, techniques which are needed and necessary to achieve the levels which might be set forth in criteria or suggested standards by the Department of Health, Education, and Welfare.

Finally, we think that research on methods for producing coal with a minimum of dust should be expanded. Some of this was touched on this morning. There has been work done by the industry, work done by the Bureau of Mines, but such research is still minimal, and it should be an integral part of the Bureau's program of overall safety.

Most importantly, this work on dust control should be coordinated with the effort to minimize hazards from methane and dust explosions. This is necessary, we believe, because it is possible that you can defeat the purpose of respirable dust control by certain other measures taken to prevent other hazards. Thank you, gentlemen.

(The prepared statement of Mr. Garvey follows:)

PREPARED STATEMENT OF JAMES R. GARVEY, VICE PRESIDENT, NATIONAL COAL ASSOCIATION

Mr. Chairman and members of the subcommittee: My name is James R. Garvey and I am president and director of research of Bituminous Coal Research, Inc., the research affiliate of the National Coal Association. I am also vice president, engineering and research, of NCA.

I appear today to present the suggestions of the bituminous coal industry in regard to several proposed bills, which would establish standards for concentrations of air-borne dust in underground coal-mining operations.

The coal industry is not opposed to dust standards for the protection of the health of coal miners; we agree they are needed. But we do believe that a constructive and planned program should be the basis for development of such standards rather than a hasty, arbitrary selection of numbers. A planned approach can lead to the development of effective dust standards needed to protect the health of miners, while at the same time enabling industry and government to cooperate in the work necessary, not only in the resolution of such standards but also in the development of methods for control and measurement of air-borne dust. On the other hand, the arbitrary selection of standards, unsupported by substantive evidence and unaccompanied by a definitive description of sampling and measurement techniques, can only lead to confusion in the attainment of the desired health objectives.

Illustrative of such confusion is the recent, near simultaneous proposals for dust standards by the several bills introduced in the Congress, and that related to implementation of the Walsh Healey Public Contract Act specified by the Department of Labor in the Federal Register, Volume 34, No. 12, dated January 17, 1969. Some of the congressional bills call for a dust limit of 3.0 milligrams per cubic meter of air, while the Federal Register specified 1.6 milligrams. Admittedly the numbers in both instances are roughly comparable, the difference being the result of different measurement methods. But the facts (1) that two different numerical standards were proposed at almost the same time, (2) that there are no published data which relate either of these proposed standards to health effects resulting from coal-mine dust, and (3) that the measurement devices needed to monitor the dust levels in the manner suggested are not currently in use by the coal industry of this country, are sufficient cause, we believe, for a thorough review of the problems involved.

High concentrations of respirable dust resulting from coal mining may very well be a health hazard, as the available evidence apparently indicates. But the level, above which adverse health effects occur, has not been determined. It is urged that a dust standard be established in accord with the latest medical or other evidence related to dust exposure and the availability of reliable instrumentation for that dust measurement. Further, it is recommended that current technology for control of the dust generation during mining and for minimizing air-borne dust distribution in possibly health-hazardous concentrations to other working places in the coal mine, plus the availablity of personal protective devices for prevention of inhalation of potentially hazardous concentrations by the miner, be considered. In other words, we request that any law written take into account *all* the factors involved in achieving the objective, namely, health protection.

What is the relationship of dust to health?

I wish to emphasize that I am an engineer and not a medical doctor. However, if we are to discuss the relationship of coal-mine dust to miners' health, we must touch on the medical aspects because they are so important to an understanding of "what dust" we are talking about. But the comments I make on "health," while I believe them to be factual, are based on the reading I have done and the discussions I have had with medical doctors, rather than on any substantive medical expertise of my own.

In most health literature relating to dust and health effects, the medical term "pneumoconiosis" appears. The word is generic, meaning dust in the lungs. Medical evidence indicates that accumulation of excessive amounts of some dusts in the lungs over a period of years may result in development of a disease which is related to the type of dust inhaled. For example, the accumulation of silica particles may result in a pneumoconiosis disease called "silicosis"; the accumulation of asbestos particles may result in a pneumoconiosis disease called "asbestosis"; the accumulation of iron oxide particles may result in a pneumoconiosis disease called "siderosis." And more recent medical evidence, resulting from British and American studies, indicates that inhalation of coal dust may result in a pneumoconiosis disease referred to as "coal workers' pneumoconiosis."

But no matter what the form of the dust, it is important to keep in mind that, for a health effect to occur, the dust must be respirable. The fact that the dust is air-borne is not sufficient because almost all air-borne dust includes a considerable portion, by weight, of particles which are too large to be of interest in the causation of a pneumoconiosis disease.

One can consider the respiratory system as an elutriator or filter which separates the inhaled dust into fractions. The coarser fractions are trapped in the nose, trachea, and other portions of the upper respiratory tract, while the finer fractions are carried to and deposited in the pulmonary air spaces (alveoli).

Medical evidence of pneumoconiosis may appear as a result of excessive deposition of this finer fraction in the tissue around these minute pulmonary air spaces. This may later result in a disabling disease.

Many researchers have studied the mechanism of pulmonary deposition of dust, and the general conclusions have been well validated. It has been demonstrated that few particles above 5 microns in size reach the pulmonary air spaces. (A micron is about 1/25,000 of an inch. As a rough index, bear in mind that a human hair is about 60 to 80 microns in diameter, 12 to 16 times the size of the largest respirable particle.)

Further, not all the inhaled dust particles are retained. One expert (Dr. J. N. Nagelschmidt) concludes from his studies that the highest pulmonary retention is at about 50 percent for particles approximately 0.7 to 1.8 microns in size, drops sharply to 22 percent for 0.25 micron, drops gradually to 18 percent for 5 microns and to zero for 10 microns. Therefore, since from the point of view of a pneumoconiosis risk only those particles which are retained in the terminal air spaces of the lower respiratory system are of concern, our dust problem primarily relates to coal particles in the size range one to five microns.

Until recently, medical authorities in this country did not recognize that the inhalation of respirable coal dust could result in a pneumoconiosis disease. It was believed that those miners who did develop disease symptons acquired them as a result of inhalation of silica particles sometimes associated with coal dust. Since, in general, the silica content of coal dust in United States bituminous mines is two percent or less, considered to be below the value for the development of silicosis, the health problem of most bituminous coal dusts was not considered significant.

However, in the late 1930's, a British medical researcher noted the prevalence of pulmonary disabilities in coal miners which was not related to the silica content of coal dust. This resulted in the instigation of a comprehensive study of the subject beginning in 1953 and still continuing.

Although the U.S. Public Health Service suspected health effects from coal-dust inhalation as early as 1952, it was not until a prevalence study of coal workers' pneumoconiosis in the miners of the Appalachian region, started in 1963 and completed two and a half years later, that substantive evidence of possible health effects became available. The results of that study covering 4,000 coal miners indicated that for all working miners, 9.5 percent had x-ray evidence of pneumoconiosis, of which 6.5 percent were classified as the simple variety and 3.0 percent the complicated variety. It is important to note that the total for all ages in the U.S. at that time was about the same as the current levels in Great Britain. The USPHS study also indicated that both the simple and complicated varieties of pneumoconiosis were more prevalent among inactive miners, the older workers and those who had spent 20 years and more working in coal mines.

The evidence of coal workers' pneumoconiosis revealed by the U.S. Public Health Survey of the sample of miners in the Appalachian area related to the prevalence of the disease to *years of employment* in the mines. But it could not be related to *coal-dust concentrations* because data on dust were not available. The British program, which has been underway for 15 years, has the same problem; only recently have this data indicated correlations of any significance between dust exposure and human response, and they are as yet not conclusive.

Has the coal industry been concerned about coal dust?

The coal industry has always been concerned about coal dust. But, until publication of the results of the first extensive health survey of United States coal miners by the U.S. Public Health Service in 1965, the concern has been about explosive, not respirable dust concentrations. And there is a substantial difference.

The U.S. Bureau of Mines has determined that to prevent explosions in the presence of one percent methane, the dust content of the atmosphere in the size ranges 74 microns and below should not exceed 0.05 ounces per cubic foot. Converted to the metric system, this is the equivalent of 50,000 milligrams per cubic meter. Although almost all dust considered for a potentially explosive mixture is in the non-respirable range, that is, over 5 microns in size, the disparity between the standards of 1.6 or 3.0 milligrams per cubic meter limit suggested for respirable dust and 50,000 milligrams per cubic meter for explosive dust is worthy of note in the consideration of the total problem and the approach to its solution. Dust concentrations which exceed the explosive limit are such that actual measurement is not necessary; preventive measures which maintain dust levels within the limits required for personal comfort and visibility range sufficient for safe working around machinery, also insure that the dust content is below the explosive limits. As I will discuss later, the determination of respirable dust concentrations is not so simple.

Is the amount of dust in U.S. coal mines increasing?

Some would have us believe that, because of newer coal-mining machinery, the exposure of coal miners to respirable dust is increasing. No one knows whether this is so, because there have been no comparable measurements made except for limited studies by the USBM and some coal companies. The conclusion that the transition to continuous mining-machine use has caused an increase in exposure to air-borne dust in coal-mining operations has not been substantiated by the limited test data which are available; quite the contrary appears to be true.

In the early 50's, the continuous mining machine was introduced in underground coal mining and its use has increased ever since. These machines eliminate the cyclic functions of cutting, drilling, blasting, and loading, by breaking the coal directly from the face without the use of explosives and loading the coal directly into transportation vehicles such as mine cars, shuttle cars, or conveyors.

High-pressure water sprays are standard equipment on almost all continuous miners and are used to allay dust as the coal is broken from the face. Usually the coal is sufficiently wetted by the sprays on the machines. However, when necessary, additional sprays are used at transfer points, such as shuttle cars to mine cars or belts, and when belts discharge coal to other belts or to mine cars.

In addition to the standard spray practices, better dust control is achieved in continuous mining by increasing the quality of air sweeping the face. With the continuous mining machine, it is usually necessary to have greater quantities of air at the face than with past mining practices, to dilute and carry away methane which is liberated in increasing quantities by the more rapid rate of penetration of these machines. Increasing air flow to control methane also reduces dust concentration by carrying it away from the face and into the return airways; particularly when line curtains are installed, a practice which has become increasingly prevalent.

We do not believe that the data on dust generation, however limited, indicate a return to former mining practices is justified. And the suggestion made in one of the bills before this Congress "that all coal to be mined must first be undercut, centercut, topcut, or sheared" is contrary to what evidence we do have on dust production. The evidence indicates that the coal cutting-machine operator may be exposed to one of the higher levels of dust found in a mine.

It is also of interest to note that since it apparently requires 15 to 20 years for medical evidence of pneumoconiosis to appear, the results obtained by the U.S. Public Health survey of Appalachian miners in 1963 probably relate to dust concentrations associated with methods of mining prior to the introduction of the continuous miner. And the fact, mentioned earlier, that the prevalence rate of coal workers' pneumoconiosis in the United States is apparently now about the same as in Great Britain despite the fact that the U.S. coal miner produces 6 to 10 times as much coal per day as does his English counterpart in their mechanized mines, is evidence that our dust problem is not comparable to theirs.

Mining equipment companies, in cooperation with the coal-mine operators, are investigating such devices as vacuum dust collectors and separators for use in conjunction with mining machines, improved cutting bits for use on the machines to reduce the amount of fine dust produced and improved methods for providing the required quantity and directive force of water sprays at the points where the cutting bits are striking the coal so as to wet the small coal particles immediately upon formation. Research in the development of dust suppression has been accelerated in recent years and it is anticipated that continued effort will result in substantial further improvement in the near future.

What are the available means for respirable dust measurements?

Dust in the respirable size range of five microns and below is not visible to the naked eye, and visual observations of the total dust in the air are not adequate indicators of that amount which is respirable. The average eye cannot see a particle smaller than 40 microns. Therefore, special dust sampling or measurement devices are necessary. Since we are concerned with those particles in the respirable and below visible sizes, the dust sampling and measuring devices must reject particles too large to penetrate the deeper portion of the lung and collect only those in the respirable, minus 5 micron range for analysis by either counting or weighing. A brief examination of some of the measurement devices used in this country and in England, where much research has been carried out, is pertinent to this discussion.

The standard American instrument for dust measurement is the Impinger and is more commonly used in the smaller model referred to as the Midget Impinger. The instrument has high collecting efficiency of particles down to one micron. Air is draw through a nozzle, the end of which is immersed in a liquid. The dust is wetted by means of high velocity impingement on the bottom of a flask and is retained in the liquid. A small portion of the liquid-dust mixture is placed in a cell and the particles in the size range of minus 5 microns are counted by means of a microscope and recorded as particles per cubic foot of air sampled.

The standard instrument used in Great Britain is the Thermal Precipitator. It consists of a heated wire mounted between two microscope slides on which the dust particles are deposited in a strip about one millimeter wide. The deposition is accomplished by the principle of a thermal force, induced by the heat of the wire, repelling the particles in the air to the glass slides. After the sample has been collected, the slides are removed and placed under a microscope for particle counting of those sizes in the 1–5 micron range. The dust concentration is recorded as particles per cubic centimeter.

Despite their widespread use in the United States and in Great Britain, respectively, the two aforedescribed sample collection and particle count systems have recognized, inherent weaknesses. Most significant of them are (1) the difficulty in distribution of a representative sample on the microscope slide in the Thermal Precipitator (the particles tend to overlap one another and rest on top of each other, thereby making selective counting difficult), (2) the fracturing of particles, and consequent misleading readings, in the Impinger, and (3) the microscopic particle counting for both instruments is a tedious operation and, because of variability in the viewer's judgment, is subject to large discrepancies in the count by two viewers of the same slide. In addition, the sampling conditions encountered in coal mines can introduce instrumental errors greater than any of these. It is probably these difficulties together with the most recent medical evidence, indicating that mass, or weight, rather than particle count is more nearly related to health effects, which have resulted in intensive studies by the National Coal Board and the Safety in Mines Research Establishment scientists in Great Britain as well as scientists in our country on gravimetric (by weight) methods of dust assessment.

One such instrument is the Isleworth or MRE gravimetric sampler developed in England by the National Coal Board. This is a two-stage device, the first stage of which is a horizontal elutriator which removes the nonrespirable, coarse particles described earlier. The second stage is a membrane filter which collects the respirable fraction of the dust which is subsequently weighed. Concentrations are expressed in milligrams of dust per cubic meter of air sampled. With this instrument the sampling and weighing includes all particles less than one micron, over 90 percent of the 3 micron, 50 percent of the 5 micron and none of the plus 7 micron sized particles in the air.

A second instrument of the gravimetric type is the sampler developed by the Atomic Energy Commission of the United States. It is also a two-stage device; a small cyclone performs the same functions as the elutriator in the Isleworth instrument, and the penetration curve of the cyclone is in close agreement with the size criterion of respirable dust. A membrane filter is used as the second or collecting stage and is treated in the same manner as filters from the Isleworth unit. Concentrations are again expressed as milligrams of dust per cubic meter of air sampled. With this instrument the sample includes 90 percent of the 2 micron and less, 75 percent of the 2.5 micron, 50 percent of the 3.5 micron, 25 percent of the 5 micron and none of the plus 9 micron sized particles in the air.

Several other sampling and measurement instruments and techniques have been tried in both the United States and abroad. However, I believe the foregoing will suffice to illustrate the type of instrumentation which is necessary, especially since it is with the use of these instruments that proposed levels of dust now under consideration will probably be determined.

But, it must be emphasized that all these methods of dust sampling are empirical and there is considerable variation between the determinations made by the various instruments. The use of such instruments by trained and skilled personnel is essential if the same results are to be obtained by the several operators conducting tests in exactly the same environment.

The location at which the sample is taken is also most important. Our interest is in that dust inhaled and retained by the coal miner and its harmful effect on breathing capacity. If the sampler cannot be readily worn by the worker, it must be so placed near him as to provide a sample representative of the inhaled dust. Further complicating the method of sampling and measurement in connection with exposure of the miner to dust, is the fact that, from a medical standpoint, brief exposures to high dust levels are not of paramount concern. What is apparently significant is the average amount of dust inhaled over an extended period of time. In few instances is the coal miner continuously exposed to the same dust concentrations and the dust concentrations can vary widely.

For example, some time studies have shown that on the average the operator of a continuous mining machine in a bituminous coal mine spends about 60 percent of his time in areas of relatively high-dust concentration and the remainder of the time in areas of low concentration. Other workers, whose duties require movement, may be in high-dust concentration areas for even less time. Therefore, the sampling and measuring devices adopted must take into account the variables in dust exposure and produce a reading of the average exposure of the miner's breathing zone over multiple shifts.

How do the proposed and in use standards relate to measurement methods and dust inhalation?

In my opening comments, I referred to two proposed standards for respirable dust in bituminous coal mines, namely, the 3.0 milligrams per cubic meter proposed in some proposed bills, and the 1.6 milligrams per cubic meter proposed for the Walsh Healey Public Contract Act in the Federal Register. I believe further discussion of these standards, and others which are relevant, and their relationship to the aforementioned sampling and measurement techniques is appropriate. For the clarification of what may appear to be abundant confusion, I have prepared for this Committee's information a table, Summary of Proposed Standards and Measurement Methods, which is appended as the last page of my statement. The following explanation refers to that table.

Four standards in use and/or under consideration are listed in the left-hand column. These include (1) the threshold limit value for nuisance dust established by the American Conference of Governmental Industrial Hygienists which published their latest recommendation for such values on May 13, 1968; (2) the standard currently in use in England as recommended by the National Joint Pneumoconiosis Committee of the British Ministry of Power; (3) the 3.0 mg/m^3 Standard suggested in several bills; and (4) the 1.6 mg/m^3 Standard suggested by the Department of Labor in the Federal Register.

The second column describes the method of measurement used in connection with the specific standards and relates to the measurement methods described earlier. The third column describes related dust standards in quantities as determined by the measurement method. The fourth column is an attempt, insofar as is possible, to relate all four standards to a common denominator for comparison.

The American Conference of Governmental Industrial Hygienists periodically publishes Threshold Limit Values (TLV) for toxic industrial materials. Their latest publication, issued May 13, 1968, does not specifically list coal dust, but it does include a value for "nuisance dust." They specify a TLV of 50 million particles per cubic foot for a dust containing no quartz (silica). For dusts containing quartz, the TLV, in millions of particles per cubic foot, may be derived from the equation

$$\frac{250}{\%\ SiO_2+5}$$

The method of sampling for determining these values is the Midget Impinger followed by microscopic counting of the particles of less than five microns in size.

The British coal industry utilizes a standard developed by the National Joint Pneumoconiosis Committee of the British Ministry of Power. Using a system of multiple-shift sampling, their standard ranges from 380 to 700 particles per cubic centimeter. The sample is obtained on a full-shift basis by the Thermal Precipitator, and the particle count is determined microscopically, covering the size range one to five microns.

It is not possible to relate reliably the particle count obtained by the British Thermal Precipitator sampling method to that obtained by the United States

Impinger method, nor to the gravimetric methods which have been discussed because (1) the sample by the British method is obtained 75 to 575 feet downstream from the point where miners are exposed to the dust and (2) their method of particle count is very specific, excluding all particles less than one micron in size and counting agglomerated particles as one. The British are now attempting to establish a relationship between the particle count and the gravimetric methods because they would prefer to use a gravimetric method of sampling and analysis.

The standard proposed by some of the bills which have been introduced in the Congress is 3.0 milligrams per cubic meter of respirable dust specifically defined in the minus 7 micron size range. One instrument which samples and measures in this size range is the Isleworth or MRE gravimetric unit. While the instrument was developed in England and experiments have been carried out with that instrument in that country, it is of interest to note that this is *not* the instrument which they *now use* for measuring dust concentrations, and their standards for dust control do not include its use. They still use their Thermal Precipitator.

Recent experiments have also been carried out by the U.S. Bureau of Mines in an effort to determine the empirical relationship between measurements obtained with the MRE unit and the more commonly used instrument in this country, the Midget Impinger. They have determined that under a rigid set of conditions for sampling and analysis of the samples obtained by both methods, the results relate to each other in approximately the ratio of 9 million particles per cubic foot for each milligram per cubic meter. On this basis, it is possible to equate, on the average, one suggested standard of 3.0 milligrams per cubic meter to approximately 27 million particles per cubic foot. But, the USBM has also found that the relationship is far from precise and variations of plus and minus 50 percent have occurred.

The standard proposed by the Department of Labor in the Federal Register calls for a limit of 1.6 milligrams per cubic meter of respirable dust specifically defined in the minus 9 micron size range. It is apparently the intent to use the AEC gravimetric sampler which samples and measures in this size range. The Bureau of Mines experiments referred to earlier have also indicated an empirical relationship between measurement obtained by the AEC unit and the Midget Impinger. They have found that 1.7 milligrams by this method are roughly equivalent to the 3.0 milligrams by the MRE instrument and therefore to approximately 27 million particles per cubic foot if the measurements had been taken with the Midget Impinger. Again rigid sampling procedures and analysis methods must be adhered to and wide variations have been found.

While there is some approximate correlation between the numerical values obtained by three of the four different standards and their related instruments for measurement, it must be emphasized that these relationships are empirical and based on limited data. The manner in which the samples are taken, the point at which the instrument is placed and the subsequent analyses of the samples, not only for particle sizing and total dust but also for silica content, can have a tremendous effect upon the results obtained.

It must be borne in mind at all times that what we are interested in is the amount of 1–5 micron dust which the miner inhales over a working shift. It is important that, whatever the sampling and analysis procedure used, the results must be reliable and representative of the average dust concentrations to which the miner is exposed over an extended time period.

Of what should our dust control program consist?

In the opening of this statement, I urged that a planned program be the basis for control of coal-miner exposure to respirable dust hazards. I hope what I have presented to you today has illustrated the complexities of the situation sufficiently that you are persuaded that a planned program is the soundest approach. In light of the current lack of correlation between dust levels and health effects, the multiplicity of measurement instruments and techniques available, the doubtful precision of such instruments, the importance of the selection of the sampling point, and the lack of substantive data on the concentrations of respirable coal dust in United States coal mines, it is recommended that the legislation be written so as to provide the following:

1. The Secretary of Interior should appoint an Advisory Committee on Coal Mine Dust consisting of representatives of the public, the coal industry, and the Union, to advise him in the development of regulations for the setting of

standards for respirable dust exposure by coal miners, the instruments and procedures for measurement of such dust content, and the frequency at which such measurements should be made.

2. An interim dust standard should be established; one that will result in immediate improvement of dust conditions in coal mines, while at the same time enabling continued operations within the limits of our current technology for control and measurement of dust levels. Any number selected as a standard must, of necessity, be an arbitrary one. Since the only recognized basis for selection of such a number in this country is that developed by the American Conference of Governmental Industrial Hygienists, it is appropriate to use their recommended Threshold Limit Value of 50 million particles per cubic foot, as measured by the Impinger sampler, in the establishment of an interim standard for coal dust. Their proposed alternative TLV also considers the presence of silica and, if one number is to be designated, a concentration of 40 million particles per cubic foot would cover most United States bituminous coals. This would, from empirical USBM data, equate to about 2.5 milligrams per cubic meter of respirable dust as determined with the AEC instrument or approximately 4.5 milligrams per cubic meter as determined by the MRE sampler. In considering these latter gravimetric standards, I want to again call the Committee's attention to the questionable reliability of converting one measurement to another; a point I discussed earlier. But whatever the number selected as a standard, it should be related to exposure of the miner at his breathing zone and should be measured as an average over at least one and preferably two successive working shifts.

3. Not all mines, because of coal structure, mining methods, etc., are going to be able to meet a 4.5 milligrams per cubic meter standard no matter what preventative action is taken. But there are devices such as respirators, approved by the USBM, which remove over 97 percent of the respirable dust from inhaled air and assure complete protection for the health of the miner in even the most dusty mines. The Act should provide that if in the opinion of the Secretary, or his representative, all possible steps have been taken to comply with the dust standard, the miner may continue to work in atmospheres which are higher than the standard provided he is supplied with devices which will prevent the inhalation of dust above the required standard. Miners should be required to use these devices when they are working in the high-dust concentration environment.

4. Appropriate methods for measurement of dust concentrations in operating coal mines which will reproduce collection efficiencies of the human respiratory system and thereby enable sampling and determination of respirable dust content are still in the development stage. Those which are available do provide empirical data useful for determining the effectiveness of dust prevention measures under given conditions, but they do not permit comparison of dust concentrations between different mining conditions and in different types of coal. Standardization of instruments and techniques for using them are essential to the development of any planned program such as is being contemplated, and the Bureau of Mines should be directed to carry out this work with the advice of the aforementioned Advisory Committee. The Bureau of Mines should also institute training programs in the proper use of approved instruments after it solves the problems of reliability.

5. While it appears that coal workers' pneumoconiosis may result from long-term inhalation of coal dust by miners, no correlation has been established between dust concentrations and health effects. An effort to obtain that correlation should be initiated immediately through continuation and acceleration of the U.S. Bureau of Mines survey of coal-miner dust exposures which has recently been started, coupled with a study by the U.S. Public Health Service to obtain x-ray and other medical evidence of the prevalence of coal workers' pneumoconiosis which can be related to dust exposure. The Secretary of Health, Education, and Welfare should, after consultation with appropriate advisory committees and Federal departments and other agencies, develop and issue as soon as practicable to the Secretary of Interior and his Advisory Committee on Coal Mine Dust such criteria of coal-mine air quality as in his judgment may be requisite for the protection of health and welfare of the miners. The criteria should accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on health and welfare which may be expected from the presence of coal-mine dust in varying quantities, and such criteria should include those variable factors which of them-

selves may alter the effects on health, including such items as part-time exposure to extremely high dust levels.

6. The Secretary of Interior should, after consultation with the Advisory Committee on Coal Mine Dust and other advisory committees as he may deem necessary from Federal departments and agencies, issue information on those recommended dust control techniques, the application of which is necessary to achieve the levels of air quality set forth in the criteria. This should include such data as are available on the latest technology and economic feasibility of alternative methods of prevention and control of air contamination by dust.

7. The Secretary of Interior should, within the statutory limits of the Act and, in cooperation with the Advisory Committee on Coal Mine Dust, modify the aforementioned interim standards and method of measurements as improved technology permits.

8. And finally, research on methods for producing coal with a minimum of dust formation should be expanded and accelerated. Such research should be an integral part of the Bureau of Mines' overall safety program and should be coordinated with efforts to minimize hazards from methane and dust explosions. This coordination is essential inasmuch as safety measures prescribed for control of these hazards, including such steps as rock dusting, can have an adverse effect on respirable dust control.

SUMMARY OF PROPOSED STANDARDS AND MEASUREMENT METHODS

Sponsored by	Measurement method	Standard	Instrument in use by	Equated to particles/per cubic feet[1]
American Conference of Governmental Industrial Hygienists, May 13, 1968. Threshhold limit value for nusiance dust.	Impinger	50,000,000 or $\frac{250}{\% \; SiO_2+5}$ million particles per cubic feet.	U.S. industry	50,000,000
National Joint Pneumoconiosis Committee of the British Ministry of Power.	Thermal precipitator	380–700 particles per cubic centimeter.	British coal industry.	(2)
Several proposed Senate and House bills.	Isleworth (MRE) gravimetric instrument.	3 milligrams per cubic meter.	Experimental in England.	27,000,000±?
Federal Register, Jan. 17, 1969	AEC gravimetric instrument.	1.6 milligrams per cubic meter for less than 5 percent SiO_2, or $\frac{10}{\% \; SiO_2+2}$ mg/m^3 for 5 percent or more SiO_2	Experimental in United States.	27,000,000±?

[1] Based on empirical data by USBM.

[2] Not directly comparable because of remote sampling points and specific microscopic analysis techniques.

Senator **Williams**. Thank you, Mr. Garvey.

Is there anything further from the committee members here?

Senator **Randolph**. Yes.

Mr. Garvey, you have indicated that there is some question as to the validity of the statistics on the extent of black lung disease. What is your recommendation for methods to be used and means to be prescribed, yes, even required by law, for the determination of what perhaps you would call accurate figures on the numbers of cases?

Mr. **Garvey**. Yes; we think this is an important point. We in the industry are not attempting to minimize the problem, but we are most confused, and I would say upset by some of the information that has been put out, for which we can see no justification whatsoever.

For example, one of the news services put out a story recently saying: "The Public Health Service estimated after a 5-year study more than 100,000 of the country's 135,000 soft-coal miners were affected by black lung disease."

We have been trying to find out how this was arrived at. We have corresponded with the Public Health Service, even with the Surgeon General. We still haven't found out what they are talking about.

The Public Health Service did conduct a survey, I mentioned in my testimony, in 1963 and 1964, and it was published in an article, the result of that, by one of their people, authored by the U.S. Public Health Service in the August 1965 issue of Mining Congress Journal.

Now, the data they found summarized quickly is as follows:

Nine and one-half percent of the people working in coal mines, active workers, had some indication by X-ray examination of what is called coal workers' pneumoconiosis. Of the inactive workers, 18.6 percent had some evidence.

Now, if we take the number of active and inactive coal workers and use these figures, we come up with quite a different number than the 100,000 which is mentioned in this article and again attributed to the Public Health Service. If we take the 9½-percent figure and apply it to working coal miners and only to working coal miners underground—obviously, this problem does not apply to the strip miners. We don't have 135,000 underground miners. As near as we can determine, we have about 110,000.

In addition, how many inactive miners do we have? Well, this Public Health Service publication which I referred to indicated in the Appalachian area the ratio was four workers active for one inactive. Now, you take these all and put them together, and you come out with a number, based on the underground workers and their percentages, and so on, of about 15,000 to 16,000 total affected by this disease.

Now, again, we get these words "affected by." What do you mean by "affected by," and how far do you have to go for disability?

Again, I am not a medical expert. I urge that you do get the opinions of a number of qualified experts, and I understand you said the Surgeon General himself is going to testify.

But we are interested in finding out what these figures are.

Further, we are interested in finding out what happens from now on. We honestly feel that the improvements that have been made in dust conditions in the coal mines in the last 10 years indicate that these figures should go down, not up. In other words, what we are reading now, the information we are getting now on health effects of coal dust, has not been the result of recent coal mining. It is the result of coal mining 10 and 20 years ago. We think that improvements which were talked about here this morning, especially in the advancement of continuous mining machines, with better methods of dust control, together with the things you may look at here later, will result in a decline in this.

We would like to know, decline from what?

Senator RANDOLPH. Mr. Garvey, you said you were quoting from a press account. Is that one of the wire services?

Mr. GARVEY. Yes, sir.

Senator RANDOLPH. Or is this a special——

Mr. GARVEY. No, sir. It appeared in the Charleston Gazette, as a New York Times bureau carried the article.

Senator RANDOLPH. The news account to which you have referred quoted what authority?

Mr. GARVEY. It does not quote anything. It states: "The Public Health Service estimated," and so on, estimated that more than 100,000 of the country's 135,000 soft-coal miners are affected by black lung disease.

Senator RANDOLPH. You say that you have made inquiry of the Public Health Service as to the material which, if not quoted, is referred to?

Mr. GARVEY. Yes, sir. One of our people wrote directly to the Surgeon General. If I may, I will read the reply. This is the second paragraph of his letter signed by William H. Stewart, Surgeon General:

> This represents an extrapolation of figures derived from the Public Health Service's 1963–64 prevalence study.

That is the one I discussed previously a minute ago.

> This study indicated a 10-percent prevalence figure for working miners and prevalence figure of nearly 20 percent for inactive miners.

There is no question that is exactly what it says.

> Although the exact number of inactive miners is not known, I assume this figure to be in excess of 400,000.

Now, we don't know how he obtained 400,000 inactive coal miners. According to the article which I showed you, they estimated on their sample, their analysis in the Appalachian area, there were 64,000 active miners and 16,000 inactive miners. We have a ratio of 4 to 1.

I think somebody got their ratios turned around.

It says:

> The estimate of 100,000 soft-coal workers affected by coal workers pneumoconiosis is consistent with published estimates by the United Mine Workers Welfare and Retirement Fund.

He is talking about 100,000 workers. Although the article, itself, as was brought to my attention, the article says 100,000 out of 135,000, we are interested, he is saying here—it does not say here 100,000 out of 400,000. We would like to know the basis for arriving at the 400,000.

The peak of production immediately after World War II, we had, I believe, something like 431,000 miners. I don't believe that today we still have 400,000 inactive, especially when the coal mining companies are seeking to get men at the rate they are now.

Senator RANDOLPH. Mr. Chairman, there seems to be a dispute as to figures. I think the subcommittee, I am sure you, Mr. Chairman, will contact the proper authorities within the Federal service. The Surgeon General, as you have indicated, of the United States will testify. Is that correct?

Senator WILLIAMS. Next Tuesday, I understand.

Senator RANDOLPH. With the figures you have given us, Mr. Garvey, and other information which you may wish to provide the subcommittee, we may find it possibly more definitive in connection with the figures which you indicate are at variance.

(The material subsequently received was ordered printed at this point in the record:)

District No. 2 United Mine Workers of America,
Ebensburg, Pa., March 14, 1969.

Senator Harrison A. Williams, Jr.,
Chairman, Subcommittee on Labor,
U.S. Senate, Washington, D.C.

Dear Senator Williams: I was very much disturbed in reading an article in the Johnstown Tribune-Democrat, Thursday, March 13, 1969, attributed to James R. Garvey, Vice President of the National Coal Association, wherein the article contends that his testimony before the Subcommittee indicated that pneumoconiosis or "black lung" did not total more than 16,000.

I obtained from the Payroll Division at Harrisburg, Pennsylvania, the following figures which can be checked:

1. They are presently paying, as of the pay period ending March 18, 1969, for regular benefits to miners or their widows, that is, those that have become totally disabled within four years of the time of their last employment, 3,671 claims.

2. Under the recent amendments to the Act in Pennsylvania, those claimants who are still alive and have exhausted their basic claims are entitled to an extension of $75.00 per month for the rest of their lives. The Payroll Division indicated to me that 8,535 receive this extension payment as of the pay period ending March 18, 1969.

3. Under the amended Section 301(I) of the Act, to benefit those individuals who do not become totally and permanently disabled within the statutory period of four years as indicated above, the Payroll Division has informed me they are paying 15,605 claims under this Section, and this, too, is as of the pay period ending March 18, 1969.

This is solely for the State of Pennsylvania, and I take issue with the printed statement by Mr. Garvey that the total does not exceed 16,000.

Enclosed herewith is a photocopy of the article which I have reference to.

Very truly yours,

Eugene A. Creany.

[From the Johnstown Tribune-Democrat, March 13, 1969]

"Black Lung" Toll no More Than 16,000, Coalman Says

Washington.—A coal industry spokesman challenged Wednesday a report that 100,000 soft coal miners suffer from a disease known as "black lung."

James R. Garvey, vice president of the National Coal Association, estimated the total number of miners suffering from pneumoconiosis, an incurable lung ailment, doesn't exceed 16,000.

Garvey told a Senate labor subcommittee he has been unable to find any Public Health Service survey which links the disease to 100,000 miners.

AWARE OF SURVEY

He said he was aware of a PHS survey several years ago which covered some 4,000 Appalachia-region miners. That study, he said, showed that 9.5 per cent had evidence of pneumoconiosis, of which 6.5 per cent were classified as the simple variety and 3.0 per cent the complicated variety.

Using these percentages Garvey estimated that not more than 16,000 workers in the entire industry could have been affected.

He said persons having the disease worked in the mines for many years. Safety improvements made in recent years have materially reduced the chances for developing the disease, he said.

100,000 SAID AFFLICTED

Last December, a Department of Health, Education and Welfare spokesman said at least 100,000 miners suffer from the disease. The figure was given in connection with HEW's proposal to set standards for the first time to reduce coal dust concentrations in working mines.

Such standards are contained in new federal coal mine health and safety legislation being considered by the committee.

Garvey said the PHS study of Appalachian miners "related the prevalence of the disease to years of employment in the mines. But it could not be related to coal dust concentrations because data on dust were not available."

STANDARDS SAID NECESSARY

Garvey said dust standards are necessary to protect miners. But, he said, "arbitrary selection of standards unsupported by sampling and measurement techniques can only lead to confusion in the attainment of desired health effects."

He proposed an interim respirable dust standard of 2.5 milligrams per cubic meter or air as measured by a device developed by the Atomic Energy Commission. This is comparable, he said, to the 4.5 milligram standard proposed by the Nixon administration, using a British measuring device.

Garvey said the safety legislation should provide that when all possible steps have been taken by mines to comply with the dust standard, the miners could continue to work in unsafe atmosphere if supplied with breathing devices to filter the air.

He showed senators respirators which, he said, can remove 97 per cent of the respirable dust from the inhaled air.

FOUR TESTIFY

Garvey was one of four coal industry spokesmen who testified in opposition to a proposal giving the secretary of the interior the power to set mandatory health and safety standards in mines.

The others were John Corcoran, president of Consolidation Coal Co. of Pittsburgh; Guy Farmer, general counsel of the Bituminous Coal Operators Association; and Woods G. Talman of the American Mining Congress.

They recommended that Congress set the standards.

Senator WILLIAMS. Senator Schweiker?

Senator SCHWEIKER. Thank you, Mr. Chairman.

Mr. Garvey, I tried to follow your very thorough and complete testimony on standards. At this point I wonder if you could sum up just very briefly your or the industry's position on standards in a few simple laymen's terms.

Mr. GARVEY. Yes, I think we can give you this very quickly.

The first point is that we don't know or we don't have, at least we don't have available to us, I don't believe anybody else has, medical evidence relating to any specific level of dust to a health effect. That is point No. 1.

Point No. 2, we think the industry should adopt by law a standard, at least an interim standard, to pick a number out of the air. We are suggesting 4.5, because this at least relates to one known suggested standard by the American Conference of Governmental Industrial Hygienists. So these two are related and give us a reason for picking a specific number as a standard.

Our third point is, and one I tried to bring out in my testimony, that we are talking about a very difficult problem in obtaining a sample which is respirable dust and representative of what the man breathes.

The point is that we have to determine how to take the sample, and these techniques have to be standardized. It is not possible to obtain an instantaneous reading and say you are exposed to 4.9 or 7.10 or any number you want, of dust. You have to do this over a period of time to get an average exposure.

The medical evidence which can be reviewed when you do talk to your medical experts, so far as I can determine, states that instantaneous exposure to high dust levels is not significant. What you breathe over a period of time is important. The British system conforms to this. They average their sample over at least one working shift, and if they are slightly in excess of one of their lower levels, they take it over two working shifts to see if they can't come back to an average.

This makes sense to us. We are for a standard, but we think the points which I have just mentioned are significant and should be considered in setting the standard.

Senator SCHWEIKER. How does the British standard compare to the standard you are tentatively suggesting, 4½? Can you interpret that?

Mr. GARVEY. It is impossible to compare them at this time. The British are undertaking studies now to attempt to apply the MRE instrument, the gravimetric instrument which has been mentioned in several of the proposed bills, to apply this to their studies which they have had underway for about 15 years. They do not use this instrument now as their basis for setting standards, but they would like to, rather than the thermal precipitator, which is a particle-count method which is very difficult to handle. They would like to go with this MRE. They have made numerous studies to try to relate one to the other. They come out with varying ratios. They have not satisfactorily developed the relationship between what they already have and what they would like to use. They are working on it.

Hopefully, they can develop this, but they do not, as we understand it at the present time, have this relationship.

Senator SCHWEIKER. In your opinion, is the industry able to ultimately achieve the 3-milligram standard that we are talking about here in some of these bills?

Mr. GARVEY. Sir, it is difficult to answer that at this time. There are two things that come in. I am not trying to evade the issue.

First of all, very few measurements have been made. I believe that the testimony by Secretary Hickel and Mr. O'Leary recently indicated that they have plans to test, make readings in some 350 mines, and they have completed 20. Based on their readings, they found that 22 percent of the working faces already conform with a sample of the 3.0 level. Something like 50 percent, 45 to 50 percent, met the 4.5 level.

The trouble is that this information can be most misleading, because we don't know whether the samples at this time were taken in a wet seam, what type of coal, was it the kind of coal that does not break up into fine dust. Until we know this, it is impossible to really say, can you comply with any standard? That is why we feel that the legislation should take a standard, the 4.5, which we believe is a logical one or reasonable one, ask for conformance to that or seek conformance to that by every means possible, but in those coal mines where you are mining under conditions where it cannot be achieved, then provide the alternate, that until the technology for control of dusting catches up, the man will be protected by some kind of personal protective device.

Senator SCHWEIKER. Are you saying that 4.5 is an arbitrary standard, just as you maintain the 3.0 is an arbitrary standard?

Mr. GARVEY. Yes.

Senator SCHWEIKER. There is really no basis that we can document for going to either one? We have to start somewhere?

Mr. GARVEY. That is the point, and we are suggesting you start with the nuisance dust. From the health effect we do not know of any information.

Senator SCHWEIKER. Thank you, Mr. Chairman.

Senator WILLIAMS. Senator Pell?

Senator PELL. No questions. I am just here to get educated.

Mr. DUNN. Mr. Chairman, our final witness is Mr. Talman of United States Steel, who will concentrate on safety standards. Mr. Garvey concentrated on the health standard. Now Mr. Talman will concentrate on safety.

Senator WILLIAMS. Mr. Talman.

STATEMENT OF WOODS G. TALMAN, CHIEF INSPECTOR, COAL OPERATIONS, UNITED STATES STEEL CORP.

Mr. TALMAN. Mr. Chairman and members of the committee:

My name is Woods G. Talman. I am chief inspector, coal operations of the United States Steel Corp. My principal duties concern safety and working conditions at 17 coal mines, 16 of them underground, a stone quarry and a zinc mine, in six Eastern and two Western States. With your permission a resume of my background and experience is appended for the record.

Senator WILLIAMS. We will accept it for the record.

(The biographical sketch of Mr. Talman referred to follows:)

BIOGRAPHICAL SKETCH OF WOODS G. TALMAN, PITTSBURGH, PA.

Personal background: born, May 8, 1910, Charlottesville, Va.; wife, Martha R. Talman, Birmingham, Ala.; children, Woods C. Talman Jr. (20 years), Martha Ann Talman (11 years).

Education: 1931, Public schools, Richmond, Va., B.S. in Civil Engineering, Virginia Military Institute. 1946–47, Selected subjects at Birmingham School of Law.

Religion: Episcopalian.

Experience: 1937–58, Engineer, 2 years, general contractor. Except during World War II, essentially coal mining management, United States Steel Corporation. Junior engineer to general superintendent, Alabama, West Virginia, Kentucky, and 2½ years of this in ore mines and limestone mine in Alabama. 1958 to present, Chief Inspector, Coal Operations, United States Steel Corp., Pittsburgh, Pa.

Technical organizations and societies:

1939: Member, American Institute of Mining and Mechanical Engineering.

1946: First class mine foreman's certificate, Alabama. Coal Section-National Safety Council, General Chairman 1966–67. Member, Mine Inspectors' Institute of America.

1952: Registered Professional Engineer, Mining and Civil, West Virginia. National Mine Rescue Association, Welch, West Virginia, Post. Awarded life membership, 1965.

1958: National Mine Rescue Association, Pittsburgh Post.

1961: Veterans of Safety-Mine Rescue.

1952: Coal Mining Institute of America, Pittsburgh. President 1969.

Trade association and governmental committee activities.

1947–49: Member of Governor's Mine Law Drafting Committee, Alabama.

1958: Member of American Mining Congress Coal Safety Committee, Chairman for five years. Consultant to Mining (Non-Coal) Safety Committee.

1961: Subcommittee—Coal, White House Office of Science, Energy Study.

1962: Bituminous Coal Operators Association Member Safety Committee.

1965: Member and initially chairman Joint Ind. Advisory Committee to Interdepartmental (USBM and PHS) Environmental Dust and Health Study—Coal Mines.

1967: Member special study committee (Sufficiency of act studies and industry positions).

1963: Industry-Labor Advisory Committee to USBM Coal Heat Dryer Study.

1964–66: Industry-Labor Advisory Committee to USBM Methane Monitor Schedule and Development.

Mr. TALMAN. I represent the American Mining Congress, a national trade association, whose membership comprises both mining and manufacturing companies. These mining companies produce most of the Nation's coal, metal and nonmetallic minerals.

A detailed written statement has been prepared which gives the industry's view on many aspects of this problem and deals in depth with proposals. In consideration of your time, I have abridged that statement for oral presentation, but ask permission to file the full statement for the record along with several appended charts.

Senator WILLIAMS. They will be received.

(The documents to be supplied follow:)

PREPARED STATEMENT OF WOODS G. TALMAN, CHIEF INSPECTOR, COAL OPERATIONS, U.S. STEEL CORP.

Mr. Chairman, members of the subcommittee: My name is Woods G. Talman. I am Chief Inspector—Coal Operations of United States Steel Corporation. My principal duties concern safety and working conditions at seventeen coal mines, sixteen of them underground, a stone quarry and a zinc mine, in six eastern and two western states. With your permission a resume of my background and experience is appended for the record.

I represent the American Mining Congress, a national trade association, whose membership comprises both mining and manufacturing companies. These mining companies produce most of the nation's coal, metal and non-metallic minerals.

A detailed written statement has been prepared which gives the industry's view on many aspects of this problem, and deals in depth with proposals. In consideration of your time, I have abridged that statement for oral presentation, but ask permission to file the full statement for the record along with several appended charts.

My testimony concerns principally the safety aspects of proposed legislation. Although health and safety standards are interwoven from the standpoint of controls, it is not my purpose to analyze health standards as such. I endorse the testimony of Mr. Garvey in that respect and endorse as well the testimony of Mr. Corcoran and of Mr. Farmer.

At the outset I must assert that I am for the coal miner. My admiration and fondness for him began with first acquaintenance in 1937 and continues unabated. My regard extends to him in whatever capacity, be it face worker or foreman, coal executive or labor leader, state or federal inspector.

Tools, equipment and working conditions in 32 years have changed drastically for the better. The coal miner had adapted to each change, yet basically he remains the rugged individual who has so long appealed to me.

He is strong, energetic, competitive, resourceful and courageous. He is so highly skilled that I can observe for hours his operation of sophisticated machinery, hardly noting the passage of time. He is truly "A workman that needeth not to be ashamed."

I could not think of him nor refer to him as a fatalist. He does not pass the buck, nor does he pre-judge. He may, in time of stress, say things that one may not understand unless he, himself, is a member of the mining fraternity.

On the contrary, his dominant characteristic, a very American one, is that he is an optimist. When this is excessive or not affirmatively channeled, it can lead to his undoing. Military commanders recognize that this positve American virtue presents problems of its own.

The typical coal miner is so highly motivated that he can become impatient, impulsive, and at times even imprudent. His very resourcefulness can be harmful, especially when it leads him to make do or improvise excessively.

If in truth "The best mirror is an old friend," you may now have a somewhat different reflection of my friend.

Summarizing these comments, our problem is not one of overcoming fatalism, a discouraging prospect indeed.

The coal miner readily absorbs and responds to training, when designed to sharpen his skill, improve his awareness and condition his reflexes. But such educational and training programs must be thoroughly prepared, well presented and mindful of his time.

Gentleman, you wish to see mine disasters eliminated, mine accidents greatly reduced and mine work performed without jeopardizing anyone's health.

So do the mine workers, so do state and federal enforcement officials. And so—beyond anyone else—do the operators, for it is they who carry the ultimate responsibility for leadership and direction, it is they who bear the criticism, the onus of failures.

Coal mining, with its attractive wages and other benefits, must become a good career choice in all respects. The industry's continued success, its very existence, its ability to serve the nation's energy needs hinge upon how it attracts and retains thousands of new miners and hundreds of technical graduates.

We have come a long way. But the great challenge, the great test, lies ahead.

Since 1910, the founding year of the U.S. Bureau of Mines, the trend of major mine disasters has been steadily downward. The lower rate of the 16 years since passage of the 1952 Act compared to the 20 years before reflects as 45 fewer occurrences, a 64% reduction. Several major coal mining states have had major disaster-free periods of more than twenty years.

There are many islands of progress in day to day safety. Shoring the roof with embedded steel bolts, a development in the mining industry, expanded rapidly in the early 1950's. Bureau of Mines records reveal that fatalities from falls of roof and face have dropped almost 75% compared to the 1946–1950 period and more than 50% compared to the 1951–1955 period.

Some major coal mining states consistently beat the national average in averting fatal and non-fatal injuries by 2 and 3 to 1 margins.

A number of companies are so effective with their safety programs that they operate regularly at frequencies of less than 15 disabling injuries per million man hours, some of them below 5.

Competition for the coveted Sentinels of Safety Trophy, sponsored jointly by the American Mining Congress and the Bureau of Mines, is now so keen that in effect there is one basic qualification—frequency zero disabling injuries. And yet so many, 18 underground and 19 surface mines in 1967, are in competition that the committee decides the winner in each category by determining which zero frequency mine worked the greatest number of man-hours in the year.

Progress, yes; trends, dramatic—but—a building in Washington reminds us: "The past is prologue."

Let us all look to the future. Let us connect up the islands. Let us share a sense of urgency.

Laws are the ground rules for assuring uniform safety and working conditions.

They must be diligently complied with. They must be strictly and uniformly enforced.

The coal industry, in July of 1967, affirmed its endorsement of timely review of laws and of amending them as needed. This statement was made in a comprehensive report to the Assistant Secretary of the Interior for Mineral Resources, a copy of which is appended to the full statement.

In addition to the present Act, the Federal Mine Safety Code (Part I—Underground Mines and Part II—Surface Mines) which was developed by the U.S. Bureau of Mines working with representatives of the UMWA and the operators, contains a detailed set of safety and health standards. Although many of these standards go beyond the requirements of the present law, they are binding on the vast majority of the industry by virtue of: (1) being incorporated by reference in the collective bargaining agreement between the UMWA and signatory companies; (2) being the safety code to which government contractors must subscribe under the Walsh Healey Act; and (3) being required by terms of leases for coal mining operations on government lands. A copy of the Federal Code and the relevant provisions of the labor agreement with the UMWA and the currently effective Walsh-Healey regulation are attached.

To be specific about legislation, we have used S. 355 and S. 1300 since they represent the views of two administrations. We endorse many of their proposals. We feel that some need clarification, others need strengthening, some points serve no worthwhile purpose, and yet others should be added.

In fact, many of the proposed standards were suggested by the industry, while others were endorsed by industry in the course of joint consultations with Bureau and union representatives.

There are points to which we must object, wholly or in part. They leave room for arbitrary action or poor administration or, more importantly, some do not impress us as likely to improve safety in the mines.

The written statement contains a point by point analysis of all safety provisions of the bills.

At this time it seems appropriate to highlight those which cause us grave concern.

The bills absolutely fail to clarify a fundamental fact:

Most so-called violations cited do not in any sense connote criminal or even civil neglect, or necessarily represent a clear and present danger to life and limb.

In fact, operators and miners must jog pretty fast just to remain even. Here are a few of the reasons for that: Forces of nature, progress of mining, wear and tear on machinery, fatigue of materials, and judgment factors.

Punishment must be considered a distasteful resort, reserved for lawbreakers or for those whose actions are grossly negligent in substantive matters. S. 1300 comes much closer to recognizing this principle than does S. 355.

Mr. Farmer speaks of S. 355's silence as to pre-requisite requirements for inspectors. Surely it would be intended that inspectors have no less qualifications than those established by states for mine foremen or for state inspectors. The strict requirements of the Acts, from 1941 to the present, should be preserved. Two years of the five required as practical experience might be waived in the case of graduate engineers. S. 1300 is much clearer that the high standards for inspectors are intended, but it should restore the five-year practical mining experience requirement with the preceding exception.

The industry feels that the provision for an Advisory Committee should be strengthened. It should be made clear that the Committee is to be appointed and used. It should be stipulated that the Director of the Bureau of Mines is to be chairman.

The industry feels that standards should be permanent and not temporary, and notes that Mr. Boyle, president of the United Mine Workers of America, concurs in that. If the Secretary is given standards setting power, he should be subject to the rule making procedure.

We object to certain of the proposed interim mandatory standards only because they are not clear and specific and appear to mean that they will be later defined by the Secretary. In such instances the industry feels that the full rule making procedure should be invoked, including the right of appeal and recourse.

We are deeply concerned at the thrust for prior approval by the Secretary, a procedure that is cumbersome, inflexible, and prone to discourage initiative. Outstanding instances of this are in the Roof Control section and in the Main Fan stoppage section, which we otherwise endorse heartily. In other words, we feel that the law should state what is required and not how to mine coal.

We are grievously disturbed by the implication that the permissible flame safety lamp is obsolescent except to determine oxygen sufficiency.

The safety lamp is an instrument and it must be regarded as such. It is rugged, sophisticated, versatile and honest. Thousands of miners, supervisors, mine examiners or firebosses, and state and federal inspectors are trained in its use.

The industry feels that the provisions of the present Act, dealing with approved instruments and means for making tests for methane are strong and should be retained. We recommend the appropriate changes throughout the bills. The written statement notes each section wherein the permissible flame safety lamp is belittled.

Rather than condemming the safety lamp we feel it would be more beneficial to revitalize training and testing programs for its designated users.

The industry endorses narrowing the legal distinction between gassy and non-gassy mines. Such matters as pre-shift and on-shift examinations are illustrative as not justifying distinctions.

The finding of .25% methane, the point which reclassifies a mine from non-gassy to gassy, is one-twentieth of the concentration of methane at its lower flammable limit, the range being 5 to 15%.

Non-gassy mines should be checked regularly to ascertain that they maintain their non-gassy condition.

Consideration might be given to requiring that all electrically powered face equipment ordered after the enactment date be manufactured as permissible.

Another matter of major concern is the proposal to mandate the use of fire resistant hydraulic fluids. This is such a complicated and involved matter that the entire subject of abating and controlling equipment fire potentials has been under study by a multi-interest study group appointed by the Director in September of 1967. Its report was made to the present Director on March 4, 1969. A copy is appended to my written statement.

Suffice it to say that the group made a systems study which included a number of field trips to mines and manufacturing plants. Their unanimous recommendation would provide far more effective standards than the mere mandating of a fluid. They expressed serious reservations at the course this project had taken in approving and recommending the use of certain types of fluids.

(Note: Section numbers hereafter refer to S. 355, with corresponding numbers for S. 1300 in brackets.)

DETAILED ANALYSIS OF SECTION 201 OF S. 355 AND TITLE III OF S. 1300—INTERIM SAFETY STANDARDS FOR UNDERGROUND COAL MINES

Section 201 [Sec. 301] The provisions applying standards to all mines, which affects gassy and non-gassy classifications, and the powers of the Secretary, are discussed previously in this statement.

General Standard (S. 1300 only)

[Sec. 302(a)] would require each operator to provide emergency shelters in the mine, adequately supplied with air and an independent communication system. This matter is appealing in principle. The industry offers to work with governmental and other agencies in the necessary research and development toward this objective. At the same time other methods of providing positive means of survival and scape should be explored.

[(b)] would require all active underground work places to be adequately illuminated while persons are working there. The industry has explored sophisticated means of mine lighting, but none has proven better than improved mine lighting in work places which has been done both by better portable illumination on the miners' person and by improving lights on machines. The industry endorses this objective in principle provided that any standards which may be forthcoming would be set according to the rulemaking procedures in S. 1300.

[(c)] would require two-way communication between the surface, each landing and each work section more than 1,000 feet from the main portal. The industry endorses this requirement.

[(e)] says the operator shall investigate all accidents to determine their cause and means of recurrence, and make the information available to the Secretary and the state. The industry endorses this provision.

[(f)] requires advance plans for emergency medical assistance, first aid training and adequate first aid equipment. The industry endorses this.

[(g)] requires the operator to cooperate in a safety training program. The industry endorses this.

[(h)] requires the operator to cooperate in indoctrinating new miners in safety rules and safe work practices. The industry regards this as a management responsibility and performs this function now.

201(b)(1) [Sec. 303] Roof Support

Present law requires protection against falls of the mine roof or ribs (walls) in underground roadways and travelways. This would extend it to working places. The industry continues to agree, as was first officially recorded in its report to the Department of Interior in July, 1967, that federal jurisditcion in this matter should extend to the working places. However, the industry feels this authority should be exercised by exception, as the present Act provides, concerning active roadways and travelways. There would be no objection to furnishing support and control plans to inspectors, or to posting them.

201(b)(2) [304(a)] Ventilation

(A) The industry approves this proposal that the use of mechanical ventilation equipment should be mandatory for coal mines in the Act as it is now in the Code. The language of the bill could be greatly improved upon by editing and then elevating Article V—Ventilation and Mines Gases—Section 1—Main Fans, from Code to Act status.

(B) [(b)] The industry endorses this improvement to Section 209(d)(1) which deals with quality of air and coursing of air currents.

(C) [(c)] The industry concurs in principle with elevating the line brattice provisions from Code to Act status and feels that this section should be strengthened.

(D) [(d)] This proposal prescribes in detail a pre-shift examination of underground working areas. It is felt that Section 209(d)(7) of the Act for gassy mines, with minor modifications, adequately covers pre-shift examination needs.

The proposal would drop the present designation of the permissible flame safety lamp as the approved test for gas and substitute "means approved by the Secretary."

We are grievously disturbed by the implication that the permissible flame safety lamp is obsolescent except to determine oxygen sufficiency.

The safety lamp is an instrument and it must be regarded as such. It is rugged, sophisticated, versatile and honest. Thousands of miners, supervisors, mine examiners or fire-bosses, and state and federal inspectors are trained in its use. The industry feels that the provisions of the present Act, dealing with approved instruments and means for making tests for gas are strong and should be retained. We recommend the appropriate changes throughout this bill. My written statement notes each section wherein the permissible flame safety lamp is belittled.

Rather than condemning the safety lamp we feel it would be more beneficial to revitalize training and testing programs for its designated users.

The known instruments should continue to be recognized as they are in the present Act. Nothing bars approval of any foreseeable new instrument provided it meets the tests for U.S.B.M. permissibility.

The record does not show that the present provision which requires the examination within four hours of the beginning of the shift has in any way been deleterious to excellence although a proviso within the 4 hour provision that examination of the active underground working places and their active roadways and travelways must take place within 3 hours would be reasonable.

(E) [(e)] The bill requires an examination of underground active working places at least once during each working shift. We endorse this provision except for our objection belittling permissible flame safety lamps.

(F) [(f)] The bill requires a weekly examination of the mine for hazardous conditions, including gas. The industry endorses this, which elevates Code Section 10 j, Article V, concerning weekly examinations, to Act status. We feel that this provision merits further strengthening to provide thorough examination before a mine is reopened after long closure.

(G) [(g)] Calls for a weekly examination of mine ventilation as to volume. The industry supports elevating Section 3 c Article V concerning weekly measurements of air volumes from Code to Act status. However, a qualified person, as defined in these bills, could make these air measurements, freeing certified persons for other duties requiring judgment in safety matters.

Section 201 (b) (2) (i) [Sec. 304 (h) (i)] Requires gas tests of a working face before electrical equipment is taken into it or operated, and every 20 minutes during operations. The industry endorses this further strengthening of the Act, providing it is understood that the provision requires a special testing for methane at the machine before it is activated and the first working face to which the machine is to be moved and does not require reexamination of all faces in the sections which have previously been tested in the required pre-shift examination. The observations concerning permissible flame safety lamps apply here also.

(ii) [304 (h) (2)] Would require prompt action when more than 1% methane is detected at a working face. Section 209 (d)(2) of present law dealing with findings of methane adequately and strongly covers this problem.

This sub-section as altered would endanger men unnecessarily by mandating that the tests other than those prior to start of the mining cycle be made as close to twelve inches from the roof, rib or face as possible. Although possible, the twelve inch mandate is impractical and often unwise for the tests at 20 minute intervals during operations, because it could unduly expose miners to hazards of rib and unsupported roof. Observations supra re permissible flame safety lamps apply here.

(I) [(i)] Calls for action when air leaving a working face is found to contain more than 1% methane. Section 209(d)(3) of the present Act concerning finding more than 1 per centum of methane in a return split of air is entirely adequate. In the bills, "frequent intervals" is vague. Observations supra re permissible flame safety lamps apply to the only change proposed.

(J) [(j)] Prescribes actions when return air from a working face contains more than 1.5% methane. Section 209(d)(4) of the present Act now covers this situation adequately with regard to methane in near-dangerous concentrations in return air currents. There is no objection to a minor editing change noted but there is vigorous objection, as previously pointed out, to the main change which implies debarring the permissible flame safety lamp for all purposes except to test for oxygen deficiency.

(K) [(k)] restates existing law but drops an escape clause which has been in the Act since 1952. The industry again endorses eliminating this clause and the strengthening of the law.

(L) [(l)] provides that air which has passed through an abandoned panel or similar area may not be used for face ventilation. The industry again concurs in eliminating the grandfather clause now contained in Section 209(d)(6) of the present Act. The industry concurs as well in applying this provision to non-gassy as well as gassy mines and agrees with the editorial clarification.

(M) [(m)] would allow the Secretary to require methane monitors on face equipment, except shuttle cars. The industry endorses the principle but again calls attention to the fact that no field-proven methane monitors are currently available for other than AC-powered machinery. To guard against arbitrary action, such orders should be appealable to the Board of Review.

(N) [(n)] requires that idle and abandoned areas be inspected thoroughly before workers enter them. The industry again endorses improving Section 10, Article V of the Code dealing with inspection of idle and abandoned areas and elevating it from Code to Act status. The previously stated objection to debarring the permissible flame safety lamp is applicable here.

(O) [(o)] requires a test for methane, before intentional roof falls. Section 209(d)(10) contains this requirement for examinations prior to fall making. The objection to debarring the permissible flame safety lamp is applicable here.

(P) [(p)] requires adequate ventilation or sealing of abandoned areas. The industry agrees in principle with this requirement which is a strengthening of 209(d)(11) and application to all mines. It is again urged that the problems of sealing abandoned workings be studied by the Bureau and its findings communicated to the industry.

[(q)] The intent and the practical meaning of this section are vague and unrealistic in terms of present day technology.

This section describes one serious safety problem in mine ventilation that merits intensive research. In this research industry would be happy to cooperate.

[(r)] seems to be an escape clause for (q). Since we do not understand (q), we do not understand the need for (r).

(Q) [(s)] provides that each mining section shall be ventilated by a separate split of intake air. The industry again supports this new requirement. Such separate splitting of intake air, without mandate, has become virtually a universal practice.

(R) [(t)] The industry concurs in elevating Section 5b, 7 and 8, Article IV, of the Code requiring examinations for methane before and after blasting, from Code to Act status and applying them to all mines. Objections previously noted regarding gas testing instruments are applicable here.

(S) [(u)] calls for each mine operator to adopt a plan of action in case the main ventilating fan stops. Strengthening of Section 1f. Article V of the Code, regarding action when a main fan stops, and elevating it to Act status was recommended by the industry.

It is believed that concurrences in plans and changes thereto should be at the inspectorate level, not requiring prior approval by the Secretary.

There is no objection to posting the operators' plan and to supplying the inspector a copy.

(T) [(v)] provides that changes in ventilation which may affect safety shall be made only when the mine is idle. The industry proposed this strengthening of Section 4 d, Article V regarding major changes to ventilation and its elevation from Code to Act status.

(U) and (V) [w) and (x)] The industry concurs in elevating Section 10 k, and 10 l Article V, which require making and prompt countersigning of mine examination daily and weekly reports, from Code to Act status.

(3) *Combustible Materials and Rock Dusting*

(A) [(a)] says coal dust shall not be present in excessive quantities in working places or electrical equipment. This change in Section 209(e)(1) to include electrical equipment was recommended by the industry.

The industry endorses including float coal dust and does not challenge substituting thet word "excessive" for "dangerous."

(B) [(b)] says when mining creates excessive dust, water or other methods shall be used to reduce it. The industry feels that 209(e)(2) concerning airborne dust abatement is adequate as presently stated but does not object to (b) [(b)] but suggest the following changes to strengthen it: After create in the first line insert the words "and/or raise". In the second line after dust add "into the air". In the last line change the word reduce to "abate". Eliminate "to safe limits" inasmuch as other techniques may also be required.

(C) [(c)] requires rock dusting of all open crosscuts and to within 40 feet of all faces. The industry concurs that this is a needed clarification of the rock dusting requirements of 209(e)(3) of the present law as related to crosscuts.

(D) states other areas of the mine which shall be rock-dusted. The industry concurs in principle that rock dusting must be adequate in coverage wherever it is required. This requirement in Section 209(e)(4) is poorly stated and leads to various interpretations. (D) herein does not clarify the matter. A positive yet strong provision, applicable to all areas of mines where rock dusting is required, could be developed. S. 1300 would require rock dusting throughout return air courses, and S. 355 could be so interpreted. The safe distances from the working faces where rock dusting should be required should be scientifically defined.

(E) [(d)] related to rock dust standards. This provision does not comprehend and encourage certain innovations now in use in modern mining in which coal dust is being continually inerted and thus not permitted to layer on top of rock dusted surfaces. These modern concepts were studied and reported upon by research people of the U.S. Bureau of Mines and have been adapted to practical use in the industry.

(F) [(e)] exempts anthracite mines from (B) through (E) of this paragraph. We have no comment.

(Note: Because the provisions of the two bills for electrical equipment vary, we comment first on S. 355, then on S. 1300.)

(*4*) *Electrical Equipment* (*S. 355*)

(a) Would eliminate the escape or grandfather clause for nonpermissible equipment in gassy mines. We again endorse this. The exception for explosion proof shuttle cars and locomotives should be continued. The bill also allows the Secretary to permit non-permissible equipment for an appropriate period, considering availability of permissible equipment.

(B) requires copies of permit in (A) to be mailed to representatives of the workers and to state officials. Extension by permit would not be needed but for extending this requirement to non-gassy mines.

(C) requires mines now classed as gassy to keep using permissible equipment. The industry endorses this provision.

(D) requires that power connections out by the last open crosscut shall be in intake air. The industry agrees in principle but feels that permissible power-connection points should be excluded.

(E) The present Act (in 209(f)(4)) limits how close trolley and feeder wires terminal points may be to active faces in gassy mines. This proposal would extend it to non-gassy mines. The industry agrees.

Electrical Equipment—General [*S. 1300*]

[Sec. 306(a)] This section provides that the mine map shall show pertinent information regarding the electrical system of the mine. The industry endorses this provision.

[Sec. 306(b)] This section provides safeguards to prevent electrical repair work from being performed on energized systems. The industry endorses this principle and believes that the section should provide for adequate alternate means with respect to locking out switches.

[Sec. 306(c)] This section provides for the frequent examination by a competent electrician of electrical equipment and for prompt correction of potential dangers. The industry endorses this proposal.

[Sec. 306(d)] This section provides for the use of electrical apparatus and conductors of the proper capacity. The industry endorses this provision.

[Sec. 306(e)] This section provides for the proper construction of splices and joints in electric circuits. The industry endorses this provision.

[Sec. 306(f)] This section provides for the use of proper fittings where electrical conductors pass through metal frames. The industry endores this provision.

[Sec. 306(g)] This section provides for the prevention of contact between certain electrical conductors and combustible materials. The industry endorses this principle but feels that further clarification and improvement should be made (to correct an apparent typographical error) by excepting specially designed cables and ground cables.

[Sec. 306(h)] This section provides for adequate insulation and protection of power cables in rope haulage slopes and at other critical areas. The industry endorses this principle but believes the provision should be clarified with respect to slopes where trolley haulage is utilized.

[Sec. 306(i)] This section provides for adequate electrical overload protection for all electrical equipment except locomotives used in certain applications and provides protection in the case of three phase motors. The industry endorses this provision as it relates to overload protection but feels that more clarification is needed with respect to application of the three phase motor protection to mobile equipment, if such is intended.

[Sec. 306(j)] This section provides for the use of disconnect switches at certain locations in main power circuits. The industry endorses this provision.

[Sec. 306(k)] This section provides for the safe design, construction and installation of switches and controls on electrical equipment. The industry endorses this provision.

[Sec. 306(l)(1), (2), (3) and (4)] This section provides for the continued use and maintenance in mines now classed gassy of permissible electric face equipment and junction or distribution boxes, for the use and maintenance of such equipment in all other mines within one year after the operative date except as permitted by the Secretary, and for notification to the mine workers and the state mine safety agency of any such permit issued by the Secretary. The industry position on this has been covered earlier in this statement.

[Sec. 306(m)] This section provides that all power connection points out by the last open crosscut shall be on intake air. The industry agrees in principle but feels that permissible power-connection points should be excluded.

[Sec. 307(a)] This section provides that trailing cables shall meet the Secretary's standards for flame-resistance. The industry endorses this provision.

[Sec. 307(b)] This section provides for the use of a specific type of short-circuit protection for trailing cables, the proper identification of trailing cable disconnect devices, and the use of a disconnect device designed to permit visual determination that power has been disconnected. The industry is in agreement with this principle but believes the provision should be broadened to provide for use of alternate types of short-circuit protective devices.

[Sec. 307(c)] Although the language is not clear, this section appears to require means to eliminate the possibility of connecting trailing cables improperly to the power source. The industry endorses this provision in its objective but feels that it should be worded in practical terms of "assuring against" rather than "eliminating a possibility."

[Sec. 307(d)] This section provides for the limitation of the number of temporary splices in trailing cables, limitation of the duration of usage of such splices at critical points, and the specifications for such splices. The industry endorses this principle but believes the provision should be clarified to indicate that a cable jacket repair does not constitute a splice.

[Sec. 307(e)] This section sets out specifications for permanent splices in trailing cables. The industry endorses this provision.

[Sec. 307(f)] This section provides for protection of trailing cables from mechanical damage and from damage at the point of connection to machines. The industry endorses this provision.

[Sec. 307(g)] This section provides that power cable and trailing cable connections shall not be made or broken under load. The industry endorses this provision.

[Sec. 308(a)] This section provides for the electrical continuity and grounding of metallic cable sheaths and for electrical grounding of certain equipment frames. The industry endorses this provision.

[Sec. 308(b)] This section provides for maintaining the frames of off-track and related equipment at safe electric potential by methods approved by the Secretary. The industry endorses this provision.

[Sec. 308(c)] This section provides for the electrical grounding of the frames of high-voltage electrical equipment and apparatus. The industry endorses this provision.

[Sec. 308(d)] This section provides for the deenergizing of high-voltage lines before work is performed on them. The industry endorses this provision.

[Sec. 308(e)] This section provides for the deenergizing of underground power circuits on idle days and on idle shifts. The industry endorses this principle but feels that certain pieces of equipment such as rectifiers and transformers should remain energized to maintain safe conditions.

[Sec. 309(a)] This section provides for the protection of high-voltage circuits entering the mine by appropriate circuit-breakers. The industry endorses this provision.

[Sec. 309(b)] This section provides for a means of providing a neutral grounding conductor in high-voltage underground circuits, a means of frame grounding high-voltage equipment supplied by those circuits, and a means of installing disconnect devices in such circuits. The industry endorses this principle but believes that provision should be made for the use of other suitable means.

[Sec. 309(c)] This section provides specifications for grounding resistors used with high-voltage transformers. The industry endorses this provision.

[Sec. 309(d)] This section provides for a fail safe system of monitoring continuously high-voltage grounding circuits. The industry endorses this provision.

[Sec. 309(e)] This section provides that underground high-voltage cables purchased after the effective date shall meet certain specifications for protection of electrical conductors, and specifies minimum sizes for ground conductors. The industry endorses this principle but believes that provision should be made for equally suitable protection of and for size of conductors.

[Sec. 309(f)] This section provides specifications for the use of couplers in underground high voltage lines. The industry endorses this provision.

[Sec. 309(g)] This section provides for the manner of connection of single phase electrical loads. The industry endorses this provision.

[Sec. 309(h)] This section provides for the use of lightning arresters on power conductors leading underground. The industry endorses this provision.

[Sec. 309(i)] This section provides for the location and installation of high-voltage transmission cables in a manner that will provide for the protection of men and protection of the cable, and will facilitate regular inspection of the installation. The industry endorses this provision.

[Sec. 309(j)] This section provides for the installation of specified disconnect switches at specified locations in high-voltage circuits. The industry endorses this provision.

[Sec. 309(k)] This section provides for the marking for identification of circuit breakers and disconnecting switches. The industry endorses this provision.

[Sec. 309(l)] This section provides that terminations and splices of high-voltage cables shall be in accordance with manufacturers specifications. The industry endorses this provision.

[Sec. 309(m)] This section provides for the effective grounding of frames, supporting structures, and enclosures of substation and switching apparatus. The industry endorses this provision.

[Sec. 309(n)] This section provides for the deenergizing of power centers and portable transformers before they are moved from one location to another, and for the deenergizing of certain power cables before they are moved or handled. The industry endorses the principle that energized cable shall not be handled. However, where other sources of power are not present, provision must be made for moving such equipment and cables while energized, provided of course that there are adequate safeguards.

[Sec. 310] This section provides for the inclusion of a neutral grounding system circuit in low-voltage circuits serving three-phase A.C. electric equipment, and for adequate means of automatic deenergization of such equipment upon the occurrence of an incipient ground fault. The industry endorses this principle but believes that the requirements should be extended to apply also to medium-voltage power circuits and that the provision should apply to low- and medium-voltage circuits serving portable equipment. In this connection the "high voltage" definition in Section 318(g) should be changed to "more than 1000 volts" in keeping with recently recognized U.S. Bureau of Mines standards for low, medium and high voltage ranges.

[Sec. 311(a)] This section provides for installation of cutout switches in trolley feeder wires at intervals of 1,500 feet and at certain critical points. The industry endorses this principle but believes that the specification for intervals should be made consistent with state mining laws.

[Sec. 311(b)] This section provides for short-circuit protection for trolley and trolley feeder wires. The industry endorses this provision.

[Sec. 311(c)] This section provides that trolley wires and certain other electric apparatus shall not be located beyond the last open crosscut or within 150 feet of pillar workings in a mine. The industry endorses this provision.

(*5*) [*Sec. 312*] *Fire Protection*

(A) repeats existing law. Section 209(g)(1) and (g)(2), requiring adequate fire-fighting equipment and examinations for fire after each blast.

(B) [(b)] duplicates the present Acts's Section 209(g)(3) concerning storage of oil and grease in fireproof places. Deletion of 209(g)(4) concerning containers for small quantities of lubricating oil and grease is a seeming oversight which should be corrected.

(C) [(c)] says underground structures in a mine shall be fireproof. This will promote confusion and should be re-studied. 209(g)(5) is clear regarding underground structures and has not proven inadequate. S. 1300 is somewhat clearer.

(D) [(d)] specifies precautions when an arc or open flame must be used underground. The industry concurs in provision for welding, cutting and soldering except for the flame safety lamp issue as covered supra.

(E) [(e)] would require fire-resistant hydraulic fluids for underground use unless the Secretary waives the requirement in the presence of fire-suppression devices.

Another matter of major concern is the proposal to mandate the use of fire resistant hydraulic fluids. This is such a complicated and involved matter that the entire subject of abating and controlling equipment fire potentials has been under study by a multi-interest study group appointed by the Director in September of 1967. Its report was made to the present Director on March 4, 1969. A copy is appended to my written statement.

Suffice it to say that the group made a systems study which included a number of field trips to mines and manufacturing plants. Their unanimous recommendation would provide far more effective standards than the mere mandating of a fluid. They expressed serious reservations at the course this project had taken in approving and recommending the use of certain types of fluids.

(F) [(f)] would require that belt conveyor drives should have the protection of deluge-type sprays or other fire control. The industry endorses this, with the understanding that adequate foam spray shall be considered one of the effective means contemplated.

(G) [(g)] The industry endorses improving and elevating Section 1(1), Article X, requiring automatic control switches on belt conveyors, from Code to Act Status.

(6) [Sec. 315] Industry endorses keeping accurate maps but feels their outside use should be on a confidential basis and only to promote safety.

(*7*) [*Sec. 313*] *Blasting and Explosives.* (*A*) *thru* (*F*)

The industry again endorses raising this subject to Act rather than its present Code status and endorses the improved coverage where changes were made. In S. 1300, Sec. 313(c) contains an obvious misprint.

(*8*) [*Sec. 314*] *Hoisting and Mantrips*

This paragraph specifies safety standards for mine hoists. The provision for a qualified hoisting engineer to be "on duty" while any person is underground should be changed to clarify that such engineer be available for ready response to signals. The last sentence of the proposal would empower the Secretary to use his own judgment in setting safeguards for transporting men and coal in the mine. The industry is opposed to mandating by one person with no recourse.

(*9*)(*A*) [*Sec. 317*(*a*)] *Miscellaneous*

The industry agrees it should comply with state laws on maintaining barriers to protect oil and gas wells drilled through coal. Oil and gas well drillers and operators should also do the same drilling and abandoning wells in coal seams.

(B) [(b)] follows closely the present law on drilling advance boreholes to avoid penetrating abandoned working or an adjacent mine. Section 209(h)(2) of present law needs more modernizing and improving than contained herein. The 8-foot rib hole requirement should permit an equal or better alternate to accommodate itself to whatever method of mining be employed.

(C) [Sec. 302(d)] The law now forbids smoking or carrying matches, etc., in a gassy mine (Section 209(h)(3)). The bill would forbid it in all mines. The industry agrees. Section 1c, Article II Federal Code forbids smoking in certain surface areas; the bill would make this law and the industry concurs in the change.

The bill would require each operator to set up a program "approved by the Secretary" to insure no smoking materials were carried underground. We agree with the goal but object to approval by Secretary which could mean wide variety of plans. The requirement should be in the Act, with the means left to the parties.

(D) [317(c)] The industry again concurs that 209(h)(4) requiring permissible electric lamps for portable illumination should apply to non-gassy as well as gassy mines.

201(b)(9)(E) [Sec. 316] requires at least two adequate escapeways from each working section. The industry again endorses this, which elevates Section 4d and 4g, Article XI of the Code (with editorial changes we accept), to Act status; however, the Act should also recognize the exceptions now contained in 4e and 4f which apply to special circumstances in opening or closing a mine.

(F) [Sec. 317(d)] says structures near the mine opening shall be reasonably fireproof or the mine shall have fire doors. The industry concurs in elevating Section 1d Article II from Code to Act status.

(G) [Sec. 317(e)] aims at preventing excessive accumulations of coal dust and methane at surface coal-handling facilities. The industry concurs in elevating Section 1b to 1c, Article I from Code to Act status and in the strengthened version of 1b.

(H) requires each operator to provide a safety training program approved by the Secretary. The industry feels that such industrywide training prepared by the Bureau and made available to the operators, with instruction by USBM wherein small operations lack sufficiency. Sec. 302(g) and (h) of S. 1300 are clearer and are endorsed by the industry.

(I) The industry does not object to the 5-splice rule in Schedule 2G nor to it and appropriate code sections becoming Act. This provision, however, is punitive and without documented basis. It should be restudied and consultation had. At most this provision should require special inspection of field splices prior to operation.

(J) [Sec. 205] Section 1b, Article IX and Section 8g, Article XI are concerned with protecting the miners from inhalation of harmful dusts and other inhalation hazards. The industry reaffirms its support of elevating them to Act status and concurs in the editorial improvement.

INDUSTRY STUDIES AND DEVELOPMENTS

Industry and its suppliers are constantly carrying on research and development in the fields of safety and environmental controls. Many of them are simply regarded as innovations and are field tried and installed without fanfare or publicity.

A few examples of such activities are:

An adaptation of roof bolting called roof trusses.

Plastic ventilation curtains more impervious and fire resistant and designed to improve efficiency in coursing ventilating air currents to working faces.

Splitting ventilating air currents in the face areas—with continuous mining.

Trickle dusting—a means of inerting float coal dust while it is airborne and as it deposits.

Placiing water at the machine bits—effecting a mechanical mix of water and the fire dust made in mining before such dust is airborne.

Holes for coal blasting drilled with water coursed through the auger.

Wet stemming of coal blast holes.

Supplied clean air in certain situations that are inherently high in concentrations of respirable dusts.

Systems on machines to deluge immediately all critical points in event of fire.

Devices on machines to remove power in event the operator misjudges clearance and is being caught between his machine and a timber or the coal rib.

Height permitting, operator protective cabs on machines to protect the operator from falls of roof or rib and from material toppling off the conveyor.

In summary, although endorsing many of the proposals in the bills, the industry hopes that its views on the points singled out as major and on others detailed in the full text will be considered as both constructive and objective.

The industry would be happy to consult further with this committee or its staff, if deemed helpful to your deliberations.

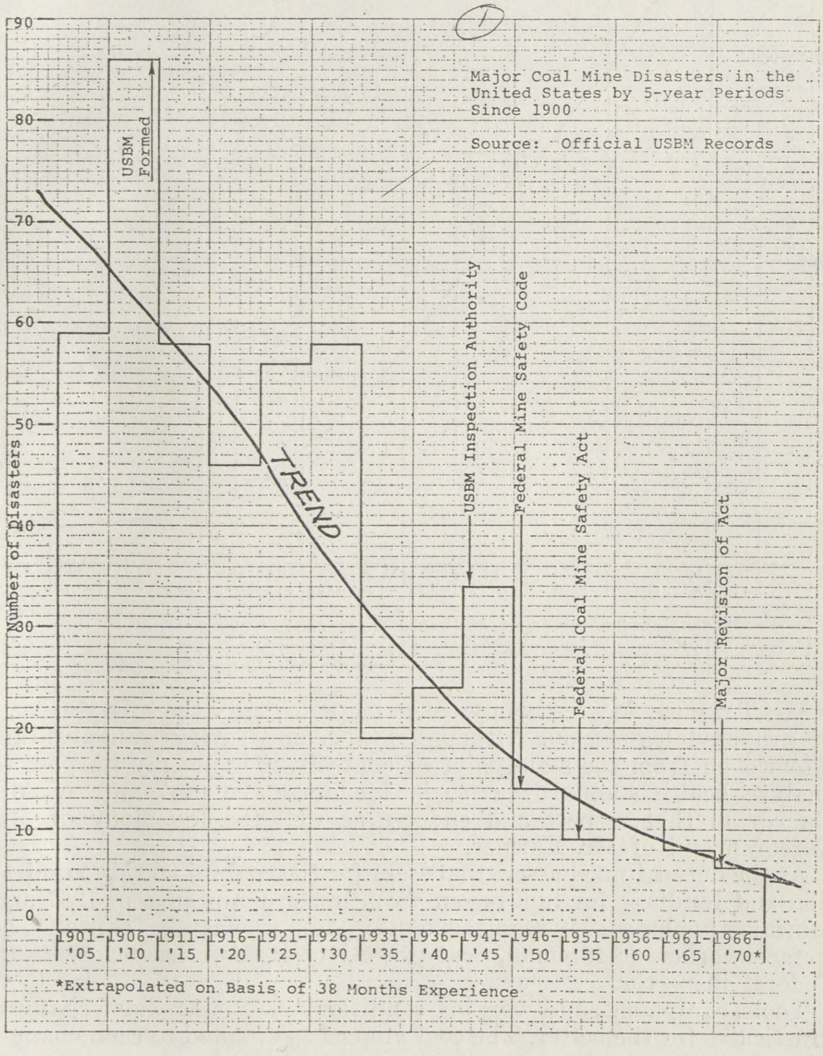
The industry endorses and will cooperate in all research activities which may result in improvement in safety and the work environment.

In the final analysis people will shape results.

We endorse—yes, we urge—acceleration of educational and training activities. We will cooperate with the Bureau and the states in developing and extending meaningful programs.

At this point, Mr. Chairman, with your permission, a few pictures and exhibits will depict some of the progressive activities and developments in the industry and among its suppliers. A complete set of the pictures, descriptively captioned, is offered for the record.

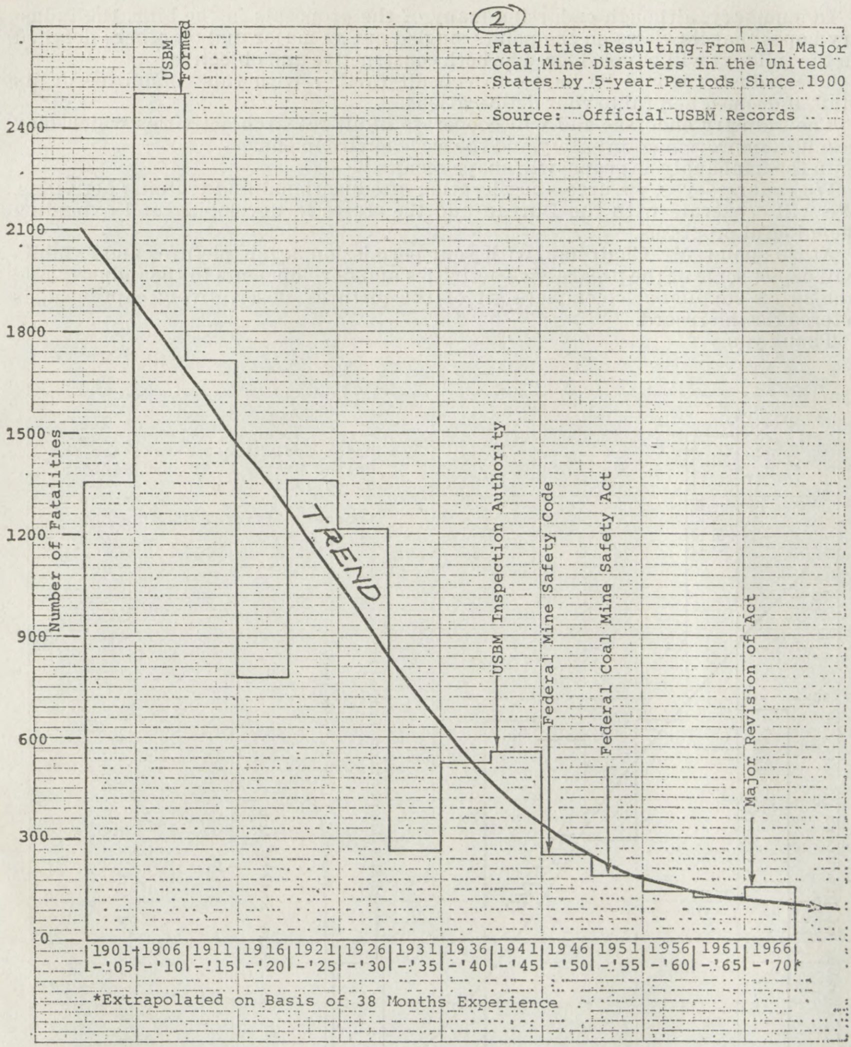
Thank you.



Major Coal Mine Disasters in the United States by 5-year Periods Since 1900

Source: Official USBM Records

*Extrapolated on Basis of 38 Months Experience



Mr. TALMAN. My testimony concerns principally the safety aspects of proposed legislation. Although health and safety standards are interwoven from the standpoint of controls, it is not my purpose to analyze health standards as such. I endorse the testimony of Mr. Garvey in that respect and endorse as well the testimony of Mr. Corcoran and of Mr. Farmer.

At the outset I must assert that I am for the coal miner. My admiration and fondness for him began with first acquaintance in 1937 and continues unabated. My regard extends to him in whatever capacity, be it face worker or foreman, coal executive or labor leader, State or Federal inspector.

Tools, equipment, and working conditions in 32 years have changed drastically for the better. The coal miner has adapted to each change, yet basically he remains the rugged individual who has so long appealed to me.

He is strong, energetic, competitive, resourceful, and courageous. He is so highly skilled that I can observe for hours his operation of sophisticated machinery, hardly noting the passage of time. He is truly "a workman that needeth not to be ashamed."

I could not think of him nor refer to him as a fatalist. He does not pass the buck, nor does he prejudge. He may, in times of stress, say things that one may not understand unless he, himself, is a member of the mining fraternity.

On the contrary, his dominant characteristic, a very American one, is that he is an optimist. When this is excessive or not affirmatively channeled, it can lead to his undoing. Military commanders recognize that this positive American virtue presents problems of its own.

The typical coal miner is so highly motivated that he can become impatient, impulsive, and at times even imprudent. His very resourcefulness can be hurtful, especially when it leads him to make do or improvise excessively.

If in truth "the best mirror is an old friend," you may now have a somewhat different reflection of my friend.

Summarizing these comments, our problem is not one of overcoming fatalism, a discouraging prospect, indeed.

The coal miner readily absorbs and responds to training, when designed to sharpen his skill, improve his awareness and condition his reflexes. But such educational and training programs must be thoroughly prepared, well presented and mindful of his time.

Gentlemen, you wish to see mine disasters eliminated, mine accidents greatly reduced and mine work performed without jeopardizing anyone's health. So do the mine workers, so do State and Federal enforcement officials. And so—beyond anyone else—do the operators, for it is they who carry the ultimate responsibility for leadership and direction, it is they who bear the criticism, the onus of failures.

Coal mining, with its attractive wages and other benefits, must become a good career choice in all respects. The industry's continued success, its very existence, tis ability to serve the Nation's energy needs hinge upon how it attracts and retains thousands of new miners and hundreds of technical graduates.

We have come a long way. But the great challenge, the great test, lies ahead.

Since 1910, the founding year of the U. S. Bureau of Mines, the trend of major mine disasters has been steadily downward. The lower rate of the 16 years since passage of the 1952 Act compared to the 20 years before reflects as 45 fewer occurrences, a 64-percent reduction. Several major coal mining States have had major disaster-free periods of more than 20 years.

There are many islands of progress in day-to-day safety. Shoring the roof with embedded steel bolts, a development in the mining industry, expanded rapidly in the early 1950's. Bureau of Mines records reveal that fatalities from falls of roof and face have dropped almost 75 percent compared to the 1946–1950 period and more than 50 percent compared to the 1951–1955 period.

Senator WILLIAMS. Could we pause there?

I know it is interesting to me. Our counsel, Fred Blackwell, and Mr. Mittelman were in the mines. I have never been in a coal mine. Fred, from his experience yesterday, recommended it to me, with some reservations, didn't you, about going into a coal mine?

Mr. Blackwell. With concrete reservations, yes.

Senator Williams. A sort of anthracite reservation. At any rate, are you talking about that bolt that is driven in the roof?

Mr. Talman. Yes, sir, that was a development of the St. Joseph Lead Co. and used by them for 20 years before the industry knew about it and was picked up by several Consolidated Coal Divisions in the early 1940's.

Senator Williams. Consolidation?

Mr. Talman. Yes, sir.

Senator Williams. In the 1940's?

Mr. Talman. Yes, sir, during the war years when equipment was very difficult to obtain. Then it was picked up in 1948 by another company and expanded in both its coal and metal ore divisions. Then beginning with the 1950's it really took off and spread rapidly throughout the industry.

Senator Williams. Now, what do you call it?

Mr. Talman. "Roof bolting."

Senator Williams. How is it driven into the roof of the mine?

Mr. Talman. In certain types of roof you use a rotary drill. This is desirable. It is hopeful. In the homogeneous sandrock roof it is necessary to use a percussion type drill, air percussion. Then you insert the rod, tighten it with the plate on.

Senator Williams. How do you tighten it?

Mr. Talman. It has a shell, and when you tighten it, the shell anchors. You tighten to a torque of about 140 to 175 pounds.

Senator Williams. I don't understand the anchorage. Is it like a flange bolt?

Mr. Talman. Yes, and the bolts are different lengths, according to what is needed.

Senator Williams. Is it a whole bolt, or does it flange?

Mr. Corcoran. It flanges. It is the same principle as plywood. You laminate the strata of the rock in the roof and make a firm and secure roof.

Senator Williams. I am not an engineer, but I thought it had a sort of arching effect. It is a laminating effect.

Mr. Corcoran. Yes.

Senator Williams. Because coal is stratified?

Mr. Corcoran. This is the rock above the coal, the rock strata.

Senator Williams. Isn't it normally stratified rock?

Mr. Corcoran. Yes, in various types. As Mr. Talman said, for that reason you will have various lengths of bolts anywhere from 5 to 6 feet up to 8 or 10 feet.

Mr. Blackwell. In the setting we were in yesterday it was rock and coal.

Mr. Corcoran. Normally it is the rock strata, tying together and making a firm structure that will hold the roof.

Mr. Talman. In some instances it is merely plastering a weaker roof, a weak strata to a firm one above. The plates on the bolts were originally known as shin plasters. It was considered that was all you had to do at first. Then it was found there were other complications that had to be met.

Senator WILLIAMS. What were the shin plasters?

Mr. TALMAN. They were the plates, normally 6 inches by 6 inches.

Mr. BLACKWELL. There is wood and a plate.

Mr. TALMAN. The wood is used where the tendency of the immediate roof is found friable and breaks around. It is a 6-by-6 plate. You are getting a little more bearing service against the roof surface by the wood.

Continuing with the islands of progress, some major coal mining States consistently beat the national average in averting fatal and nonfatal injuries by 2- and 3-to-1 margins. A number of companies are so effective with their safety programs that they operate regularly at frequencies of less than 15 disabling injuries per million man-hours, some of them below five.

Competition for the coveted Sentinels of Safety Trophy, sponsored jointly by the American Mining Congress and the Bureau of Mines, is now so keen that, in effect, there is one basic qualification—frequency zero disabling injuries. All the contestants must have operated the entire previous year with frequency zero disabling injuries. And yet so many, 18 underground and 19 surface mines in 1967, are in competition that the committee decides the winner in each category by determining which zero frequency mine worked the greatest number of man-hours in the year.

Progress, yes; trends, dramatic, but a building in Washington reminds us: "The past is prolog."

Let us all look to the future. Let us connect up the islands. Let us share a sense of urgency.

Laws are the groundrules for assuring uniform safety and working conditions. They must be diligently complied with. They must be strictly and uniformly enforced.

Now, the coal industry affirmed its position on that in July 1967, that laws should be reviewed periodically and amended as needed. That was included in a lengthy, comprehensive report to the Assistant Secretary of the Interior, a copy of which is appended to the full statement for the committee.

The coal mine industry is accustomed to operating under strict standards. Since 1946 we have had the Federal Coal Mine Safety Code, and the labor organizations, operators, and the Bureau of Mines, as a third party in this, have had that in the contract. That is more complete than anything anyone proposes today. In fact, 28 of the provisions in this Senate bill 1300, less in some of the others, are elevated from the code.

Now, we directed our review of the safety provisions to Senate bill 355 and 1300, inasmuch as they represented the views of two administrations. We endorse many of the proposals, as Mr. Dunn has said, 53. Some need clarification, and others need strengthening; 41 we endorse in principle.

Some points serve no worthwhile purpose, and yet others should be added. In fact, many of the proposed standards were suggested by the industry, while others were endorsed by the industry in the course of joint consultations with Bureau and union representatives. Some points we have to object to. They leave room for arbitrary action or poor administration or, more important, some of them do not impress us as likely to improve safety in the mines. The written statement goes into detail on that.

Now, Mr. Corcoran touched on violations that show up in the report that do not show negligence at all. Except to mention that we have that in ours, I will go no further than that.

Mr. Farmer speaks of the requirements for inspectors. I won't go into the details that we have here, except to say that we endorse rigid requirements and we have some ideas how the Bureau might help in the recruiting situation, which will be submitted directly to them. We don't think it is proper to submit that suggestion here. That is a departmental matter.

The miners and operating safety people are very concerned that the Advisory Committee which has been in the act since 1941, but never appointed by any administration, be strengthened, appointed, and used. In fact, the statutes should state that the chairman is to be the Director of the Bureau of Mines. I won't go into detail about the feeling that the standard should be permanent. That has been covered by Mr. Corcoran and Mr. Farmer.

Some of the interim standards that we have objected to in the detailed report are only because they are not clear and specific and appear to mean that they be later defined by the Secretary. It was our feeling that if the proposed mandated standard says that its definition will come later that that definition wouldn't even come under the rulemaking procedure because it would probably apply to the promulgation of new standards rather than defining an old one.

We are concerned at the prior approval thrust in certain important areas. We think that is cumbersome, inflexible, and prone to discourage initiative. Outstanding instances of the prior approval objection are in the roof control section, bearing in mind that, approximately, there are 6,000 mines in the country, that 6,000 mines have to have prior approval on their roof support program and main fan stoppage section.

The industry recommended that the main fan provision in the bill be lifted from the code statutes and strengthened. We didn't recommend insertion of the clause approved by the Secretary because we think that should be at the inspectorate level and you can move with more flexibility.

We are grievously disturbed by the implication that the flame safety lamp is obsolete except to test for oxygen sufficiency. The safety lamp is an instrument and must be regarded as such. It is rugged, sophisticated, versatile, and honest. Thousands of miners, supervisors, mine examiners, fire bosses, Federal, and State inspectors are trained in its use.

Industry feels that the provisions of the present act dealing with approved instruments and means for making tests for methane are strong and should be carried forward. We recommend the appropriate changes throughout this bill.

The written statement notes each section wherein this objection runs. Rather than condemning the safety lamp, we feel it would be more beneficial to revitalize training and testing programs for its designated use.

In that connection, the training film, which you will also see depicted in the slides, in the Senate parking lot just outside the entrance—and we hope you will find time immediately after the recess or some time this afternoon to go by—and in 10 minutes after a briefing and demonstration you can become a qualified user of a permissable flame safety lamp that will detect methane gas. We will have experts manning the trailer for your convenience.

Suffice it to say that since that trailer was put into service in April 1968, over 1,300 miners and supervisors in western Pennsylvania and southern West Virginia have taken the little short training course voluntarily and have checked out in the trailer. Included in that have been some State inspectors as well as Federal Bureau people.

Now, in the area of the nongassy mine classification—I am not going to belabor that, even as completely as we have it here—we note what Mr. Hickel has to say about the impact of that, and we offer a suggestion that consideration might be given to requiring that all electrically powered face equipment ordered after the enactment date be manufactured as permissible.

Another matter of major concern to us is the proposal to mandate the use of fire-resistant hydraulic fluids. That is a complicated matter, and the Director in late 1967 appointed a multi-interest group to study the subject and report back. The group made a systems study and made a number of field trips to mines and manufacturing plants. Their recommendation would provide far more effective standards than merely mandating of the fluid. They expressed serious reservations in approving and recommending the use of certain types of fluids.

Now, in answer to one of the questions earlier, that multi-interest group—you have the full copy of the report with the written statement—was made up of two representatives of the Bureau of Mines, Mr. Overton of American Mining Congress, Mr. Judy of BCOA, Mr. Drane, who was head of the Manufacturers Division of the American Mining Congress, Mr. Core, vice president of United States Mr. Suter, vice president, vice president of Consol, and Mr. Grumback, who is a very highly trained specialist in the fire prevention and fire abatement methods for Bethlehem Steel, and Mr. Lewis Evans, safety director of the United Mine Workers of America.

It was a very comprehensive report. Some of the report, which you will see in these pictures, was unanimously recommended by the group.

Unfortunately, it did not reach the Director and Secretary of the Interior until March 4. This was due to the fact that some needed data from the Bureau of Mines did not get to the chairman of the committee until February 19. The meeting, conclusions, signatures, and transmittal to them took place in the 2 weeks. Since the Bureau was represented on it, they had knowledge as it went along. It was not anything that hit them as a big surprise.

Senator WILLIAMS. This was not available when Secretary Udall had his meetings?

Mr. TALMAN. The report, sir, was not available, but two of the people on the committee were Bureau of Mine people, who participated in the various preparations.

Senator WILLIAMS. Their report was not completed until February of this year?

Mr. TALMAN. No, sir. There was nothing secret about the import of it.

Senator WILLIAMS. I did not imply that. I wondered when it was available.

Mr. TALMAN. The industry would be happy to consult further with this subcommittee or its staff. The industry endorses and will cooperate in all research activities which may result in improvement in safety in the work environment.

In the final analysis, people will shape results. We endorse, we urge acceleration of educational and training activities. We will cooperate with the Bureau and the States in developing and extending meaningful programs.

With your permission, sir, I would like to introduce Mr. Vincent Weisenberger, one of my associates, who will help with these pictures.

Senator WILLIAMS. While he is setting up, could I ask a question? We have before us the Federal Mine Safety Code for the mines underground and strip. The date is October 8, 1953. What is the significance of that?

Mr. TALMAN. That was the date of the last changes.

Senator WILLIAMS. That was going to be my question.

Mr. TALMAN. There is a procedure for making changes.

Senator WILLIAMS. Do you mean to tell me the Mine Safety Code has not been changed since 1953?

Mr. TALMAN. No significant changes since 1953. There have been some changes in that a procedure permits the joint industry safety committee, made up of equal representation from the union and the operators, to approve recommended improvements without actually changing the code itself.

Senator WILLIAMS. But that is intra-industry?

Mr. TALMAN. Yes.

Senator WILLIAMS. That probably had more antitrust implications than safety implications. Am I right? In other words, this was cooperation between you and the union for intra-industry updating safety.

Mr. TALMAN. Yes. It is done based on Bureau recommendations normally. If a problem comes up, they call on the Bureau to study that problem.

Senator WILLIAMS. It is not part of the code?

Mr. TALMAN. The procedure for granting exceptions is part of the code, itself.

I would like to say, sir, that this code developed in 1946 from the inspection code developed in 1941. It was extremely fair, and it has been the basis, you might say the bible, for most of the modern State laws enacted since this date. They are very complete.

Senator WILLIAMS. You certainly have educated us as to the roof bolt, which, as I recall from what you said, is a development, since really—not a development, but a general application since 1953. There is nothing in the code requiring a roof bolt, then?

Mr. TALMAN. No, sir; but the code deals with how you go about making the roof bolt installation and protection.

Senator WILLIAMS. It is in the code?

Mr. TALMAN. Yes, sir; that much was known.

Senator WILLIAMS. But it is not a requirement?

Mr. TALMAN. We consider it a requirement, even though it is not in the Federal act.

When you speak of the large bulk of the industry, we consider ourselves just as much obligated to do something about any finding of a Federal inspector under this code as under the act.

Senator WILLIAMS. Does your understanding and practice apply equally in all the 5,100 other mines?

Mr. TALMAN. I would not say it applies equally, but a substantial bulk of the tonnage in this country is mined by companies bound by the code.

Senator WILLIAMS. In other words, for the larger mines you would say "Yes, they do"?

Mr. TALMAN. Many of the smaller ones do. I could not answer that question categorically yes, because I would be answering about something that I don't have personal knowledge of.

Senator WILLIAMS. Before we get to the pictorial presentation, Senator Randolph?

Senator RANDOLPH. You have mentioned in response to the inquiry of our able chairman, the smaller mines brought under the act in 1966. We did include those mines in which there were 15 or less workers.

Mr. TALMAN. Yes, sir. It is interesting to note, sir, that most of the mines that were included in the amendment, which was enacted March 26, 1966, for the first time under title II, were already bound under this code because it made no distinction as to size. If they wanted a contract with the United Mine Workers of America, the operators dealt with them. Or if they were mining on Government leased land or reservations under the Walsh-Healey Act, they had to agree to abide by this code.

Mr. CORCORAN. May I make one point clear here? The code that Mr. Talman refers to was originally a document agreed to between the United Mine Workers and the industry as a safety standard. It was not a matter of law originally. Except as it has since been applied in the law, it is still a matter of collective bargaining agreement.

Mr. TALMAN. Yes, sir, it is also factual except with some improvements, that the provisions of the present act were covered in the code before they were enacted into law. So you get back to 1946 that the substantial bulk of the industry has been living and has accommodated itself to rigid standards.

Senator RANDOLPH. Mr. Chairman, I don't want to belabor this point, but, Mr. Corcoran, you and your associates supported the amendment in 1966?

Mr. CORCORAN. We did very much.

Senator RANDOLPH. Very strongly?

Mr. CORCORAN. Yes, sir. As I said in the beginning, I think the safety laws should be uniform and uniformly enforced.

Senator RANDOLPH. We in the Congress who worked on the legislation from 1963, until enacted in 1966 felt that it was important to have the statute of our safety regulations apply to the smaller mines.

Mr. CORCORAN. Yes.

Senator WILLIAMS. So that as we improve the law, there will be no need to say it goes to all mines. Any amendments of our law will go to all mines, is that right?

Mr. TALMAN. Yes, sir.

Senator WILLIAMS. Is that your understanding, Senator Randolph?

Senator RANDOLPH. That is correct.

Senator WILLIAMS. If we approve the law through this committee, through the Senate and through the Congress, it will go to all mines?

Mr. TALMAN. If I may be bold enough, there are many of us in the industry, including the committee that I have worked with for 2 years, this technical committee, who feel that the procedures that have been customarily followed of a multi-interest group attacking a certain problem should have been applied in the drafting of proposed legislation or proposed standards. We rather suspect that the outcome might have supplanted the code, and we had no further need for the Bureau of Mines as the third party to the labor agreement. We just feel that—I wouldn't say that is absolutely correct, but we feel that what you are considering would be a much, much stronger bill had the industry and the labor organization been permitted to participate in the program of developing the standards or proposing the standards.

Senator RANDOLPH. What act are you talking about, Mr. Talman?

Mr. TALMAN. Senate bill 355 and Senate bill 1300.

Senator RANDOLPH. You mean the legislation now pending?

Mr. TALMAN. Yes, sir. We feel you would be looking at a stronger proposed bill had the custom that this industry had adapted itself to through the years been followed in the most recent instance.

Senator RANDOLPH. Mr. Corcoran and Mr. Talman and gentlemen, I think it cannot be said too often here that insofar as this Senator is concerned, the legislation before us is subject to discussion and to refinement and, finally, to the decisions that must be made as to the actual provisions. In 25 years I have seldom seen any bill enacted into law exactly as introduced. It may have happened. I do feel that even though there are shortcomings, even though perhaps parties at issue were not as fully a part of the discussion to the introduction of the bill as possible, you must put responsibility on the shoulders of the Members of Congress. And we accept the responsibility of working these matters through very, very carefully in a hearing like this today, and in executive sessions.

Now, we passed the first act in 1941. I want to ask you, Mr. Corcoran, do you think it was necessary to pass that act?

Mr. CORCORAN. I think every act which has been passed has been necessary because I would have to admit that the record of the industry, as we look at the industry as a whole, has not been a satisfactory one.

I would answer your question, yes, all the laws, I feel, have been necessary. I think one is necessary today.

Of course, as you suggest, this is why we are here hopefully to present our views and to come up with something that is workable and that will improve the safety record of the industry. We have tried, many of us, to set standards, so to speak, of our own.

Mr. Talman's company, I know, and others and ours that are represented here go far beyond some of the provisions in this law. We think it is high time the industry as a whole faces up to the fact that we do have a problem that we have to find an answer to.

Senator RANDOLPH. Mr. Corcoran, I commend you for that statement. I feel that we must realize, as we go into this consideration of the pending bills, that perhaps in a sense we have reached a watershed in connection with the subject matter. We must pause as we have never paused before and we must drink all the knowledge that we can from all useful sources. You gentlemen are practical and understanding and I have that feeling that those persons who appear before us later will be objective and constructive, too. I would hate to feel otherwise.

I have no sense of that misleading attitude which is discussed so often. I ascribe to all persons, Mr. Chairman, who come before us sincerity of purpose and a desire to be helpful to this subcommittee.

I think it is very important that we approach this problem in this way in 1969. As you have said, Mr. Corcoran, it developed mainly out of the tragedy in West Virginia at Farmington, where you were directly concerned as the chief executive of a company which believes that, by and large, it has been improving its health and safety standards.

Is that correct?

Mr. Corcoran. That is correct. As I said earlier, Senator, and I appreciate your comments because I subscribe to those sincerely, but I said earlier and I meant this, that at the time that tragedy occurred we honestly did not believe an accident of that magnitude to occur in one of our modern mines. We were shocked, of course, but it did demonstrate to me rather clearly, among other things, that we just don't know enough yet, we do need more research in some of these areas.

In spite of the fine records that some of these companies have established in their accident frequency and, as I pointed out earlier, some of them are below the accident frequency record for manufacturing generally, in spite of that we still don't know all the answers.

In addition to law, I urgently suggest we need more research, we need to obtain more knowledge so that we can hopefully prevent another disaster of this kind from ever occurring again.

Senator Randolph. Mr. Chairman, I address Mr. Talman. You stressed in the concluding paragraph, Mr. Talman, the need for educational and technical training procedures; is that right?

Mr. Talman. Yes, sir.

Senator Randolph. It has not been mentioned, Mr. Chairman, but I think it should be in the record. We do have schools of mines within our university structure. We have a school of mines in West Virginia University. I don't know whether there is a member of your panel who can tell us what contribution is being made to this subject matter on these campuses where the schools of mines are in being, but I hope they are useful.

Mr. Talman. Very valuable contributions from those schools, sir, through extension courses given in the mining field and through their own research and studies publicized to the industry and to the regulatory agencies, a very substantial contribution, by specifically coal-oriented universities, the University of West Virginia, Penn State, it used to be the Missouri School of Mines, I think it has university status now, Alabama, Colorado School of Mines, and I am missing some, but I am merely using some so that there is a geographical spread. There has been a valuable contribution by all of them.

Senator Randolph. There is continuing dialog, then, between the student, the learner, with those who know, at least in part?

Mr. TALMAN. Yes, sir. There is increasing use and support by the industry of the work-study plan so that the mine-engineering students and other engineering students are working alternate 3-month periods and then school for 3-month periods.

Senator WILLIAMS. Senator Schweiker?

Senator SCHWEIKER. Some of the previous testimony on other days indicated on Federal inspections that there was in some cases, and perhaps the implication was a number of cases, advance notice given to the mine operators of an inspection. I wonder, Mr. Talman, if you will tell me a bit of your experience as a chief of inspections what has been your experience and what the practice of the Federal Government has been in this regard, to your knowledge.

Mr. TALMAN. To my knowledge, which would be from the level of, first, mine superintendent, assistant general superintendent, and general superintendent, and also two occasions as chief inspector, once at a district level and then corporate division level, I have never had anybody notify me ahead of time when an inspection was to be made. In all honesty, when we have had advance notice, somebody on the safety committee tipped us off they would be there the next day—there is nothing underhanded, nothing wrong with this from the standpoint of their knowing, because they are entitled to travel with the inspector if they wish—so they might get word the day before so they could check out and be excused from their regular assignment in order to travel with him. It was that innocent is my point.

I wouldn't say that that has not been done. I never was notified of it, and I have checked a lot of my associates and with other companies, and they tell me the same thing. And they don't care, because nobody in 24 hours could put an unhappy mine in shipshape, enough to fool a qualified man who is inspecting. You might gild the lily a little; you might whitewash a little, but you are not going to change it from a badly kept mine to a well-kept mine on any advance short notice prior to inspection.

Senator SCHWEIKER. As I recall, Mr. Boyle made a point of talking about hot lunches being required at the mines for Federal inspectors, so that advance notice would be given to the mine operators. I am not disagreeing with what you are saying. This might be the situation from your experience. I am a bit confused as to what he might have meant.

Mr. TALMAN. I could not analyze Mr. Boyle's presentation on that, sir.

Senator SCHWEIKER. Do you concur with the idea they should not be announced?

Mr. TALMAN. That is perfectly satisfactory to us to have no advance notice, because we don't care. If you are trying to comply with the law, that is the spirit of the industry, and you are doing the best you can, you really don't care whether you have advance notice. The only convenience if such a thing existed, if advance notice would be recognized, is to have overnight to plan who is going to accompany the inspector.

Now, if an inspector shows up at 7 o'clock, then the mine foreman in 5 minutes has to alter people's assignments to have a person available to each inspector. As far as I can see, that would be the only advantage, if you will, of having 12 hours' advance notice. You could plan your disposition of people to accompany him, and no other reason.

In fact, the Federal inspector and State inspector are not considered as ogres. The Bureau of Mines is a fountainhead of knowledge in this industry, and we are leaning on them very heavily, and we lean on the State inspectors for help and guidance.

The pictures which we will show you are developments within the industry itself, its manufacturers and its suppliers. They represent activities in six different companies, but because of the press of time I will proceed and make it as rapidly as I can.

(Photograph presentation.)

Mr. **Talman**. End of view of the trailer parked out there, which we hope you will find time to visit.

Senator **Williams**. How long will the trailer be there?

Mr. **Talman**. We will keep it all afternoon, sir. We will keep it as long as the committee might want if they feel they can learn by it. We will have it manned until 6:30 this evening, which I think is normally the time they close the garage, and so forth.

Senator **Williams**. We were here to welcome the men who brought the trailer in last night.

Mr. **Talman**. Yes, sir.

This depicts a miner actually testing for gas in the interior of the trailer itself.

This is a miner testing underground using his flame safety lamp.

Now this is an exciting new development, an extrapolation of roof bolting into a brandnew field. This is called roof trussing. A manufacturer in Birmingham, Ala., conceived the idea. It has been field tested in about five or six States.

This picture is an application in the development of longwalls in the mines of central Pennsylvania. Those trusses go over the ribs, and they are put under great tension and lifted, pulling the roof into compression. The roof bolts do this in part, but they also tend to pull the roof down under certain roof conditions. This can be fully as dramatic as the roof bolt introduction itself, where it is applicable and needed.

This is a two-headed drilling machine, homemade application of two hydraulic jacks to improve the protection to the bolters as they drill and place the bolts.

This is a machine designed for that purpose. You will notice the jacks at the masthead. Those jacks carry 28 to 30 tons before they yield.

This gets into the area of protecting people even though they, you might say, will use judgment all the time and unforeseen things happen.

A 6-year survey in one company indicated that the engineering aspects of containing the material that injures and maims and kills people through falls is not at all insurmountable. The problem of applying it is a little more difficult.

This is an operator's protective cab on a shuttle car and will protect that operator from massive falls of material.

This is a shuttle car with a cab on it being loaded.

This is a mobile drill machine with protected cab for the operator, protected not only while he is operating but as he travels from place to place.

This is a development of a small manufacturing company in West Virginia of the type of curtain wall more impervious and more fire resistant than types formerly used.

This depicts a brattice, a coursing of the air. The air goes up to the left side of the place, and it sweeps the place and returns to the right side of the curtain.

This is the same sort of material being used for an air bulkhead, preceding with the construction of a block wall or masonry.

You might notice in certain areas the conditions of weak wall. We call them "ribs." You might have noticed the roof bolts and boards in the ribs themselves for protection.

This is something worked on by that same company in West Virginia, western Pennsylvania, and then Kentucky, attempting to make it a usable thing, sort of the curtain rod principle, so that as the miner advances it is always taking the curtain with the operator. As he had to move back, as he does in the course of mining, this spring would pull part of the curtain back. We think it is quite close to being commercially feasible.

This depicts a method of ventilating in extraordinary situations of either gas or dust, and this happens to have originated in southern West Virginia. The air currents are taken up in this case to three center places. Then in the face area we call them splitting at the face. One returns on the right-hand place, the other returns on the left-hand place. By using this method we can keep the continuous miner on one side of the section on one split while the preparation is taking place on the other and never have anybody exposed downwind to the miner's dust.

In other words, it ventilates the continuous miner's place. It is headed for the fan; it does not travel over any other work. That is not necessary in all cases, but in extraordinary dust situations it has merit.

This is an application of something—I think Mr. Corcoran mentioned earlier that safety is not competitive in the coal mines, no pride of authorship, no copyrights. A mine in Alabama learned about an application to machines that permitted them to wet drill the holes for coal blasting. They adapted it to handheld drills, and that is the adaptation of a collar for wet drilling.

This is two men drilling with one of those machines. I know that seam. I know it is dusty, and I guarantee you would see a lot of dust in that picture but for the fact that the water is going up through the auger and coming out as a slurry.

This shows the operating cab for the continuous miner. Also, that continuous miner has water directed to the bits themselves. The principle is, to get a mechanical mix of the dust-making tool and the water at the point of contact.

You might also notice the roof bolt in there and the curtain behind it, which in the committee photograph you can discern.

This is a closeup of the same machine in the same location. You see those jets of water coming out where the tools are that make the dust.

This, Senator Randolph, is in your State, close to Charleston, a small company, small by comparison to Consolidation. Water is infused on the longwall in order to abate the dust. The superintendent is holding two of the plugs that they use to infuse the water.

This depicts that wall with the conveyor running, the mining machine running. It is coming toward that man in the white cap dumping onto the conveyor that takes it away from the wall, passing in front of him and alongside of him. There is no visible dust on that wall, as you can see.

This is not a universal thing, but where it is applicable, it is a means of abating dust in advance of mining.

This gets a little into the space age technology and what Senator Javits was asking about earlier.

The man on the left is wearing an approved self-contained mine rescue apparatus approved by the Bureau of Mines, which employs the cryogenic gas principle, the liquid to the gas, and actually that one gets lighter as the man wears it.

The man on the right is wearing the older type, which is a regenerating type of breathing apparatus and gets heavier as it is used, also gets hot.

Senator WILLIAMS. This is for rescue operation?

Mr. TALMAN. It started for rescue. There was an extrapolation made that the principle could be applied to people exposed to dust. So we are using the principle there.

Senator WILLIAMS. What is the weight of that?

Mr. TALMAN. Thirty-eight pounds fully charged. As it is used, it drops down to about 30.

The one on the right is about the same weight, but it gets heavier on account of the regenerating of the moisture.

Senator WILLIAMS. That is not in use?

Mr. TALMAN. Yes.

Senator WILLIAMS. I thought you said it is hard to get the men to even wear this little filter cup.

Mr. TALMAN. Mine rescue men are the most highly trained people in the industry.

Senator WILLIAMS. This is not the working man?

Mr. TALMAN. As you see it there.

In adapting the principles of the cryogenic to protecting people against excessive dust exposures there are situations where on account of thick cover, high mountain or the nature of the coal in the mine, that the control of the dust is almost impossible. From a disaster standpoint we know how to control it and do.

This is filling a cylinder with this liquid air, perfectly clear, no impurities in it at all. That cylinder is put in a prepared place on the mining machine and the miner is breathing that perfectly clean air at 70° temperature. There is no appreciable resistance to the breathing. There is a butterfly valve in it so it won't leak when he is not running the machine, not wearing the mask, but it takes so little inhalation that it is hardly noticeable.

That was first tried for several days in late 1955, field tested for 60 days starting in April 1966, and in the intervening period efforts have been made to get other successful means of delivering clean air in this extraordinary situation. It is now in the process of being put in a mine application for each continuous miner operator a machine in that mine in southern West Virginia. We hope it will encourage and stimulate other developments in the same general area, but this has been going on as an active study for the last several years.

We are getting, then, to the firefighting; some of the things that came out of this multi-interest group conducting study have been applied. This is what is called the "play pipe." If you want a flat foam instead of water as a spray, you can use that play pipe in the discharge of foam rather than spray of water if it is needed in firefighting.

This is an automatic system installed on the shuttle car. Shuttle cars are not connected to water. They are run like trucks. This company put a tank on the shuttle car. They use nitrogen to expel it. They place foam at the flip of a switch by the operator on all the vital parts of the car. This depicts foam on one of the rubber tires.

This a water deluge system. This, too, came out of the committee's activity while they were working. There is water again at the turn of the valve going to every critical part of that machine, every electrical part, every part that has hydraulic lines, and spray is directed to the roof to keep the place wet and cool. Water is the best heat exchanger there is to fight fire with.

This is another application of it by a different company, and also we put that in because it depicts the closeup of the operator cab protection for a loading machine operator. We can't show you the sprays to parts of the machine, but there are similar sprays to cover every critical area of the machine every place where a fire might spread.

This is a water deluge system thermally actuated, protecting the belt drive in the critical area of the conveyor belt. At rising temperature that will start a deluge of water. This is the same sort of thing using a dry-dust fire-extinguishing system. In some places you might have a freezing situation and have to use this.

Gentlemen, I didn't ask for the opportunity to identify the three gentlemen who have these exhibits. Mr. Dave Engle of Electronic Products Corp. and his company is working with this technical committee on BCOA on a breakthrough they have on signal transmission. We are attempting to adapt that to this problem of having positive emergency communication regardless of what might happen in the mine. We don't know whether it will work. It has already been field tested twice. They have been doing further work on it, as are the people working with them, so that it will be further explored to determine whether we can use that.

Mr. Engle, if you will stand and be recognized.

Then Mr. James Burgess of Madison, W. Va., president of the West Virginia Ventilation Equipment Co., and the author of extrapolating the mine rescue cryogenic apparatus to dust control, as well as the innovator of this plastic curtain and other developments.

Lastly, we have some other experts with him, Mr. John D. Ryan, board chairman and chief executive officer, Mine Safety Appliances Co., who, in addition to other things, has on the display table life support equipment and systems based on chemical oxygen systems, which I hope you will see, oxygen candles, and clean air blowers that they are working on which might accomplish this delivery of clean air to certain occupations, respirators, and other equipment.

We have the trailer available for your convenience and hope you will have an opportunity to go out and become a flame safety lamp user, you and your committee staff. And when it will not interfere with one of you, we will welcome anyone in the audience that would like to do it.

Senator **Williams.** Thank you for an excellent presentation.

Mr. **Talman.** Some of the things that MSA has been working with and industry with them that may provide answers to the fire and escape problem.

Senator **Williams.** Will they be here throughout the afternoon?

Mr. **Talman.** Yes; we will have people here.

Senator **Williams.** We have a fellow who has worked harder than we this morning.

It is now 20 minutes of 2. We have been at the watershed that Senator Randolph described since 9:30 this morning. I think it is time we left the watershed and went to the table. You men have had to do the work here, and we have been educated, as Senator Pell says.

Mr. **Dunn.** May we resume a most earnest and urgent invitation to you and the others on the committee to take a trip to the coal mines? We have had Cabinet officers there. I recall Senator Randolph accompanied them when Secretary Udall went with us in 1961, and other high Government officials, people from the Congress, and they have all come away impressed with the safety.

Senator **Williams.** We appreciate that. We do plan to do that. That is why I suggested to our staff people, while we couldn't get away yesterday because of floor action, and the staff did go, I wanted to be there prior to your testimony, and it was very helpful to know about some of the safety factors from the scene rather than from the academic situation.

Mr. **Dunn.** We want to thank you and Mr. Blackwell and the staff for helping us arrange the physical exhibits.

Senator **Williams.** Whoever helped to arrange the trip did an excellent job, making, on short notice, their trip very meaningful.

(The following letter was subsequently received for the record:)

KOEHLER MANUFACTURING CO.,
Marlborough, Mass., March 17, 1969.

SENATE COMMITTEE ON LABOR AND PUBLIC WELFARE,
Subcommittee on Labor
Senate Office Building,
Washington, D.C.

GENTLEMEN: We are writing to endorse the statement to your committee on March 12 of Mr. Woods G. Talman, Chief Inspector—Coal Operations of United States Steel Corporation. We support, particularly, his comments regarding the implication in the pending legislation that the flame safety lamp is obsolescent as a means of testing for methane. As a manufacturer of permissible flame safety lamps since 1915 (as well as a manufacturer of permissible electric cap lamps), we know of none of the several alternate means for testing for methane which gives as clearcut an indication of methane as the flame safety lamp, and we know of none constructed in such a durable manner. We believe that increases in our unit sales in recent years confirm the continued satisfaction which the coal mine operators and employees find in the flame safety lamp. We urge you to continue the present designation of the permissible flame safety lamp as an approved means for testing for methane.

Sincerely yours,

RAYMOND R. RICHARDS, *Treasurer.*

Senator WILLIAMS. The subcommittee will recess until 9:30 a.m., tomorrow.

(Whereupon, at 1:45 p.m., the subcommittee recessed, to reconvene at 9:30 a.m. Thursday, March 13, 1969.)

COAL MINE HEALTH AND SAFETY

THURSDAY, MARCH 13, 1969

U.S. Senate,
Subcommittee on Labor
of the Committee on Labor and Public Welfare,
Washington, D.C.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 4232, New Senate Office Building, Senator Harrison A. Williams, Jr. (chairman of the subcommittee) presiding.

Present: Senators Williams, Randolph, Eagleton, Cranston, Javits, Saxbe, and Schweiker.

Committee staff members present: Robert O. Harris, staff director; Frederick R. Blackwell, counsel to the subcommittee; and Eugene Mittelman, minority counsel.

Senator Williams. The Subcommittee on Labor hearings on the various coal mine health and safety bills that have been reported to the committee will continue this morning. We are particularly fortunate that our opening witness is one of our most esteemed colleagues, Senator George Murphy, of California, a most valued member of the Labor Committee. He comes from a varied background but one that is particularly important today: a background of hard labor. Am I right on that, Senator Murphy?

STATEMENT OF HON. GEORGE MURPHY, A U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator Murphy. You are quite right, Mr. Chairman.

I would like to thank the chairman and the committee for permission to appear here this morning as a witness.

It seems a shame to me that we have to wait until the experiences of the last year—the unfortunate explosions, fires, cave-ins, and near disasters—to be made conscious of the constant dangers faced daily by those who work underground in the coal mines.

There are many considerations that complicate the actual conditions in which the coal miners must work. Modern mining methods, with the use of machinery replacing the pick and shovel and the hand-turned drill, have been a great asset to the growing economy of our Nation.

But, with our added need and desire to increase production, concern for the human element must not be overlooked. In the past, it has been.

It is a sad commentary on our sense of priorities that it requires the death of 78 miners to renew our awareness of the problems that exist and the necessity for immediate attention to them and to finding means for the elimination of as many of these problems as possible.

You might wonder why a Senator from a State without coal mining interests for 40 years would want to testify on the subject of mine safety. I feel I have something to contribute to the subject from my experience as a coal loader in the bituminous fields of Western Pennsylvania, in the little town of Portage, Pa., to be exact.

My first job as a "greenhorn" was in a room which had to be approached either by creeping through the air course or riding in a mule-drawn coal car which passed through about 6 to 8 inches of water.

I remember this vividly because I went to work through the air course, where it was quite difficult carrying all the tools in my hands.

One Friday while I was returning to the surface at the end of the day I noticed that some of the beams bracing the ceiling seemed to have shifted.

The following Monday morning, before the men were permitted in, a thorough inspection of that particular area was made and it was found that hundreds of tons of rock had slipped down over the weekend, closing off that particular portion of the air course where I had worked. Had I been in the wrong place, at the wong time, I might not be testifying before this distinguished subcommittee this morning.

Another incident I cannot forget took place when I first began working in the mine. My partner who was sent in to instruct me for the first 2 days made a cartridge to blast coal by rolling a newspaper around a pick handle making a small tube which he filled with black powder.

There was a rule requiring that he take the carbide lamp off his cap and place it a safe distance away. He did this, however, with the open carbide lamp still on his cap, and I assure you that I made it clear, in no uncertain terms, that as long as we worked together I would make all the shots from that time on.

He was breaking a safety rule and he knew it, but he brushed it off by saying that he had been doing it that way for 12 years and had never had an accident. It didn't bother him that his negligence might have taken the lives of 15 to 20 men, including mine.

Of course, there were also rough jokes that were played on "greenhorns" such as wiring the handle of lunch buckets to the powerlines, which could have resulted in serious injury.

Thus, from my personal experience I have found that industry has not always done all that it might have in order to provide for the safety of the miners; and by the same token, the men in the mines have oftentimes been lax in protecting themselves when stringent safety standards did not exist or were not enforced.

Mining is a hard, dangerous, tough profession. Men who have gone underground to work know that too much care cannot be taken to protect the health and the lives of miners.

In my opinion, we must see to it that management, inspectors, and operators are not lenient in the enforcement of rules and do not allow miners to act in any way other than in their own best interests and that of their companions. We must also see to it, Mr. Chairman, that the rules are proper rules of safety to protect the welfare of the men.

I was gratified by President Nixon's decision to issue orders requiring an increased number and improved methods of inspections, expanded research activities, and greater Federal-State coordination.

The President also recognizes that this should be supplemented by legislation creating new programs to effectively attack the dangers inherent in coal mining. For this reason, I enthusiastically endorse the administration's recommendation for the passage of legislation modernizing health and safety standards, improving Federal-State inspection plans, increasing enforcement measures aimed at providing a safer, healthier and, thereby, a more productive environment for our Nation's coal miners.

The importance of the industry as one of the great sources of energy should never be permitted to surpass the importance of the lives of the men who work underground.

Thank you very much, Mr. Chairman.

Senator WILLIAMS. We are grateful to you, Senator Murphy. Your testimony is really most forceful because of the benefit of your personal experience in coal mines.

I will not ask how long ago that was. You certainly have done a great deal since you were a coal miner.

Senator MURPHY. I will tell you that it was a good deal more than 2 weeks ago. I worked in the mines during the period I was going to school. My older brother worked in the mines for 9 years. It was our hope that being orphans maybe the two of us would learn the operation and, if we were lucky, one day we could have an operation of our own.

As it happened I left one night and went to New York and got into another industry. He finally went into the steel business and is now retired. I am sure he feels as I do. We would not have traded it or missed the experience for anything. But, while we got through our experiences in the mines safely, we never lost consciousness of the fact that those men underground are in danger at all times. You never know, for instance, in the early mornings when they go through the safety liner and make certain that there is no gas content or too much gas, they never know when they swing a pick against a wall of coal in there if they will hit a gas pocket. This is what happens very often.

I see my distinguished colleague, Alan Cranston, who has been working with me on safety measures in oil drilling. There is much that has to be done in that area, too.

In both cases it seems to be a two-way street. It is the obligation of both management and, if necessary, the Federal Government to bring about and enforce these safety measures, and it is also the obligation of all the miners to see that they protect their companions and themselves to the greatest degree possible.

I thank you very much, Mr. Chairman.

Senator WILLIAMS. Just one moment. Perhaps our members would like to inquire if you have time, sir.

Senator MURPHY. Yes, sir.

Senator WILLIAMS. There has been some difference of view before the subcommittee and there are different provisions in the various bills relating to the method of persuasion or encouragement of the miner himself to obey safety rules and regulations.

Some of the legislation would call for a fine running to the coal miner. Others would leave the sanction, a penalty for infraction, to the coal operator, the penalty being management's right to fire a man.

We have not resolved this. This is what our hearing is for, in part, of course.

Senator **Murphy**. When I worked in the mines, any time a miner would break the rules it was up to the superintendent of the mine to decide whether to penalize him by letting him off for a half day or a day, you see.

I am more inclined, however, toward finding a way to get the people to do the right thing enthusiastically, voluntarily. I think that a good promotional program just as they have had in many of the safety programs in some of the large manufacturing plants ought to be the first approach.

I think the last approach ought to be a penalty imposed on the individual miner. Of course, the responsibility of the operator is constant, and I think that there ought to be some very definite penalties, if he is consciously not doing the job that should be done.

Senator **Williams**. Thank you very much.

Senator Randolph.

Senator **Randolph**. Mr. Chairman, I think we are fortunate in having in the Senate of the United States a man who was, in the earlier period of his life, active as a producing coal miner.

I have had the privilege often of discussing with Senator Murphy his experiences in this industry. Although he has come not to discuss with us the differences between the legislative proposals before us, we will be aided in those considerations by Senator Murphy's cogent comments.

Yes, Senator Murphy, as we proceed in these hearings, and when we come to the time for serious discussion within the committee, your observations and advice will be helpful and useful.

There are many perplexing problems that I am sure we will face as we attempt to draft this legislation. We do know, as you have indicated, there must be proper equipment within the mines where the miners work that will further increase the safety of those who toil underground.

That is correct, is it not?

Senator **Murphy**. That is correct.

Senator **Randolph**. I feel that you made that explicit. You have also indicated that there needs to be cooperative effort—you have said it in other words—by labor and by management. Then, too, Government, by constructive law, can aid in improving the health of the miners and in bringing a greater degree of safety to those who mine coal. I agree with you this is an obligation of legislators.

You have spoken also of the interest of the administration of which you are a part in bringing the impact of its affirmative thinking to this subject. This is commendable.

I should like to add, Mr. Chairman, to what Senator Murphy has said. I feel that he would want improved inspection procedures, and this is an area that we must go into very, very thoroughly.

Proper inspections will, of course, help to detect the elements that could result in tragic disaster.

The thought that you have expressed, Senator Murphy, about persuasiveness rather than, let us say, the discipline of penalty is thoroughly valid. That is a good way to approach a subject of this kind, but I do feel that there must be, to use a trite expression, teeth in the law so that there will be no misunderstanding by any of the parties to this issue. Government, through its programs and codes of safety and their enforcement, has a prime responsibility. Management has its responsibility and those who toil have their responsibilities, too.

We must be definitive, we must spell out responsibilities. I know that you, on other subjects in the Senate, speak often of the need for discipline in American society.

I return to my request, Mr. Chairman, that we continue to counsel with the Senator who has been a coal miner in the Commonwealth of Pennsylvania.

Senator MURPHY. I will be available.

Senator RANDOLPH. I think this would be of value to us.

Senator WILLIAMS. I certainly echo Senator Randolph's observation and hope that we can avail ourselves of your experience and wisdom.

Senator MURPHY. I think Senator Randolph will recall my older brother was in to see him about 2 weeks ago.

Senator RANDOLPH. That is correct. I remember it very well.

Senator MURPHY. He is now trying to perfect a new process that will make use of some of the lower grades of coal from mines that have been closed, so they can be reopened and run profitably and provide jobs.

Thank you very much, sir.

Senator WILLIAMS. Senator Schweiker.

Senator SCHWIEKER. Thank you, Mr. Chairman. I, too, want to thank Senator Murphy for his helpful testimony. I think it is helpful to have some practical experience on the job, Senator. I certainly appreciate your comments and interest.

I want to say, too, I am very delighted to see that you got your start in Pennsylvania and that this is why you have been so successful.

Senator MURPHY. I lived in Philadelphia as a youngster. My dad was the director of athletics of the University of Pennsylvania up until the year 1913 when he died. So I have a lot of roots in Pennsylvania. In fact, my roots are pretty deep because the room where I worked was about 600 feet underground.

Senator WILLIAMS. Senator Cranston, your colleague.

Senator CRANSTON. I would like to say that the varied background of my senior and distinguished colleague never ceases to amaze me.

Senator MURPHY. It amazes me, too, Senator.

Senator CRANSTON. Your testimony and your presence will be a great help.

Senator MURPHY. Thank you very much.

Senator WILLIAMS. Our next three witnesses for this morning have many things in common. They are all going to be addressing themselves, from their educational experiences, to the health aspects of our legislation and all of them are doctors.

I wonder, Dr. Buff, Dr. I. E. Buff, chairman of the Committee of Physicians for Miners Health and Safety from Charleston, W. Va., would you like Dr. Rasmussen and Dr. Wells to come up with you.

Dr. BUFF. Yes, that will be fine.

Senator WILLIAMS. Fine. We will have a true panel of experts before us.

Dr. Rasmussen is from the Appalachian Regional Hospital in Beckley, W. Va., and Dr. H. Wells is coordinator at Conemaugh Valley Memorial Hospital, Johnstown, Pa.

We have Pennsylvania outnumbered this morning, Senator Randolph. Be seated, gentlemen.

By the way, our appreciation to you gentlemen for coming here to be with us in our deliberations.

STATEMENT OF DR. I. E. BUFF, CHAIRMAN, COMMITTEE OF PHYSICIANS FOR MINERS' HEALTH AND SAFETY, CHARLESTON, W. VA.

Dr. BUFF. We are delighted to be here. I want to thank you all for the opportunity of telling the other side of the story which you have not heard.

Now I want the lights out, please, and I want to show you what we are talking about.

Senator WILLIAMS. Is this film or slides?

Dr. BUFF. Slides.

Senator WILLIAMS. On the big screen?

Dr. BUFF. Yes, sir.

(Slide presentation.)

Dr. BUFF. Senators, this is a normal lung. You do not have many of them anymore; there is too much pollution.

In Kanawha Valley we do not have it. In West Virginia, we have the brown lung. We have too much ash and soot in our air and sulphur dioxide and other contaminants.

Here you see a normal lung. It is a rare specimen. It shows you one thing, that when it takes in oxygen it lets out carbon dioxide. Carbon dioxide is the key to the problem.

That looks good, that lung. When you do an autopsy and see that you say, "Ah, what a nice pair of lungs."

(Slide.)

Dr. BUFF. But this is what you see in a coal miner, black lung. It is dead, half dead. The carbon dioxide cannot come out. There it comes in eddies. You do not get a transmission of oxygen to the carbon dioxide. So what happens. You get an individual whose brain is damaged, whose lungs are damaged, whose kidneys are damaged, whose heart is damaged, whose bones are damaged.

There is not an organ in the body that is not affected by high CO_2. What it means basically is this: You are not getting the feed line, the oxygen, to the muscle, to the tissue, and the tissue works halfway.

Well, a halfway-working liver makes you look half dead. This is the reason why people with black lung look like they have got cancer.

If I had my choice of cancer of the lung or black lung I would take cancer of the lung because you live 4 or 5 years and you die.

With this you live 15 and 20 years and you choke to death as if one takes a string and ties it around your neck, day by day, tighter and tighter, begging for a little air, just a little air.

This is a disgrace, this is terrible. It should never have existed and it should be eliminated from our people in this country.

(Slide.)

Dr. BUFF. I want to show you a slide. This is a rare slide. It shows the dust around the artery. That is how coal dust attacks the lung. That artery will get smaller and smaller.

(Slide.)

Dr. BUFF. Now you see a very close section. You can almost pick the dust particles out. Look at the artery getting smaller.

(Slide.)

Dr. BUFF. This is the artery to the lung. This is the pulmonary artery.

Senator SCHWEIKER. How does the black contaminant get around that? What happens? Will you explain that process?

Dr. BUFF. It gets out by irritating and going into the system.

Senator SCHWEIKER. How does it get from the lung to around the artery?

Dr. BUFF. The artery is in the lung.

Senator SCHWEIKER. This is in the lung?

Dr. BUFF. In the lung, yes. It goes right in. There is no problem.

(Slide.)

Dr. BUFF. This is a barrier to an artery. It shows you how the artery is getting constricted. These are the pulmonary arteries, the small arteries. You can almost see the dust there on the side but in the center is the barrier to the arteries.

This is a picture of the same thing.

(Slide.)

Dr. BUFF. Here is pneumoconiosis, early stage but enough to cause a pneumonic process in the lung as you can see in the upper part, the brown part.

(Slide.)

Dr. BUFF. You see what we often say about black lung. It causes holes in the lungs. If you look real close you can see those holes being made. Also, you can see the dust in the lungs.

(Slide.)

Dr. BUFF. Now you see an accumulation of dust. That part of the lung is dead. This is a half dead individual. But look above the real dark part and look at the holes in that lung.

How would you like to try to catch fish with a net where nine or 10 of the little circles were dispersing and you had one big circle all through that net. You would not get any.

And in the lungs you do not get any air because you have eddies of air.

(Slide.)

Dr. BUFF. This is another section of a lung producing pneumoconiosis and also producing holes in the lungs.

(Slide.)

Dr. BUFF. This is a more advanced case.

(Slide.)

Dr. BUFF. Now you can see pretty definitely on the upper part the holes that are being formed. I do not think there is any question about that.

Senator WILLIAMS. Doctor could you give us any ideas of the age groups you are talking about here?

Dr. BUFF. This has nothing to do with age. It has to do with the number of years they are exposed to dust.

Senator WILLIAMS. Could you give us an idea?

Dr. BUFF. That would be an individual, I do not know, could not say. I would not want to say but it would be someone who would average about 45 that was becoming disabled from pneumoconiosis.

(Slide.)

Dr. BUFF. Now this is massive fibrosis or scarring of the lung. This fellow is about 6 months from death. He is ready to go.

(Slide.)

Dr. BUFF. Now you see how it is spread out and it is thick, there is nothing there.

(Slide.)

Dr. BUFF. One week, 2 weeks before death, and that is all. The coal miner has left this earth.

(End of slide presentation.)

Dr. BUFF. Mr. Chairman, I brought here a miner's cap that was given to me by a coal miner. I brought here a lamp. Maybe some of you have never seen a carbide lamp. This is the method used in the 18th and 19th centuries to mine coal.

Our production methods are the 21st century but the coal miner's health is still in this period, it has not changed.

This is also seen in testing methane in the coal mines. They use antiquated equipment, a flame test when they could use monitors and accurate ones but they refuse to do this.

If you want to monitor gas in the coal mine you use a monitor that is an accurate method. But to take a lamp and hold it up and see if it gets to be a big flame is old time and it is not needed here in this country.

General Betancourt in 1794 addressed the Continental Congress of this country and he said, "Gentlemen of the Congress, figures don't lie but liars figure."

And I do not think it has changed in 175 years. West Virginia has been called a feudal State. I do not think it really is a slave State but the coal miners are considered somewhat slaves.

They figure the coal miners belong in a crown colony because 90 percent of our coal is owned by outsiders and not owned by West Virginians. But what segment of our population in this country lives camping, they have been camping for 50, 60, 70 years. The average individual camps for 1, 2, 3 weeks and he has had enough, but not the coal miner.

He has nowhere to go. He has no paved streets. They are made of dirt and coal dust. His hair is terrible. His water has iron and sulfates in it and acids. And the sewerage system is something of the 17th century.

You just dump it in a creek. But there is no sewage system in very many coal mining areas in this country. They throw it out of the back yard or in the creek.

They can't get life insurance of over $1,000 or $2,000. Who would want to give it to them? Because they live 10 years less than the other population. It is risky.

Then in West Virginia last year, 1 in 300 miners was killed. This is not a good risk for an insurance company. Who would give a coal miner accident insurance?

Senator SAXBE. You mean on the average, 1 in 300 miners was killed?

Dr. Buff. Last year. As far as accident insurance, as of January 1969, in 1 month the West Virginia State Compensation Department reported 1,140 accidents in 1 month. Multiply this by 12 and divided into 43,000 miners and you come up with a 30-percent accident rate.

What industry in this country can even touch it? Who would give him accident insurance? That means if a man works 3 years he is bound to get hurt. And the worse thing, and I think this is what has always bothered me so much and I know it is going to bother you, the suppression of brains in the coal mining community.

The schools are bad, the teachers are the worst that you can get, and they really do not want these people to get a high school education and go to college and become doctors, lawyers, scientists, and other things—the professions.

They want to add fodder to that machine and the women are kept ignorant. The men won't stay there without women.

At West Virginia University, two professors enlisted 25 graduate students to go into Monongalia County to help with preventing dropouts.

Do you know what happened? They asked for $3,000. The service club refused to give it to them. They went to Charleston, to a very benevolent individual; he refused.

The basic reason was that this is a bad thing to start—education at this level among the coal miners' children. But they put the money out of their own pockets for transporation and I can report to you now that students at West Virginia University are doing a great job in trying to keep these children from becoming dropouts and giving them incentives to learn.

Let us talk about the economic pressure of the coal company. If the man does not behave he gets blacklisted. If blacklisted, he can't get any job in another coal company. These are not idle remarks. They are true, it happens every day.

In some coal communities they have police departments; they remind you of the Gestapo of Germany. Let us take the medical care in a coal mining community. The medical care is second or third rate.

I want to report to you that we have had 50 meetings of miners in the State of West Virginia to educate them in what dust disease was, what it does, and how it will affect them and what they should do about it.

In the first place, we have the best educated coal miners in the United States on dust disease. They really know their stuff.

In the last fight with the legislature in order to get a compensation law, and I would like to hesitate here a minute and show you what happens in Charleston [putting on white hat].

The legislators wore the white hats when they talked to the miners and they said, "We are for you."

They went into committee and [witness puts on black hat] they put the black hat on of the coal operator. That is exactly how they voted. They tore this law to pieces.

When they came out [witness puts on white hat again] they said, "I tried but I couldn't do anything."

At these 50 meetings that I have had I would shake hands with all the coal miners. Some would have one finger missing, some two fingers, some three fingers, some could not raise their arm, some limped, some, you look on their face and you see the scars of coal mining accidents.

I would say to a man, "How old are you?" He would say, "30." I would say, "You look like 50." Another one would say he is 40. He looked like 60. They actually deteriorate earlier than other people.

Ask any newspapermen who have visited the coal mining regions about their experiences and what they have found.

I want to say that my interest in this is not just 6 months ago. It is not 1 year ago. It was 20 years ago when I worked on vectors, a system of taking a cardiogram in space.

We found 20 years ago that the coal miner's vector, the heart vector went to the right instead of to the left. We found their X-rays were normal and we did not understand it but as time has gone on we know what has happened and when the pneumoconiosis or coal dust disease gets so bad that it increases the pressure on the right side of the heart the heart vector turns to the right.

This happens years before the electrocardiogram gets bad.

Senator WILLIAMS. Senator Randolph understands the immediate aspect of what you have just been saying. Frankly, I do not.

Senator WILLIAMS. Do you gentlemen understand the shifting of the vector?

Dr. BUFF. Then I will explain.

Senator WILLIAMS. We are mere laymen.

Senator SCHWEIKER. You are going too fast for us laymen, Doctor.

Dr. BUFF. With the average heart in the average individual the current is to the left, this way or this way, because the left side of your heart is three times as big as the right. It is the mass that pushes the blood through the system.

When you get pneumoconiosis the right side enlarges because of the pressure on the right side getting the blood to the lungs.

This back pressure causes the vector to shift from the left to the right. It can be seen only in a vector cardiogram; it cannot be seen in a cardiogram.

Now, it does not come early, it comes late. But we were appalled at the fact that we could take a person whom we knew nothing about and take a vector cardiogram and find out he was a coal miner without asking any questions.

This bothered me because it really shows that coal dust affects not only lungs but the heart, itself.

Two years ago, I asked the Bureau of Mines in Pittsburgh to give us a monitor system because I had seen too many coal miners come in my office and in the hospital with heart attacks who had lung failure.

So I wanted to know how much carbon dioxide, oxygen, and methane was in the air of the mine. There are very simple monitors that can tell this. They are very inexpensive. I was not treated too nicely because I do not represent a corporation, I am just one fellow. So I went to Washington and tried to find out here and got nowhere. They referred me back to Mount Hope and they knew less about it than I did. So I got nowhere.

In fact, I was told that the law of 1952, the miners safety law, protected property but not humans. And if you read the law you get to believe that. It protects property rights.

It stops explosions, but it does not do anything about the health of the miner. It does something about sudden death in the mine, a catastrophe but nothing about dust, indeed, itself.

Then came Hominy Falls and I spent 2 days and 2 nights up there and I found the cause of that accident and it was not as reported. It was "grubbing" coal or taking coal that did not belong to them.

There is even some question about that map, which I think that the Congress of the United States should look into.

Senator **Randolph.** Dr. Buff, may I interrupt at this point?

Dr. **Buff.** Yes, sir.

Senator **Randolph.** For the information of the members of the subcommittee, Dr. Buff refers to the fire, the accident, the tragedy, which took place in Nicholas County, W. Va., at a mine near the community of Hominy Falls.

I think it will be valuable to the members of the subcommittee to check on that situation in view of the statement that Dr. Buff has made this morning. Reviewing that picture would be perhaps informative.

Senator Williams. What is the name of the disaster?

Dr. **Buff.** Hominy Falls disaster.

Senator **Williams.** When was that?

Dr. **Buff.** That was in May 1968, sir. Four died, 21 got out. But they were lucky.

Senator **Williams.** Was that an explosion in the mine?

Dr. **Buff.** No; that was water. They did not drill 8 feet ahead of them when they were driving. They were too interested in coal production and not the men. This would stop production.

These men got caught in water. But I do not think that is the whole thing. I think they were grubbing—that means hogging in plain language—coal that was not really supposed to be theirs. This is why they got into the difficulty.

Now about that map. I am interested in that map because engineers as a whole do not make mistakes of that caliber. Engineers are pretty good, pretty precise.

However, in Hominy Falls I sent a telegram to the chief of the mines and I said this accident is a horrible thing, we don't want it to happen again in West Virginia.

So I asked that they have a Federal inquiry with the right of subpena. I got a nice telegram back, very flowery, saying, "Yes, we will do that." Nothing more happened. Then they had the hearing in Summersville. The chief of mines of West Virginia sat at that hearing, went over the evidence, and said, "I need a few weeks to make up my mind as to what happened." Two hours later that mine was opened.

How in the world they came to the conclusion nothing was wrong, I don't know. They had not even looked over the testimony.

I made the statement at that time that another catastrophe would happen, it would come, and I was fearful for the lives of the people, the coal miners of West Virginia, our coal miners.

Senator Williams. You referred to most of the mines being owned by "outsiders." What mines are you talking about now?

Dr. Buff. That was the Maust Coal Co. and also New River Coal Co.

Senator Williams. Are these owned by outsiders?

Dr. Buff. They are not locally owned.

Senator Randolph. I think the record should show that stock could be purchased by individuals in the corporation. Maust is spelled M-a-u-s-t.

Dr. Buff. Well, about the stock business reminds me, Senator, when I was talking to bankers in Charleston, and they are not so easy to talk to, especially I am not too popular because I believe in keeping the air clean and this is a problem.

So they said, "Doctor, how much does it cost to do what you want to do? You know we have to pay dividends to the stockholders."

I said, "Now, sirs, you know as well as I do in a great many corporations the president and the board of directors and trustees get the ham of the hog and the stockholders get the chitterlings and occasionally a sow's ear."

As far as Mannington is concerned, 78 died and, you know, the reason it is so terrible is that I have spent some time up there and I have found out that there might have been a little adobeing and that is setting off dynamite on top of slate. There was a miner caught in there, a continuous miner, had been caught for 3 days.

I talked to some men on the previous shift and they told me they had brought dynamite up there and yet, believe it or not, on the next shift that explosion occurred. Nobody has the proof but I know the dynamite was there and I know they were going to dynamite it because a miner that is inactive costs money, costs plenty.

They are a $100,000 to $200,000 piece of equipment and they were told to get that thing going and it got going and so did the 78 people go to heaven.

Senator Williams. What is the point you are making regarding this dynamite?

Dr. Buff. I will explain that to you, sir.

When you take dynamite and put it on top of slate, that is illegal even though you put coal dust or rock dust or anything else on it.

You are supposed to dig eight to 10 to 12 holes, divide the dynamite in equal parts, cover it with mud or rock dust or coal dust and set these off independently.

If you do that you get no flash fire. If you adobe on top, which is illegal, you blow the whole thing to smithereens if there is any methane around.

I happen to know that there was not any drill at that site at the time the second shift went off. I am making no accusations, I am merely saying what someone told me but I believe because two or three told me the same story. It is true. They had no reason not to tell the right facts.

Then, gentlemen, I am disturbed by the fact that the Federal Government gave $63 million for coal research for new markets in 1969 and not even a million dollars for coal dust control.

Why do you give so much for the production and nothing for the man? They have also an education program because the coal miners are getting disabled at a fast rate. So they go to the high schools and they enlist these students with Federal funds for training.

I asked many high schools to give the other side of the story as far as the health of the coal miner, the fact that if he does not die in an accident he may die of black lung and that he will be sick the last 10 or 15 years of his life.

But only until recently did anyone allow me to speak and that was in Wyoming County, with three high schools.

Yet the Federal Government gave $5 million for this program.

Mr. Chairman, the Department of Education of this Government wrote me and said they are interested in education, they are not interested in health. The Department of Mines wrote me and said these people will be strip miners who are trained so they do not get dust disease. This is an exaggeration.

Strip miners get dust disease the same as anyone else. With the high-powered augers even though they are out in the open the dust is so high they can't help getting it in their lungs. I have seen many strip miners who had pneumoconiosis.

Now let us get to the crux of the problem, the black lung business where there is so much argument as to how many cases are there.

I know because in previous testimony there have been some who say it is a rare disease, some say it is like phlegm in the nose and you flop it out.

But you can't do that. Because once it gets in the lungs it is progressive; 1,000 autopsies were done in the Beckley hospital. Eighty-five percent showed coal dust disease. We figure that about 50 percent of the miners eventually become disabled from this disease. It is a progressive disease.

If a man leaves a mine 10 years later it affects him. He gets short of breath, he develops the emphysema, he develops the right heart failure and out he goes.

Of course, it is easy enough to say that mining did not have anything to do with it. But it does.

Those who do not have coal dust disease do not get right side of the heart failure. What are the symptoms? What does a coal miner look like? What does he say? He says, "I am so short of breath, I can't work like I used to. When I work real hard, why, I get dizzy."

He says, "I start coughing, I am spitting up black stuff."

He uses about 30 to 40 percent of the energy of his body in breathing while in a normal person it is 10 percent. He uses 30 to 40 percent of his energy in breathing while in a normal person it is 10 percent of your total.

I want to briefly go over the book, 1952. If this book had been adhered to, there would have been——

Senator WILLIAMS. Doctor, could you read the title page on the book you have.

Dr. BUFF. "Federal Coal Mine Safety Act, as Amended, 30 U.S.C. 451, January 1967, the U.S. Department of Interior, Bureau of Mines."

In studying this book you find there are four gross violations every day in a coal mine. No. 1 I have already mentioned: adobes or illegal setting off of the dynamite.

No. 2, using the tape on wire instead of vulcanizing. Tape will not keep a wire from getting hot or catching on fire. Then when the cable catches on fire these men get sicker than with coal dust because cable dust really fixes them in a few years.

Senator SCHWEIKER. What should they use?

Dr. BUFF. They should be vulcanized but they use this tape because it is faster and a lot cheaper.

And, there, dust. You talk about dust standards. You know it makes me smile sometimes the way you talk about 3 milligrams and about 4½ milligrams. My lord, in some of those mines it is 300 milligrams. You can't see a foot ahead of you.

So, the dust on the ground these men have told me is such they have worked in 18 inches and 20 inches of dust which should have been removed because it causes explosions and it makes people sick, humans sick, not animals, but humans.

Now the most dastardly practice in this book is working "ahead of air." That means ahead of ventilation. I should say about 90 percent of the miners have done this in time.

The reason it is bad is because they have bad lungs anyhow, they can't help it, and if you cut the oxygen down from 19½ to 18 percent the man becomes unconscious. So they are hauling him out of the mines, "heart attack, heart attack," to the hospital.

He doesn't have a heart attack, he has respiratory failure. Heart attack is not compensable, respiratory failure is. You have to be a pretty strong doctor to make a diagnosis of respiratory failure if you work for a coal company. I do not think you would be around very long.

I think there are thousands of miners in West Virginia who think they have coronary disease and heart diseases, who have lung disease, never had heart trouble.

And that is a sad thing because once you get a label of heart disease you are cooked. Nobody will hire you. You can't get life insurance, no one wants you. You are a drag on humanity because you cannot cure heart disease. And everyone knows it.

So they believe the man has heart disease and that is it.

If you gentlemen do not believe me, if any of you have had a diagnosis of coronary heart disease and did not have it, just try to get life insurance, just try it.

Now I think a lot has been said about masks in the prevention of dust. I saw, Mr. Chairman, a picture of you with a mask on you yesterday.

Senator WILLIAMS. It was upside down.

Dr. BUFF. I know that. Basically, I want to tell you that mask wouldn't help you. It is a waste of time. The particles of dust that cause pneumoconiosis, the filter in that mask will not take out because if it took that particle of dust out you could not breathe. They are the same size as air particles.

Senator SCHWEIKER. What size are we talking about?

Dr. BUFF. Half micron, 1 micron.

Senator SCHWEIKER. How large a particle will that mask take out?

Dr. BUFF. Two or above.

Senator SCHWEIKER. You say practically all the black lung is caused by something that will go through that mask?

Dr. **Buff.** No. Most miners do not use the mask because they can't breathe. What I am saying is even if they wore the mask it wouldn't help.

Senator **Williams.** Say that again. Why would it not have helped if they had used the mask?

Dr. **Buff.** Because the size of the dust particle, a half a micron to 1 micron, is the size of air. If you cut the dust out you cut the air out. That is why these fellows start working in it and they throw it off and they say, "I can't work in this thing." It suffocates you.

They are not sick in the head. They know what they are talking about.

And then there is the other problem. Most of them have lung disease. If you cut down the oxygen supply through that mask he is going to get silly, he is going to see double. So he throws it off.

Senator **Schweiker.** I would like to pursue this a minute, your previous answer. What size particles in your opinion causes black lung?

Dr. **Buff.** Under 1 micron.

Senator **Schweiker.** Is this on the basis of tests you have made or is this generally accepted?

Dr. **Buff.** It is pretty generally accepted. It is the small particles that cause the difficulty.

Senator **Schweiker.** Are you saying, then, that this mask will not sort out the particles of under 1 micron?

Dr. **Buff.** It will do no good except take the big particles out.

Senator **Schweiker.** Is there any kind of breathing apparatus that will?

Dr. **Buff.** Yes, a closed system. I want to tell you, gentlemen of the Senate, that I will soon get a real new mask made by the Czechoslovakian people who have good mines. I do not mean "minds," pardon me, sir, I did not mean that in that way, because they look upon the coal miner as a machine and they take care of that machine.

But their initiative in doing something for the coal miner went back to the time of the initial revolution in Czechoslovakia in which they wanted to protect the workingman.

Incidentally, there are two countries that have good dust control: England and Czechoslovakia.

Senator **Williams.** How about Austria?

Dr. **Buff.** They are very good. I will soon go to Czechoslovakia and Wales because I want to see for myself what they do and I do not like to take other people's word for this.

Senator **Schweiker.** Doctor, this other mask you said was Czechoslovakian?

Dr. **Buff.** Yes. They have one, I understand, that works but I have not seen it.

Senator **Schweiker.** Is it a closed system or direct air filter system?

Dr. **Buff.** It is closed but I do not know how it works.

Senator **Schweiker.** You are really saying only a closed system will do the job?

Dr. **Buff.** I am saying, frankly, only a closed system will work. You have to have a mask developed with compressed air piped into the mine so that a man is able to breathe without getting any dirt in his lungs.

I doubt whether you ever will get a mine clean enough that he can stand there and breathe without getting dust disease.

Senator SCHWEIKER. Could you get this subcommittee a Czechoslovakian mask?

Dr. BUFF. I am going personally to get it. I will get it.

Senator SCHWEIKER. Mr. Chairman, I would like to request that we see this and examine it.

Senator WILLIAMS. I will certainly join in that request.

As I understand it, this is a system that is manufactured abroad in Czechoslovakia?

Dr. BUFF. Yes.

Senator WILLIAMS. How would we arrange——

Dr. BUFF. I have already got the process going to get them, sir.

Senator WILLIAMS. You are going to bring it here?

Dr. BUFF. Yes, sir. I will give it to Senator Randolph.

Senator WILLIAMS. Is there any way we can expedite it?

Dr. BUFF. They are on their way, sir. They are on their way.

Senator SCHWEIKER. Mr. Chairman, if everyone wears a mask and the masks are so good, I think we ought to see what the difference is and have some medical experts testify.

Senator WILLIAMS. This is in opposition to the testimony we had yesterday. We had this mask and we were well photographed as you noticed in the paper, with a very simple mask and it occurred to us that if this works, the problem is reduced substantially.

You are saying that that particular mask does not work?

Dr. BUFF. Well, it is foolhardy to even try it. If you make a mistake and it doesn't work, you will get black lung out of it.

We know that this mask is not safe. But that point of view, if you are on the other side, anything works, even a piece of cotton over your nose. It depends on your viewpoint.

The people in England and the people in Czechoslovakia have a good system. We say they don't produce coal in the proportion that we produce it and that is why it wouldn't work here. No one knows. No one knows.

Senator EAGLETON. Are there statistics available on the incidence of black lung in Wales and in Czechoslovakia?

Dr. BUFF. Yes, sir, in Wales it has been reduced from 60 to 20 percent.

Senator EAGLETON. What about Czechoslovakia?

Dr. BUFF. It is supposed to be somewhere around 25 percent now. I do not know what it was recently but it is going down. They are very strict on this dust control.

Senator EAGLETON. In your opinion, what are the key things they are doing that we are not doing?

Dr. BUFF. They have a system where they suck the air, when they cut the coal they cut large pieces instead of small pieces.

They have like a cyclone over the machine. It sucks back the air. It goes through a wool-cotton filter and then an electrostatic precipitator and it comes out clean.

It is a little expensive but, my lord, we are talking about human lives. We are not talking about other things.

Now if the industry itself says that they cannot reduce dust, it is not economically feasible, it will put men out of work, it will put their wives and children on the want list, I give you one answer: What is the price of a husband that is killed in an accident?

What is the price of a coal miner who chokes to death the last 10 years of his life and leaves his family and his boys to support him?

Is this fair? Let us consider another thing about economic feasibility.

The Czechoslovakian Government and the British Government compete with us a little bit in coal. We want private industry to do this but if they cannot, if they say they will not, then the Government of these United States will have to do it for them.

As far as West Virginia is concerned, I am worried about the fact that when a coal miner goes into the mines you know he has no toilet. He does his business on site or up the hollow.

He breathes this stuff after it dries and he gets fungus infection in his lungs from this. I asked a couple of coal operators would they put toilets in the mines, chemical toilets?

The answer I got was "Do you know I have 300 miners? They put out 2 pounds of waste a day. That would cost me 25 cents a man or $75 a day for toilets. Do you think I'm nuts?"

They work and live like hogs. This should not be allowed. In one mine that I was in Summersville, I asked to go to the bathroom.

They said, "Go down 1 mile down there, there is a bathroom, otherwise, go up on the hill."

I said, "Why, I don't want to do that." They said, "What do you want? Do you need some paper?"

This is America. Three dollars a month the coal operators give to the miners so that he does not have a bathhouse. That is the compensation. It would cost more than $3 for the towels a month to keep a coal miner clean and you know it, and I know it.

As far as in West Virginia, I think you ought to know who owns the coal. I think it is only fair. I think it is only right and I think you should know what is really going on.

The main coal owners in West Virginia are the C. & O. Railroad, the B. & O. Railroad, the N. & W. Railroad, the Western Maryland Railroad.

They have land-grant coal properties that were given to them many years ago when they put the railroads through but they still own them and they lease this coal out. They have control over it.

This is some of the finest coal in the world, low-sulfur, low-ash coal. We have the captive mines, the United States Steel. The Bethlehem Steel, the Armco Steel. They both own and operate.

Bethlehem leases some that they can't buy. We have the Occidental Oil which used to be the Island Creek Coal Co. and which has interests in California and in Illinois and then we have the Continental Oil which I know, most of you know, is owned by a group and a family that has a plaza in New York, a little old plaza on 50th Street. And there are two billionaire families.

Senator WILLIAMS. Is that anywhere near a center?

Dr. BUFF. Near 50th Street. You know, a little place.

There are two billionaire families that also own coal. They own most of West Virginia. As a matter of fact, one of them recently said he did not own anything. Of course, it makes me think sometimes some men are so rich they do not known what they have.

I say to you, Mr. Chairman and members of this subcommittee, and I know your interest is primarily in the man and not the company, I hope your interest is in the man and not the company; or I will put it another way, your interest ought to be in the man and not in the company.

But that is the way it should be regardless of pressures and the lobbyists that I gave you are the most powerful in Washington and we as doctors have had some of the nicest nicknames. We have been called "Castroites," "medical bandits," "Communists," "Socialists," "born out of wedlock," "born double out of wedlock."

So, that has not made much difference because we as doctors amount to very little. We are just trying to help in a cause, and we mean nothing. It is the main drive that is important.

We have talked to miners and we have associated with them and we have learned a great deal about their problems. I do feel that the Government of these United States cannot stand idly by and allow these conditions to exist any longer.

The most powerful interests in the United States own coal in West Virginia and if we get a law we will need the Lord's help.

There is no State in this Union that has an effective air pollution law. And one that has an effective mine safety law.

The chief of mines of Kentucky is a coal operator. The chief of mines of West Virginia used to work for Consolidation Coal. No vested interest, just a tinge.

What we need is a rigid health and safety act with 100 percent enforcement.

We need this enforced like we do with the other agencies of the Government.

We do not want any hanky-panky. We do not want an inspector coming around and letting them know 3 weeks in advance they are coming.

We do not want an inspector coming around and the superintendent meets him and says, "Don't go to mine No. 1, go to No. 9. No. 9 is cleaned up. The other is filthy."

This happened to Armco. The inspector went to one and closed the mine. I think he might have regretted that because that is an awful lot of pressure on one company. They did clean it up and, thank God, they might have saved some lives.

But we feel that the coal industry—the coal owners, because I do not think we should talk about operators or producers—I think we ought to get to the gist of it, who owns this coal.

I think the Federal Government should find out who owns coals. You are jumping on the wrong guy when you jump on the operator. He leases; he takes orders. He is just a boy.

The coal owner is the boss. You know as well as I do that most big corporations do not have too much respect for State law but they do respect Federal laws.

Gentlemen, one corporation tried to play a little game with the Federal Government and the officers ended up in jail. You do not play with the Federal Government.

Thank goodness, their laws are enforced. But not in coal mine safety.

I want to say this to you, gentlemen. It was only when Mr. O'Leary came to the Bureau of Mines that there was any feeling of safety by the coal miners in the State of West Virginia.

As a matter of fact, I have a little box in my office called Miners Suggestions in which any miner in West Virginia can put down what he thinks is unsafe or unhealthy in his mine.

But I do not want him to sign his name because I do not want any repercussions. I have a special phone of the Physicians for Miners Health and Safety Committee on which a man can call up. We have to call back on a number because the coal operators might harass us just a trifle. So we know we are talking to a coal miner.

He will report what is going on and we will transmit it to Washington, to the Bureau of Mines. It is wonderful that we have such a man in Washington that not only the miners have faith in but most of the people of West Virginia.

Senator Williams, and members of this subcommittee, we need your help and we need it desperately.

These human beings should not be forgotten people. The coal miner deserves better than this. Thank you.

Senator WILLIAMS. Thank you, Dr. Buff. I will be very brief and I know all the members of our committee, vitally interested as they are, are certainly inspired by your testimony. Let me ask this as briefly as I can.

Do we know enough now to make the coal mines safe?

Dr. BUFF. You mean dust or for other things?

Senator WILLIAMS. Both safe in the physical cave-in sense or flooding sense and the health factor arising from the dust content.

Do we know enough to make them safe and reasonably healthful? I will put it that way.

Dr. BUFF. Yes; I think we do. Of course, let us use this premise. If you talk about 4.5 or 3, I want you to know that the least dust is the best. There is no safe dust level.

So if a man is exposed to 3 milligrams he probably would not get sick as fast as a fellow exposed to 6 milligrams. But there is no argument about 4.5 being safe. There is no safe level.

Senator WILLIAMS. Do you know what is realistic in terms of reducing the dust inhalation?

Dr. BUFF. I do not know why they got away from 3 milligrams but the industry said they could not do it. They can do a lot of things if you put it into law that they could not otherwise.

I know that since England does reduce hers and Czechoslovakia, we ought to do as good as they do. We have got to. We are the most progressive country in the world.

Our production outshines all others but the health of our miners is of the old age and we have to do something about it and do it fast.

Senator WILLIAMS. From the medical standpoint what would reducing it to 3 milligrams per cubic meter do in terms of the health of the miner, his longevity, his condition before he retires, assuming this is his life's work?

Dr. **Buff**. I think it would work. But I think we also should strive for a dust-free atmosphere. I think we should have a closed mask developed.

We have a mask, it is not real good, it is closed but a lot of good can be done with it. Hooked up with a hard hat and compressed air, it would work. The reason is that the operator does not want to pay $75 for the mask this last year and $3 a day for compressed air.

We are not talking about oxygen but compressed air because if you breathe oxygen all day you would get real sick.

Now, we at least should try it. We should stop saying we are going to study it for 10 years. Everybody wants to study and then they come up with nothing. I think action speaks louder than words.

Senator **Williams**. So really, it does ultimately boil down to a decision whether a certain amount of money will be spent in order to get a greatly improved health factor added?

Dr. **Buff**. That is right, sir. If you spent the money. But I am thinking of that $63 million that was spent for making coal a little better to sell would have been better spent on the coal miner to keep him healthy because what you have now, if you have men disabled at 35 and 40, they can't get social security, really, because they are too young.

Senator **Williams**. In expressing themselves in West Virginia, the coal miners did stop work, did they not, to express themselves on the need for better health standards for this black lung condition?

Didn't they go to the capital city? Didn't the workers go to the capital city?

Dr. **Buff**. In Charleston?

Senator **Williams**. Yes.

Dr. **Buff**. What was that all about?

Senator **Williams**. Did they stop working?

Dr. **Buff**. Yes.

Senator **Williams**. Did they lose wages?

Dr. **Buff**. Yes.

Senator **Williams**. Can you estimate how much they lost in wages?

Dr. **Buff**. No. But I can say this: I had nothing to do with calling the strike.

Senator **Williams**. Those men did go on strike?

Dr. **Buff**. They might have lived longer because they stayed out of the mines 2 weeks. There is another angle.

Senator **Williams**. They lost 2 weeks' wages?

Dr. **Buff**. That is right.

Senator **Williams**. What did the mine operators lose in production?

Dr. **Buff**. I know. What is more important, production and health.

Senator **Williams**. I am saying it all cost a bundle of money to say we are not going to work under conditions from which we will get this disease. Is that what they are saying?

Dr. **Buff**. They say they want cleaner conditions but they don't get them so fast. We would like to have them as soon as possible.

Senator **Williams**. How many men were out of work in protest?

Dr. **Buff**. About 30,000, I think. Is that right?

Senator **Randolph**. Yes; I think 30,000 miners would be an approximate figure.

Senator **Williams**. We will try to find estimates on production lost and wages lost and compare that with some of the other expenditures that are made for safer and healthier mines and better production.

Dr. **Buff**. You see the age of this hat. I want you to remember this when you make this decision. The health of the miner is back in the lamp stage. It is not modern. I want you to know that.

So, why should we produce coal so beautifully, we do a wonderful job, and we end up with people at 40 thrown out of work.

Senator **Williams**. Would you put that hat on again?

Dr. **Buff**. Yes, sir.

Senator **Williams**. Now that is not an electric lamp, is it?

Dr. **Buff**. No, it is carbide.

Senator **Williams**. That is not used today?

Dr. **Buff**. No. I was merely demonstrating that the health of the miner——

Senator **Williams**. Now that one is electric?

Dr. **Buff**. Yes, we have the tools to produce coal but we do not have the health facilities. Actually, you know, it has gotten so bad in a coal mining community when a man gets sick he has to go 40, 50, 60 miles to see a doctor for a sore throat. This should not exist either. They should be better taken care of as individuals.

Senator **Williams**. I said I would be brief. Obviously, we all could inquire for a long time of you. You know what you are talking about.

Senator Randolph, one of your most articulate constituents is now before you.

Senator **Randolph**. Of course, I have known Dr. Buff for many years. He is known as a crusader in West Virginia. He is in the thick of many fights, especially the one that is now current.

Dr. Buff speaks with vigor, of course, and with years of personal knowledge and he has drawn on that experience to help the subcommittee as we deliberate on the legislation before us. Doctor, we will not just consider; we will act by reporting what I hope will be effective legislation from the subcommittee and the full committee, and it will pass the Senate of the United States.

So the action that you suggest is action that I feel sure will be reasoned action, and it will be forthcoming during the 91st Congress. We have had difficulty in the past in the enactment measures that go generally to the subject matter to which you have been addressing yourself with vigor this morning.

I recall many of those difficulties. But I must not go into the years past because we are intensely interested in doing our job now in the light of the continuing problems which affect the coal mining industry.

But along the way these fights have been rather complicated. Some of them have been disagreeable, and at times we have not had the cooperation, Doctor, that we should have had from those sectors of our society that are affected by the conditions concerning which you speak here this morning.

I think the record should reflect as we continue to hear from Dr. Buff and Dr. Rassmussen and Dr. Wells, that these men come here to make a contribution to the substantive matter which is going to be before the subcommittee and before the full committee and, of course, before the Senate, itself.

I know these are men of good intent as they sit at and speak from the witness table. I attribute that some good intent to all persons who come to this witness table.

We are going to find differences of opinion. We have already had them expressed.

Dr. Buff said at the outset that he came to give "the other side" and it is necessary these days to hear, frankly, not just two sides, Doctor, because there are many sides, as many sides as there are parties at issue. But we want to do a constructive job, and Congress, I think, will respond to the need.

Dr. Buff. Thank you, Senator.

Senator Williams. We had other members here and I know they did want to inquire but I am pretty certain they went over to the floor. There was an earlier session today.

Senator Eagleton.

Senator Eagleton. Doctor, are you a specialist?

Dr. Buff. A cardiologist.

Senator Eagleton. What is, for my edification, the Committee of Physicians for Miners' Health and Safety? What is that committee that you represent?

Dr. Buff. It represents 24 doctors in Ohio, Pennsylvania, West Virginia, Virginia, and Kentucky who have and do treat coal miners.

Senator Eagleton. You are in the private practice of medicine?

Dr. Buff. Yes, sir, but it is a little cut now since we had the drive.

Senator Eagleton. Do you know what the permissible tolerance of dust level is in the coal mines of Czechoslovakia or Great Britain to which you referred?

Dr. Buff. I do not, sir. I will get that information when I go to Czechoslovakia to find out for myself.

Senator Eagleton. Mr. Chairman, I would like to request of the committee staff that they inquire as to what the health regulation standards and permissible dust levels are in existence in those two countries and if they are deemed to be significant improvement over what has been suggested before this committee?

Senator Williams. We will certainly do that. We are hopeful that one of our witnesses as soon as tomorrow might give us some enlightenment on it.

Dr. Buff. There is a Dr. Tsinger who is the head of the Czechoslovakian Bureau of Mines whom I have written several times. We have never gotten down to what the percentage of dust level is. But I could easily find out by writing them. I did find out about sucking the air through a wool-cotton filter and then through an electrostatic precipitator.

Senator Williams. Pursuing the line of inquiry that I indulged in yesterday with Mr. Corcoran, who is president of the Consolidated Coal Co. of Pittsburgh, I asked him the same general question which I would like to ask of you.

Assuming that Congress would enact strict and medically and scientifically meaningful laws relating to mine safety and health hazards and assume further that Congress would appropriate for the Federal Bureau of Mines sufficient money to enforce these laws uniformly and on the basis of frequent inspections, do you see any useful purpose to be served by having each State duplicate these services with a separate State system of inspection?

Dr. **Buff.** I think you can forget about the State system. It does not work. I said before there is no State system in this country that has an effective control of the mines.

This includes also Pennsylvania. There is a lot of talk but this is not true. It will take a Federal regulation to do this.

I realize many States do not want Federal intereference but as they do with air pollution of which Senator Randolph knows so very, very well, he is an expert on it, you can't regulate the mines with State regulatory agencies.

For instance, sir, the chief of mines of Kentucky is a coal operator. The chief of mines in West Virginia worked for Consolidated Coal. You can talk about influence or anything else you want but it is your point of view.

It is like having the head of the Union Carbide Co. the head of the air pollution program in West Virginia. He thinks he is right.

I am not arguing about that. But he does not have the common man's viewpoint.

Senator **Eagleton.** I take your testimony to be, and parenthetically I agree with it, that if Congress does its job in terms of enacting a truly meaningful law with teeth in it, a law that will be enforced frequently with on-site inspection, periodically, without forewarning or prearrangement, then State laws with respect to ancillary inspection by the States are purely superfluous and a waste of time and money by the States?

Dr. **Buff.** It is a waste of time, a waste of money, a waste of effort.

Senator **Eagleton.** And it accomplishes nothing?

Dr. **Buff.** It is merely a place to give people jobs and have them salute in the morning. Nothing else, sir.

Senator **Williams.** There is one question, Doctor, that Mr. Blackwell has.

Mr. **Blackwell.** Dr. Buff, let us focus again on the size of the particle.

Dr. **Buff.** Yes, sir.

Mr. **Blackwell.** Now the previous medical testimony has given a definition of the harmful size as 5 microns or less. Earlier today, you were speaking of a particle size of one-half micron.

Dr. **Buff.** Yes, sir; 1 micron, because that is the size of air. This is why you get into so much problems with masks. That is why the standard mask has never worked.

Mr. **Blackwell.** You are not disagreeing, though, with previous testimony?

Dr. **Buff.** You said 5 and under. I said 2 and under. But the 5 would affect him but you should get it out.

Mr. **Blackwell.** Was your point this morning that the one-half micron particle would be taken on through the screen-type mask?

Dr. **Buff.** Yes, sir; that is the difficulty. You know, when you look at these filters after they have been used they get dirty all right. But the dust goes right through and gets into the lungs and they spit it up as soon as they get out of the mines, part of it, not all of it, just part.

Mr. **Blackwell**. Now, do you have findings that indicate whether the smaller sizes do more harm, more lung damage than the larger particles?

Dr. **Buff**. I think it is generally accepted, sir, by medical authorities that the smaller the particle the more dangerous it is because it can get into all ramifications.

You get a 10-micron particle, it stays up here and you spit it out. When you talk about 5 microns I think they are splitting hairs.

What I am saying is that I want these people not to get sick. If you cut it down to 2 microns and understand they are not going to get sick but to do it with a mask, so far you can't. I wish you could.

With all the research that has been going on by all the industry on this and medical equipment, they have not come up with any mask that was effective.

Mr. **Blackwell**. Now the filter-type mask which was demonstrated yesterday was stated to be 90 percent effective in the screening out process.

Your point is that the 10 percent allowed to pass through the mask is the most harmful material in the air.

Dr. **Buff**. I would say also 90 percent is a high percentage. I think it depends on your point of view. I have tried those masks you are talking about. I have walked around the office with them. I can't breathe with them.

How do you expect a coal miner to? Before we take anybody's word about masks, I think all the Senators should wear one around their office and they would find out after an hour they would throw it off and say, "What am I trying to do, choke myself?"

That is what the coal miner says. It does not take him an hour. It takes 10 minutes.

Mr. **Blackwell**. Could the record be corrected to show that the testimony yesterday was 97 percent effective?

Dr. **Buff**. Did you say 97?

Mr. **Blackwell**. That was the testimony yesterday. I misstated it at 90 percent.

Dr. **Buff**. May I make a comment, sir? That is dreaming.

Senator **Williams**. That was the mask with the filter that we saw?

Dr. **Buff**. Somebody has a vested interest viewpoint but it was slightly distorted. They had blinkers on as a horse does and they only saw their viewpoint because you could not do that. That is difficult.

Senator **Williams**. If we could get a group of those masks we would accept your invitation to use them for as long a period as we could continue to work while we use them.

Dr. **Buff**. I can get them. How many men do you have?

Senator **Williams**. We can start with a demonstration project with the staff people. We will talk to you about that later.

Senator **Eagleton**. Doctor, yesterday we heard testimony from a Mr. Woods G. Talman who is the chief inspector of the coal, American Mining Congress, with offices here in Washington.

I do not know if you know Mr. Talman or who he is.

Dr. **Buff**. He is chief inspector.

Senator **Eagleton**. Chief inspector for coal of the American Mining Congress, Washington, D.C. He observed in his testimony, and the reason I am asking you this is because of your association with your medical committee which has doctors in a number of key coal mining

States, that there were State inspection systems in some of the States that were more stringent, more strict, more on the ball, than Federal inspection of mines with respect to safety and health.

Dr. **Buff.** What State did he say?

Senator **Eagleton.** He was generalizing.

I will ask you to be specific on this. Do you know any State in which the inspection by the State through State inspectors is more stringent than that which is prescribed by the Federal Bureau of Mines?

Dr. **Buff.** That is also a distorted point of view. In Pennsylvania, no inspection system works; West Virginia, none; Illinois, none; Kentucky, none; Alabama, none; Virginia, none; Indiana, none.

Where do you get anything? I think it depends on what you are trying to do. It seems like it is easy to twist and I originally started my testimony, Senator, with General Betancourt's statement before the Continental Congress and it has not changed in 175 years.

Senator **Randolph.** Mr. Chairman, so that the record may be clarified in reference to the identity of Mr. Talman, I understand that what the Senator has indicated is true as to his affiliation with the American Mining Congress, but he is actually in a position of importance with the United States Steel Corp., in its coal mining division.

He appeared here, Senator, for the American Mining Congress but he is an employee of the United States Steel Corp.

Senator **Eagleton.** Thank you, Senator, for clarifying it.

Dr. **Buff.** I have given Senator Williams a black lung from a dead coal miner. He suffered. Look at it, feel it. We want to stop this business, Senator.

Senator **Randolph.** What is the marking here, the lettering, the figures, Doctor?

Dr. **Buff.** That is the autopsy number.

Senator **Randolph.** Was this a public autopsy?

Dr. **Buff.** How do you mean public, sir?

Senator **Randolph.** I mean a coroner's inquest.

Dr. **Buff.** No; it was done at the hospital.

Senator **Randolph.** I just wanted the record to be clear.

Dr. **Buff.** Yes. I never used the term. We do not allow that.

Senator **Eagleton.** Are these the holes in the lung you are talking about?

Dr. **Buff.** Yes; they are. You can see them.

Senator **Williams.** We are going to have to recess for a vote that was just called in the Senate. We will recess now to reconvene in 15 or 20 minutes.

Dr. Rasmussen or Dr. Wells, do you have statements or are you going to summarize? You are colleagues of Dr. Buff; are you not?

Dr. **Wells.** Yes, sir; if we may, we would like to make some specific suggestions about the bills if you would give us an opportunity.

Senator **Williams.** We will be back.

(Whereupon, a brief recess was taken.)

Senator **Williams.** We will reconvene. We appreciate your patience, gentlemen.

Dr. **Buff.** Senator Williams, I have the information on Czechoslovakia already.

Senator **Williams.** All right. We will get to that after Senator Eagleton's inquiries.

Senator **Eagleton**. Doctor, I keep asking one more question, but as time passes things creep into my mind based on yesterday's testimony and I want your opinion on it.

It was suggested yesterday and as part of one of the bills pending before this committee, I do not know whether it is in the Hickel bill or which bill, that Congress enact various standards and requirements and regulations in terms of minimal safety and health requirements, but that Congress in turn delegate the inspection and enforcement function of those requirements and safety regulations to the States. As it were, Congress would contract without to let each State do the investigation on its own subject to the basic, overall Federal requirements.

Would you have any comment to make on that kind of system?

Dr. **Buff**. Yes. If you want to ruin it, do it. But if you want it to be effective you had better let the Federal Government have it. I have been in a State too long that is controlled by these interests.

What you will have is a fellow who regulates it, who does the bidding of the coal interests. He just won't see the violations. He gets double vision.

Senator **Eagleton**. Doctor, would you give us your information now on Czechoslovakia?

Dr. **Buff**. Yes. In Czechoslovakia, they have dust with a low quartz content, 10 milligrams, but dust with high silica, 2 milligrams. They can get it down to 2 milligrams. That is what is important.

In other words, we have industry here saying they can't do it. Over there behind the Iron Curtain, they are doing it. Now let us take the Soviet Union.

Senator **Williams**. Is that the same dust we are talking about?

Dr. **Buff**. Yes, sir, coal dust with silica. You see, there is no coal dust without silica.

Senator **Williams**. In other words, you are talking about the same dust that exists in our mines in this country?

Dr. **Buff**. Yes, sir. No difference. Now let us take the Soviet Union.

The Soviet Union with less than 10 percent free silica, 4 milligrams per cubic meter. Coal with more than 10 percent free silica, 2 milligrams per cubic meter.

What that makes you think is that it must be feasible to do it or they would not have any regulation. It must be important or it would not be written in their law.

Senator **Williams**. Now this is measured in terms of the silica content.

Dr. **Buff**. Silica and coal dust.

Senator **Williams**. What is our silica content per cubic meter?

Dr. **Buff**. Our coal may run 5 percent.

Senator **Williams**. What does that mean if we are to compare our situation with theirs?

Dr. **Buff**. I would take four and two and put down three—of course, I say 3.5, you say three. I think that is where they got the idea on the three milligram stuff. Four and two is six, divided by two is three.

You are talking about three milligrams per cubic meter in the law.

What I am saying is that it is feasible to make it to two milligrams but the industry says no, this is impossible. If they can do it, we can do anything that any Communist country ever thought of doing.

Mr. **Mittelman**. Do you have any information as to whether that standard is actually observed in practice?

Dr. **Buff**. I do not, sir, but they could say the same about our standards.

Mr. **Mittelman**. We do not have any at the present time.

Dr. **Buff**. No, but I mean our air pollution standards or whatever we do have. We have some rules in this book and they can say your book is not adhered to. I do not know.

I think they try because I think they are really interested in cutting the dust down. I think they are sincere. I am sure the Czechoslovakians are.

Senator **Williams**. We did have testimony that in comparison the European mines are safer and healthier than the American mines. We did have testimony to that effect. We did not get testimony on the techniques of mining, whether they are still more in the hand-mining stage or whether they have gone to the advanced machinery that has been developed in this country. We do not know that.

Dr. **Buff**. When you talk about sucking up air in the cyclone and passing it through a wool-cotton filter and then putting it through an electrostatic precipitator, they are pretty mechanized. It takes a lot of ingenuity to do this.

Senator **Williams**. You are describing what you know to be the method in Europeon countries?

Dr. **Buff**. Yes, this Czechoslovakia. I will say this, while they may not have the production capacity of this country, that does not mean that we could not do it, too. There is nothing that is done in Europe that they can't do in this country.

Senator **Williams**. Thank you very much, Doctor. I understand you can remain with us while Dr. Rasmussen and Dr. Wells present their statements. We will hear your statements through, gentlemen.

Senator **Eagleton**. Could I clarify one thing for the record?

I am a little confused by these three milligrams and two milligrams.

Doctor, do I take your testimony to mean that you would prefer to see two milligrams, you would prefer to see one milligram, you would prefer to see no milligrams if we could achieve absolute earthly perfection?

But with our inability to perhaps achieve perfection would you be satisfied, as a competent medical observer of the scene, with a three-milligram limit?

Dr. **Buff**. Yes, sir, Senator, but it is a start, just a start.

(The following letters were received and ordered printed in the record:)

Bituminous Coal Research, Inc.,
Pittsburgh, Pa., March 17, 1969.

Hon. Harrison A. Williams,
Chairman, Subcommittee on Labor, Committee on Labor and Public Welfare,
Senate Office Building, Washington, D.C.

My Dear Senator: One of the medical witnesses who appeared before your Committee on March 13, 1969, disputed the effectiveness of respirators as protection for coal miners against air-borne dust. We submit this letter in support of our contention that such devices afford adequate protection.

The U.S. Bureau of Mines has for many years conducted a test and approval program for respirators. The test procedure, Schedule 21–B, is described in "Title 30—Mineral Resources," which was published in the Federal Register 1965.

Schedule 21–B requires that for approval a respirator must conform to certain specified standards of design, construction, and face fit. Further, in a filtering test with a mechanical apparatus, three respirators are tested in a dust suspension of 60 mg per cubic meter of dust having a mean size consist of 0.4 to 0.6 micron. The total permitted to pass through all three respirators in a 90 minute period at 32 liters per minute flow must not exceed 4.5 mg and no single respirator may pass more than 2.0 mg. This means that the three respirators must have an average efficiency of not less than 99.13 percent and no one of the three respirators can have an efficiency of less than 98.84 percent.

The U.S. Bureau of Mines Information Circular 8281, "Respiratory Protective Devices Approved by the Bureau of Mines as of October 1, 1965," and a supplement thereto dated February 1, 1968, lists 14 respirators which meet the Bureau's approval standards. One of those included in their list of approved respirators was shown to you and your Committee at the time of our testimony on March 12, 1969.

The witness who questioned the efficiency of respirators indicated they did not protect against the minus one micron dust. This is not so and the U.S.B.M. approval procedure covers this in the size consist of the dust they use for test purposes. We feel our statement, ". . . there are devices such as respirators, approved by the U.S.B.M., for removal of 97 percent of the respirable dust from inhaled air and assure complete protection for the health of the miner in even the most dusty mines." is substantiated by the U.S.B.M. approval procedure, and we respectfully request that this letter be included in the record of your Committee hearings.

Sincerely yours,

JAMES R. GARVEY,
President and Director of Research.

ARMCO STEEL CORP.,
Middletown, Ohio, March 17, 1969.

Re Testimony of Dr. I. E. Buff.

Hon. HARRISON A. WILLIAMS, Jr.,
U.S. Senate,
Washington, D.C.

DEAR SENATOR WILLIAMS: I attended the hearings before the Senate Labor & Public Welfare Sub-Committee on the morning of March 13 and was present during the testimony of Dr. I. E. Buff.

At approximately 10:45 a.m., during questioning by one of the Senators with respect to Federal mine inspections, Dr. Buff related essentially as follows: Upon arriving to make an inspection, Management prevailed upon the Federal Inspector to inspect No. 9 Mine, which they believed to be in good order. The Inspector insisted upon inspecting No. 1 Mine which he found in such unsafe condition that he ordered it shut down. He later permitted the mine to be reopened which he should not have done. This, he stated, was at a mine operated by "Armco" near Charleston, West Virginia.

I immediately checked this report with Mr. O. C. Kane, Manager, Armco Steel Corporation, Montcoal, West Virginia and can report as follows:

> No Armco mine has ever been "shut down" per se as the result of Federal Inspection. Two Federal Inspections have been made since the new concept of jurisdiction which resulted from last December's hearings, and, since Management has been briefed on ground rules by a representative of the Bureau of Mines.
>
> Robin Hood Mine at Montcoal, West Virginia, was inspected on January 6th, 10th, 13th and 14th of this year. The only item written up by the Federal Inspector after 4 days' inspection was one with respject to a spent fire extinguisher found on a mine haul locomotive. The extinguisher was replenished immediately with a spare cannister already available on the locomotive.

Montcoal Mine No. 7 was inspected on February 6. At *one section* of that mine, the operators had watered down a portion of the haulway immediately adjacent to the working face. The Federal Inspector felt that it should be rock dusted. It was purely a matter of interpretation and, rather than quibble, a delay of one hour in production was incurred while limestone dust was brought in and rock dusting performed as requested.

These two mines are those currently operated by Armco Steel Corporation. Attached is a copy of their performance in safety for 1968 ie: 1.86 major injuries per million man hours worked as compared to 31.7 for all mines and 14.0 for all of industry.

While we of Armco concur, with the testimony of those representing the coal operation, that a strong Mine Safety and Health Bill is desirable, I do not feel that implications such as those made by Dr. Buff should go unchallenged.

I will be very glad to furnish further evidence to substantiate the facts which I have related.

Respectfully yours,

GEORGE H. TODD,
Assistant to Group Vice President Steel.

Attachment.

In the wake of the Farmington mine disaster last November that took the lives of 78 men, the recent annual safety dinner of the Armco West Virginia coal mines had tremendous significance.

The Montcoal mines, for example, had a frequency in 1968 of 1.86—better than Armco's corporate frequency figure. The Armco mines as a group had a frequency of 2.80 against an astounding coal industry frequency in West Virginia of about 60.00. During the dinner, attended by all the employees of the winning mine, Works Manager C. O. Kane, had this to say:

"When I came to Armco's Montcoal mines in 1943, we had 131 major injuries and a frequency of 95.26. They were averaging five tons of daily production for each person on the payroll.

"In 1968," said Mr. Kane, "we had 2 major injuries with a frequency of 2.80 and we had an average daily production of about 17 tons for each person on the payroll."

He continued to say that Armco people in the coal mines have proved, contrary to what some people believe, that production and safety records can be improved at the same time.

"In fact," he added, "you can't have good production without a good safety performance. If we had suffered 131 majors with a frequency of 95 we probably would not be in business—we simply couldn't afford it.

"The best part about records like these is the fact that all of us could attend this annual safety dinner alive and free from injury."

Senator WILLIAMS. Dr. Buff, another gentleman has joined your colleagues. Will you introduce yourself, sir?

Mr. DAUGHERTY. I am George Daugherty, a lawyer from Charleston, W. Va. I am a friend of Dr. Wells. I have actually no official position with these doctors or their association. I am just an interested observer. Dr. Wells has asked me to be here in connection with his statement to possibly clarify a part of his presentation.

Senator WILLIAMS. I think we are very safe here today. We have you as an attorney, a Federal District Judge from West Virginia who was here a moment ago. We are in safe hands.

Dr. Rasmussen.

STATEMENT OF DR. DONALD L. RASMUSSEN, APPALACHIAN REGIONAL HOSPITAL, BECKLEY, W. VA.

Dr. RASMUSSEN. I have a prepared statement which I will not read. I will just submit it.

Senator WILLIAMS. We will include your prepared statement in the record at this point.

(The prepared statement of Dr. Rasmussen follows:)

PREPARED STATEMENT OF DONALD L. RASMUSSEN, CHIEF, PULMONARY SECTION, APPALACHIAN REGIONAL HOSPITAL, BECKLEY, W. VA.

During the past 6 years, I have been engaged in the evaluation of pulmonary function and work capacity in coal miners from southern West Virginia, southwestern Virginia and eastern Kentucky. I have become acquainted with the lung diseases afflicting miners and have demonstrated physical impairment in many. I have also become acquainted with some of the socio-economic consequences of the lung diseases of coal miners. The latter are responsible for suffering not only of the miner but also his family.

All too frequently a miner who is relatively young, with heavy financial responsibilities begins to note unusual shortness of breath with exertion. Although he may be somewhat concerned, he continues to work in the mines, since mining is his only profession and work outside the industry in this area is not plentiful. Over a period of two, three or four years, his shortness of breath becomes progressively worse. He finds it impossible to keep pace with others walking on the level ground, and has extreme difficulty in completing his day's work.

If this miner is fortunate, he may have reached the age of 55 and he may be eligible for a miners' pension and continued medical benefits from the Welfare and Retirement Fund. He may qualify for disability benefits under the Social Security Administration. He is not likely to receive workman's compensation benefits in keeping with his disability, and he may not qualify under workman's compensation for any award.

Many other men are disabled while they are in their 40's. They receive no miner's pension. Their Welfare and Retirement medical benefits are withdrawn, usually in one year. Because of the nature of their disease, they may not be able to convince the Social Security Administration of the severity of their disability. They may not qualify for workmen's compensation benefits because x-rays are not felt "diagnostic." Those who have proper x-ray credentials face opposition from coal corporation attorneys and indifferent medical boards. Awards of 15 and 20% disability are commonly granted to men who are, in fact, totally disabled as a consequence of their employment.

Many men now exist in Appalachia only by virtue of a subsistence begrudgingly provided by welfare agencies who too often regard these men as shiftless laggards. This degradation is the final reward for their inability to continue the productivity which added to the local economy and to coal corporation profits.

Accurate estimates of the incidence of disabling respiratory diseases among former miners and other workers are not generally available. West Virginia, however, is rated as having one of the highest rates of disability from lung diseases in the United States. I am convinced that these figures underestimate the incidence of respiratory disability among miners because of the failure to recognize the kind of impairment suffered by approximately ⅔ of those miners who are disabled.

This impairment of function or disability cannot be recognized by the standard tests designed to identify the more common lung diseases. Thus, the test—forced vital capacity—which can be used to identify diseases involving the airways may be entirely normal in disabled miners. More time-consuming tests and the use of exercise provide a much better means of assessing disability in coal miners.

The results of these tests performed on coal miners are very similar to the results of the same tests performed on patients with a group of somewhat uncommon lung diseases. All of the uncommon lung diseases show injury to or destruction of the small blood vessels of the lung. We believe the dust deposits around the smallest muscular arteries of the lungs in coal miners result in injury to these arteries. We believe that this is the primary lesion of lung disease in coal miners.

Among the 3,000 miners evaluated in our laboratory, approximately 50% have been found to have significant impairment of pulmonary capacity. An additional 40% show varying degrees of impairment, while 10% show little or no abnormality. Of interest is the fact that the x-ray findings bear little relationship to functional capacity. Thus, men whose x-ray reveals only a widespread increase in linear markings may have impairment as great as one with advanced pneumoconiosis (complicated pneumoconiosis or so-called "progressive massive fibrosis"). We are aware of men in the 70 and 80 year group with advanced pneumoconiosis, who are apparently as healthy as age permits.

Our observations in Beckley have been challenged by the coal corporations and are not recognized by industry-oriented physicians nor even a number of experts in various medical schools as well as within the U.S. Public Health Service. These critics base their opinions on published medical evidence, largely that from Britain. None of the criticism is based on actual test results.

Much emphasis has recently been placed on cigarette smoking and this has been labeled as the cause of disabling lung disease in coal miners. The effects of cigarette smoking are obvious in our miners and cigarette smoking can produce measurable abnormalities, even in our subjects who have no overt bronchitis. On the other hand, the effect of working at the face in mechanized operations shows a more marked effect than any other known factor, including cigarette smoking. Workers at the face in mechanized operations appear to develop pulmonary impairment on the average 5 years earlier than all other workers within the mine. This is even more startling since certain miners in other areas are also exposed to relatively high dust concentrations.

Suggestions by the coal industry that "additional research" is warranted before dust suppression is imposed should be regarded as evidence of a total lack of regard for human life and health. We are disturbed by the increasing frequency with which we encounter men less than 40 years of age who have been employed for under 20 years who are significantly impaired or exhibit clear-cut abnormalities of pulmonary function. Almost always, these men have been employed at the working face. The majority of such men have worked on or near continuous mining machines for 3 to 10 years only, having spent the earlier years operating more conventional machines. It is our opinion, that unless immediate and rigid dust control measures are instigated, we will see a shocking increase in pulmonary disability within 5 to 10 years.

Much more research is indeed necessary in order to more clearly define the dust diseases of coal workers, and to find additional methods of safeguarding the health of miners. Methods of early detection of impaired health are required to identify those men who should be moved to non-dusty areas. Uniform workman's compensation based on objective physiologic methods should be sought, and much more effort is required to provide employment for the presently affected miners who, under present practices are doomed to an early disability and impoverishment.

Dr. Rasmussen. I would like to make a couple points and amplify some of the contents of the prepared statement.

The first is that there are indeed many, many miners in at least the southern West Virginia and eastern Kentucky and southwestern Virginia area who are severely disabled as a consequence of mining coal.

We think there are differences regionally. We do not believe there are as many impaired miners in northern West Virginia, and this will be no surprise nor would it be different in fact from the known incidence of disease in Britain.

The types of lung disease which we encounter in miners are basically of two varieties. One is very similar to the kind of common pulmonary disease which afflicts perhaps 10 percent of the adult male population in the United States, so-called nonspecific chronic obstructive lung disease.

We think that this type of disease is a little more common in coal miners than it is in the general public but we do not have any good information on this.

The other type of lung disease in coal miners, in our opinion, is an entirely different type of disease and in our laboratory it afflicts approximately two-thirds of those who are impaired.

The primary difference in these so far as detection is concerned, is that the chronic obstructive disease of the common variety can be quite readily identified by a simple test of breathing, whereas, the more common impairment of lungs of miners is more difficult, and does require more time-consuming methods of investigation.

The other thing which is pertinent in relation to the impairment in these miners is the very poor relationship between the findings on chest X-ray examination and either the man's symptoms or any of the laboratory tests.

Now, I have personally not seen a coal miner who is severely impaired who had a completely normal X-ray, although I do not hold that this is impossible.

In contrast to the general medical opinion prevalent in this country, we find that men whose X-rays reveal only minimal changes, which are either insufficient for making a diagnosis of pneumoconiosis, or dust disease, or men who have X-ray evidence of only simple pneumoconiosis with scattering of small nodular densities, may have considerable impairment.

As I say, this is in contrast to those who believe the impairment occurs only in the presence of advanced X-ray changes or complicated pneumoconiosis or so-called progressive massive fibrosis.

There are other features of the X-ray which I think are poorly understood, partly because of our lack of an occupational health program for our miners.

One of these is that the X-ray may be positive, showing definite evidence of pneumoconiosis sometimes, for many years, while a man continues his employment, without symptoms and without measurable abnormality.

Among those men who do become impaired eventually, there may be progression of the X-ray although there need not be progression of the X-ray in relationship to the amount of impairment or disability that the man suffers.

I will close my remarks by stating that in the mines in southern West Virginia there are gross deficiencies in the maintenance of present dust control measures and present dust standards.

I am aware of perhaps two mines in which the miners tell me dust conditions are the same on every operating day as they are on inspection day.

In the vast majority this is not the case. In the vast majority the dust in the mines, particularly at the working face, is so dense, as Dr. Buff said, that one may not see his hand extended in front of him 2 or 3 feet away.

This is the type of dust that these men are exposed to.

I do not believe the Bureau of Mines has dust measurements under these conditions nor do I believe industry has any that would be published.

No one has an idea of the total amount of dust to which these men have been exposed. My point is that whatever dust standard is selected as appropriate must be enforced vigorously in order to achieve the ideal level or the practical dust level.

I am sure that I do not have an opinion as to what the safe level is. I would prefer, of course, to see no dust. I believe, however, that adherence even to current standards, which are not sufficient to protect the health of miners, would be a great help in reducing the incidence of disease.

I think the standard should certainly be lower than the current levels or standards for prevention of explosion.

Senator WILLIAMS. Thank you, Dr. Rasmussen.

Dr. Wells?

STATEMENT OF DR. HAWEY A. WELLS, COORDINATOR, CONEMAUGH VALLEY MEMORIAL HOSPITAL, JOHNSTOWN, PA., ACCOMPANIED BY GEORGE A. DAUGHERTY, ATTORNEY, WEAVER & DAUGHERTY, CHARLESTON, W. VA.

Dr. WELLS. If it is all right with the chairman, I would like to summarize my statement. I will submit it for the record.

We would like to speak specifically to two points that we feel would strengthen the legislation which Senator Randolph has said he felt surely would be passed.

Dr. Rasmussen has suggested that X-rays is an inadequate indicator of the disease.

We would like to suggest that you consider in your legislation not using X-ray as the sole means of following this disease but that functional disability testing be included.

The language in several of the bills say X-ray and physical examination should be done periodically to follow the course of the disease.

Functional disability, as Dr. Rasmussen has performed on over 3,000 miners, is a simpler and much better indicator of the disease.

As a pathologist, I have examined more than a thousand living and dead coal miners, some of them close to Portage, Pa., where Senator Murphy lived and worked.

I am very much convinced that these particles that are so fine that you can't see them are the cause of this disease, which was found in 80 percent of 202 consecutive autopsies of miners dying from all causes.

It has been shown that the death expectancy from respiratory disease in miners between ages 60 and 64 is eight times that of the general population.

You have heard many statistics. One of them is probably the most irrelevant statistic in the books about the 4-year longer lifespan of the coal worker than the average American male.

A worker when he becomes sick removes himself from the work force; therefore, he is not counted in the statistics. All workers have a longer life expectancy than the average American male even in much more hazardous industry.

For instance, in the asbestos industry, the worker there has an 8-year increase in life expectancy. I think probably the only solid data we have now is the death expectancies between the ages of 60 and 64 as quoted by Enterline indicating that there is eight times the expected death from respiratory disease in that age group in miners.

Now to the matter which Senator Randolph has chosen to call teeth. We have all spoken about what we feel should be done and that it should be vigorously enforced because we have had the experience that enforcement is the hangup.

My experience in West Virginia and Pennsylvania coalfields leads me to the inescapable conclusion that the main factor that has led to the deplorable conditions in and around the mines is the fact that employers are effectively immune from suit under most State compensation acts and they are not liable for even the most callous disregard for the health and safety practices.

For example, in West Virginia, the injury from death and disease caused by gross negligence of an employer cannot be compensated by a jury unless the essential elements of first-degree murder can be demonstrated.

Relatively minor additions to the proposed Federal legislation could result in major benefit in the workplace and make it much cheaper to run a safe shop than a dangerous and unhealthy one.

What I am saying, gentlemen, is that we must give these men back the right to a jury trial. This denial has led to the deplorable conditions and if we can give them the right to go to a jury in cases where there is negligence and bad health and safety practices, we will go a long way toward the elimination of these bad practices because the man who does the wrong will have to pay the bill.

This is the American way, the way it should be done. Because of the inequities in the various States' compensation acts, the employers do not have to answer for their wrongdoings.

I would like, if the chairman would, to insert in the record the language that we feel should be included in whatever legislation you decide upon and Mr. Daugherty is with me and will answer questions referable to this. Thank you.

Senator WILLIAMS. We will include your language. What does this deal with now? The examination?

Dr. WELLS. Yes.

(The document referred to follows:)

SUGGESTED ALTERNATE TO SEC. 17 (b) OF S. 1094 BY GEORGE A. DAUGHERTY, WEAVER & DAUGHERTY, ATTORNEYS AT LAW, PENTHOUSE, KANAWHA VALLEY BUILDING, CHARLESTON, W. VA.

(b) This section shall supersede any state legislation granting immunity from common law damages in instances in which injury, disease, or death is due to conscious indifference to a known and correctable inherently dangerous health or safety hazard ignored and not remedied by an employer, i.e. where such injury, disease, or death is due to the deliberate intent of the employer.

The issue whether the employer was guilty of deliberate intention shall be determined by a jury, in the following manner. The following questions shall be submitted to the jury by the trial judge:

1. Whether the employer permitted to exist a condition which was inherently dangerous to his employees, that is, a condition which an ordinary prudent employer, acting under the same or similar circumstances should know would ultimately result in the death, serious injury, or disease, including respiratory ailments, of one or more of his employees.

2. Whether such inherently dangerous condition existed for a sufficient length of time so that an ordinary prudent employer acting under the same or similar circumstances would have or should have known of its existence, and had time and opportunity to correct such condition, and the condition could have been corrected.

If the jury should answer the above two questions in the affirmative, then the jury may conclude that the employer chose to run the risk of death, serious injury, or disease, including respiratory ailments, to his employees rather than to expend the money or take other appropriate measures to correct the inherently dangerous condition and the jury may accordingly find that the employer was guilty of deliberate intention and award such damages as they deem just for any injury, death, or disease, including respiratory ailments, proximately caused by such deliberate intention.

The willful and continued violation of any safety rule or regulation of any federal, state, or other governmental regulatory authority, or any contractual agreement between employer and employee, or their representative, which shall be found by the jury to have proximately caused injury, disease, including respiratory ailments, or death to an employee shall constitute a rebuttable prime facie case of deliberate intention against the employer.

Any employee, or his representaive, shall have the right of entry onto the premises of his employer for the purposes of fully investigating his claim against the employer, during working hours, upon three days' written notice, which notice shall designate the purpose of the investigation, the parties who will conduct the investigation, and the time the investigation will be conducted.

PREPARED STATEMENT OF DR. HAWEY A. WELLS, COORDINATOR, CONEMAUGH VALLEY MEMORIAL HOSPITAL, JOHNSTOWN, PA.

I am Dr. H. A. Wells, Jr. I am Director of the Pulmonary Research Laboratory of the Memorial Hospital, Johnstown, Pa., and Assistant Clinical Professor of Pathology at the West Virginia University School of Medicine. I am a Diplomate of the American Board of Pathology, Clinical and Anatomic. I also served as Chief of Pathology at the Appalachian Laboratories for Occupational Respiratory Diseases at Morgantown, West Virginia.

During the past five years, I have examined more than 1,000 living and dead coal miners by conventional and research techniques. I am convinced that the inhalation of minute particles of dust so fine that they cannot be seen by the naked eye is responsible for the disease, coal workers pneumoconiosis, found to some degree in 80% of 202 consecutive autopsies in miners dying from all causes. In 40% there was massive enlargement of the right side of the heart—this is the part of the heart that must pump blood through the dust covered vessels of the lung. The cause is dust; the cure is dust control.

No amount of equivocation and confusion by the coal industry can refute the fact that, in 15 years of mandatory dust control in Great Britain, the incidence of new cases was reduced from over 12 new cases per 1000 soft coal miners to slightly over 1 new case per 1000. Further this incidence was measured by X-ray which as you have heard does not reveal the true extent of this disease.

The miners and the public have been educated to the need for corrective legislation, and this Congress must act decisively. It must establish permissible levels of dust exposure.

My experience in West Virginia and Pennsylvania coal fields leads to the inescapable conclusion that the persistent health and safety hazards in and around the mines are a direct result of two factors:

First, employers are effectively immune from suit under most state compensation acts and are not liable for the most callous disregard for health and safety. For example, in West Virginia, injury, death, or disease caused by gross negligence of an employer cannot be compensated by a jury unless the elements of first degree murder can be demonstrated. A relatively minor addition to the proposed federal legislation could result in major reform in the workplace by making it cheaper to run a safe shop than a dangerous and unhealthy one.

We propose that the legislation include this language. Every employer can be sued without immunity for conscious indifference to a known and correctable inherently dangerous health or safety hazard ignored and not remedied by the employer. Under these circumstances, no state or agency can grant to any employer immunity from civil suit and trial by jury nor can they limit in any way the recovery of full common law damages to the extent found recoverable by a common law jury.

Secondly, the United States was slow to recognize the true nature of the disease and its extent because advances in medical diagnostic and research techniques and talents were not available in areas where the disease was most severe. They are still meager. Legislation would be strengthened by providing advanced pulmonary research facilities in endemic areas.

I have with me Attorney George Daugherty who has spent 6 years attempting to clarify the rights of the working man through the judiciary system and the legislature. He will be happy to answer questions pertaining to the legal aspects.

I feel qualified to answer questions relative to pneumoconiosis and related research.

Dr. **Wells**. We would like to urge the committee to not just X-ray these men yearly but to examine them with the latest techniques.

Our main problem, as Dr. Rasmussen has said, is that we have not had in America the latest techniques to detect these diseases in the areas where the diseases occurred and we still don't.

Dr. Rasmussen has said that X-ray is not adequate. So we urge the committee to include functional disability testing as a regular screening test for the ravages of this disease, that is, to measure it.

Senator **Williams**. Will you yield from a medical standpoint to describe what you mean? You know that means something general to me but nothing specific.

Dr. **Wells**. You go to an office for an examination by a cardiologist. He will have you run up and down a couple stairs several times and measure certain parameters. This is functional testing and it is very simple.

Dr. Rasmussen, with a very simple bicycle ergometer has demonstrated, as have many other pulmonary psysiologists, that diseases of this nature can be detected early, and these men can be rehabilitated before the disease becomes severe, they can be put in better working conditions and we can slow the progression of the disease.

If we can't eliminate the dust we, at least, can detect and prevent the further ravages of the disease by proper modern diagnostic tools. This would strengthen the legislation and improve the chances of the miner.

The other suggestion was that we include in the legislation language that would give back to these miners the right to a jury trial in cases of wrongful death, injury and disease.

Senator **Williams**. Senator Javits.

Senator **Javits**. First, of course, I know the work which these doctors have been doing, which is in the great tradition of evangelism as well as medicine which has caused so much change in our world.

I know that you gentlemen need not be advised, you know that so many of us are very sympathetic to what you have in mind.

The way to do it, of course, is a big problem. We have workmen's compensation as a State function. Senator Randolph and I have joined in a review of all workmen's compensation, and to perhaps consider Federal standards. Of course that is a long way from passing.

But I am sure that we can do something in this legislation, the safety legislation, to meet at least some of your views.

I would beg you, however, as you are all men of science, to respect us as we will press the Public Health Service and the National Institutes of Health to do the research, to give us solid backing for your feeling that the X-ray test is a means of avoidance rather than a means of confrontation.

As I understand it, you urge physiological tests. But I can assure you that certainly I will try, I do not say this in any sense of exclusivity, my colleagues are just as much interested in it as I am, to use our ingenuity to write in the health and safety legislation means for dealing with the problem which you raise.

We may not be able to do it quite exactly as you wish it because you sort of sweep aside the whole question of the State and the national authority but I am sure we can find some way and I certainly will do it, and as I say, I do not say this with any sense of exclusivity, I am sure my colleagues feel exactly as I do.

We are well aware and our minority counsel, Mr. Mittelman has briefed me on the argument made by the lawyers for the mining companies, and so forth.

I hope, gentlemen, you will understand, the workers will understand, as well as management, that from my own experience in this subcommittee and in this Senate, we are not going to ride on the special interests.

This is altogether too precious, altogether too serious. I see no evidence whatever that anyone need fear that the human life and the value and the opportunity of the man to be more than a vegetable—human life itself, as you doctors know, is not nearly as vital as what you do with it—will be really within our care.

Personally, I am as much impressed with your evangelism as well as your profession.

Dr. Wells. Thank you, Senator Javits. This kind of educated concern gratifies us all.

Senator Williams. Senator Randolph.

Senator Randolph. Mr. Chairman.

I have listened very carefully to Dr. Rasmussen and to Dr. Wells, as I did to Dr. Buff.

I am sure, Dr. Rasmussen, that we would like to have no lung disease whatsoever, whether caused by the problems within the mines or problems that might come from our own smoking. These are the utopias.

We recognize as Senator Javits has indicated that we are all guilty of shortcomings, of mistakes, of errors. But our intent here in the doing of this job will be to press forward in a constructive and, frankly, I say a very hard-hitting way.

The timid approach will not suffice. It must be a very strong, effective law which now supplements and breaks through, as it were, into new ground which is necessary to meet these problems of the mining community. It is very important, not alone in West Virginia, where coal is a vital part of our economy, but important wherever this energy fuels the Nation.

We depend so much upon it. So, humanity, as you men know it, and I agree fully that it is a very common and important denominator in what we do here.

Economics, of course, have a consideration when we pass legislation. The technological status and advances will be probed deeply by the subcommittee. You cause me to have some concern today about our inability to match the scientific advances of other countries.

I had not realized that we are lagging, and I want to check this out very carefully, I have no reason to doubt at all what has been said in this regard, and my checking into it will be only in an attempt to develop further facts in reference to these matters.

I think that the testimony today, Mr. Chairman, is helpful to the members of this subcommittee. I not only have listened but I shall go over it, I shall read and reread it.

We have been talking very much, Doctor, today about West Virginia. Even with our problems with our good people in those valleys and hills, we have made progress, great progress. This is not the time for me to discuss those matters, but I mention quickly some examples.

Like bringing pure water to tens and tens of thousands of our people in the rural and small communities in West Virginia.

Our efforts in housing, not the ultimate but real progress is being made.

Our educational structure, improving not only the facilities but also the type of educational training which is moving us forward.

The diversification of our industry, not relying almost totally upon the coal industries as we once did but moving into other types of business and industry, light industries as we call them in many cases.

Since we are talking about West Virginia, and since Dr. Buff and others live in West Virginia, and you know West Virginia, I think I could be pardoned for telling this story of the mountaineer who seemed not to receive a response from his son that he thought should be forthcoming.

He rather abruptly exclaimed, "Son, are you listening?"

The reply was, "Yes, pappy, but I ain't paying no attention."

Now I think, Dr. Buff, you must realize, and I know you do, that we pay attention to you when you testify here and we evaluate it, and that is the spirit in which the chairman and the members of this subcommittee functions.

There are no politics in this subcommittee. We have men of different political faiths, of course. We realize this is not just a considerable job but this is a very, very epochmaking period that we come to, and our task is not an easy one.

I think this is important for us to realize, too. We sit here not in just another day, Dr. Buff, but we sit here in a new day and we must recognize that with the new day there come new challenges.

I want to assure you—and it is not windowdressing—I want to assure you that what you say here will be carefully considered. That which you have presented is helpful to the committee.

There will come a time when you will feel that what you did and said contributed in a constructive manner. That is what you want, I know, that is what Dr. Rasmussen wants, and that is what Dr. Wells wants, and that is what Mr. Daugherty wants, as do all who sit at this table today.

I appreciate the privilege of sitting here during this hearing today. I want the record to show that I shall be here at all times possible to listen to all the witnesses and to work during the coming weeks in a matter that may help bring to fruition a legislative enactment that will benefit the safety of our coal mining population and improve their health.

Dr. Rasmussen used the words that we want to arrest the disease. Doctor, I know you want to eliminate it also, insofar as possible.

It is so with air pollution and water pollution and solid waste disposal. We want to do just as much as we can, frankly, as quickly as we can, as realistically as we can, and we want to do it for the public good and for the general welfare.

I thank you gentlemen for your attention to these very vital problems, and for your contributions toward solutions.

Senator WILLIAMS. If I might be pardoned, I would like to thank you for that statement, Senator Randolph. I think that statement could well be just as is, without additions, subtractions, or editing, the opening speech for the legislation before the U.S. Senate just before we go into our general debate on the way to doing what you suggest; namely, coming in with hard-hitting legislation meeting the objectives that we are working for, better safety, better health for coal miners.

Senator Eagleton.

Senator **Eagleton**. I will address these questions to Dr. Wells first. First, Doctor, what is your background or specialty?

Dr. **Wells**. I am a pathologist, sir. I am a diplomat of the American Board of Pathology, Clinical and Anatomic, and I am assistant clinical professor of pathology at the University of West Virginia, chief of the Pulmonary Research Laboratory at the Memorial Hospital in Johnstown.

Senator **Eagleton**. Doctor, do you know how much money the U.S. Public Health Service has spent for research with respect to coal miners' black lung?

Dr. **Wells**. The last figure that was available to me was $4.5 million in the last 5 years. We are not sure exactly where this money was spent. This brings up another problem.

May I suggest that if this body decides on legislation it must be made in such a way as to provide regular congressional followup or congressional oversight of the progress of this program.

I believe that this has been lacking in the spending of the $4.5 million in the last few years bcause we have, as yet, very little to show for this money.

Senator **Eagleton**. That was my next question.

What can you point to as a pathologist and as one who specializes now in black lung, what can you point to in the way of positive results in this 5-year research with $4½ million during that period?

Dr. **Wells**. As to a tangible result from the expenditure of that money I am unable to find any advancement. I understand that about 85 patients have been studied at the Appalachian Laboratories for Occupational Respiratory Disease at Morgantown.

Senator **Eagleton**. Do you have any information on what other countries are doing in the way of research in the same general area we are talking about here today?

Dr. **Wells**. England, for the past 20 years, has spent much more per year than we have. They started earlier. They have gotten more results. They have demonstrated, in fact, the very existence of the disease, coal workers' pneumoconiosis.

Russia, Czechoslovakia, Germany, all have very energetic research programs that should make us a little bit ashamed of ours.

Senator **Eagleton**. Have such results as have been derived from these other research programs abroad, have the benefits of those findings been made available to us, the Congress, the coal industry, what-have-you, in terms of new techniques, new regulations, new procedures of the United States?

Dr. **Wells**. Senator, I wanted to read into the record the testimony of Dr. Jethro Gough from Wales, a man who has had much experience with dust levels and disease resulting therefrom and who contributed his testimony to the West Virginia Legislature but I was informed that the transcript of the Joint Judiciary hearings have been purloined and we will have to read into the record at some later date if you are interested the unofficial transcript of Dr. Jethro Gough's explanation of exactly what could be done in America based on English and German research.

Senator **Eagleton**. Will you make that transcript available to the staff and I trust, Mr. Chairman, it can be made a part of the record?

Dr. **Wells**. Yes, sir.

(The material referred to had not been received by the subcommittee when this hearing went to press.)

Senator **Eagleton**. I would like to address this question to any one of the three doctors who wishes to try to answer; this is to clarify something in my own mind.

I have written it out so that it will read well.

If a 3-milligram limit were adopted and rigorously enforced, would the incidence of black lung be reduced or would the disabling effects of black lung simply be prolonged?

What I am getting at is this, would a 3-milligram limit merely prolong the work and life expectancy of the worker but sooner or later black lung will appear in many coal miners even with the 3-milligram limit for coal miners?

Dr. **Rasmussen**. I do not think anyone can answer your question specifically related to a 3-milligram level, whether continued exposure at this level would be, let us say, completely well tolerated and handled by every miner in the mine for any length of time.

We do not know the answer to this question. I think that the British experience would certainly indicate that a lower dust level than we now have would result in a much lower incidence of the disease.

I suspect that were men to remain in the mines for, say, a greater length of time that some of them would again begin to show change.

I think it is a time and dose related matter.

Dr. **Buff**. You asked how much money was spent by Britain. In 1967, $10 million. We spent $4½ million in 5 years. Great Britain in 1 year, $10 million. A smaller country.

Senator **Williams**. Thank you, gentlemen.

We have a vote. I would like to say while we have had this remarkable testimony, Apollo 9 reentered the atmosphere and is down safe.

Senator **Randolph**. I want the record to show that sometimes we do better above earth and on earth than we do under the earth.

But I want, Mr. Chairman, the privilege which I know you would want to give, of having any supplemental material that you desire, that you feel is pertinent, that you may have thought after your testimony today, included in the record. We will want to keep the record open to receive such information from you gentlemen.

Thank you very much.

Dr. **Buff**. Thank you, Mr. Chairman.

Senator **Williams**. We will reconvene tomorrow morning at 9:30.

(Whereupon, at 12:25 p.m. the subcommittee recessed, to reconvene at 9:30 a.m., Friday, March 14, 1969.)

COAL MINE HEALTH AND SAFETY

FRIDAY, MARCH 14, 1969

U.S. Senate,
Subcommittee on Labor of the
Committee on Labor and Public Welfare,
Washington, D.C.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 4232, New Senate Office Building, Senator Harrison A. Williams, Jr. (chairman of the subcommittee) presiding.

Present: Senators Williams, Randolph, Eagleton, Saxbe, and Schweiker.

Committee staff members present: Robert O. Harris, staff director; Frederick R. Blackwell, counsel to the subcommittee; and Eugene Mittelman, minority counsel.

Senator Williams. We will continue our Labor Subcommittee hearings on the health and safety legislation dealing with coal mines.

Our scheduled hour of 9:30 has arrived. I see that our morning witnesses are with us and ready to present their statements.

Dr. Lorin E. Kerr, who is assistant to the executive medical officer of the United Mine Workers Welfare and Retirement Fund is our first witness this morning.

Dr. Kerr, we welcome you before the committee and look forward to your statement in connection with this very important legislation.

STATEMENT OF LORIN E. KERR, M.D., ASSISTANT TO THE EXECUTIVE MEDICAL OFFICER OF THE UNITED MINE WORKERS OF AMERICA WELFARE AND RETIREMENT FUND

Dr. Kerr. Good morning. Thank you for your introduction.

Senator Williams. You may proceed in any way you wish. We have a copy of your statement.

Dr. Kerr. Do you mind if I read it?

Senator Williams. You may summarize it or read it. It is at your option, sir.

Dr. Kerr. Mr. Chairman and members of the subcommittee, I am Lorin E. Kerr, M.D., assistant to the executive medical officer of the United Mine Workers of America Welfare and Retirement Fund. Since joining the fund in 1948, one of my major concerns and focus of interest has been the occupational dust diseases afflicting the Nation's coal miners. Today, I want to share with you the knowledge which I have acquired on this subject during my professional career in the hope it will prove helpful in the formulation of legislation intended to resolve this serious national problem.

The U.S. Senate, for more than half a century, has heard testimony about the dangers of working in coal mines. Not included in these recitals of death and disability have been the losses inflicted by the daily inhalation of dust in the coal mines. Approximately 125,000 active and former coal miners have some stage of coal workers' pneumoconiosis, commonly called black lung, and about 50,000 of them are probably disabled by the disease. These are shocking figures.

At work the miners are covered with coal dust. It is in their hair, their clothes, and their skin. The rims of their eyes are coated with it. It gets between their teeth and they swallow it. They inhale so much of it into their lungs that until they die they never stop spitting up coal dust. Some of the miners cough so hard that they wonder if they have a lung left. Insidiously some miners notice they are getting short of breath when they walk up a hill. On the job they stop frequently to catch their breath. Finally, just walking across the room at home is an effort because it makes them so short of breath. As medical knowledge has increased, this breathlessness on exertion among coal miners has been called many things.

Miners' asthma was one of the first terms used and it is still heard in many places. The cause of the spitting, coughing, and breathlessness in coal miners was unknown so doctors used the well-known word "asthma" as a label to identify the condition. Later, silicosis was reported to be the disease producing breathlessness in the coal miners. Anthraco-silicosis became a further refinement in nomenclature and this was soon followed by anthracosis, the black twin of silicosis. Today, after years of research and study, we know that coal dust alone can be the cause of the spitting, coughing, and breathlessness and the name of the disease it produces is coal workers' pneumoconiosis. This clarification is important because, today, many people still believe that silica is the only dangerous dust and silicosis the only disabling dust disease.

They also maintain that coal dust containing little or no silica is harmless. Thus, according to them, there is no need to prevent coal dust or provide workmen's compensation for coal workers' pneumoconiosis.

Contrary to these erroneous statements, beliefs, and attitudes, coal workers' pneumoconiosis is the most important occupational dust disease occurring in the United States today. It is a manmade disease that can and must be prevented. Coal, for centuries, was dug out of surface outcroppings and shallow mines. There was little dust and no dusty lungs.

This picture began to change, however, in the 18th century with the advent of the steam engine and the smelting of iron. The demand for coal increased rapidly and the mines got deeper and deeper as some problems of ventilation, lighting and flooding were solved. By 1813, physicians were reporting the occurrence of "black lungs" in autopsied coal miners and 20 years later British doctors identified this as a disease associated with coal mining. From then until the end of the 19th century coal dust was generally acknowledged in Europe to be the cause of the "black lungs" and the shortness of breath occurring among coal miners. Emile Zola vividly describes this disability and its effects on the miner, his family and the community, in his famous novel, "Germinal" which portrays the horrors of the French coal mines about 1880.

Unfortunately, in the early years of the 20th century efforts to suppress coal dust subsided. It was claimed that improved ventilation in the coal mines had practically eliminated the dangerous development of black lungs. There was also opposition to the idea that coal dust was a hazard. In fact, some medical leaders suggested that it was not only harmless but possibly beneficial.

The main reason, however, for reversing the earlier concern about the danger of coal dust was the rising focus of attention devoted to silica and silicosis. By 1915, silica gained the dubious distinction of being labeled the only important occupational dust. To this day, many American physicians and lawyers maintain that silicosis is the only disabling dust disease.

Senator WILLIAMS. Dr. Kerr, if I should forget later when you finish your statement, will you give the medical theory that suggested that the dust was possibly beneficial—not now but when you get through.

Dr. KERR. Yes, I will be glad to.

Senator WILLIAMS. In other words, doctors are in error, too?

Dr. KERR. Yes, definitely. We find that out every day, Senator.

British investigators, unlike Americans, continued their studies of diseases associated with coal dust. In 1927, British physicians were reporting X-ray differences between silica and coal dust exposure. British coal miners disabled by silicosis were finally able, in 1934, to get limited workmen's compensation awards. However, the number of men receiving awards was a small percentage of all the miners with a pulmonary disability. Their disability was acknowledged, but the British doctors could not find evidence of silicosis. Deeply concerned about the increasing number of these disabled miners, the British Medical Research Council, in 1937, initiated a comprehensive study of chronic lung diseases among coal miners.

Their first report, issued in 1942, identified a new dust disease which the British investigators called "coal workers' pneumokoniosis." The following year this disease, as distinct from, and in addition to, classical silicosis became compensable. In the United Kingdom, coal workers pneumoconiosis is accepted as a diagnosable occupational dust disease. It has characteristic chest X-ray changes which have been observed in workers exposed to hard or soft coal and some other carbon dusts both in Britain and the United States. Lung changes observed at autopsy are specifically characteristic.

Senator RANDOLPH. Doctor, could I interrupt. You say other carbon dusts?

Dr. KERR. That is right.

Senator RANDOLPH. Tell us what those are, Doctor.

Dr. KERR. In making carbon electrodes and pencils, there is exposure to a pure carbon dust which produces coal workers' pneumoconiosis. This disease has also been reported to occur among foundry workers where they used to use what was known as "sea coal." This was a sand that had a rather heavy mixture of coal dust in it. It fired very easily and was used to make molds.

Senator RANDOLPH. Then, Doctor, you are telling us that the disease which we associate with coal mining is a disease that also of the same nature exists in manufacturing and in foundries.

Dr. KERR. It occurs among workers that are exposed to coal and other carbon dusts. For instance, one of the most famous papers on this disease was written in 1940 by Dr. Gough. He reported on a study of 12 British "coal trimmers." These are the men who load the coal in ships. They had worked for a number of years on the ships at Cardiff, Wales. When these 12 men died an autopsy was performed and their lungs showed exactly the same changes Dr. Gough had been observing for many years among the coal miners. These coal trimmers had no exposure to coal dust other than that encountered while working in the holds of the ships.

Senator RANDOLPH. Doctor, at that point I want the record to indicate that in the Newport News area, Hampton Roads, W. Va., coal to the amount of perhaps 6 to 8 million tons—this figure I will revise so that it will be correct, Mr. Chairman—the tonnage in that very large amount which moves from the West Virginia coalfields by rail and then is loaded on ships for, let us say, central Europe, the men who would be loading the coal in the holds of those ships, would be subject to the lung affliction that you say is prevalent in the coal mining industry. Is that so?

Dr. KERR. I think that this would be a question that would have to be seriously considered, Senator. It would depend upon the ventilation in the hold of the ship and how much exposure to hurt the men had when they were in the holds. I would imagine that the holds of these ships are probably somewhat different than the holds in the ships in 1940.

Senator RANDOLPH. That is true; within the last year they have deepened and widened the channel there under a Public Works program of the Federal Government. The ships coming in from France and from Italy are larger in gross weight and capacity. They afford the means for moving 2 or 3 million more tons of West Virginia coal to Europe every year because of this development. The ships I have seen there are very modern.

But be they of older vintage or modern, I want to establish that here is an area where the disease which we are discussing as being prevalent among coal miners may also occur. Is that right?

Dr. KERR. Yes, this is very true. In fact, I heard 10 to 12 years ago of a man with coal workers' pneumoconiosis who had no dust exposure except for working 5 years on a Navy stockpile here in Washington. His job was to shift that pile of coal around from one place to another. That was the only dust to which he had ever been exposed.

The physician who was taking care of this man felt quite certain that this was definitely a case of coal workers' pneumoconiosis.

Senator RANDOLPH. Thank you, Mr. Chairman, for allowing me to interrupt at this point. I thought we could develop facts concerning other occupational areas in which people face this difficulty which, in greater degree, seems to afflict our coal mine worker population.

Senator WILLIAMS. In other words, the coal, after being mined and brought out of the mine, still carries with it the dust that causes the lung problem?

Dr. **Kerr**. Yes, the coal still has the potential of causing the same disease, trouble, Senator, under certain circumstances.

Senator **Williams**. Very good. I appreciate your interruption, Senator Randolph.

Dr. **Kerr**. My first reason for giving this historical background is to show the similarity of conditions in Britain 30 years ago and the United States today. The second reason is to make the record clear. Coal workers' pneumoconiosis is not a new, unknown disease. It has been reported to occur in every coal mining country in the world, first as "black lung" and more recently as coal workers' pneumoconiosis.

The British Medical Research Council, in 1945, established a Pneumoconiosis Research Unit, near Cardiff, Wales, and their contributions since then have played a major international role in the diagnosis, control, and prevention of the disease.

The International Labour Office has conducted several meetings of international experts on coal workers' pneumoconiosis. In 1950, they accepted, with minor modifications, a standardized method of describing and classifying the X-ray changes developed by British investigators. This international classification was further refined in 1958 and the standardized X-rays and photographs illustrating the classification are readily available from the ILO.

Senator **Randolph**. You speak of the International Labour Office.

Dr. **Kerr**. Yes, sir.

Senator **Randolph**. For the record we should know exactly what organization that is and whether the United States of America participates.

Dr. **Kerr**. Yes. That is the International Labour Office. It is associated with the United Nations. It is my understanding that the United States is always a part of those deliberations. The names of the American physicians attending the 1950 conference in Sydney, Australia, appear in the report of that conference. The same is true of the conferences held in Geneva and elsewhere. So that I am quite certain that Americans do participate in ILO conferences.

Senator **Randolph**. Whatever was done would be done with the cooperation of our representatives?

Dr. **Kerr**. Yes. Not only that but they made a contribution to every one of these conferences.

Senator **Randolph**. Thank you, sir.

Dr. **Kerr**. The British National Coal Board has made tremendous strides in the prevention of this disease. In 1955, nearly 5,000 new compensation awards were granted for coal workers' pneumoconiosis, but a decade later this number dropped to 1,007. The number of new cases of coal workers' pneumoconiosis diagnosed each year by the pneumoconiosis medical panels have fallen from a peak of 5,807 in 1949 to 1,213 in 1964. Likewise, there has been a fall in the prevalence of the disease in the last 10 years as noted in the annual reports of the board. This is particularly noticeable among the younger men.

You have heard in recent testimony that 220 men were killed in the Nation's coal mines in 1967. Last year, the number killed was 309—a 40 percent rise over the preceding year. The U.S. Bureau of Mines reports that 29 more miners have already been killed in January of this year. The National Safety Council reports that each day 28 coal miners suffer disabling injuries. At the end of the year the total is nearly 10,000 miners. Each disabled miner loses on the average 144 days of work—more than half a year off the job. While these figures on death and disability caused by accidents are readily available, no one can say with complete accuracy how many miners are afflicted with coal workers' pneumoconiosis or the number disabled by it. There are some figures which permit us to make conservative estimates. In Pennsylvania, nearly 1,000 miners die of coal workers' pneumoconiosis every year and the same disease is listed as a contributing cause of death for almost 1,000 or more. Prior to 1960, coal workers' pneumoconiosis rarely appeared on a death certificate in Pennsylvania.

The U.S. Public Health Service recently reported that in 1950, American coal miners died at nearly twice the rate of other workers; diseases of the respiratory system killed miners at a rate five times greater than the general working male population; and the mortality rate for American coal miners was roughly twice those reported for British coal miners.

Among the living, the Pennsylvania Department of Public Health reported in 1967 that 19,175 coal miners had X-ray evidence of coal workers' pneumoconiosis and 23,768 more were disabled by the disease. In 1965, the U.S. Public Health Service reported that throughout the entire Appalachian soft coal mining area one out of every 10 active, and one out of every five former miners had X-ray evidence of the same disease.

These and other American statistics are a grisly repetition of those reported by British investigators for the last 25 years. In Great Britain, coal workers' pneumoconiosis accounts for more deaths than all other forms of dust diseases combined. Since 1930, it has constituted the greatest medical and social problem in all industry.

It is safe to conclude from all available information that in the United States, as previously stated, that at least 125,000 active and former coal miners have some stage of coal workers' pneumconiosis and of this number nearly 50,000 may be disabled by the disease. In the last 20 years, at least one million miners have been exposed to a daily dose of life-threatening coal dust.

Scientific studies have repeatedly shown that achievement is not confined to any one nation. New discoveries and inventions usually occur simultaneously in a number of different locations. Why has coal workers' pneumoconiosis been an exception? Why, with our outstanding contributions in medicine, should we stand today where the British did nearly 30 years ago?

A major reason for this situation is that coal workers' pneumoconiosis is not well known or widely recognized in the United States. Until recently, little has appeared in American medical journals on this disease and most of the earlier articles were reports on British research and surveys. This lack of concern about coal workers' pneumoconiosis has been due in part to a belief that conditions reported in Britain did not exist in the United States. It is also due to the conviction that only silica and dust containing silica is injurious.

I would like to depart from the record a moment to elaborate on this item, if I may, Senator.

We began research here in the United States on silicosis about 1915 with studies that were done in the tri-state area where the lead and zinc mines are located near Joplin, Mo. This followed a 1902 study in South Africa concerning high tuberculosis mortality rates among gold miners. It was determined that silicosis provided the development of the tuberculosis among these miners.

This study was followed by others elsewhere. Mass X-rays were first used in a 1911 study of silicosis. Subsequent studies here in the United States revealed a lot of silicosis in various industries.

Slowly it was thought to be diminishing. Then about 1930 a tunnel was dug at Gauley Bridge, W. Va. It is difficult to say whether it was silicosis or whether it was an overwhelming dose of dust in the lungs of these men that caused so many deaths. However, it created such a scandal that there was a congressional investigation. This was followed by a National Silicosis Conference in 1936 called by the Secretary of Labor, Madam Perkins. The reports were made in 1937. The definition of silicosis was one that had been developed in 1933. It has since been incorporated into most workmen's compensation legislation in the country. In fact, there was no workman's compensation for silicosis until about 1937.

There has thus been this focus of attention over the years on silica and coal dust has been classified as an inert dust because it did not produce any fibrosis in the tissues.

I think it is important to keep in mind that when silicosis did hit the headlines here in the United States it was followed by a congressional investigation, a National Conference on Silicosis, and the development of certain recommendations some of which are still not implemented. Even today we do not know the actual incidence or prevalence of silicosis in the United States. There is no accurate reporting on that disease either.

The impact of physician knowledge and attitudes is apparent in inaccurate or incomplete death certificates. These documents are essential for determining the existence of dangerous coal dust requiring governmental action for control or eradication. Too often no records mean no action.

A final comment on our 30-year lag behind the British is provided by Dr. Donald Hunter, the world-famous British authority on occupational health. Ten years ago in his book, "Health in Industry" he wrote extensively on coal workers' pneumoconiosis and said that not until 1934 did British physicians begin to accept the fact that coal dust in miners' lungs produces a slowly progressive fatal disease. He continued to say:

> It must be admitted that medical men by their ill-informed complacency have a heavy load of responsibility to bear for this failure to discover the true state of affairs, a failure which constitutes what is probably the greatest disgrace in the history of British medicine.

Today, 35 years later, American medicine has barely begun to overcome its "ill-informed complacency" and "discover the true state of affairs" regarding coal workers' pneumoconiosis.

I can vividly remember, 21 years ago when I came with the UMWA Welfare and Retirement Fund, the constant stream of wheezing, breathless coal miners coming to the area medical office in Morgantown, W. Va., seeking relief from the struggle to breathe. I can also remember how overwhelmed I felt. Never in my earlier professional experience had I observed or heard of a single industry with so many men who seemed to be disabled by their jobs. I say "seemed to be disabled by their jobs" because doctors said these men rarely had silicosis and it was unusual to find a physician who even suspected that coal dust might be dangerous. The disability was called miners' asthma and it was accepted by miners and doctors as part of the job.

We, in the fund, also became acutely aware of the unusual medical care these breathless miners required. They had more colds and other respiratory infections than other miners and these infections lasted longer. Some of these men would become so ill when they had an upper respiratory infection that they would need to be hospitalized, where they frequently would stay for 2 and 3 weeks, several times every year. Oxygen in the hospital or at home seemed to bring more relief than anything else. If all the tanks of oxygen these men have used were laid end-to-end I would venture that a long green line would run at least 6,000 miles—twice across the Nation, coast-to-coast.

I might say parenthetically that I computed that, myself, and I think it is quite accurate.

In searching for the cause of the shortness of breath afflicting the coal miners, the fund's medical administrators could not agree with those doctors who claimed that it was due to "compensationitis" or nervousness. I can assure you that were I as breathless as some of the miners I have seen I would be nervous. But to claim it was due to nervousness and had nothing to do with dust was nonsense. I know of one doctor who even maintained that breathlessness was due simply to a fear of coal mining.

Our search for answers also included a review of death certificates but they were of little help. Cor pulmonale or right-sided enlargement of the heart was often given as the cause of death but there would be no mention of what we now know was the primary cause of the heart failure—coal workers' pneumoconiosis.

No Government agency, including health departments, could answer our questions. They were all willing to listen but no one knew the cause of the breathlessness and no one was willing to even guess how many breathless miners were disabled by their jobs.

The fund was unable to get any help or information from any source. As part of its long-range endeavor to provide beneficiaries with a high quality of medical care, the fund embarked early on a program to develop professional understanding of chest diseases among coal miners. Over the years the fund has—

Prepared, published, and distributed summaries of available knowledge on coal workers' pneumoconiosis.

Arranged for the care and treatment of beneficiaries at teaching institutions equipped and staffed to provide the finest therapy and concerned with the advancement of knowledge in this field.

Distributed widely to physicians current information as it is received from authoritative sources.

Stimulated and assisted practicing physicians and research scientists in recording and publishing their reports.

Provided drugs, oxygen, oxygen equipment, and other therapeutic measures for hospital and ambulatory patients suffering from coal workers' pneumoconiosis.

Assisted in planning and conducting numerous conferences with physicians and other interested professional personnel.

Arranged for national and international authorities to meet with the physicians in coal mining areas to acquaint them with the latest research and findings in coal workers' pneumoconiosis.

Encouraged and assisted the U.S. Public Health Service and the U.S. Bureau of Mines in their efforts to determine the prevalence of coal workers pneumoconiosis.

Provided expert consultation to assist in the formulation of State and Federal disability policies relative to this disease entity.

Utilized clinical research developed in the former miners' memorial hospitals to hasten the provision of adequate medical care for coal workers' pneumoconiosis.

Encouraged and assisted Federal and State surveys and studies of dust diseases occurring among coal miners.

Introduced and encouraged utilization of the "International X-ray Classification of Coal Workers' Pneumoconiosis" for the diagnosis and treatment of this disease.

As Mr. W. A. Boyle, president of the United Mine Workers of America, said recently in a letter to the then Secretary of the Interior, "In the absence of the fund and the union more than one of these achievements would have been possible. Working together with all other interested groups it is possible today to record an impressive development little known to those outside the coal industry. Despite this record, of which we are justly proud, much remains to be done."

Senator WILLIAMS. Where is your library of publications and the other written material? Maybe I should ask where is headquarters?

Dr. KERR. The Welfare and Retirement Fund is at 907 15th Street NW., here in Washington.

Senator WILLIAMS. All of your publications are there?

Dr. KERR. Yes, sir.

Senator WILLIAMS. From there you distribute?

Dr. KERR. We distribute them through our 10 area medical offices, Senator. Materials are sent out to the 10 area medical offices and then they keep in touch with the local practicing physicians to keep them informed of the developments.

Senator WILLIAMS. What was your address again?

Dr. KERR. 907 15th Street NW., here in Washington.

Senator WILLIAMS. Is it all right for us to drop by and see what you have?

Dr. KERR. Of course, sure.

Senator WILLIAMS. Excuse the interruption. This is a very impressive list of accomplishments here. That is why I interrupted to be sure I knew where your headquarters are.

Dr. KERR. Yes, sir.

In describing coal workers' pneumoconiosis I have briefly touched on the characteristic symptoms such as coughing and breathlessness on exertion. This disease also produces disability, varying from slight breathlessness on effort in the early stages to severe shortness of breath in the advanced stages. Premature death is preceded by total incapacity for work. Coal dust is the killer but death comes slowly.

What is the present situation with respect to coal workers' pneumoconiosis?

What courses of action are open to us?

It would appear that your major focus of attention is directed toward the prevention of coal workers' pneumoconiosis. The urgent need for such a program is further emphasized by the recent announcement that the U.S. Office of Education is supporting programs to train workers for the bituminous coal industry. It is estimated that at least 49,000 newly trained employees will be needed in the coal mining industry during the next 5 years. Of these, 30,000 new mining personnel will be needed to replace losses from expected attrition, while the opening of some 100 new mines now being planned will create an additional 19,000 jobs.

The first and most important preventive measure is a dust suppression campaign. This requires the effective control of coal dust at its source. Essential for the success of dust suppression is a determination of the safe level of dustiness in mines. Other coal-producing countries, but particularly the United Kingdom, have had extensive experience which should prove helpful. In the early phase of their campaign, the British used the thermal precipitator to collect dust in the mines. The particles collected by the precipitator were microscopically counted and the results expressed as millions of particles per cubic centimeter. In the United States we expressed it as millions of particles per cubic foot. Experience showed that counting the particles was time-consuming, required special training and that there was considerable variation in the results. Continuing medical research revealed that this method of determining dustiness in the mines did not accurately correlate with the development or progression of the disease process.

Subsequent post mortem studies of miners' lungs showed instead a relationship between the average weight of dust in the lungs and the X-ray classification of the disease. The British Medical Research Council, in 1957, expressed the view that mass or weight of coal dust might prove to be superior to counting the number of particles and urged the development of suitable measuring instruments. The 1959 Pneumoconiosis Conference in Johannesburg concurred and recommended the measurement of the weight of dust in the mines.

Essential for measuring the weight of airborne dust in relation to coal workers' pneumoconiosis is a restriction of the dust collected for measurement to the "respirable particles." These are 5 microns or smaller in diameter and are generally agreed to be the dangerous particles capable of producing coal workers' pneumoconiosis. Measurements of the dust collected are expressed as milligrams per cubic meter of respirable dust. In accordance with these findings and recommendations a selective gravimetric sampling instrument was developed by the Mining Research Establishment of the British National Coal Board. This instrument is now commercially available in the United States. This instrument has probably been the most significant advance in dust measurement.

It is my understanding that British experience with this instrument has convinced them that the safe level of dustiness in coal mines is 3 milligrams per cubic meter of respirable dust. Above this level the early X-ray changes of coal workers' pneumoconiosis develop as well as X-ray progression of the disease. At 3 milligrams or less these changes do not seem to occur. It is fair to assume that these observations must mean that a significantly large number of the British mines have achieved the 3-milligram level.

It is my further understanding that there are a number of mines in Pennsylvania which are reported to have attained a 3-milligram dust level.

Thus all available information seems to indicate that there is a direct correlation between levels of dustiness in excess of 3 milligrams and the prevalence of coal workers' pneumoconiosis. For example, at 4.5 milligrams there is 50 percent more disease than at the 3-milligram figure.

In 1965, the U.S. Public Health Service announced that a joint committee representing the Division of Occupational Health and the U.S. Bureau of Mines was working on criteria, instruments, and procedures necessary for the control of dust in coal mines. This information, as you know, was released in December of last year. This was encouraging and both the U.S. Department of Health, Education, and Welfare and the U.S. Department of Interior are to be commended for this action.

I strongly urge that 3 milligrams per cubic meter of respirable dust be established as the safe level of dustiness in the Nation's coal mines.

Respirators have also been proposed as a means of controlling dustiness. There are many problems connected with these devices. One of the chief objections is that their use does not encourage the elimination of the dustiness in the mines. Moreover, they inadequately filter the dust inhaled by the miner. Dependence would not be placed on respirators to protect miners from airborne dust. They can be useful, however, in some circumstances. Even then they should be used only if they are constantly maintained in accordance with criteria assuring their efficiency.

A second preventive measure which has been utilized successfully in the United Kingdom and elsewhere has been the limitation of the coal miners' total period of dust exposure. This can be accomplished by setting an upper limit to the working period on a dusty job and an upper age limit on hazardous dust exposure, as well as making employment available, in less dusty jobs, when indicated. These measures need to be accomplished without the miner losing his job or lowering his income.

Experience in the United States indicates that a third preventive measure requires better workmen's compensation legislation and the improvement and diligent enforcement of existing occupational health laws and regulations. This might encourage the early application and improvement of known preventive measures. Four States, Alabama, Pennsylvania, Virginia, and now West Virginia have assumed leadership in specifying coal workers' pneumoconiosis as an occupational disease covered by workmen's compensation legislation. Because of the numerous problems existing in all coal mining States, I would urge you to investigate these disparities and encourage their early elimination. Medically there is a need to combine pulmonary function studies and clinical evidence with X-ray findings in making a diagnosis of coal workers' pneumoconiosis. The overwhelming medical needs of miners disabled by this disease also require adequate coverage by workmen's compensation legislation.

The fourth preventive measure requires a medical research program conducted by the U.S. Department of Health, Education, and Welfare. This should be designed to provide additional knowledge on the pathology produced by coal dust in the lungs, the cause and precise measurement of breathlessness on exertion, and the value and effectiveness of various types of treatment. When indicated, this medical research should collaborate with the environmental studies conducted by the U.S. Bureau of Mines. Only the Federal Government can conduct and support the in-depth, unbiased research necessary to solve these problems.

The Senate report on appropriations for this research should indicate your interest in certain specific areas such as those noted above. In addition to the appropriations there is a need for continuing congressional review of the research and its results. Congressional appropriations for medical research on coal workers' pneumoconiosis passed the $1 million mark 2 years ago, but European and British investigators have been spending nearly $20 million yearly, for over a decade, for research on the same disease with outstanding results, particularly in the United Kingdom. Let me make it clear that the answers sought by medical research should in no way delay any other aspects of the total preventive program.

There has been little public discussion about coal workers' pneumoconiosis until recently. It has now jumped from obscurity as a scarcely recognized disease hidden for decades in the chests of coal miners to the headlines and wide technical discussion in the United States and other countries. The ravages of disability and death are the daily penalties paid for not preventing this man-made disease. Throughout the world the great plagues, polio, typhus, malaria and smallpox are being eradicated. Coal workers' pneumoconiosis, a man-made plague, can be eliminated in one generation.

Senator WILLIAMS. That was a great statement, Dr. Kerr, and very, very helpful to this committee.

It is shocking how the manifestation of the disease was so visible and yet the inquiry was so limited for such a long period of time.

It is almost fantastic, isn't it?

Dr. KERR. Yes, it is. I think it is due to a number of reasons which I touched upon in this presentation. There was and still remains overwhelming concern with silicosis here in this country; it was very hard for people to believe that anything other than the silica dust could cause this disability; and coal dust had been classified by the pulmonary experts of three decades ago as an inert dust.

So coal dust, even in the face of the British reports, was felt to be something that just did not happen in the United States.

Senator WILLIAMS. You emphasize at the end the disparity of money for research between this country and the European countries.

As a result of their broader research and greater attention to research on controlling conditions of dust in the mines have they been able to reduce dust levels substantially below what you consider average in this country.

Dr. KERR. It is my understanding that they have done a very unusual job in this area. For instance, it is my understanding that in Great Britain a very high percentage of their mines have achieved this 3-milligram level. This figure has not been released publicly for problems that they have but it is my understanding that this is the figure that they are shooting for and will put into effect publicly within a relatively short period of time. I am quite certain in view of all the research and the way they work at this problem that they would not be ready to move in that direction if they did not think it was possible to put it into effect.

Senator **Williams**. Thank you very much.

Senator Randolph.

Senator **Randolph**. Mr. Chairman.

Dr. Kerr, I consider this statement very informative. It is very enlightening, and it is very helpful to the members of the subcommittee.

There is a concern which I think we will share to a greater degree in this matter as we hear more and more from the physician, the technician, the experts who have been studying individually or collectively this problem, even at the International Labour Office level.

I would like you to turn to page 16 of your testimony. You were discussing respirators. Dr. Kerr, you indicate that there are problems with these devices.

Dr. **Kerr**. That is right.

Senator **Randolph**. You say that even though they are in use, there is objection because they "do not eliminate the dustiness in the mines," to quote you directly.

Dr. **Kerr**. Yes.

Senator **Randolph**. And this is important. You say "they inadequately filter the dust inhaled by the miner."

Dr. **Kerr**. Yes.

Senator **Randolph**. Now this brings us to a difference of testimony.

Dr. **Kerr**. I have not had a chance to keep up with the testimony that you have been taking, Senator.

Senator **Randolph**. The day before yesterday we heard testimony from—we shall broadly classify it—the industry, which indicated that the filter, the respirator, is effective.

Yesterday, we heard testimony from those in the medical profession that it is not adequate, that it is deficient.

Now you are saying today what was said yesterday, in effect, that there is an inadequacy in the filter. You say it fails to do the job.

Then you say that they are useful under certain circumstances. Then you qualify by saying, "Even then they should be used only if they are constantly maintained in accordance with criteria assuring their efficiency."

Dr. **Kerr**. Yes.

Senator **Randolph**. Now, who is going to take the responsibility, Doctor, where these appliances, these parts of equipment, are used to see that there is a constant maintenance and that there is a standard which is followed and criteria which are observed?

Dr. **Kerr**. I think, speaking as a physician, a professional person, that I would want to know the criteria for the masks and their method of operation. From the medical point of view, I would want these criteria established by the Department of Health, Education, and Welfare. Certainly this could not be done without their working in close concert with the Bureau of Mines. These two agencies would have to work very closely together to establish the criteria that would determine in what instances a respirator could be used and, of course, this would require their full knowledge of how effective the respirators are.

For instance, there was a study reported by the U.S. Public Health Service about 1966 at a meeting of the industrial hygienists in Pittsburgh. This report stated that the electron microscopic investigation of the dusts in the lungs showed that the particles ranged in size from 2 microns to 0.012 microns. This was the range. The average diameter was 0.2 micron. If this is the average size of the dust particle that is being found in the lungs, then we have to gear the respirators to be taking out even that small size particle.

While I would not want to disparage American technology, this is a real difficult problem. We must take out particles this small and yet still permit the men to be able to breathe when they put the mask on. For instance, a miner who is just moderately disabled—let us say he is still able to work but is a little short of breath—yet you are trying to filter out these small particles. These are some of the problems confronting those concerned with developing the respirator that will do the job adequately. There is also the problem of maintaining the respirator on a daily basis to assure the miner that every time he puts that respirator on it is going to do the job that it is built to do and it will protect him when he uses it.

Senator Randolph. Thank you, Doctor.

I would like to have you discuss, briefly, of course, the United Mine Workers welfare and retirement fund only because you have made reference to what has been accomplished by that organization.

You have said that there has been a utilization of clinical research developed in the former miners memorial hospitals.

As you know, those hospitals even though under other management today—nine in number; five in Kentucky, three in West Virginia, and one in Virginia—are in a position where it is necessary that funds to be paid from many sources if these hospitals are to continue to do their work.

We are told that 34 percent of the operating income comes from the United Mine Workers' health and welfare fund. It has been said that payments to those hospitals from the United Mine Workers of America health and welfare fund amounts to approximately $7½ million a year.

When you speak of the clinical research, has there really been progress made? You have called it as one of the developments that has been helpful.

Dr. Kerr. Yes, there was quite a bit of research that was done out at the Beckley Memorial Hospital beginning in 1956 under the direction of Dr. Albert Kistin who has since died, of Dr. Laqueur, who is a pathologist; Dr. Robert Hyatt, who is now with the Mayo Clinic, and other physicians who were there. This research was conducted with the aid of grants from the Occupational Health Division of the U.S. Public Health Service. The studies were specifically concerned with the problems of the lungs and the heart as they relate to coal workers' pneumoconiosis. I must say that the research they conducted down there have been first rate.

Senator Randolph. Dr. Kerr, have you had a free hand in your work within the framework of the health and welfare fund of the United Mine Workers of America? Have you been able to make the decisions that you feel should be made, the statements that you should make and have made, without interference?

Dr. KERR. Why, of course.

Senator RANDOLPH. And there has been no inhibition placed on you in the work that you have carried forward?

Dr. KERR. No, no.

Senator RANDOLPH. The reason I mention this is because this is a matter of discussion?

Dr. KERR. In fact, I do not even know what you are talking about.

Senator RANDOLPH. I know what I am talking about, certainly. Are you not employed by the United Mine Workers of America?

Dr. KERR. I am employed by the United Mine Workers of America welfare and retirement fund, Senator.

Senator RANDOLPH. That is right, which is a part of the United Mine Workers of America.

Dr. KERR. They are two separate organizations, sir.

Senator RANDOLPH. I realize they are separate organizations. Where do the moneys come from?

Dr. KERR. From tonnage royalties paid by the operators into the fund.

Senator RANDOLPH. Who brought that into being, the operators or the Mine Workers Union?

Dr. KERR. It was a wage agreement signed in 1946.

Senator RANDOLPH. Who were the people?

Dr. KERR. It was the operators and the union.

Senator RANDOLPH. Are you saying that Mr. Boyle, when he spoke here earlier before the subcommittee, was wrong when he said that the union really brought this into being?

When I said there had been cooperation between the operators and the Mine Workers Union, he, in a sense, corrected me by saying it came about only because of the determination, the thrust of the fight made by the UMWA.

Dr. KERR. Senator, may I say that I am employed by the fund and I am a technician. What happened at that level as far as the union is concerned, I would not be privy to those things.

Senator RANDOLPH. That clarifies the record, Mr. Chairman. I just felt that it was right that I ask this because you are speaking here about a fund which Mr. Boyle has said was brought into being because of the efforts of the UMWA.

Dr. KERR. Yes.

Senator RANDOLPH. The testimony so indicates.

Dr. KERR. Yes, from what I know, this is very true.

Senator RANDOLPH. Now you quoted today on page 13 of your statement from a comment apparently made by Mr. Boyle.

Dr. KERR. Yes, sir.

Senator RANDOLPH. You have read his words, "In the absence of the fund and the union none of these achievements would have been possible." You have read these words?

Dr. KERR. Yes, sir.

Senator RANDOLPH. You believe them to be true?

Dr. KERR. Absolutely.

Senator RANDOLPH. You believe what Mr. Boyle said then is factual?

Dr. **Kerr.** Yes, sir.

Senator **Randolph.** Thank you very much.

One other item that I want to discuss with you is on page 10 of your statement.

You speak of the miner who has a common cold problem in greater degree than the person who is not mining coal. You speak of the infections that come to the coal miner and last for a longer period.

I have no desire to labor this point but I mention it from time to time because I think it has a relativity.

What about the matter of the miner, for that matter the worker, who is an excessive or constant or even substantial smoker? What happens to that individual in connection with the colds and the infections? Are these greater in degree? Do they last longer?

Dr. **Kerr.** These men had a definite diagnosis of coal workers' pneumoconiosis made on them, Senator. This diagnosis was made on the basis of the X-ray findings as well as the clinical findings, including pulmonary function studies. Their disability was caused by the inhalation of dust. You can't get the change in the X-rays that occurs in coal workers' pneumoconiosis by smoking cigarettes. They have to have coal dust in the lungs for those changes to be apparent by the X-ray and there was a definite diagnosis made on these men.

Senator **Randolph.** I am grateful for that clarification, Doctor, because I am constantly being told through the Federal Government and through other sources that the smoking of cigarettes accentuates problems within the smoker's lungs.

Dr. **Kerr.** Of the coal miners?

Senator **Randolph.** Anyone.

I am just wondering if there is a greater incidence, you see, combining the two.

Dr. **Kerr.** Well, this has been up for a lot of discussion. There are some researchers that maintain these men are short of breath because of the number of cigarettes they smoke.

Senator **Randolph.** I have read that, sir; and that is why I ask you these questions.

Dr. **Kerr.** There has been a very recent study done in a clinic in Fairmont,, W. Va. They took X-rays, performed pulmonary function studies, and took a complete occupational history including a history of cigarette smoking on about 250 men. This was done on a Sunday so that no miner would lose any work. It was the men from the Grant Town local. Of that number of men, there were about 13 percent who had no history of smoking cigarettes at all. There were an additional 13 to 14 percent of the men who had not smoked any cigarettes but had smoked an occasional cigar or pipeful of tobacco. This was a total of about 26 percent of the 250 miners studied who had absolutely no history of smoking cigarettes at all. Yet they were kind of short of breath, Senator.

Senator **Randolph.** Mr. Chairman, I appreciate the opportunity to have the expert advice and counsel of Dr. Kerr on this subject. I bring these matters to the attention of the subcommittee not to speak for or against smoking, per se. I continue to read these statements and that is why they must be made a part of the record. They are pertinent in connection with our discussion.

That is all I have, Mr. Chairman.

Senator **Williams.** Senator Saxbe.

Senator **Saxbe.** Doctor, do you believe a man can work in a mine in a completely closed environment?

Dr. **Kerr.** Doing what?

Senator **Saxbe.** Well, operating a mining machine or a loader or shuttle, other functions or work on a tipple?

Dr. **Kerr.** I have heard this idea being propounded as a means of taking care of the men who are driving the continuous miner. There have been people who have been wondering whether it is not possible. I understand that there has been some work that has gone so far as to provide the machine operator with a totally enclosed space while he is operating the continuous mine. I do not know what the results of this are, Senator. I think it poses a lot of problems because you shut the man off from an awareness of his environment. The coal miners tell me that after they have worked in the mines for any considerable period of time the noises that occur in the mine alert them to the possibility of dangers. After hearing this you wonder if the completely closed environment will cut the miners off from this sort of sixth sense that these men must develop to protect themselves. You wonder how dangerous would it be? Yet, I know what you are driving at and I think that there has to be some research on this subject.

Senator **Saxbe.** We have been told that the inhalator cannot succeed to the point where it is going to relieve these men completely. It does not need to be a completely controlled cab, it could be a scuba gear. It could be an inhalator no bigger than the present one and could be supplied by outside air such as in undersea or space suits.

I am just thinking that if this environment is so hostile and by ordinary means we can't accomplish this, perhaps as the pick and shovel go out and men are occupied more in operating machines, this is something that we should think about.

Dr. **Kerr.** As I say, I have heard this idea in the bull sessions with doctors. This idea has been kicked around and you wonder whether it could be done. Yet, I would question, Senator, whether the environment is so hostile that it can't be made, in and of itself, more friendly by bringing the level of dustiness down to the point where it is not a hazard to the men who are working there.

Certainly the prime thrust of research should be the development of techniques necessary to insure the health of the men throughout the mines. This would apply not only to the man on top of the mining machine but those who work in advance of the machine, and on both sides of the machine who have as great an exposure to the dust as the man who is right on top of the machine.

While enclosure would protect one man you have six or seven other men who work with him in the same area who presumably have somewhat the same levels of dust exposure. It seems to me that with the same thrust we should be able to develop the techniques that would bring down the dust level.

For instance, there is an extensive use of water in British coal mines. While I know their methods are different than ours they have infused the face of the coal with water under pressure so that when the coal comes off the face it is a wet coal. There is also the use of water sprays at every stage of the operation within the mines.

How extensively that is done at the present time in our mines I am not prepared to say. Is it possible to develop, however, a continuous miner or any other type of mining machine which would be less dusty than the ones we are using at the present time?

Senator **Saxbe**. Thank you. That is all, Mr. Chairman.

Senator **Williams**. Thank you very much.

Senator Eagleton.

Senator **Eagleton**. Doctor, I have a few questions that I would like to ask you for the purpose of the record. It is not clear to me and so we could have it in the record, what is your specialty?

Dr. **Kerr**. I am a diplomate of the American Board of Preventive Medicine. I am also a visting professor of public health at Howard University College of Medicine and a fellow of the American Public Health Association.

Senator **Eagleton**. Can I direct your attention, Doctor, to page 5 of your prepared statement, the first paragraph, the next to the last sentence there in which reads as follows:

"It has," speaking of black lung, "characteristic chest X-ray changes which have been observed in workers exposed to hard or soft coal and some other carbon dusts both in Britain and the United States."

Will you explain in greater detail what you mean by "characteristic chest X-ray changes"?

Dr. **Kerr**. Yes. There is an international X-ray classification of coal workers pneumoconiosis which I mentioned in the testimony. This has been accepted by the ILO and is readily available from their offices. There have been some joint studies by the British and the U.S. Public Health Service on the utilization of this classification. Very briefly, on the basis of this classification there are two major types of changes defined.

The first is known as simple pneumoconiosis and there are three categories. The difference in these categories depends upon the size and the number of the opacities in the X-ray which are produced by the coal dust.

The second change is complicated pneumoconiosis or progressive massive fibrosis which develops on a background of simple pneuomoconiosis.

Simple pneumoconiosis is distinguished by the profusion and distribution of small minute opacities which may measure up to 5 millimeters in size. The four categories of complicated pneumoconiosis, designated A, B, C, and D, are differentiated by the size of massive shadows. These are due to a conlesience of the earlier minut opacities and a destruction and distortion of lung tissue.

Senator **Eagleton**. Doctor, would you say it would be the consensus of professional medical opinion that (*a*), the utilization of X-ray diagnosis is the best or, indeed, the only way of determining pneumoconiosis at the outset and, (*b*), the tracing of it from time to time as it grows worse?

Dr. **Kerr**. Senator, I am very glad you asked that question because I personally feel quite keenly about this. I think that the X-ray is a very important tool to use in the diagnosis of the disease but we are developing some other techniques which I think must be taken into consideration at the time of diagnosis.

For instance, it would be foolhardy to place in front of a competent radiologist, and I do not profess to be in that category, the X-ray films of a miner and ask him to make a diagnosis. All he could tell you is that there is dust in the lungs and that this might be somebody that had been in a coal mine or in some other type of dusty occupation. Before you could make the diagnosis you have to have not only the X-rays but the clinical history as well as the detailed occupational history of the man. Regardless of the diagnosis, be it coal workers pneumoconiosis, silicosis, asbestos, or any of the other dusts, you have to know the occupation specifically, and what the man did.

In addition, we are now developing some pulmonary function studies which also give us a very important clue as to what is going on inside the man's lungs. There are also physicians that are doing extensive research in coal workers' pneumoconiosis that feel that another aid is the electrocardiogram. They feel this is also an important tool. I certainly would be the first to say we should not make this diagnosis with the X-ray alone. These are the tools to make it in the living. The only way you can be sure of the diagnosis is when a man dies. The autopsy enables you to see what those lungs actually look like.

This thesis, that you with your questioning have been able to develop, is a very important concept to understand in the development of a preventive program. Not only must there be a dust-suppression campaign, but we need to know the effectiveness of that dust-suppression campaign.

The only tools that we have at hand professionally to assess accurately the dust-suppression campaign is to combine the X-rays, the physical examination, the clinical and occupational history of the men with the other tests. With this information, you could then go into a coal mine and say, "Look, you have 400 men here. We have done X-rays, taken histories, and performed all the tests on these men and we find since our last X-ray, which was 2 years ago of the same group of men, that you have 25 miners who have progressed from category 2 to category 3 of simple pneumoconiosis. Now, the dust-suppression campaign obviously is not doing the job that we thought it was going to do. So let us go back and review what has been done and where it can be improved so that we don't have this occurring with any more men in this mine the next time we come around."

Senator EAGLETON. Fine, Doctor. How often would you suggest as a competent physician in this field that coal miners should be examined, using the whole gamut of examination, X-ray, clinical history, and so forth, in order to determine whether a dust-prevention program has been successful?

Is once every 2 years often enough?

Dr. KERR. There are two ways I can answer you. One way is on the British experience which is aimed at just this very point, Senator. They have geared their studies of the men to once every 3 years and now it has become, I understand, I think I am correct, a 5-year period. Whether that is adequate or not, I don't know. I don't think we have enough experience.

I personally would feel a little more comfortable if it were less than 3 years, if we could get down to 2 years. Whether you could go so far as to say it should be done every year, I don't know whether we could even keep up with it. Certainly, 3 years would be within the realm of being able to do all of the men. A large number of men is necessary so that we have a statistically sound sample and nobody can argue with the results. We certainly should have nothing less than 3 years and preferably shorter if we could get the manpower to do the job.

Senator EAGLETON. Wouldn't you say perhaps it would be wise if a new program were enacted by Congress permitting certain minimum tolerances, 3 milligrams or what have you, that at least on a pilot basis in one given mine or in one given area of the country affecting two or three coal mines that annual medical examinations in depth be made in order to keep track of it as closely as possible?

Dr. KERR. Yes; I think you ought to have more than one or two mines on that, Senator, because you need a statistically sound sample. For instance, the U.S. Public Health Service in their 1963 and 1964 prevalence study set it up so well statistically that while there were 2,000 men who were active miners and a thousand who were former miners, the sample is so solid that you can safely draw conclusions for the total mining population. If it can be done for that prevalence study, certainly you could select the mines that you are talking about so that nobody can shoot any holes in the study and they can tell you the results are solid.

Not only must we do these examinations, but there must be criteria further, Senator, for the taking of the X-ray, itself, the development of the X-ray, and the reading of the X-ray. These criteria need to be established for such a study, as well as the use of all diagnostic X-rays in this disease by the Department of Health, Education and Welfare, preferably by the U.S. Public Health Service.

Senator EAGLETON. Doctor, can I call your attention to page 15 of your prepared statement, the last full paragraph on that page which reads as follows:

> It is my further understanding that there are a number of mines in Pennsylvania which are reported to have attained a 3 milligram dust level.

Doctor, would you know, and I know you are a physician and not a financier, but of your knowledge, would you know if these mines you are referring to in Pennsylvania are operating profitably?

Have you had conversations with the coal operators of these mines to determine whether they are a losing proposition?

Dr. KERR. I could not answer that question. All I can say is that I assume they are still operating.

Senator EAGLETON. Would you have any notion as to how long a period of time they have been operating at a 3-milligram dust level?

Dr. KERR. No; but I would assume that this information is readily available from the Department of the Interior or the Public Health Service, and they can give you the details on this.

Senator EAGLETON. You would assume if they have been operating for a couple of years or so at that level that they were doing so profitably since business does not usually stay in business too long at a loss?

Dr. KERR. I think that is a safe assumption.

Senator EAGLETON. Please refer to page 18, Doctor. There you refer to the moneys that have been spent, for instance, about line 10, "Congressional appropriations for medical research on coal workers' pneumoconiosis passed the $1 million mark 2 years ago."

Then you went on to say about how much more has been spent in Europe, Great Britain and what have you, $20 million or so.

Can you point to anything tangible that has resulted from the expenditure of the million dollars by Congress in this area on medical research in the past year or preceding years, for that matter?

Dr. KERR. That research has been conducted primarily at the Appalachian Laboratories for Occupational Respiratory Diseases at the Medical Center at the University of West Virginia in Morgantown.

While I am not familiar with all that they have done there I know that there has been one study of 400 miners with which I am familiar. It is a very extensive in-depth study that involves not only the question of X-rays, the pulmonary function studies, but also work tolerance levels. This is 400 men. At the present time, if my memory is correct, I think in 2 years they have examined somewhere in the neighborhood of about 80 men. This is one of the studies.

There is also a question which is tied in here with the appropriations. I am not sure just how these moneys have been expended in the coal fields. I think perhaps questioning the U.S. Public Health Service could give you the details with which I can't absolutely provide you.

Senator EAGLETON. I take your answer to be then, Doctor, that the money has been spent, surveys and studies have been made, but at least to your knowledge you know of no tangible results, progress or what-have you, that have emerged therefrom?

Dr. KERR. Let us say that I am a little ignorant on that one. I am sure that the details of that if you want them, Senator, can be provided by the U.S. Public Health Service.

Senator EAGLETON. Thank you. Do I take your testimony to mean that you would accept a 3 milligram level as being medically safe under present circumstances?

Of course, you would prefer a no milligram level or a half milligram level.

Dr. KERR. That is right. That is definitely right. But I think 3 milligrams is a good starter. If we can get some mines which have reached 3 milligrams we can do some real intensive work and study of the men and relate the results to the levels of dustiness that have been achieved in those mines. Over a period of time we could determine the number of new cases that develop or the progression that develops. By this means we have some hard facts by which we can then start dropping below the 3 milligram level.

Senator EAGLETON. Is your home State Pennsylvania?

Dr. KERR. No, my home State is Ohio. I was born and raised there.

Senator EAGLETON. Is that where you practice?

Dr. KERR. No. I am assistant to the executive medical officer of the United Mine Workers of America Welfare and Retirement Fund and I have been here in Washington since 1950.

Senator EAGLETON. But you have had some experience in coal States such as Pennsylvania, West Virginia, and Ohio?

Dr. KERR. Yes, I have been 21 years with the Fund.

Senator EAGLETON. Now I will ask you this question which I have asked of several witnesses including Mr. Corcoran and of the Consolidation Coal Co. and yesterday a series of doctors before the committee.

Assuming that Congress enacts a strict and justifiable set of laws regarding health and safety, assuming further, that the Congress appropriates sufficient funds to the U.S. Bureau of Mines to make frequent unannounced inspections of coal mines, do you see any necessity for each State to have its own separate and ancillary system of mine inspection with respect to safety and health?

Dr. KERR. I am not too well qualified to answer that question, Senator. I am not familiar enough with what the States do on the basis of coal mine safety. This has not been my area so that my answer is not very meaningful on that, Senator.

Senator EAGLETON. Thank you, Doctor. Thank you, Mr. Chairman.

Senator WILLIAMS. Senator Schweiker, do you have questions of Dr. Kerr?

Senator SCHWEIKER. Yes, Mr. Chairman, thank you.

Doctor, going back to the particle system you gave earlier, I understand you said that the average particle size, from studies which you referred to, of particles imbedded in lungs was about 2/10ths of a micron. Is that correct?

Dr. KERR. Yes, as I remember that study that was reported in 1966, Senator.

Senator SCHWEIKER. The present face mask that is available now, with the mask filter, what is your estimate of the particle size that that actually excludes in breathing?

Dr. KERR. I can't tell you that, Senator. I do not know. I have not had enough experience with the respirators to answer that question absolutely.

Senator SCHWEIKER. You did say earlier you felt the mask was inadequate, did you not?

Dr. KERR. Yes. It has been my understanding that the masks which are currently available do not act effectively at that level.

Senator SCHWEIKER. We had earlier testimony about one way of diagnosing the problem of black lung by means of vector-cardiography. I did not hear you use that term. Is this a new term? Is it something that is or is not helpful? What is your opinion on this medical technique?

Dr. KERR. Cardiology is one of the many specialties in which I am not particularly proficient. However, I would assume from what little I know of it that in doing the ordinary electrocardiograms that one would be able to ascertain this item.

Now I could be wrong on that but this is my understanding.

Senator SCHWEIKER. You mentioned also in your testimony about a right-sided enlargement of the heart being given as the cause of death. You did not amplify on that. I am just wondering, are you saying that the right-side enlargement is directly related to the coal miners' working problem?

Dr. KERR. Yes. What I meant to say on that—evidently I did not make it clear, Senator—is the fact that the usual cause of death for a man with coal workers' pneumoconiosis is cor pulmonale or right-sided enlargement of the heart. Cor pulmonale is the technical way of saying the man has died from a right-sided enlargement of the heart. Then you have to go immediately and ask yourself the question, well, what caused that right-sided enlargement of the heart. Was it coal workers' pneumoconiosis with the changes that it produces in the vascular bed of the lungs that produced this right-sided enlargement of the heart?

The right side of the heart is responsible for the pumping of the blood into the lungs. When changes take place in the arteries and veins in the lungs which make it harder for that supply of blood to go through the lungs, then the right side of the heart has to work harder in order to pump the blood through the lungs. To compensate for that extra load of work that is being thrown on it the right side of the heart expands, it gets larger over a period of time. There have been some excellent studies that have been done on that.

Senator SCHWEIKER. Are we able to medically measure that by X-ray?

Dr. KERR. No; by autopsy.

Senator SCHWEIKER. Can we measure it in living people? Is the vector-cardiograph a way of measuring that?

Dr. KERR. I would have to rely upon the specialists in that field to give you the answer on that one, Senator.

Senator SCHWEIKER. Is there any known way to you of measuring this enlargement today in a living person?

Dr. KERR. You can, as I understand it, pick it up when you get a considerable enlargement of the heart by means of the X-ray.

Senator SCHWEIKER. I just asked you that and you said you could not.

Dr. KERR. Well, this is a radiologist that would make this examination. He would tell you that within his experience this heart looks somewhat larger than it does in a normal person of the same age, a nonminer of the same age. Whether this can be picked up in the cardiogram, I am not qualified to answer on that one because I really do not know. But I would assume that if cardiologists have said this is possible, I would have to bow to their knowledge in this area.

Senator SCHWEIKER. Do you have a cardiologist available to you in your work at the fund?

Dr. KERR. The fund makes payments to about 8,000 physicians throughout the country for providing services for our beneficiaries. I known that there are a number of those physicians who are cardiologists.

Senator SCHWEIKER. I have one other question.

In terms of the 3 milligrams standard, just very briefly again, what sources have convinced you or can you say what is the reason for using the 3 milligrams standard?

Dr. KERR. The biggest convincing argument to me, Senator, is what has been accomplished in Britain by dropping their dust levels down. When they started their dust suppression campaign in 1949, they used a measurement that was standard at that time, the number of particles per cubic meter. This was used as their measurement of dustiness in the coal mines.

They found that those 1949 levels were too high and were reduced somewhat. When they had the medical knowledge that I talk about in my testimony, the autopsies, they found that it was not the number of particles but rather the weight of the particles, the mass of the particles, that had a direct correlation with the pathology that was observed at autopsy. For that reason they then swung over to a system of using the mass or the gravimetric method of measuring the levels of dustiness.

In looking at their reports and use of the gravimetric method to reduce levels of dustiness to what I understand are now 3 milligrams, which is pretty universal throughout the mines or certainly in a large percentage of them, it is impressive to note that they have been able to markedly reduce the prevalence of the disease, the number of new cases and the number of new cases that apply for workman's compensation. On the basis of their experience, it would seem to me that the 3 milligram figure is a highly desirable one.

Senator SCHWEIKER. That is all, Mr. Chairman. Thank you.

Senator WILLIAMS. I have just two brief questions, Dr. Kerr.

You indicated the retirement fund does retain over the years 8,000 doctors.

Dr. KERR. We do not retain them, we pay them.

Senator WILLIAMS. You use the professional service of 8,000 doctors?

Dr. KERR. Yes.

Senator WILLIAMS. It seems like an awful high figure. Your retirees number what, a little over 100,000?

Dr. KERR. The retirees number somewhere in the neighborhood at the present time of about 75,000 to 80,000 men. You have to remember, Senator, these people not only live in the coal mining States but they live in all 50 States and in the District of Columbia. Throughout the Nation we would utilize the services of roughly 8,000 doctors a year to provide medical care for these beneficiaries. This is done regardless of where they live. Some of them retire to California, some of them down in Florida.

Senator WILLIAMS. These are all former coal miners?

Dr. KERR. Yes; as well as the coal miners themselves who are living back in the coal mining States.

Senator WILLIAMS. Do their families fall within the coverage, too?

Dr. KERR. Yes; all of their dependents.

Senator SCHWEIKER. I have one more question.

Senator WILLIAMS. Senator Schweiker.

Senator SCHWEIKER. Doctor, the test that we hear about and is now being used relatively widely for emphysema, do you say or do not say this has some bearing on diagnosing the situation?

Dr. KERR. I did not talk about that one.

Senator SCHWEIKER. What is your opinion on that? One of the experts did and I have forgotten which one it was.

Dr. KERR. Well, as it relates to coal mining, when you get into the question of emphysema that is produced by coal dust, this one has been the subject of some rather strong and vigorous debate. There is a feeling I think among the majority of the men who are doing the investigative work that there is emphysema that is produced by the coal dust, itself.

Now I think what you are referring to, if I may try to interpret your thoughts, I think what you are referring to is the men who are breathless, who are disabled and yet when you look at their X-ray you see no evidence of coal dust. Is that what you refer to?

Senator SCHWEIKER. Yes. As I understand the emphysema test, you measure lung capacity and lung ability. Would this or would this not be an indication that some people might have emphysema?

Dr. KERR. Yes. There have been many reports of the men who have worked in the mines, who have had this coal dust exposure who are disabled or are breathless to a greater or lesser degree and yet their

X-ray changes show absolutely nothing. Sometimes a radiologist is able to make a diagnosis of emphysema.

However, there has been some rather recent work that is being conducted which shows that there are some changes that occur in the blood vessels in the coal miners and that these can occur without the deposition of the coal dust being apparent in the X-rays. In fact, it is these changes that occur in the blood vessels that are thought to account for the disability. So this indicates that not only must we use the X-ray but we must use the pulmonary function test, we must use the exercise tolerance test and the clinical aspects of medicine in order to make a diagnosis where it is not obvious insofar as the X-ray is concerned.

You can't just fluff a man off who claims he is disabled because he has a negative X-ray. We can't say from our knowledge today that, "You just don't have anything," because our knowledge and experience today are such that we know there is a good likelihood he has something. Just because we can't see it on the X-ray does not mean that it is not so.

Senator SCHWEIKER. Thank you.

Senator WILLIAMS. You suggest followup studies as we attempt to improve the conditions in terms of dust control and the ultimate objective of reducing the dust content that does get into the workers' lungs.

On followup studies, both in terms of equity and the effectiveness of the studies, who should bear the cost of these studies, in your judgment? Both equity and effectiveness, I think, are important here.

Dr. KERR. As far as the effectiveness is concerned we must use the governmental resources to set the criteria so that there is no question in anyone's mind as to whether these criteria are good, sound, and proper. For instance, a study that will soon be getting underway involves 35 coal mines. The U.S. Public Health Service will do the X-rays, pulmonary function studies, and occupational histories. The U.S. Bureau of Mines will determine the levels of dustiness. It seems to me that this is the kind of study that we must have ongoing all the time.

Senator WILLIAMS. I am not too sure I understand that. Does that mean that there would be less certainty if the producers of the condition, and this would be the owners of the coal mines, did followup studies? Would there be less certainty as to their findings than the Public Health Service's findings paid for by all the people of the country?

Dr. KERR. Senator, when this type of study is done by a governmental agency medical history tells us that no questions are raised by one group of people as against another. I do not want to restrict my answer to the coal mining industry, because my overriding interest is in the whole field of occupational health. Let us say that management was to conduct research on some aspect of a dust disease. The results would be questioned by the workers the same as management would question research financed by the workers.

And in order to make sure that there are no vested interests, it seems to me that these studies have to be under the direction and supervision of the Government, either State or National.

Senator WILLIAMS. I do not believe that this question raised by our staff counsel is a question that should be addressed to you. Perhaps I will present it as an observation. You are a man of medicine. This is an observation that probably should be directed to men who are in the grip of policy rather than in the purity of medical science.

It is suggested that the levy of a 1 cent a ton tax for research to be undertaken by the Public Health Service might be one of our approaches.

It that correct, Mr. Blackwell?

Mr. BLACKWELL. Yes. Following the royalty principle that has been established in this industry, we might have a health recovery royalty of 1 cent a ton on the product which has caused the condition, to cover the need for these comprehensive medical examinations of individuals.

At the current rate of coal production, 550 million tons, 1 cent would yield \$5½ million annually. And then, of course, as coal production goes up the figure would go up.

But 1 cent is thrown out as an illustration of how the arithmetic might run.

Dr. KERR. I think the Senator's observation prior to your elaboration on it would stand me in good stead.

Senator WILLIAMS. Thank you very much.

Senator RANDOLPH. Thank you very much, Doctor.

Senator WILLIAMS. We have kept you here for more than an hour but it has been most beneficial and helpful to us.

Dr. KERR. Thank you. I am very glad to be here.

Senator WILLIAMS. Now, Dr. Werner A. Laqueur is with us this morning, director of laboratories, Appalachian Regional Hospital, Beckley, W.Va.

Dr. Laqueur, we welcome you before the subcommittee. We have your statement before us. I believe you indicated earlier you would like to summarize it. Is that what you indicated to me?

STATEMENT OF WERNER A. LAQUEUR, M.D., DIRECTOR OF LABORATORIES, APPALACHIAN REGIONAL HOSPITAL, BECKLEY, W. VA.

Dr. LAQUEUR. Yes, Mr. Chairman.

Senator WILLIAMS. You proceed in your own way.

(The prepared statement of Dr. Laqueur follows:)

PREPARED STATEMENT OF WERNER A. LAQUEUR, M.D., DIRECTOR OF LABORATORIES, APPALACHIAN REGIONAL HOSPITAL, BECKLEY, W.VA.

I have been working in Southern West Virginia since 1950 with a special interest in lung disease of coal miners. I am actively engaged in research in this field since 1960.

I wish to testify on the relationship of dust exposure and the disease known as coal workers' pneumoconiosis.

I would like to preface my statement with a quote from the testimony from the eminent English pathologist, Professor Gough of Cardiff, at the hearings of the combined judiciary committees of the West Virginia Legislature in Charleston, West Virginia in February 1969. Dr. Gough was testifying in support of changes in the West Virginia Compensation bill, the so-called "Black Lung Bill." He stated, "We have licked the problem of pneumoconiosis in our mines by strict enforcement of dust control. New cases of the disease are in constant decline and pose no problem any more. The problem for us which remains is simply just compensation for existing cases."

Should we not be able to do what England did?

The facts are simple. The biological mechanisms are quite complex. (1) The lung inhales air as it is offered, clean or dirty. There is no way of selection except possibly by masks, which most workers feel are very uncomfortable. The lung has built-in mechanisms to eliminate a portion of inhaled foreign material, as for instance dust, but some will always remain in the lung. This portion of dust is called "deposited dust" and is obviously always less than the total inhaled dust.

It is easy to understand that if the amount of total inhaled dust becomes very high, the mechanism of elimination will soon be exhausted and deposition in the lung tissue will increase. Length of time of exposure to dust inhalation is an additional factor. Breathing of small amounts of dust over a long period of time will result in normal circumstances, in minimal dust retention only. Inhalation of large quantities of dust over a long period of time will lead to increased amounts of deposited dust which may reach dangerous levels. The same may be the case with excessive dust exposure in a relatively short period of time.

Thus, there is a definite relationship between the amount of dust retained and the time of exposure.

(2) It has been held that inhalation and deposition of coal dust is innocuous. This view has changed in the last 20 years all over the world: we in the U.S. have had the sad distinction of resistance to this changed concept until quite recently. We used to speak of a disease called silicosis caused exclusively by silica dioxide. It is now recognized that "coal dust is a conglomerate of many different elements and chemical components, including silica which causes functional impairment with distinct structural changes." It becomes mandatory therefore that in the language of any law, the disease be referred to as "Coal Workers' Pneumoconiosis," or as I would prefer in simple English language, "Coal Workers' Dust Disease." Silicosis as it may occur in the hard coal industry would be a part of this broader disease designation.

(3) It is appropriate to describe the pathologic findings of the disease of coal workers' dust disease based on my own experience of approximately 1,000 autopsies of coal miners. This is essentially taken from a publication which appeared in *The American Review of Respiratory Disease*, Vol. 98, 1968. "*Pathologic findings*: The diagnosis of coal workers' pneumoconiosis requires the demonstration in lung tissue of one or more of the following lesions: (1) disseminated dust foci or maculae—these are aggregates of dust-laden macrophages situated around bronchioles and/or their arteries; dilatation of air spaces or focal emphysema is associated with this lesion; (2) perivascular mantles or cuffs—retained dust particles in or around the wall of the small pulmonary arteries; (3) modified maculae with more intense dust retention, extending down to the alveolar ducts and alveolar walls, a type of lesion always associated with prominent vascular mantles; distortion of air spaces (anatomic emphysema is always pronounced); (4) nodules that are distinguished by their size, their tissue composition, and by the structural arrangement of their components. For simplicity, ignoring transitional changes, one can distinguish five categories: (*a*) simple dust macrophages and reticulin nodules: (*b*) mixed nodules similar to (*a*) but with collagen fibers in a haphazard arrangement—often stellate in appearance and may cause considerable distortion of surrounding alveolar architecture (mechanical or traction emphysema); (*c*) silicotic nodules with whorl arrangement of collagen or hyaline material, often with a conspicuous lack of alveolar distortion; (*d*) mixed nodules with necrotic centers, various amounts of dust, clefts between necrotic center and fibrotic periphery, and marked inflammatory reaction, either purely cellular or granulomatous (Kaplan's rheumatoid nodules); (*e*) distinct, round, fibrotic nodules with calcific centers and various amounts of dust in the periphery, and perinodular emphysema (similar to chronic histoplasmosis). These lesions, all directly related to retained dust, may be and are frequently associated with all known types of non-dust related lung diseases, such as chronic bronchitis, infections, or neoplasia.

Morphologically advanced forms, referred to as complicated pneumoconiosis, are, in essence, only exaggerations of the lesions just described. They develop by virtue of coalescence of closely seeded nodules, by collapse of lung tissue, or by nondust-related fibrosis-stimulating processes. These lesions are often found in association with other nondust-related diseases in the same manner as simple lesions.

In approximately 1,000 autopsies of coal workers, about 95 percent were found with occupational exposure times of more than 20 years. About 80 percent of the miners had morphologic evidence of pneumoconiosis. About 60 percent of those with pneumoconiosis revealed the stigmas of simple pneumoconiosis. In the writers' experience, simple maculae are only slightly more frequent than perivascular dust retention. In the latter group, nodules are usually present but may vary considerably in their numbers from case to case. About 15 percent of the patients show predominant perivascular and diffuse dust retention. In these instances, nodules were often quite insignificant. The clinical impairment was generally great and was proportional to the amount of retained total dust (19–20). It was also impressive that the most severe instances of occupational lung death were those with the highest dust content in almost pure perivascular and diffuse interstitial distribution and with conspicuous lack of nodule formation. These cases were classified as diffuse, non-nodular coal workers' pneumoconiosis. Right heart hypertrophy, determined from the weights of dissected ventricles, occurred in 41 percent of the patients (21). In cases of non-nodular pneumoconiosis at Beckley Appalachian Regional Hospital, right heart hypertrophy approached 100 percent.

The present morphologic studies of coal workers' dust disease in West Virginia have more or less confirmed the earlier findings of European pathologists. But beyond that, they have convinced the writers that the perivascular lesions, known for many years and attributed to innocous anthracosis, may indeed be of considerable pathologic importance. The area of respiratory bronchioles with its concomitant artery is the region in the primary lobule where most of the transfer of dust into the interstitium takes place. It is not difficult to assume that dust retention in either of these structures will interfere with the function of the whole unit, causing not only interference of air distribution but also possibly derangement of perfusion. It is therefore conceivable that even small dust deposits around vessels alone, and especially in combination with paribronchiolar maculae could impair lung function. Furthermore, in cases of the most severe clinical respiratory distress, nodulation may not be a predominant feature. There appeared to be a relationship of increasing dust retention in perivascular and diffuse foci to increase loss of lung function with clinical cor pulmonale and anatomic hypertrophy of the right ventricle."

(4) The majority opinion in the U.S. holds that the simple, discrete, nodular form of coal workers' pneumoconiosis is never or seldom the cause of disabling impairment. Significant impairment is believed to follow the development of complicated pneumoconiosis. This opinion is contested for several reasons:

(*a*) Dr. Wells reported from our material an incidence of 41 percent of hypertrophy of the wall of the right ventricle of the heart in autopsies of a group of 200 miners. These findings have recently been supported in a study in Pennsylvania.

(*b*) In 200 cases used in a contractual report to the United States Public Health Service (PHS 64–65–9), we found 20.5 percent complicated pneumoconiosis and 14 percent diffuse pneumoconiosis. Practically all of these cases had right heart hypertrophy. A group of diffuse pneumoconiosis is classified by our present criteria based mainly on X-ray findings as "simple pneumoconiosis," yet it is just this group which shows the greatest functional impairment, the largest amount of retained dust in the lung (by objective chemical measurements), and the highest incidence of death related primarily to the cardio-pulmonary disease.

(*c*) An additional 250 cases, which have not yet been published, the number of complicated pneumoconiosis cases is going down, but the incidence of diffuse pneumoconiosis with excessive dust retention and the primary cardio-pulmonary death rate is going up.

(5) The direct relationship between disabling dust diseases and duration of exposure is suggested by looking at main causes of death versus exposure time.

In cases of exposure up to thirty years, death from cardiovascular causes (hardening of the arteries, heart attacks, etc.), 13 percent and the group of thirty and more years exposure, 17 percent. Death related to cardio-pulmonary disease up to thirty years exposure, 10.5 percent—thirty and more years exposure, 19 percent. Malignant tumors group to thirty years, 10 percent—above thirty years, 12 percent. It is evident that the gap between the two groups widens for cardio-pulmonary disease with larger exposure and usually concomitant greater dust retention in the lungs.

(6) Our observations in Beckley have been challenged by coal corporations and physicians related with them; and, if not challenged, they are not used by the United States Public Health Service. The reasons are a bit difficult to understand. In connection with these challenges, much emphasis has recently been

placed on cigarette smoking and chronic bronchitis and emphysema as they occur in the general population as a cause of disabling cardio-pulmonary disease in coal workers.

It would border on the ridiculous to deny that coal miners should be subject to the dangers of smoking are prone to contract any lung disease afflicting the general population, but it is likewise inconceivable to deny accumulative effect of lung damage due to dust and other factors causing respiratory impairment. In other words, if impairment and disability due to respiratory disease could be reduced in coal miners to the level of the general population, everybody would be happy, and part of these hearings would be unnecessary. Yet everybody who has ever worked with an open mind in coal field communities knows that the incidence of respiratory ailments is much greater in coal miners than in the general population. This is especially true in Southern West Virginia, and most of my experience is based in this area.

There is sufficient evidence from our work in Beckley on living and dead miners to form a strong opinion in these matters, even if strictly scientific proof has not been delivered. Constitutional factors cannot be overlooked. Some individuals are able to handle dust better than others; they are less prone to disabling disease, even if they smoke. The reasons for this are not known. Much more research is necessary to clarify some of the scientific problems of occupational lung disease, but we should not neglect to act upon established facts. Coal workers' pneumoconiosis is to great measure preventable by strictly enforced dust control. The English have shown us the way.

Dr. LAQUEUR. Mr. Chairman and members of the subcommittee, I have been working in southern West Virginia since 1950 with a special interest in lung disease of coal miners.

I am actively engaged in research in this field since 1960. In fact, the first study which was funded by the fund of the Public Health Service's so-called coal study went to my department for a study of the pathology of coal workers' pneumoconiosis or of the lung disease as we had it in America.

Until that time we had to rely on statements from other countries and there were no larger studies in the bituminous coal industry or coalfields done in regard to this disease.

In the meantime, we have examined close to 500 cases. Some of these with the support of the Public Health Service, recently on our own, unfortunately.

I wish to testify especially on the relationship of dust exposure and the disease known as coal workers' pneumoconiosis.

I would like to preface this statement with two quotes, one only of tangential relationship, the other very pertinent.

The first one is a first paragraph of minutes of a 2-day meeting in the National Institute of Environmental Health, which, by the way, to me would be the organization which should carry out all research which should be done in environmental medicine.

Senator WILLIAMS. Were you here yesterday?

Dr. LAQUEUR. No.

Senator WILLIAMS. That question came up. I am glad to have your observation.

Dr. LAQUEUR. This was a special meeting on a peculiar situation in relation to the asbestos industry and I do not want to bore you with that but I want to read the first paragraph:

> It has been known for centuries that individuals working in the mining and weaving of asbestos had a high incidence of what is now known as fibre pneumoconiosis, a relatively acute disease. When the relationship between fibre pneumoconiosis and exposure to high concentration of asbestos fibers was recognized, improved ventilation procedure, the use of dust filters and other corrective measures were instituted and the incidence of pneumoconiosis decreased slowly.

The second quote, which I had wished I could read into the record as an official quote but I could not get hold of the official transcript so it is a quote from memory, is a statement made by the eminent English pathologist, Professor Gough, of Cardiff, at the hearings of the combined Judiciary Committees of the West Virginia Legislature in Charleston, W. Va., in February 1969.

Dr. Gough was testifying at that time in support of changes in the West Virginia compensation bill, the so-called "black lung" bill.

He stated:

> We have licked the problem of pneumoconiosis in our mines by strict enforcement of dust control. New cases of the disease are in constant decline and pose no problem anymore.

Now, the purpose of these quotes to me are that I see no particular reason why we should not be able to do what the English have done and to do what the asbestos industry has done.

Senator WILLIAMS. There has been a lot of emphasis on the British here this morning by Dr. Kerr. Are they way ahead of other countries in Europe?

Dr. LAQUEUR. They are way ahead of us. They are a little bit ahead of Germany. Germany is catching up very fast. Germany has changed its mine safety laws in the last 12 years, I think six times, and they keep very close track of scientific developments and quite recently they have changed and I think, I am quoting from memory, there are about six amendments of the law based on some of these findings which we have found in Beckley and which are so violently challenged at the moment in all the newspapers, and scientifically as well.

So we are a little bit behind.

Now, the facts, to me, are relatively simple. The biological mechanisms are quite complex. Senator Randolph has touched on one of the most critical points of this in his questions to Dr. Kerr in the situation of smoking. Quite obviously, we cannot discuss any condition of the lung, neither smoking, nor coal workers' pneumoconiosis for that matter, or cancer or tuberculosis, or what have you, in a vacuum.

We can only discuss an organ which has to react to a number of agents which are noxious and then see what kind of reaction is going to show up and then you will have cumulative effects, you will have effects which cancel each other out, and all sorts of things.

So we have to try to establish a disease as clearly as we can. I think the best way of doing this is the relationship of dust to morphological changes in the lung which are uncontestable because they are there.

If I show you this picture here, this is a very small vessel in the lung and this black stuff around it is dust. So nobody can argue against that, it is there.

Of course, you can argue about it, "so what?" does it mean anything if it is there.

This, of course, has to be proven by constant studies and questions have been asked by Senator Schweiker in this respect.

The pathologist is in the unpleasant situation that he sees the end stage. Of course, he tries to put life in this end stage and he tries to see some effect of function into that and tries to correlate these things.

I am with my findings 20-years behind. These miners have been 20 years short of breath before they come to me finally. That is unfortunate.

Now the important thing is that the amount of dust inhaled in the lung will be always much larger than the amount of dust retained in the lung. Retained dust means dust which has some access into the lung tissue and cannot be eliminated anymore.

That means that any time we inhale something, as I said, the lung inhales air as offered, clean or dirty, there is no way of selection. And as to masks, things like this, this is just an additional lung which you might want to add to it but do not overlook the psychological factor, in talking with miners, how great the resistance is with some of them.

I can't go into this, it is out of my field. It is a statement that they feel very, very uncomfortable with these masks. So, a portion of this dust is eliminated immediately by a mechanism which is one of the functions of our lungs, to clean.

Some people have called this respiratory toilet, cleaning, really, of the lung. Now, there are two ways that this cleaning will be unsuccessful. One is if the amount of dust inhaled is greater than the natural ability of the lung to get rid of it.

You can almost compare this with a carburetor of a car and TV commercials to keep the carburetor clean, otherwise, it will be sticking. This is one thing.

So if there is a large amount of dust and even given a normally functioning lung, then there will come a level where the lung is not able to eliminate this dust and dust will be retained.

Now, this is the beginning of dust disease when this happens. Now there is a definite time and quantity relationship and it works both ways.

A certain level of dust over a long period of time will do about the same as what a large amount of dust will do in a short period of time.

But, of course, we can come up to it at the average level. From our experience in Beckley, it takes almost 20 years of mining exposure before something really develops, although there are cases of 10 years and much shorter, but this depends on the exposure.

Senator WILLIAMS. Could I interrupt?

Dr. LAQUEUR. Yes.

Senator WILLIAMS. Yesterday, members of this subcommittee did have an opportunity to observe a lung that was brought in here by Dr. Buff. This was a lung taken on autopsy of a man who died at age 40, who had been out of the mine for 5 years before his death. He had worked for 15 years, I believe it was, in the mine, and his death was caused by this lung condition which was so obvious even to those of us who are laymen. It was absolutely black and perforated with holes in the lungs as we observed it.

There was evidently a heavy concentration from 15 years in the mine and the man died at age 40.

Dr. LAQUEUR. That specimen that Dr. Buff showed you he got from my laboratories. I don't know how he got it but he did. And he had a large amount of dust retained and the lung completely destroyed, something like this?

Senator **Williams**. I will say, Doctor, you are exhibiting colored pictures of lungs. The lung that we observed was a great deal darker than the one in your left hand.

Dr. **Laqueur**. Long exposure to small quantities of dust will reach dangerous levels and do the same as a short exposure with high quantities.

Therefore, there is a relationship between the dust and the length of exposure.

Now the second point I would like to make a few comments on, and Dr. Kerr has referred to this, the silicosis story versus pneumoconiosis in the bituminous coal industry.

In my material and I think it is the largest one in the United States on this, it is roughly 13 percent where we can find under the microscope evidence of silica.

In addition, together with the U.S. Public Health Service, we have done quantitative determinations of the amount of free silica in the lung and have compared this with statements which have been made in Germany of the level of silica which you have to find in the lung in order to produce the disease silicosis, and 80 percent of our lungs are below that level. So we do not have silicosis.

Senator **Randolph**. I understood, but we do have it in the limestone stone, and in crushing it.

Dr. **Laqueur**. I was talking of the bituminous coal industry.

Senator **Randolph**. I understood, but we do have it in the limestone quarries.

Dr. **Laqueur**. Thirteen percent.

Senator **Randolph**. And in West Virginia, we must recognize that we have many, many quarries. This is a very big industry. You may not know it, but in the State of West Virginia, the limestone industry is a substantially large one. Limestone is used, of course, for agricultural purposes and for roadbuilding purposes.

Several hundred persons, perhaps even thousands of persons, are employed in West Virginia in that industry.

Dr. **Laqueur**. For that very reason, Senator, I personally prefer a term which is clear to everybody and that is a simple English term of coal workers' pneumoconiosis. This includes dust inhaled and retained during the operation of mining coal.

I like to tell you that again in studies with the Public Health Service now on almost 200 lungs, some of which are published, others not published, there is approximately in the average lung between 60 and 75 percent coal dust which can be burned off at the temperature where we burn coal in our stoves. That is what we are doing. That is coal dust.

Then we have about 25 percent which is noncoal dust. This varies. Apparently this noncoal dust business varies in the coal mines in the different coal fields considerably.

There are fantastically interesting things in this noncoal dust. There we have, for instance, titanium, we have vanadium, we have beryllium, in very small quantities, but up to 10 times higher than in the normal city dweller, for instance.

Now, nobody knows whether titanium or vanadium may not do something to lung tissues.

There are two papers from Germany with pictures of lung changes of titanium oxide which are indistinguishable from our coal miners' lungs.

I am not saying that we have a titanium problem but we could have one. And much more research will have to go into this.

Why do we have in coal dust retained in the lung so much more titanium or for that matter, other trace elements?

So the concept of dust as a conglomerate of elements and particules is very, very important.

Senator SCHWEIKER. What is your other percentage, Doctor? Sixty-five, 25, what is the rest of it?

Dr. LAQUEUR. If it is 65, then it would be 35. Then we have silica, free silica, free silica is in the neighborhood of .2 percent, something like that. We express the values, actually, in milligrams per hundred grams dried lung. It means a lung which has been evaporated and is free of water. That seems to us the most accurate way of expressing these figures.

So what we have, then, is coal workers' dust disease which is caused by retained dust due to the failure of the lung to get rid of the dust.

Now I said before it takes a certain amount of dust in relation to a normal functioning lung. A normal lung has a certain level of dust which it eliminates. Now if we have a lung which for one reason or another does not work on this normal level, and of course we do not know what the normal level is, we have fantastic individual differences in our population—people who can be exposed to tuberculosis and never get it and others will get it immediately—so if a miner is smoking, and certainly a large number of these miners do, and if smoking will do something to the lung where we have evidence that it will do, then I think all it is going to do is, it is going to lower the level of what the lung can tolerate, and this is still an occupational disease because if you were not a miner you would not have this disability.

I think it is really not entirely scientific to make these questions up because we can not expect to say to the miner, as a condition of his mining, "You do not smoke". There are a lot of activities in our life which we are continuing which we know may be a little bit dangerous.

Senator RANDOLPH. I have made it very clear that I bring this question of tobacco smoking into the colloquy because this has been discussed, not in the last few days but discussed for years, and especially in past months. I have felt that men of medicine, skilled in the understanding of the disease of which you speak, should be able to clarify the picture for us, and you have been able to clarify this situation very much for the Senator from West Virginia.

Dr. LAQUEUR. I am very happy to do so, Senator.

Now as far as the pathology of the disease goes, we have heard a lot about this this morning already, and questions have been asked with regard to X-ray. Now let me clarify this from a very personal point of view.

Although I am very happy to say that some of the great pathologists concur with this point, every technique which we are using in determining disease has its limitation of precision and accuracy. Unfortunately the tool of X-ray, and this is no fault of the radiologist, is a rather crude tool, and all it does is show shadows. It shows shadows in the lung which is normally an organ and which contains air and whenever lung tissue is replaced by something which does not contain air, namely, nodules—if you will look at one of those nodules under a microscope it may be something like this—this you would not see on X-ray because it is not large enough.

Now this happened to be the internationally accepted basic lesion of coal worker's pneumoconiosis. Now this nodule here, which is a development of this, can be seen on X-ray. Still this nodule is only about 2 millimeters or 3 millimeters in diameter. But this is much, much smaller. So the fact that we do not have positive X-ray evidence does not rule out that a patient or a miner does not have coal worker's pneumoconiosis. On the other hand, and I don't know whether the person who testified yesterday had a chance to state it, but I am discussing these matters almost every day with him, it is rare to find a coal miner who does have beginning of this disabling respiratory problem with a perfectly normal X-ray.

There are some shadows of a different type which are called linear fibroses. The cardiologists call this category "sez", neither here nor there.

Senator **Randolph**. Mr. Chairman, may I underscore what the doctor has said in his prepared statement:

"Much more research is necessary to clarify some of the scientific problems of this disease. But we should not neglect to act," as you have said, "on established facts."

I think this discussion is very important to this subcommittee. We realize the necessity to search, to quest, to work with the profession of which you are a member. But where the determination has been established, I am sure this subcommittee will want to be responsive, as it will be reflected in the legislation which will be reported from the Committee on Labor and Public Welfare following our hearings. Thank you, Mr. Chairman.

Senator **Williams**. Thank you. Proceed, Doctor.

Dr. **Laqueur**. I think this is very excellent. The point which I established is (a) the disease is coal worker's pneumoconiosis. I think this is really not contested any more and therefore the language of the law should reflect this.

As I said, I prefer the good English name because then there is really no argument about it.

The second is that the amount of dust is directly proportional to the degree of changes of the lung. Now I am speaking as a pathologist. I have the idea that this will reflect the function as well, but I want to be as careful as possible. But we have a correlationship between the amount of dust retained in the lung and the severity of changes. We have come up with this in a very simple way:

The chemists from the Public Health Service have the absolute values. I am looking at my slides and on these lung sections I make remarks estimating what I think should be the dust content of these lungs and we have a very good batting average. Occasionally there is a discrepancy and, personally, it makes me happy if I find a discrepancy because it shows that I am working with biological material and in biology never anything goes really according to rule, there is always an exception. So this does not bother me if occasionally something does not fit. But by and large there is a direct relationship between the amount of dust retained in the lungs and the severity of changes found in the lung.

Now these facts alone could be sufficient for any legislative body to act because it points to the fact that the less dust that somebody inhales and retains, the better off he will be since we are not dealing in our population with alpha alpha species, the term of Huxley in "The Brave New World," but when we have different types of people you have to go to the lowest possible level where we can assume that even a lung which might be average in other environmental situations or which may be normally functionable, will be able to eliminate.

I might add one point which is not in my statement here—this was mentioned before—that Dr. Wells, working in my laboratory at this time, and later other people, have found 41 percent of hypertrophy of the right ventricle in a group of 200 miners and this figure has not changed now in the group of about 450 miners, and was recently confirmed from Hershey, Pa., on 100 miners.

Senator WILLIAMS. This is the enlargement of the right side?

Dr. LAQUEUR. This is the enlargement of the right side which we have measured in a rather elaborate method of separating the heart into two halves, which you can do, but ordinarily it is done by measuring the width of the heart.

Now this indicates that a large number of miners do have the hypertrophy of the right heart. Now whenever we talk about the enlargement of the right heart it means that there is something wrong with the vessels in the lung because the sole purpose of the right orifice is to pump blood through the lung so that it can take up oxygen and then carry it from the lung to the heart to distribute it through the body.

Whenever there is resistance in the lung, and this resistance in the lung may be either in the blood vessels or around the blood vessels, but any resistance which will influence blood flow, either the speed of blood flow or the amount of blood flow, will necessitate that the heart has to pump more in order to get the same amount of blood through the lung which we need.

Now, if the heart does this for a while, it starts growing the same as the muscles of an athlete in training. Then comes a point where, after the heart has done this for awhile, it has reached a maximum, the same as I told you with dust, there is a limit of what can be tolerated, there is a limit to what the heart can tolerate. Then these people come into what we call right heart failure and pulmonary insufficiency, and they die from this. In fact, in my material, 29 percent of the miners which I have autopsied died directly of this.

Now this does not mean that only 29 percent have this situation. Others do have the same situation but before they could die of this they died of a stroke or of a cancer or something like this. But these are people who have not died of any other disease, not of hardening of the arteries, not of malignancy, and which in my opinion unquestionably would have lived longer had they not had preventable occupational disease.

Senator WILLIAMS. It all goes back to the lung, even though the cause of death would not be found in what happens immediately in the lung, but along the path of oxygen supply from the lung?

Dr. LAQUEUR. Yes, Senator.

Senator WILLIAMS. You said a stroke. That can be attributed to lack of oxygen in a part of the brain, can it not?

Dr. LAQUEUR. Yes. If we lay this thing to occupational disease it becomes rather sophisticated.

Senator WILLIAMS. I missed that.

Dr. LAQUEUR. You did not mean the stroke in relation to the occupational disease?

Senator WILLIAMS. No, I just meant in terms of oxygen deficiency.

Dr. LAQUEUR. Yes. Occlusion of an artery where no blood comes through which by the way, happens in the lung as well, vessels are completely occluded.

Senator WILLIAMS. This is obviously very, very complex medicine. But where there is a lung in an advanced disease state—what we call black lung, pneumoconiosis: Because there is an insufficiency of oxygen going to the heart, at some point is there a diminution of the oxygen supply leaving the heart, which could cause a stroke?

Dr. LAQUEUR. Yes. It may cause a heart failure, which goes beyond the right heart failure and influences the general circulation. But ordinarily they die already before this.

Senator WILLIAMS. Is that the end of your statement?

Dr. LAQUEUR. Yes, Mr. Chairman.

Senator WILLIAMS. If we didn't have the hour of 12 approaching with a very important announcement from the President, I would like to talk with you further.

Senator Eagleton.

Senator EAGLETON. I would like to ask a couple of quick questions because of the time and the hour.

Doctor, I notice on page 1 of your prepared statement—and you verbalized extemporaneously on this, the testimony of Dr. Gough where he testified before the West Virginia Legislature in their recent hearings. This was new to me, perhaps it is not new to anyone else in the committee, but do I take it that the transcript of that testimony has disappeared?

Dr. LAQUEUR. I read this in the papers; yes.

Senator EAGLETON. Do you know of any other recording that was made, or anything of the testimony?

Dr. LAQUEUR. I hope that there would be a recording. I listened to this but this contained only the latter part of Dr. Gough's statement, especially the statement which he made in the afternoon session when he was asked questions.

Senator EAGLETON. Are they trying to locate the transcript?

Dr. LAQUEUR. I hope so.

Senator EAGLETON. Is Dr. Gough sort of a Stan Musial——

Dr. LAQUEUR. He is the "Grand Old Man." We owe most of what we know about this disease to the work of Dr. Gough. All we have done in this country, or I have done, and I have spent considerable time with him, is really taking his methods and applying his methods to our material and then coming up with the same results as he did.

Senator **Eagleton**. Perhaps some time, Mr. Chairman, I know he is from Wales, but if we could hear from Dr. Gough. It certainly would be revealing, since I gather he is a recognized world authority.

Dr. **Laqueur**. He was in this country 3 weeks ago. He came especially for this hearing in Charleston.

Senator **Williams**. We missed our opportunity, then.

Senator **Eagleton**. Doctor, may I direct your attention to page 5 of your prepared statement, subparagraph 6, which I will read as follows, and then ask a question:

> Our observations in Beckley have been challenged by coal corporations and physicians related with them; and if not challenged, they are not used by the United States Public Health Service. The reasons are a bit difficult to understand.

That is what is stated.

Dr. **Laqueur**. Yes.

Senator **Eagleton**. Would you amplify that a bit? What do you mean by the reasons are a bit difficult to understand?

Dr. **Laqueur**. I tried to stick with the statement which I am making here to strictly scientific conclusions or statements which can be based on the facts. It so happened that our supporting the case of the miners——

Senator **Eagleton**. Who is "they"?

Dr. **Laqueur**. I mean our findings. It could have been the other way around. When I started out doing research I did not know what I would find. It happened to be for one reason or another that the coal operators do not like this. It is hard for me to say why, whether it is just economic, whether it is just too expensive to have clean mines, I don't know. I have a feeling that this is part of it.

As far as the Public Health Service is concerned, here is a report to the U.S. Public Health Service. They have never used this officially so I don't know why they have not done this.

Senator **Eagleton**. Have you written to the U.S. Public Health Service and asked them to explain for your information why they do not use this?

Dr. **Laqueur**. Yes. I have discussed it. There are some problems and I have touched on these problems, that you have to try to combine the findings which a pathologist makes, a statement, with some functional studies. Now Dr. Rasmussen, who was here yesterday, is in the same predicament; in fact, a little stronger.

The Public Health Service claims that his studies cannot be reproduced. This bring the question up, who should be doing research? Because research obviously should be an unemotional, factual affair with results coming out as they are. I think the ideal situation which exists since last year is your new—I am sure the Senate of the United States has had dealings with this—is the new National Institute of Environmental Health.

I talked to them last year when they were still the Bureau of Environmental Health about continuing our own coal research because we are not supported any more by Public Health Service and we were told, "We cannot touch coal."

Senator **Eagleton**. Who told you that?

Dr. **Laqueur**. The Bureau of Environmental Health. This must mean this is a policy decision somewhere in the Public Health Service, and I am just somebody who receives grants. I am pretty sure right now with the National Institute of Environmental Health you cannot break parts of environmental health out of it. At least I wouldn't think so. Therefore I am a bit hazy on what is really behind this.

Senator EAGLETON. Public Health Service does not use Dr. Rasmussen's studies, they won't accredit your studies. What studies are the Public Health Service utilizing? Do they do anything on their own?

Dr. LAQUEUR. The prevalent study and the studies earlier referred to of 400 miners.

Senator EAGLETON. You were told to keep out of coal?

Dr. LAQUEUR. I am doing whatever I can. I still work with some part of the Public Health Service on a private basis. I give them all the material I can for these chemical determinations which I think are very, very important. But it is a bit difficult.

Senator EAGLETON. Thank you, Mr. Chairman.

Senator WILLIAMS. Are there further questions?

Senator SCHWEIKER. Thank you, Mr. Chairman.

Doctor, I wonder in layman's terminology if you could sum up, because of your extensive research experience, what we as legislators might write into a law in terms of diagnostic tests.

Senator WILLIAMS. I wonder if we could recess until after the press conference and return whenever it is concluded.

Senator SCHWEIKER. Surely.

Senator WILLIAMS. Senator Kennedy could not be here with us. He was called away for other official duties this morning.

We will be right back.

(Brief recess.)

Senator WILLIAMS. Doctor, are you ready to reconvene?

Senator Schweiker had the floor when we recessed for the press conference.

Senator SCHWEIKER. Let me reask the question, Doctor since we were interrupted.

On the basis of your medical findings and research, what advice could you give this committee as to specific requirements that we might make in the law in terms of periodically testing of the health of miners in this area? In other words, knowing that if X-rays are limited, are there any other specific things we could recommend that we ought to be writing into the law, should be looking into, to solve this problem?

Dr. LAQUEUR. I did some thinking about this question during the intermission because it is a very pertinent question and a very difficult question to answer because it almost touches upon the philosophy of what a law is.

Is a law a static thing, or is the law a flexible thing? We are dealing here in this area where we hope progress will continue. We are searching for new tools. Unless there is a provision in the law that certain sections of a law—I am speaking in general—are subject to revision from time to time, because they are so related to technological progress, it may become very dangerous to designate certain tests which years from now may be superseded by better ones.

Now a general statement of tests to study the function of the lung, including, I would say, studies of the regulatory function of the lung, that means the breathing, versus what one of you gentlemen referred to in one of your questions, emphysema, this is one parameter of the lung function.

Another one is the perfusion, that means the circulation, of the blood through the lung which some of us, including myself, think is the earliest change in the lung.

So if you would formulate it in a broad concept, not a single one test will do, but a combination of tests which covers the broad spectrum of the pulmonary function—if I may explain this perhaps with another organ a little easier, the liver.

It is known that there are 750 established functions of the liver. One hundred of these functions have been developed into laboratory tests. Out of these hundred we are using at the moment about five tests. Now 20 years ago when I was involved in liver research we used quite different tests but in the meantime we got other tests which are better.

Senator SCHWEIKER. What would those five be today?

Dr. LAQUEUR. You mean in liver?

Senator SCHWEIKER. You are not talking about the lung?

Dr. LAQUEUR. No, I am not talking about the lung. But the point I am making is that in tests one should cover the broad spectrum of what an organ does. The lung definitely does more than just breathing. Therefore, specification of the ventilatory test which is used to diagnose smoking emphysema would be absolutely unjust in my opinion.

The X-ray line is not sufficient but is part of a broad spectrum and I think one of the questions to Dr. Kerr was based on how often should a miner have a full spectrum examination.

Senator SCHWEIKER. Doctor, on the particle size evidence which has come to your attention, do you fairly well concur that the average size of dust particles entering the lungs is two-tenths of a micron and that this plus or minus is the range that we are dealing with? Does a dust mask really have a meaning or relevancy to this particle size?

Dr. LAQUEUR. This is way out of my field. As far as the particle size, yes, I concur. A filter or respirator, if it would work of course would act as a second lung. Theoretically, if you can get miners to wear it and if it really retains the small particles because the real big particles the lung gets rid of—it is the small particles——

Senator SCHWEIKER. In earlier testimony you indicated that the dust masks don't filter below 1 micron.

Dr. LAQUEUR. Yes, therefore it is not sufficient. Therefore I don't think we should use this as a crutch and say we can go higher with our dust level in the mines because some will be taken out of this because we cannot separate between the small particles and the large particles in the overall dust.

Senator SCHWEIKER. Have the English had any productive success from specific tests that we either are not using or might consider using?

Dr. LAQUEUR. Dr. Gough was talking in Charlestown about a number of tests and methods which we have used. One of them he referred to as water regulations, and I am really not familiar with the technicalities of it. I know only that because of the coal study which started in 1962 that there was a time where everybody talked about it, that the next step has to be to go into the mines in order to get more insight about the amount of dust, the type of dust, the size of dust and, of course, this is not a sample once a week because dust concentration may change from hour to hour. It means continuous sampling.

Then for reasons which I do not know, it never came about.

Senator **Schweiker**. That is all, Mr. Chairman.

Senator **Williams**. Thank you very much, Senator Schweiker. Thank you very much, Doctor. You have been very helpful.

Dr. **Laqueur**. Thank you.

Senator **Williams**. We will now adjourn. The subcommittee will continue hearings next Tuesday, March 18, and the starting time is 10 o'clock.

(Whereupon, at 12:45 p.m. the subcommittee recessed, to be reconvened at 10 a.m. Tuesday, March 18, 1969.)

COAL MINE HEALTH AND SAFETY

TUESDAY, MARCH 18, 1969

U.S. Senate,
Subcommittee on Labor of the
Committee on Labor and Public Welfare,
Washington, D.C.

The subcommittee met at 10:10 a.m., pursuant to recess, in room G-308, New Senate Office Building, Senator Harrison A. Williams, Jr. (chairman of the subcommittee) presiding.

Present: Senators Williams, Randolph, Eagleton, Bellmon, and Schweiker.

Committee staff members present: Robert O. Harris, staff director; Frederick R. Blackwell, counsel to the subcommittee; and Eugene Mittelman, minority counsel.

Senator Williams. We will resume our hearings on various bills that are before us dealing with safety and health conditions in coal mines of our country, and this morning's meeting will begin with a statement by our distinguished friend and colleague from Utah, Senator Frank "Ted" Moss.

We welcome you to our committee, Senator Moss. We know that you will be very helpful in our deliberations, coming from a State that knows quite a bit about mining.

Senator Moss. Thank you very much.

STATEMENT OF HON. FRANK E. MOSS, A U.S. SENATOR FROM THE STATE OF UTAH

Senator Moss. Thank you, Mr. Chairman. I do appreciate this opportunity to appear briefly this morning. I wish to commend you and the members of this subcommittee for your earnest activity in this field which is of great importance and, as the Chair indicated, Utah has a great deal of coal and we have coal mines and coal miners. So this is a very real subject in my State, one which gives us a great concern and we are most anxious to have the hearings develop all of the facts and then move on from there in whatever legislative direction is indicated by the facts that will be produced.

I have a brief prepared statement and I will try to stay pretty well with that so I don't wander.

I will be most happy, of course, to answer any questions or to make any further comment, if that seems to be indicated at the conclusion of my statement.

Senator Williams. Very well.

Senator Moss. I am happy to see my friend, Senator Randolph, Chairman of the Public Works Committee, under whom I served for a long time and who, I know, is equally concerned about this great problem and most knowledgeable on it, and my colleague Senator Bellmon, with whom I currently serve on the Post Office and Civil Service Committee.

Mr. Chairman, I thank you for the opportunity to appear here.

My interest in coal mine health and safety is, in part a personal one. As you know, the State of Utah is a coal-producing State with an annual production of approximately 4 million tons per year and an average employment of over 1,200 men. Thus, as a Senator from the State of Utah, it is very important to me that Congress do whatever is necessary to fully protect both the health and safety of the men in the mines.

But, my interest does not only extend to those men currently employed. Utah has a coal reserve of almost 8 billion tons, of which approximately one-half is considered recoverable. We in Utah hope that this reserve will form the basis for industrial development in our State and will provide for jobs and incomes for future generations of our State's residents.

However, while we look with anticipation to the fullest development of our coal resources, we have an obligation to insure that such development is not paid for through the death and injury of the men who mine our coal.

The record in both the health and safety field in the Nation's coal mines is a deplorable one. Since 1960, more than 2,400 men have lost their lives in coal mine accidents. Since 1960, almost 100,000 miners have been injured while at work. This is an abominable record, a record which cries out for correction, a record which should galvanize this Congress and all others concerned to do whatever is necessary to effectuate a prompt and significant improvement in the safety field.

In 1968, 309 coal miners died in accidents. This represents an increase of almost 50 percent over the fatality accidents per million man hours. It is obvious that the situation is worsening rather than improving. For example, in 1960 the frequency per million man hours was 1.15, while in 1968, the frequency rate was 1.28 fatalities per million man hours. I cite these statistics, Mr. Chairman, only to illustrate what is obvious to all of us, that the American coal miner does not now have the protection to which he is entitled.

The record in the safety field is echoed in the area of coal mine health. Coal related diseases are ravaging our mining population to a point where a major crisis is developing in every coal field in this Nation. It has been estimated that 125,000 U.S. coal miners, active and retired, suffer from coal workers' black lung.

More significantly, medical testimony already given to your committee indicates that there is an increasing incidence of the dust diseases among younger men who face the prospect of this work related disease during what should be their prime working years.

I am alarmed, as you are by these facts. Assuredly, the record substantiates the need for legislative action by this Congress and the proper enforcement of the coal mine health and safety statutes.

Coal mining is a vital industry in the United States. Coal is produced here by the most modern mining techniques available anywhere in the world. Output per man-day has improved to the point where the American coal miner is the most efficient miner on earth. Production and consumption, after a long period of decline in the early postwar years, has turned upward. Today the coal industry can look to the future with more confidence than it has ever done before.

A part of this confidence is based upon the ever growing demand for all forms of energy in the United States. Since coal is the largest indigenous source of energy available to our Nation, it seems to be inevitable that coal mining must expand to meet a large part of this energy growth.

However, it is imperative that as coal mining grows, the coal miner should not be made to suffer from occupational death and disease. He should not be subjected to the daily threat of a roof fall, a fire, or an explosion, as well as other coal mining hazards, which will kill or main him. Nor, should he have to face the grim probability that his final years on earth will be spent grasping for breath through lungs filled with deadly coat dust.

The cost of such human misery is more than the American people have to or will bear.

I do not intend to go into details on any of the bills currently pending before this committee. I would, however, like to make some general comments in the areas of health and safety which I feel are in need of attention.

First, I would like to emphasize the absolute necessity of rigid and impartial enforcement of the present Coal Mine Safety Act and whatever additional legislation is enacted by the Congress. Enforcement, Mr. Chairman, is the keystone upon which compliance can be built. With compliance will come safer coal mines.

I feel that it is imperative that this committee make abundantly clear to the executive branch that it wants, yes, it demands a strict compliance with the provisions of the Coal Mine Safety Act by every coal operator in the United States. I am sure our major coal operators are more than willing to do this. I note that the number of inspections and the number of mine closures because of dangerous conditions have increased sharply in the past several months. This is indicative of a heightened interest in enforcement procedures and I for one believe that this enforcement must continue.

There is a need for a proper dust level standard to protect the health of coal miners and to prevent the widespread occurrence of coal workers' black lung in the United States. I do not profess to be able to say now what that standard should be.

But, I believe there should be a standard and it should be set at a level which will fully protect the health of coal miners. If further research and development work is necessary to make available technology which will permit the mining industry to achieve this dust standard, we in Congress should be prepared to make available whatever resources are necessary. I am concerned that if we do not set dust limits, we will see in the coming years an ever growing number of men who will die long before they should because of their exposure to dust.

In the field of safety, I feel we need a great deal of research and development to insure that the technology of safety keeps pace with the technology of production. We must establish methods which will insure that the hazards created by the widespread use of mechanical equipment will somehow be brought under control. And we must begin to apply the most modern technology available to the coal mining industry.

For example, it is incredible to me that communication cannot be maintained between the surface and men trapped below in an explosion. In an era when we can maintain contact with astronauts circling the moon, I see no justification for the lack of a proper communication system in the mines.

Finally, Mr. Chairman, I would hope that from these hearings and from all of the attention currently being devoted to coal mine health and safety will come a firm resolve to insure that the stark tragedy of mine death and the chilling reality of mine disease will be reduced and hopefully eliminated. I have great confidence that the Nation's coal mine owners will cooperate—they should be as anxious as we are to make full use of the technology and know-how we have. Certainly the saving of hundreds and thousands of our coal miners' lives in the years ahead justify the attention of all of us.

Hopefully, the Congress, the United Mine Workers and the coal operators will work toward meaningful legislation and more importantly, will commit whatever resources are necessary to bring about a coal mining industry which does not have to include human life as a part of the cost of production.

Senator WILLIAMS. We are most appreciative to you, Senator Moss, for that fine and very helpful statement.

I believe at this point we can be assured that with the combination of all of the elements necessary for successful legislative enactment, we can look forward to safety and health legislation this year. Of course, we in Congress have had our bills in for sometime now. More recently, the administration has come forward with legislation that is in principle with the measures that Members of Congress have introduced.

The industry has been here to testify for substantially better or realistic and stricter safety and health standards and, of course, the United Mine Workers have been most knowledgeable in this field and have been very forceful and we have their statements for the legislation before us.

If I might, I would like to ask you a question, coming as you do, from a significant coal-producing State.

You indicate the abundant coal reserves in the State of Utah, 8 billion tons, I believe, and 4 billion of that "recoverable," is that the word?

Senator MOSS. Yes, that is.

Senator WILLIAMS. Which indicate a longer period of years ahead that coal mining can be important in your State, important if all of the elements of production are available. That brings in my question. Are young men who are coming on in your State looking to coal mining as an exciting and interesting and desirable occupation?

Senator MOSS. No; it hasn't been as appealing as it should be, and part of it is the safety hazard. Another part of it is, of course, the remarkable mechanization that has gone on in the mines which have really reduced the number of coal miners that are needed to produce the ever enlarging amount of coal. Consequently, I think the mining force has tended to grow older because not as many young men are coming in.

However, there is growing production now year after year and it will bring some new men in, of course. There is a squeeze now in the number of men needed to mine coal because of the new machinery. But as we get new mining machinery, we must make sure that the safety factors are applied so we won't have any disasters, and we must also consider the dust factor.

Senator **Williams**. Well, the staff folks from this subcommittee have gone to a mine very recently, and one of the observations made was very few younger people are now working in the mines. They did observe this in Pennsylvania.

Senator **Moss**. I think that same factor is true in my State.

Senator **Williams**. As a matter of fact, one of our staff counsel who went on the field trip advised me not to go because of the present hazards. And I was going next week.

Senator **Moss**. Even as a visitor in the mine.

Senator **Williams**. Even in the visitors' mine.

Senator **Moss**. Yes. At this point I would like to place in the record a letter I received from a constitutent of mine.

(The letter referred to follows:)

HUNTINGTON, UTAH, *February 18, 1969.*

WALLACE F. BENNETT
Senator of Utah,
Senate Office Building,
Washington, D.C.

DEAR SENATOR BENNETT: Several months ago, a Coal Mine Safety Bill was introduced in Congress and passed into law.

This bill, stated in effect, that it was no longer lawful to use two-conductor Power Cable in Coal Mines; it also stated that all machinery must be frame-grounded.

I have carried on a successful mining operation at my present location since 1953, using two-conductor Power Cable, and Mining Machinery which was not frame grounded. In all my years as a Mine Operator, from 1930 through 1967, I have not had a fatality, nor a serious accident of any kind in my Coal Mine.

Never-the-less, this so-called Mine Safety Bill which was made into law, put me out of business for the year 1968 and again in 1969.

Now, another, more drastic bill has been proposed, and if passed, will put me and a staggering amount of other Coal Mine Operators out of Business and cause us all to go bankrupt. We, the Operators, and an enormous amount of employees will have to be added to the Welfare-Rolls.

This new proposed bill, puts all Coal Mines under the term "Gassy," whether the mine is gassy or not gassy; my mine has no gas. This new bill will also eliminate all non-permissible machinery which is being used successfully in the Coal Mines today. *Not one* of the small Coal Mine Operators is financially able to throw away his present and costly machinery and buy new permissible machinery to re-equip his Mine. He couldn't go out and shop around and buy other used, but good machinery, as it, too, would be non-permissible. So, if the proposed bill is passed, all the small Mine Operators and all the Companies making their living by buying and selling used mining machinery, will be forced out of business. Think of the staggering number of men who will be put out of work by this unscrupulous and unfair legislation sponsored by the U.S. Bureau of Mines.

This Bill, of which I speak, is Senate Bill, No. 355, introduced by Senator Jennings Randolf, (D-W.Va.) and is called the "Coal Mine Health and Safety Act of 1969." It is designed, not to safeguard health, or save lives, but to once and for all, put the small Coal Mines out of business. It contains many drastic measures, such as the elimination of good, but non-permissible machinery; this alone, will close all small and some large Mines as well.

This Senate Bill No. 355 gives to the Secretary of the Interior, the right to assess fines, and even Prison terms, to Operators for certain violations; see Section 115 of the bill.

State Mine Inspectors are men who have worked in Mines and have had a great deal of experience in mining practices, and they are fair-minded men, yet this proposed bill will take away their power and will supersede anything they say.

In a conversation with a State Mine Inspector last fall, he told me that I had always maintained a clean Mine; well ventilated, well timbered, well rock-dusted and safe in every way. He said to me. "Go in and start mining and get your share of the business which is just starting; Your Mine is safe; Go in and start to produce coal." A few days later the Federal Inspector came to my Mine and told me the first safety bill had gone through, and that there were no more small Mines. This meant that my small operation would be subject to all the rules and regulations of the large Mines, regardless of the fact that there was no gas in my Mine. I said to the Federal Inspector; "Well, I don't have the money to expand to make this a large Mine, so what will they do to me, shut me down?" He replied, "Well, that's the Code." So as you can see, the intention of the U.S. Bureau of Mines is to force the small Mine Operator out of business.

I do not have capital to buy new Power Cables to go throughout a mine or to replace the good machinery which I now have. This would be very costly, indeed. I maintain safety standards throughout my Mine, such as good ventilation, adequate timber for roof support, an adequate supply of rock dust on floor, roof and ribs, and keep the haulage-way clear and clean; Numerous other safety measures are followed in accordance with good mining practices.

I am seventy-one years old, and since the above unfair regulations have forced me to cease mining and selling coal, I am trying to live on the small Social Security check of $79.40 per month, which is not adequate for my wife and me for food, clothing, medicine and other necessities. Mining is my only way of making a living, but if Senate Bill 355 passes, my Mine will be closed and my only means of a livelihood will be stopped. I will not be able to sell my machinery, for no one else could use it either. The junk price it would bring would not justify the costly removal from the Mine. My health is good, and I can still work if I am allowed to do so. "Welfare," as I see it, is only for those who can't work to earn their living. I can. Please help me to keep my job.

When you needed my support, I voted to keep you in Office. Now, I need your support. I am not alone in this need for the help you can give. All the small Mines in the United States are now threatened with bankruptcy if Senate Bill No. 355 is passed. I join with them in asking you to seriously consider this matter and to do all in your power to *defeat* Senate Bill Number 355.

If a petition with signers would be of any help to you, please let me know, and I will be glad to circulate such a petition and send it to you.

Yours very truly,

JOHN HELCO,
Huntington Canyon, Emery County, Utah.

P.S.—I started to work in a Coal Mine in Clinton, Indiana in 1912; Over the years, have done all types of work in the Coal Mining Industry; At 71, I can still perform any and all duties in and around Coal Mines today.

Senator WILLIAMS. I don't have anything further except to thank you.

Senator Randolph.

Senator RANDOLPH. Thank you, Mr. Chairman. Senator Moss, you are from a coal-mining State. Your production is not high, but you lay stress on the recoverable coal which might be produced in the future under, let us say, some type of economic pressures, even war, where certain types of coal come into prominence and necessary to our economy. We had it, of course, in World War II when we developed large-scale surface strip mining. Strip mining was carried on to a very minimum degree prior to World War II but thereafter became an accepted part of the industry.

Sometimes operators used certain equipment that they moved into place almost in a week or 10 days' time to do the job, at the request of the Federal Government. So, sometimes we do face stringencies which arise to cause our coal deposits to be extracted under emergency conditions. All deposits in all States, therefore, are important.

Senator Moss, I don't know whether you have read the morning Congressional Record. I read it early this morning, and I was really stimulated by a statement in the Record by our able colleague on this subcommittee, Senator Saxbe of Ohio. He said that he was making a proposal which might be somewhat a Buck Rogers type, but he drew on the equipment of the astronauts in connection with communication between men in space and the earth, and you, too, have wondered why we cannot have communication between men in mines underground and those above the ground who operate certain types of communication systems.

The space suit for miners which Senator Saxbe is talking about perhaps constitutes an unusual recommendation, but it may have real merit. I refer to it, Mr. Chairman, because of what Senator Moss has said about the failure to date to apply the space technology and know-how to some better communication systems between those above the ground and those who are working under the earth. So, it is very helpful that you lay stress on this point, Senator Moss.

I would suggest, Mr. Chairman, I am sure it has been anticipated, that our staff members contact the technological people in whatever spheres of mining are concerned, from whatever source, and let us find out what technicians are saying about this subject that Senator Moss is talking about here today. Let us find out what might be known that is not now being applied with respect to equipment that could be used. Ofttimes, as Senator Moss knows, we do find that there is an unexplainable or unnecessary lag between the production of a piece of equipment and its installation and use. This has happened in practically every industrial growth factor that we have had. I am not saying this is the situation today in the coal mining industry. I do not know. But I think we want to inquire of our technical people.

Thank you, Senator.

Senator Williams. That is very interesting. That is a most interesting observation going to those areas of that technical knowledge in this communication field.

Now, as I understand it, this is just from newspaper reading, there are methods, electronically, for people to listen to other people at a distance, and listen to conversations that those who are talking don't even want heard. This is the electronic, this is the modern day wiretap.

Senator Moss. Snooper.

Senator Williams. It is listening without wires. Have you heard anything about this?

Senator Moss. Yes; that is used quite widely now. I don't know whether it would be able to penetrate through the ground. But we now do have listening devices that can be focused or pinpointed, as it were, over a long distance and intercept sound waves and people can be heard. It is kind of a snooper device. But it simply indicates that the technology is moving out farther all the time.

Now, there may be problems. I am not a scientist. There may be problems because you must penetrate the earth in this instance. But perhaps there is a way to do that. If not, maybe there should be a requirement that there be a drill hole every so often along the way where the mine shaft is going to run, or the drift is going to run, so you might have wire connections. Then if you had any trouble behind in the drift there would be a connection through which you could contact the men immediately.

I am just speculating, but surely with the great advanced technology we have now we could find some way to resolve that one problem of communication.

Of course, that is just one of the problems.

Senator WILLIAMS. I appreciate that Senator Randolph raised it and I am glad that he did.

In law enforcement, these developments appear, don't they, in terms of listening to communications?

Senator MOSS. Yes.

Senator WILLIAMS. Were you in law enforcement before you came to the Senate?

Senator MOSS. Yes, I was a prosecutor before I came to the Senate.

Senator WILLIAMS. Could we have your technical assistance?

Senator MOSS. I was never a snooper.

Senator WILLIAMS. I am sure the nations of the world are amazed indeed to learn about that most courageous man in Utah who was trapped in a zinc mine and had no communications until finally his voice was heard through the wall.

Senator MOSS. That is true. They finally drilled a small hole through there and his voice was heard. His ordeal was a great tribute to him, with the fortitude that he had. But he was out of communication for nearly 4 days before they were able to determine that he was alive in there and he could be heard. And it was nearly 8 days before he was extracated.

Senator WILLIAMS. What was his name?

Senator MOSS. Buck Jones, with a wife and 11 children. And he is a lead-zinc miner. But it is a great problem when a mine cave in comes—it doesn't matter whether it is a coal mine, or lead or zinc mine. Jones had a terrible problem and a very happy ending in his rescue.

Senator RANDOLPH. Mr. Chairman, Senator Moss mentioned the other types of mining. I want to say of Senator Moss that he was very helpful in connection with the consideration and passage of the legislation not too long ago that brought mines into our safety programs other than just the coal mines. Inadvertently, Mr. Chairman, I used the wrong term in reference to Senator Saxbe's idea, speaking of space ship. I meant to say a space suit. He has an idea that maybe a miner can be fitted with a certain type of protective suit to avoid overexposure to dust particles while working in mines.

Senator MOSS. I appreciate that, and, of course, we do have other types of mines in Utah. Mining is a very important industry in my State and I compliment this subcommittee in moving ahead in the mine safety field. I want to pledge my support in the Interior Committee. I am chairman of the Mineral and Fuels Subcommittee with a direct interest in the mine safety. So whatever I can do to support this committee I will do it.

Senator WILLIAMS. Senator Bellmon.

Senator BELLMON. Mr. Chairman, I would like to add my word of congratulations to Senator Moss for the fine statement he has made.

As I listened to the statement, I was impressed by the fact that Utah and Oklahoma have a great deal in common in that both of us have immense reserves of coal which are not presently being mined as much as we hope they will be in the future, and the question that comes to my mind now is the one that has crossed my mind when other witnesses have appeared, and that is this: Whether or not there is danger that in drafting safety legislation we will be so restrictive that we may limit the future development of our coal reserves and cause the cost of coal mining to go up to the point where our industries and utilities will turn increasingly to petroleum and perhaps nuclear power as a sort of energy.

As a Senator from Utah, are you concerned we need to be careful we don't go too far in this field, or do you feel there is a danger here?

Senator MOSS. Well, of course, it is to be hoped that the mining of coal will be economic and profitable and therefore, this resource will be used. But I don't think that we can sacrifice any safety measure for the men who must mine the coal, in order to keep the cost down.

I think even if the resource has to stand unused, that we must not bring it out of the mines by endangering their health or periling their lives, by proceeding with less than the maximum amount of safety that we can possibly devise for the mines.

I really don't worry too much. I think the use of coal, is on the increase now, and I think our energy demands are going up at such an astronomical rate that surely the coal fields will be called upon to furnish a good part of that energy. As we go forward in developing coal, I want the safety factor kept paramount. I wouldn't restrain any effort in the safety field just to keep the cost down.

Senator BELLMON. One other question. I am not sure what the conditions are in Utah, but I know that in our State we have many different conditions under which coal is mined. And up to now it has been partly at least the responsibility of the State to enact safety legislation and to administer these laws.

I am sure Utah has a State Mine Safety Department?

Senator MOSS. Yes, we do.

Senator BELLMON. And, in your opinion, is this a fairly effective agency, or is it undermanned and underfinanced?

Senator MOSS. Well, it is underfinanced, as usually is the case. The State governments are having a difficult time, of course, adequately financing the functions to be performed, but under the circumstances I think our mine safety inspectors have done rather well in Utah and I don't have any great criticism of them.

But with passage of the National Coal Safety Act and the reinforcement, as it were, from the Federal level, we can expect still better inspections, more frequent inspections, and more willingness to apply strictly the regulations that we have.

Fortunately we have not had a coal mining accident for sometime in Utah and we hope we never have another one.

In part, I would say it comes from the inspection system that we have been using.

Senator BELLMON. Thank you, Mr. Chairman.

Senator WILLIAMS. Thank you very much.

Senator MOSS. Thank you, Mr. Chairman.

Senator WILLIAMS. We are fortunate to have Dr. William H. Stewart, the Surgeon General, as our next witness before the committee. We have been looking forward to this day and this hour, Dr. Stewart, before the committee.

I gather we are fortunate to have you in your official capacity as Surgeon General, before you go to what we call greener pastures, different pastures.

STATEMENT OF DR. WILLIAM H. STEWART, SURGEON GENERAL, PUBLIC HEALTH SERVICE, ACCOMPANIED BY DR. KEITH MORGAN, CHIEF, APPALACHIAN LABORATORY FOR OCCUPATIONAL RESPIRATORY DISEASES, MORGANTOWN, W. VA.; DR. MARCUS M. KEY, ACTING DIRECTOR, BUREAU OF OCCUPATIONAL SAFETY AND HEALTH; VERNON MACKENZIE, SPECIAL ASSISTANT TO THE ADMINISTRATOR, CONSUMER PROTECTION ENVIRONMENTAL HEALTH, PUBLIC HEALTH SERVICE

Dr. STEWART. Thank you, Mr. Chairman.

Yes, after my term ends and subject to formal approval by the board of supervisors of the university, I will be going to Louisiana State University.

Senator WILLIAMS. We certainly are grateful for the service you have given the Nation in this office.

Dr. STEWART. Thank you very much.

Senator WILLIAMS. We are glad to see you officially before you go.

Dr. STEWART. Thank you, sir.

Senator WILLIAMS. We have your statement, and any way you want to proceed, Doctor. I have read the statement. Perhaps if you did read it, it might be useful to all of us.

Dr. STEWART. Thank you. I would like to read the statement.

Before I begin, I would like to introduce the gentlemen who are with me at the table. On my far left is Dr. Keith Morgan, who is Chief of the Appalachian Laboratory for Occupational Respiratory Diseases in Morgantown, W. Va. Next to me is Dr. Marcus M. Key, who is our Acting Director of the Bureau of Occupational Safety and Health. On my right is Mr. Vernon MacKenzie, who is special assistant to the Administrator of the Consumer Protection Environmental Health of the Public Health Service.

Mr. Chairman and members of the subcommittee, I appreciate the opportunity to present the views of the Department of Health, Education, and Welfare in support of a strong, comprehensive new program to improve the health and safety of men who work in the coal mining industry of the United States.

S. 1300, which is the administration's bill, was transmitted by the Under Secretary of the Interior with a message from the President, and introduced by Senator Javits, joined by Senators Cooper, Scott, Schweiker, and Stevens. My comments will be addressed to the provisions of this bill which we strongly recommend for enactment.

In his recent special message to the Congress on coal mine safety and health, the President described death in the coal mines as of two kinds, "sudden as an explosion" or "insidious" as "from pneumoconiosis or 'black lung' disease."

The expanded programs and new legislative authorities proposed by the President would deal with both of these types of dangers. S. 1300 would provide for "a comprehensive new program to provide a vigorous and multifaceted attack on the health and safety dangers which prevail in the coal mining industry."

As the principal health agency of the Federal Government, the Department of Health, Education, and Welfare has a deep and fundamental interest in improving the health and safety conditions in coal mines. S. 1300 would improve very substantially the Federal Government's capacity to accomplish this purpose by—

Modernizing a wide range of mandatory health and safety standards, including new provisions for the control of dust, electrical equipment, roof support, ventilation, illumination, fire protection, and other operating practices in underground and surface coal mines engaged in interstate commerce;

Authorizing the Secretary of the Interior to develop and promulgate any additional or revised standards, which he deems necessary for the health and safety of the miners. Mandatory health standards proposed by the Secretary of the Interior would be based upon criteria developed and furnished by the Secretary of Health, Education, and Welfare on the basis of research, demonstrations, experiments, and other information;

Substantially increasing, by direct action, grants, and contracts, the necessary research, training, and education for the prevention and control of occupational diseases, the improvement of State workmen's compensation systems, and the reduction of mine accidents; and

Providing for cooperative action with States in relation to coal mine safety and health conditions, and for grant assistance to such States for the advancement of health and safety in coal mines.

Before discussing the activities of the Public Health Service relating to the health of coal miners or commenting on specific provisions of the proposed legislation, let me describe the disease mentioned by the President. Pneumoconiosis is a pathological condition of the lung induced by inhalation of small particles. There are many types of pneumoconiosis caused by specific kinds of dusty materials, as, for example, silica and cotton fibers.

Coal miners' pneumoconiosis is a chronic chest disease, caused by the accumulation of fine coal dust particles in the human lung. In its advanced form, it leads to severe disability and premature death.

Coal miners' pneumoconiosis was recognized, in Great Britain as early as 1943, as a disease entity separate from silicosis. It was not generally recognized as such in the United States until the 1950's. Prevalence studies by the Pennsylvania Department of Health (1959–61) and by the Public Health Service (1963–65) confirmed the existence of the disease entity, documented its prevalence among coal miners, and showed that it is a widespread problem.

Coal miners' pneumoconiosis is a distinct clinical entity, resulting from inhalation of coal dust. However, it should be pointed out that data from postmortem examinations indicate a higher prevalence of the disease than can be diagnosed from X-ray examinations.

Physicians classify coal miners' pneumoconiosis as simple or complicated, depending on the degree of evidence in the X-ray picture. In the simple form, pinpoint, micronodular or nodular lesions distributed throughout the lungs show up in the X-ray picture. The physician decides the so-called radiological category of simple pneumoconiosis on the basis of the extent of the opacities.

There are no specific symptoms and pulmonary function tests seldom enable the physician to say whether or not the patient has the disease. It is generally accepted by physicians that simple pneumoconiosis seldom produces significant ventilatory impairment, but, the pinpoint type may reduce the diffusing capacity, the ability to transfer oxygen from the lung into the blood.

Complicated pneumoconiosis is a more serious disease. The patient incurs progressive massive fibrosis as a complex reaction to dust and other factors, which may include tuberculosis and other infections. The disease in this form usually produces marked pulmonary impairment and considerable respiratory disability. Such respiratory disability severely limits the physical capabilities of the individual, can induce death by cardiac failure and may contribute to other causes of death.

Medical researchers in both Britain and the United States have repeatedly shown that coal miners suffer from more respiratory impairment and respiratory disability than does the general population. These respiratory problems are frequently accentuated by chronic bronchitis and emphysema, the causative factors of which remain to be clarified.

There is no specific therapy for pneumoconiosis in either its simple or complicated form. Adequate environmental dust controls, use of respirators, or removing the miners from the dusty environment as soon as they show minimal effects appear to be, under present technology, the only helpful preventive procedures.

For over 30 years, the Public Health Service has undertaken cooperative studies with the Bureau of Mines on coal miners' health problems. Not until 1963, however, did the Department first receive funds for the specific support of operations in this area. Our first major project was a prevalence study of pneumoconiosis in soft coal miners in Appalachia and other coal mining areas.

This study established pneumoconiosis among soft coal workers in the United States as an occupational respiratory disease of serious and previously unrecognized magnitude. Our research showed that one in 10 men in the mines and one in five of the former miners in Appalachia showed X-ray evidence of this chronic respiratory disease. Data from postmortem examinations would indicate an even higher prevalence of this disease.

For work periods less than 15 years underground, the occurrence of pneumoconiosis among miners appeared to be spotty and showed no particular trend. For work periods greater than 15 years underground, there was a linear increase in the prevalence of the disease with years spent underground.

The major shortcoming of this study was the lack of environmental data, especially on dust concentrations, particle size and chemical composition. For information on the relationship between environmental factors and the disease, we consulted with the British National Coal

Board, which provided us with technical information indicating a straight-line relationship between the amount of dust breathed and the progression of pneumoconiosis in miners.

In 1966, the Department established the Appalachian Laboratory for Occupational Respiratory Diseases which we call ALFORD in Morgantown, W. Va.

Our accomplishments to date have been modest. Nevertheless, we have established a firm scientific foundation. ALFORD, which is now a field station of the Bureau of Occupational Safety and Health in our Environmental Control Administration, continues as the base for epidemiological and diagnostic studies on coal workers' pneumoconiosis. Miners admitted to the West Virginia University Hospital are examined by ALFORD's physicians.

In their evaluations, they use the latest techniques of pulmonary function testing, vectorcardiography, cardiac catheterization and biochemical analyses. Research is currently underway there to determine more precisely the role of environmental factors in pneumoconiosis and to develop early diagnostic techniques.

Upon the completion of the new Appalachian Center for Environmental Health at the University Medical Center in Morgantown, W. Va., the Public Health Service's work on pneumoconiosis will be expanded as called for by the President.

Scheduled to begin soon at ALFORD is an epidemiological study, to be made in cooperation with the Bureau of Mines, on a group of over 5,500 miners working in about 30 mines, predominantly in Appalachia. The purposes of the study are to determine the prevalence and the progression of the disease and to correlate those medical aspects with dust levels in the mines. Miners will be examined initially and special attention will be given to former miners, to assess the extent of lung damage they have suffered. We also plan to conduct animal studies on the possible synergistic effect of infectious agents and coal dust.

In brief, the goal of our research program is to develop the knowledge which will allow men to work in the coal mines without danger to their health.

The United States is the only major coal-producing Nation in the world which does not have an official Government standard for coal mine dust. Since Great Britain began requiring dust control efforts in the coal mines—which resulted in reduced concentration levels—there has been a substantial reduction there in the prevalence of coal workers' pneumoconiosis.

Thus, the incidence of new cases in miners has decreased from 8.1 new cases per 1,000 miners in 1955 to 1.9 new cases per 1,000 miners in 1967; the age specific prevalence of simple coal miners pneumoconiosis has also decreased as has the overall prevalence (12.5 percent in 1959–62 as compared to 10.9 in 1964–67).

An official respirable dust standard for coal mines could, in our opinion, if properly enforced, make a significant reduction in new cases of pneumoconiosis and decrease the rate of progression of old cases. Last year we concluded that sufficient data were available to recommend the adoption of an interim coal dust exposure standard for miners, pending further refinement of technical knowledge. After careful analysis of the British and Pennsylvania experiences, and after consultation with many authorities, we concluded that:

An interim standard should represent no more than a reasonable degree of risk to our miners, given our present technology, and be one that would significantly reduce the rate at which new cases of pneumoconiosis would develop in the future and old cases would progress.

On the basis of those conclusions, last December, the Secretary of Health, Education, and Welfare recommended to the Department of the Interior a Federal standard which could be used to lower respirable dust levels in coal mines. This standard called for a respirable dust level not to exceed 3.0 milligrams per cubic meter as measured by the Mining Research Establishment (MRE) horizontal elutriator instrument.

We recommended this standard in the conviction that it could, if adopted and properly enforced throughout the coal mining industry, make a significant reduction in coal miners' pneumoconiosis. This standard, if adopted and enforced, would place the United States along with other major coal-producing nations which have set health standards for dust exposures in the coal mining industry.

The suggested interim standard of 3.0 milligrams of respirable coal dust per cubic meter (MRE instrument) is consistent with the data from the British pneumoconiosis field research project in which dust concentrations in 24 mines ranged from 1.0 to 8.9 milligrams per cubic meter (average of 3.8) and with the standard used since about 1966 by the Pennsylvania Department of Mines and Mineral Industries to evaluate dust exposures in bituminous coal mines in that State.

The standard thus used in Pennsylvania is that recommended by the American Conference of Governmental Industrial Hygienists as the threshold limit value for quartz containing dusts. We have the formula in the testimony:

TLV equals 250 divided by the percent of quartz plus five expressed as million particles per cubic foot.

Senator WILLIAMS. Is there any further amplification you would like to make on this point of TLV equals 250——

Dr. STEWART. I think the next paragraph indicates the point we are trying to make, Senator Williams, because this formula is expressed as a particle count. Weight equivalents of this standard used by Pennsylvania are shown in the chart as associated with the various percentages of quartz in the dust.

The table shows that, as the percentage of quartz goes from zero to three to five, the particle count limitation decreases from 50 to 31.2 to 25, and the conversion to dust weight in milligrams per cubic is 5.5, 3.45 and 2.8.

The significance of these data is that the quartz levels in the bituminous mine dust run roughly around two or three. So the standard that we are suggesting as 3.0 milligrams per cubic meter of air is roughly equivalent to the standard that the Department of Mines in Pennsylvania is using at the present time.

Senator WILLIAMS. When you say Pennsylvania is using it, do they have a mandatory standard here?

Dr. STEWART. They use the standard that is recommended by the American Conference of Governmental Industrial Hygienists, which is a particle count type of standard.

In comparing their standard, which varies by the level of quartz that is in the coal dust, to a dust weight standard of 3 milligrams per cubic meter, it should be noted that the level at which quartz is usually found in the bituminous mine dust is around two and a half or 3 percent. This is roughly equivalent, if you look at the chart, to around 3 milligrams or a little bit more, or a little less, depending on which mine you are talking about.

The whole purpose of this is to illustrate that the standard of 3 milligrams per cubic meter of air is quite consistent with the standard that the Pennsylvania Department of Mines is using, even though the methodology of measuring is quite different.

Senator WILLIAMS. What is the effect? This Pennsylvania standard, have they made this a mandatory condition that must prevail in the mine?

Dr. STEWART. I don't think that it can be called a mandatory standard at this time.

Senator WILLIAMS. This is then from their finding, this is a recommendation, and the recommendation is their conclusion as to what is safe and what is not safe?

Dr. STEWART. Correct.

Senator WILLIAMS. And that comes to, when we are talking about dust, not the quartz, but whatever the computation is, it comes down to what we are talking about dust, that comes down to 3 milligrams per cubic meter; is that it?

Dr. STEWART. For dust containing 5 percent or less of quartz.

I might add one other factor that they take into account when they are using the standard, and that is the technology of mining that will allow a standard to be reached.

When we recommended the interim dust standard last December, it was fully recognized that dust concentrations in most American coal mines exceeded the recommended standard. Furthermore, we fully recognized, partly based on discussions with the Bureau of Mines, that it would not be feasible to achieve immediate compliance with such interim standard and that a time-phased schedule for compliance would be necessary.

Consequently, we are in full accord with the provisions of S. 1300 which would require compliance with an initial interim standard of 4.5 milligrams per cubic meter within 6 months after enactment.

Senator WILLIAMS. I would like to pause there.

Dr. STEWART. Certainly.

Senator WILLIAMS. Why are we talking, Doctor, about compliance to a standard, whatever the standard, within 6 months after enactment? That is where I have a pause—after the enactment. We don't know when legislation is going to be enacted and there is no counter we have to tell how in the legislative process that will come to pass. But we know right here today, as you sit there as an eminent authority on matters on national health, that dust is dangerous. We know as a matter of fact, not opinion, certain quantities are dangerous. To just let everything go as is until a 6-month period after enactment, isn't that saying that we are going to permit between now and then hazardous health conditions to continue without doing anything about it?

Dr. STEWART. I would think, first, Mr. Chairman, I would hope the Congress would enact this piece of legislation as rapidly as possible.

Second, I would think the minute it is enacted and knowing that the interim standard would be operative within 6 months, that the coal mines would begin to move toward that 4.5 figure.

Senator **Williams**. It is my observation, wouldn't they be well advised in their interest and in the interest of their workers and the national interest to start gearing up for what we feel is going to be inevitable as law that will guide them later on, but the grist of the thing is right there now?

Dr. **Stewart**. That is correct.

Senator **Williams**. Wouldn't the wise mine operator be doing something now about this?

Dr. **Stewart**. I think you are quite right, Mr. Chairman.

Senator **Williams**. That is the point. Thank you.

Dr. **Stewart**. The best technical information available to us indicates a straight-line relationship between the amount of dust breathed and the progression of pneumoconiosis in miners. Thus, we can expect that under any interim standard some new disease will develop and some old disease will become more severe.

However, such an interim standard will materially reduce the development of new disease and the progression of old disease. Consequently, we recommend minimization of dust exposure to the full extent that is technically feasible. Also, any other practicable steps to control this disease should be taken. One such reasonable step is that each miner be given a chest X-ray or other appropriate examination periodically.

The fact that there is no apparent threshold limit for coal dust below which no disease will occur points up the urgent need for further research. There are enough leads to make us hopeful that biological and environmental investigations in depth will ultimately result in further methods of control of the disease that would be almost fully effective.

I would now like to turn to the specific legislation pending before you. We strongly support the enactment of S. 1300 as a necessary measure to provide comprehensive protection for the health and safety of persons working in the coal mining industry. There are several features of this bill to which we would like to make especial reference.

We particularly endorse the concept of combining both health and safety protection in the same legislative enactment. The health and safety of the coal miner, as well as the administration of the inspections program with respect to each, are so closely related that it is impractical to consider them as separate problems. And both are urgent problems that need to be dealt with immediately.

We are also strongly in favor of the authority being vested in the Secretary of the Interior to establish health and safety standards for the protection of life and the prevention of injuries and occupational disease in coal mines. In these highly technical areas of regulatory control we believe it impractical and inadvisable to freeze these detailed requirements into the law except upon an interim basis.

This legislation would encourage Federal-State cooperation on coal mine inspection and the development of other programs relating to the health and safety of coal miners. The Department of Health, Education, and Welfare has always endorsed a strong Federal-State relationship in administering programs that lend themselves to this approach. We especially support this feature of the legislation.

S. 1300 also provides for an appropriate division of responsibility in the establishment of the health standards required by the legislation. The bill provides that the mandatory health standards to be proposed by the Secretary of the Interior shall be based on health criteria furnished by this Department.

There has been a long period of recognized cooperation between this Department and the Department of the Interior relative to the health of coal miners and we believe the legislation provides a sound foundation to further the cooperative programs between the departments in the interests of the health of coal miners.

Thank you.

Senator WILLIAMS. Dr. Stewart, did your colleagues want to offer anything at this point?

Dr. STEWART. No; I think they are here to respond to questions, Mr. Chairman.

Senator WILLIAMS. Fine. If I could, I would like to ask one or two questions. I might have missed it in your statement.

Well, first of all, to back up, I was impressed by your statement that ours is the only coal producing nation that has not established tolerable standards of dust in the mines.

Dr. STEWART. Major coal producing nation.

Senator WILLIAMS. I was impressed, but not favorably impressed, by that fact, and I am sure none of us are favorably impressed by that and that is one of the reasons why we are here. We want to do something about it.

Dr. STEWART. That is correct, Mr. Chairman.

Senator WILLIAMS. Great Britain evidently has been one of the leading nations in recognizing the relationship between coal dust and one branch of pneumoconiosis, miner pneumoconiosis, from coal dust; is that correct?

Dr. STEWART. That is right, they have done the most extensive work in this area.

Senator WILLIAMS. I gather other countries have too. We had the doctor here that gave us some of the experience in Czechoslovakia, and evidently they are in the advance of making their mines healthier places for people to work.

Dr. STEWART. You will find in most developed nations where coal mining is a major industry, that there is great effort to make it safe for the miners and to protect their health.

Senator WILLIAMS. Coming back to Great Britain. They are running into the end of the second decade of intense work in studying the problem?

Dr. STEWART. That is correct.

Senator WILLIAMS. And dealing with it. I think it was in the early fifties?

Dr. STEWART. It is about the end of the third survey, and they are five year cycles, so it is about the 15th or 16th year.

When one is studying a condition which manifests itself mostly after 10 or 15 years under the ground, you have to have a long time scale on this type of study before you finally get the answers.

Senator WILLIAMS. Has there been any relationship found between coal dust as obtains in the mines of Great Britain and coal dust as obtains in this country?

Dr. STEWART. Yes.

Senator WILLIAMS. Is coal dust coal dust?

Dr. STEWART. They are one and the same thing. There is some different reaction depending upon the kind of coal dust. As I am told, there is something called rank of coal, and the higher the rank, the more reaction you get. I think that is related to age. I am not an expert on coal quality.

Senator RANDOLPH. Like West Virginia moonshine, which, they tell me, gets better with age.

Senator WILLIAMS. Could we divert here and hear a little more about that subject?

Well, it would be possible to conclude that findings in Great Britain would have a relationship to our situation here and standards there in terms of toleration for better health would be in general terms applicable here?

Dr. STEWART. Oh, there is no question the disease is the same. It is the body's reaction to the dust. And if you have a similar relationship with the dust, this is what you have. It is the same in the United Kingdom as it is in the United States.

Senator WILLIAMS. I don't know, threshold isn't the word here—what is the word to describe the mine standard that they have in Great Britain?

Dr. STEWART. This is a highly significant point and what has really come from the early part of their study, and that is that there is a linear relationship between the amount of dust inhaled as measured by mass and the progression of the pneumoconiosis. That means there is no minimum standard. The ideal standard would be zero.

The decision as to which standard should be adopted really depends upon the technology of mining and of dust control. How low can you get it and still be compatible with mining and dust control technology? There is no threshold below which you would not get any disease.

Senator WILLIAMS. Well, with the state of technology as it is today, and what technology could be in this country, could we not have the same standard they have affixed in Great Britain?

Dr. STEWART. The information that I am citing from the United Kingdom has not been published as yet. They are not quite through with it. We can insert a table in the record in which this linear progression is illustrated, which they allowed us to have. They are about to implement a new standard and also to start using the mass method of measurement of coal dust. They have not heretofore used the mass method of measuring coal dust routinely in their mines. They used it in the study. They have used particle counts routinely in measurements for control. And their standards are now expressed in particle counts. I can ask Dr. Key what their standard is.

(The table referred to will be found on p. 750.)

Senator WILLIAMS. Before you do that, their particle count, could that be understood in terms of the mass method of measuring, or is there no comparison at all?

Dr. STEWART. It is difficult to make precise comparison. You can on averages. Particle count is a less precise way of measurement than weighing something.

Senator WILLIAMS. And what did you call it in your testimony, you had milligram?

Dr. STEWART. We are talking about a mechanism that weighs the amount of coal dust per cubic meter of air.

Senator WILLIAMS. Is that mass?

Dr. STEWART. That is mass. The business of converting particle count to equivalent mass is done by multiplying by a mass number which serves as a conversion factor. The two methods roughly correlate. If you take a whole series of many measurements by both systems and average them out, you get a better correlation than on individual measurements. The British also take samples a little differently. They put their measuring device, as I understand it, about 25 yards from the face and in the stream of air that is leaving the area, which is a little different than the locations of measurement that we usually use. Dr. Key, do you want to expand on that?

Dr. KEY. The British use a particle count upper limit for bituminous coal dust of 700 particles per cubic centimeter of air. Using a conversion factor based on density for bituminous coal, this is roughly equivalent to 10 milligrams of respirable dust per cubic meter of air. However, they ordinarily approve faces only at much lower figures.

For example, 370 particles per cubic centimeter is the maximum figure that is used for approval of a face after 1 day's sampling, and this would correspond to about a little more than half of this value. I will have to compute it.

Dr. STEWART. Dr. Key says it is 5.1 milligrams. I think you should also understand we have been informed by the British authorities that on the basis of the study they have been doing, they intend to shift to a mass standard and we don't know exactly what that level will be. But it probably will be close to what we are talking about.

Senator WILLIAMS. Referring to your statement, Dr. Stewart, page 12, I am, I will confess, and it will show up anyway, in lack of understanding of the first part of that statement at the top of page 12, just an interim standard. The suggested interim standard of 3 milligrams of respirable coal dust per cubic meter (MRE) instrument is consistent with the data from the British pneumoconiosis field research project. We will stop there.

The suggested interim of 3, whose suggested interim is that now?

Dr. STEWART. That is ours.

Senator WILLIAMS. And that was consistent with the British field research project in which dust concentrations in 24 mines ranged from 1 to 8.9 milligrams per cubic meter—average of 3.8?

Dr. STEWART. That is correct. Some of them ranged above.

Senator WILLIAMS. In other words, there the British method of measure and your recommended interim are on all fours in method?

Dr. STEWART. That is correct. But I do want again to emphasize, Senator Williams, that with the linear progression relationship that the best standards would be zero and that the level that is picked really depends on the technology of mining reaching that level.

Senator WILLIAMS. Well, speaking for myself, and working in our area, that has to have the word "practicality" in it. I would hope that our realizable objective would be your suggested interim standard of 3, notwithstanding our hope that in time, mindful of the linear progression, we also can get to the absolute health standard.

Dr. STEWART. Well, we will, if the S. 1300 is enacted by the Congress and the interim standard of 4.5 is implemented by the Secretary of the Interior; we then will move on to what the mandatory level will be. We will certainly urge him to set that as low as possible, as soon as possible, the determination of when and how fast will really depend on how fast and how practical it is for the mines to reach that level.

Senator **Williams**. Well, of course, we appreciate the administration has come forward with an idea. Our responsibility is different than theirs, and I know if we do know that other countries have been able to do better than that, I don't see why we can't do just as well as other countries in our work in trying to bring safety to mines.

Dr. **Stewart**. Senator Williams, it was our judgment when we learned of the extent of pneumoconiosis and of the linear progression, that with the examination of such data we had from measurements that had been made in U.S. mines, the 3-milligram level was obtainable and that is why we suggested it.

Senator **Williams**. I never found you to be wrong, Dr. Stewart. I appreciate that.

Dr. **Stewart**. There needs to be more measurements made, but it certainly appears to be attainable, and I think we owe it to the miners to press for as low a level as practical within the state of the art of mining.

Senator **Williams**. And we certainly do from where we sit in the legislative body. Thank you.

Senator **Randolph**. Mr. Chairman, you have said, Dr. Stewart, that in 1952 or 1955 or 1956, but in the 1950's, we came to realize in this country the affliction of pneumoconiosis—I will say black lung. Now, in our House Labor Committee in the 1930's, we thought silicosis was black lung, to all intent and purposes. We had trips and we visited mines and did a very thorough job from a legislative standpoint, we thought, in trying to cope with the problems of silicosis.

Why would we not know in the 1930's, if they knew in Great Britain silicosis was not pneumoconiosis?

Dr. **Stewart**. I think it was later that the British began to piece out the elements of this generic disease called pneumoconiosis.

Senator **Randolph**. Why did we find this in the fifties, you say? When did the British find it?

Dr. **Stewart**. In the forties they began.

Senator **Randolph**. Ten years earlier?

Dr. **Stewart**. Yes.

Senator **Randolph**. Explain why that would be. You are a medical man. Tell us why.

Dr. **Stewart**. I don't know all the story behind this, Senator Randolph, but I know that in the thirties there was great concern and attention to silicosis and the attention was drawn to it because of the high incidence of tuberculosis among people who have silicosis. And it was felt that the problem was caused by the amount or the percent of silica in the dust. This was not only the prevalent feeling in the United States, it was pretty well a worldwide consensus that silica caused the problem. In the forties, we began to realize that there were similar pathologies appearing on the X-rays from other kinds of dust, asbestos dust, cotton dust, and so on. There were also some studies done by various researchers in the United States among some of the coal mines where the silica content in the dust was very, very low and yet they were reporting pneumoconiosis in the miners. I don't know why it took us until 1960 to get around to doing the prevalence work, but it was just a matter of the way the state of knowledge developed.

Senator **Randolph**. Well, I think it is a fair question to ask, because I don't direct it at the operators or the mine unions, I direct it at the the medical pofession.

Dr. **Stewart**. I think we were trying to piece out the more specific elements of this generic disease called pneumoconiosis. We have done similar things many times.

We had an entity that we called typhoid fever until we discovered typhus, and then we separated those fevers into three or four different groups. We had measles and then we separated out German measles. So we have gone through this process in the history of medicine several times. I don't think we are through yet, because I think we are going to show someday, my own personal opinion, that black lung is a disease of the arteries of the lung.

Senator **Randolph**. The arteries of the lungs?

Dr. **Stewart**. That is right. It looks to me from what I can gather from the pathology that it is the coal dust particles gathering around the small arteries in the lung that cause the pathogenesis of this situation rather than what one would call damage to the inner tissues in the lung. This is an interesting hypothesis and would account for some of the statements you have had before this committee. It would also be consistent with some of the research work we have done which shows pulmonary hypertension in miners with minimal or no findings in the X-rays.

Senttor **Randolph**. Then you would feel that sometimes there are other nations or scientists or medical people in the other nations that move ahead of us in research?

Dr. **Stewart**. No question about that.

Senator **Randolph**. Is that what happened here?

Dr. **Stewart**. Yes. As another example, penicillin was invented in the United Kingdom, too.

Senator **Randolph**. You have indicated the finding of these two diseases affecting workers, because of our stressing at a particular time emphasis on silicosis. Is that true?

Dr. **Stewart**. I think that is true.

Senator **Randolph**. Dr. Stewart, we have heard conflicting testimony as to the number of cases of coal workers with pneumoconiosis—that is a word I am having trouble with this morning. How much black lung disease is prevalent in the United States.

I recall one source made an estimation of 100,000, of 135,000 workers.

Now, does the U.S. Public Health Service have reliable statistics—I shouldn't perhaps use the word reliable—but statistics that can be presented to the subcommittee?

Dr. **Stewart**. Yes; I have used the figure 100,000 as an estimate of pneumoconiosis that was based on the prevalence rates we found in our study of both active miners and of inactive miners. I think the difficulty arises, Senator Randolph, when people try to apply that to 135,000 active miners. We included also the inactive miners in the estimate. One out of 10 active miners, one out of five inactive miners.

The difficulty we have had is in determining how many inactive miners there are. We used a figure of 400,000 inactive miners, derived from a variety of data, in making our estimate of the cases of pneumoconiosis. In addition we know from other data, for example—the known number of disabled miners in Pennsylvania and the total man-years of mining experience between 1940 and 1955, that you can come up with a figure close to 100,000 for the total of coal miners pneumoconiosis cases.

We also know from the disability insurance statistics of the Social Security Administration that the disability among miners from respiratory diseases is much greater than the average that you would expect.

As far as what is needed for making a decision that you have a health problem, that we need to take some preventive measures, that estimate of 100,000 cases is a perfectly good statement.

Senator RANDOLPH. Now, there is the 3.0 standard that you advocate, Doctor. How soon do you believe that would be attainable? Is it here now?

Dr. STEWART. We have had some measurements from the Bureau of Mines which showed that some of the mines have a 3 milligram or lower dust level at the present time. So given the configuration on the state of mining in those mines, it seems to be attainable. How soon it can really be applied to all mines depends on the technology of mining and the willingness of mine owners to apply the technology to reach this standard.

We feel that it is possible to reach this standard in about a year. This, of course, would be dependent upon what the experts in mining can do.

I would like to say, Senator Randolph, that it is terribly important that we set a target and that we try as hard as we can to reach it, taking into account these practical things that the chairman has been speaking of.

Senator RANDOLPH. Dr. Stewart, the metric system, or the metric standard, we are told, is used in Great Britain in connection with the dust abatement program.

Would you comment on that?

Dr. STEWART. Yes. Metric weight measurements were used in the research study that we have mentioned. They were not used for routine measurement of dust. They still use the particle count. However, we have been told they intend to shift to a weight measurement.

Senator RANDOLPH. I may be in error about this, Doctor, but I am trying to have the record clarified. I have been told that the British do not set the standard at 3 parts per cubic meter that you propose here today. Is this true?

Dr. STEWART. This is correct.

Senator RANDOLPH. And you have spoken about their being in advance of us. Why now would you indicate to the subcommittee the reason why the British would not attempt to have the 3.0 standard that you have set forth?

Dr. STEWART. They have used a particle count method. They now have found in their own study that the progression of pneumoconiosis correlates best with the mass of dust that is inhaled and that the mass is a better measurement of the total insult to the person resulting in progression of the pneumoconiosis.

They have told us also they intend to shift to a mass measurement very soon.

Senator RANDOLPH. Have the British been successful in their thermal precipitator data in reference to the metric sampling standard?

Dr. STEWART. If you take large numbers of measurements, both by particle count and weight, and take an average and then relate them, they relate fairly well. The thermal precipitator collects particles that are 5 microns or less in size and then you count them, whereas the mass measurement is a measurement of weight. Whenever you have a measurement where it requires counting large numbers of particles the standard error around your average is rather large. This is true when you count red blood cells or anything else. But if you take large numbers of measurements, it averages out reasonably well.

Senator RANDOLPH. Doctor, I do not have the answer and ofttimes I will ask questions here simply that we make a very thorough record. It is important here in these hearings, as the chairman and other members of the subcommittee understand.

Dr. STEWART. I agree with you, Senator Randolph.

Senator RANDOLPH. On page 12 of your statement, you referred to British dust levels as 1.0 to 8.9, with an average of 3.8 milligrams per cubic meter.

I wonder if you could tell us how this leads you to recommend the 3.0 milligram per cubic meter as the standard? I have asked this in another way, but I go back now to the figures that you use.

Dr. STEWART. Well, Senator Randolph, this did not lead us to the 3-milligram standard at all. The judgment on the 3-milligram standard was based on our judgment after consultation with people who know more about mining than we do, and the British, that it is an attainable level.

We then, after we looked at it, looked at how compatible is it with the British level at the present time? And it comes up within a range of measurement that you can talk about.

If we said 3 and the British were 25, then we would have some problem. But their figures are within the order of magnitude that we are talking about.

We based our considerations mainly on two things, lots of pneumoconiosis, and the linear relationship between mass of coal dust inhaled and the progression of pneumoconiosis. Then the judgment becomes how well can we within the state of technology of mining reach the lowest obtainable level possible and still meet the practical considerations the chairman has talked about. Our judgment was 3 milligrams.

Senator RANDOLPH. You will recall, Mr. Chairman, that physicians appearing before the subcommittee have discussed the use of X-ray.

Mr. Chairman, I asked Dr. Stewart, Do the British use X-ray as a means of concluding today, not yesterday, that a miner has black lung?

Dr. STEWART. Yes, sir.

Senator RANDOLPH. And have they done that over the years?

Dr. STEWART. Yes; it is an X-ray diagnosis.

Senator RANDOLPH. Have the British, Dr. Stewart, ever closed a coal mine because of the problem of the dust readings? I would like to have that in the record.

Dr. STEWART. It is our understanding that they have not closed any coal mines, but they do move the miners.

Senator **Randolph**. Then it is a matter of moving the miners?

Dr. **Stewart**. That is my understanding.

Senator **Randolph**. Rather than closing the mines.

Now, are those mines ever checked again, or are they closed?

Dr. **Stewart**. No; they are checked and corrective action is taken and they move the miners back.

Senator **Randolph**. I presume you moved from one part of a mine to another part.

Dr. **Stewart**. That is correct.

Senator **Randolph**. To another part, not to a new mine?

Dr. **Stewart**. That is correct. I should also clarify this, Senator Randolph, they are moving the miners who have reasons for not being exposed to dust—those that have already shown some pneumoconiosis. They move them out and correct the dust problem and then move them back.

Senator **Randolph**. Dr. Morgan, do you have any comment on that point?

I believe you have done some research and have some special knowledge that might help us.

Dr. **Morgan**. Mr. Chairman, Senator Randolph, I think the Surgeon General has stated it correctly. If the face is not approved, in other words, if the dust level at that particular face exceeds the limit, then they move all the men with pneumoconiosis, as diagnosed by X-ray out of that particular face and put them into an approved face. But they don't actually close that face down.

As the Surgeon General indicated, they do then take measures to correct level of dust there and get it down to what is a reasonable level. But they move all men who have been diagnosed as having pneumoconiosis by X-ray and they have to work in an approved face.

Senator **Randolph**. Thank you very much.

A final question, Dr. Stewart. If the 3 milligrams per cubic meter is a standard that would be set by Federal law, would you tell us how the sampling would take place?

Dr. **Stewart**. Yes. I would think the sampling would be an average over an 8-hour work shift. Respirable dust measurement would be an average made over an 8-hour work period. I am not talking about one measurement or one short period of time, but an averaging out over this time.

Senator **Williams**. Senator Schweiker, do you have questions?

Senator **Schweiker**. Thank you, Mr. Chairman.

Dr. Stewart, I would like to ask what you have—or your staff—found about particle size in terms of this problem?

In other words, where, in your judgment, or your staff's judgment, is the greatest danger as far as particle size of coal dust is concerned?

Dr. **Stewart**. Well, I can just generally say it is a small particle. Could I call on Dr. Key to answer that?

Dr. **Key**. There are several elements in this problem: the composition of dust in the coal mine air; the composition of dust that is inhaled into the lower part of the lungs and retained; and, thirdly, the composition of dust that is found in the lungs at autopsy.

Regarding the dust that is generated, I think the statements that have been given here before are approximately correct. It is the particle size less than 5 microns that we are really concerned about.

There is perhaps a difference of opinion in this country and some of the European countries as to the importance of the submicron particles, those less than 1 micron in diameter. These are found in coal mine dust.

I have some figures from a German source indicating that in the order of 5 percent of the dust in their coal mines is in this range of less than a micron.

Regarding the amount that is inhaled and retained in the lower part of the lungs, which presumably is the area where the dust particles do their damage, there is information available which indicates that there are two peaks—one between 1 and 2 microns, and another around half a micron or less.

To me this means that any respirator that is developed would have to give maximum protection in these two areas—the range of particle size between 1 and 2 microns and the range around half a micron.

Senator SCHWEIKER. Can you enlighten me about the conventional dust masks that are available commercially today? What filtering range are they in? Are they in that range or do those particles go through the filter?

Dr. KEY. We should refer this question to the Bureau of Mines. They have a respirator approval program and test dust respirators for efficiency as well as comfort. I do have some information about new masks, respirators, that are being developed.

The British have come out with one which covers the lower part of the face and supplies clean air under pressure so you don't have to worry about dust particles leaking into the mask.

Senator SCHWEIKER. That is a closed circuit we are talking about?

Dr. KEY. In this system, filtered air is supplied under pressure to a facepiece. This has an efficiency for the submicron particles of 99 percent. The British have also been testing a Czechoslovakian mask which is an open system made of a pleated plastic material. There is also a new mask being developed in this country by one of the asbestos companies. It is also an open mask using regenerated cellulose deposited on fiberglass backing, effective for asbestos particles and it should be effective for coal dust particles as well.

Senator SCHWEIKER. Doctor, in your testimony you said one of the studies showed 15 years of dust exposure was a key indicator as to when the trouble started from autopsy studies. And then you talk also about a straight line relationship between the amount of dust breathed and the deterioration or progression of the disease.

Specifically, what study is this—is this British work?

Dr. STEWART. The latter study is British work. The former was based on our own prevalence study. The former one of the pneumoconiosis we diagnosed related to years underground in working. There were only a relatively few cases before one reached 10 to 15 years underground, and then there was an upward linear progression of cases with time. The latter is the British study where they did actual dust measurements on the mass of respirable dust and correlated it with a progression index, that is—the progression of the disease in the X-rays of those with pneumoconiosis over a period of time. They are two different studies.

Senator SCHWEIKER. Were both the studies based on autopsies, or was one an X-ray of living people and the other, an autopsy?

Dr. STEWART. No; they are both related to X-ray diagnosis. One is measuring the relationship of the prevalence of pneumoconiosis diagnosis by X-ray with years underground. The other is relating the progression of the pneumoconiosis in the X-ray over long periods of time correlated with the mass of dust inhaled.

Senator SCHWEIKER. You recommend in your testimony an X-ray for miners, and you also concede this tells only part of the story.

Is there any other test specifically at this time that you folks recommend that we should require in our legislation?

Dr. STEWART. At the present time there are no other tests that are practical that could be used. This is, of course, one of the things we want to look into at our Morgantown laboratory, as to whether there are possibilities of developing earlier diagnostic techniques or ones that are less expensive or better than X-rays periodically. What you would have to fall back on are pulmonary function tests and cardiac catheterization. There is some possibility of exploring vectocardiography. I am not sure it is sensitive enough to really serve the purpose but it is certainly worth looking into.

Senator SCHWEIKER. We have been talking about a 4½-milligram standard and a 3-milligram standard.

To your knowledge, is there any data showing a correlation between black lung disease and those two standards? In other words, do we have a right to expect, based on any documentary evidence, that the disease incidence will improve in a 3 milligram atmosphere compared to 4.5 and, if so, what is it?

Dr. STEWART. The linear progression of the disease with the mass of dust that is inhaled over time, if you accept that, then 4.5 will have 50-percent more progression than 3.0.

Senator SCHWEIKER. And that 50 percent is an arithmetic relationship between the two?

Dr. STEWART. Arithmetic. We do know that this is the hypothetical basis. We do have evidence to show that when one lowers the dust concentration, the prevalence of the disease drops. This has been true in the United Kingdom. If our linear progression is correct, and all the data points to it as the right hypothesis, then we should have a lowering of pneumoconiosis in the U.S. mines as we move from 4.5 milligrams to 3, and if we possibly move it to 2 or 1, we would probably have even less pneumoconiosis.

Senator SCHWEIKER. In terms of recommendations from you and the Department, you are not prepared at this time to make any dust mask recommendations beyond your previous statement; is that right?

Dr. STEWART. No, we are not.

Senator SCHWEIKER. Are you saying that dusk masks would be an important factor, or that the atmosphere in mines is far more critical and this is the area you want to control?

Dr. STEWART. Well, I think it really depends on what is the most practical method of cutting down the dust inhalation by the miners. It could be ventilation, it could be use of water, it could be using masks, it could be something else. But I believe that the specific technology to be used in putting a barrier between exposure and the man depends on the mine itself. Also, even though one has masks, it is difficult to get men to wear masks.

Senator SCHWEIKER. I think the Federal Government has done some research; you referred to it, in this area of coal mine or dust hazards to health. Has this come under your jurisdiction?

Dr. STEWART. Yes; the health risk.

Senator SCHWEIKER. And how much a year are we spending on this?

Dr. STEWART. We have about $1 million in the 1970 budget for this activity.

Senator SCHWEIKER. Based on what we might do, and the staff that you have, and the avenues that are now open, how much money might we spend effectively in this area?

Dr. STEWART. Well, I really can't answer that. I think what we have in the 1970 budget will meet our needs for the development——

Senator SCHWEIKER. Have you made recommendations to Congress previously on either increasing these funds or setting aside a specific amount to be available in this area?

Dr. STEWART. This amount is about comparable to what it has been in the last year, if you don't count our efforts in uranium mining, too.

Senator SCHWEIKER. That is all, Mr. Chairman. Thank you.

Senator WILLIAMS. Senator Eagleton.

Senator EAGLETON. Doctor, do I take your testimony to mean that clearly from a medical point of view, due to research that has been made available to you, part of which the Public Health Service has participated in, that 3.0 is clearly a preferable permissible level than anything higher thereto, 4.5, or anything else you might pick out of the air?

Dr. STEWART. From a medical standpoint, that is correct.

Senator EAGLETON. So, in terms of you as a professional physician, you would recommend, would you not, 3.0 from a medical point of view, not being a construction expert or design engineer or coal mining?

Dr. STEWART. Ideally, I recommend no dust. But knowing the practicalities of the situation, you can never reach that. And this is so true of many things we do. We are always measuring the benefit and risk on so many things. The determination of that level depends on the technology of mining and the determination to reach some level.

Senator EAGLETON. But the health of the coal miner is going to be better protected by a 3.0 level than by a 4.5 level?

Dr. STEWART. This is correct.

Senator EAGLETON. Let me direct your attention, Doctor, if I may, to page 10 of S. 1300, section 104, the caption of which is "State Plans."

As I understand the thrust of section 104, if the State agrees to enforce the Federal minimal standards, then the inspection function will be left in the hands of the State.

In your judgment, in the interest of uniformity and consistency of inspection and enforcement, is it preferable to leave the inspection to each of the States, or would it not be preferable to have the U.S. Bureau of Mines do the inspecting directly across the board?

Dr. STEWART. We have stated in our testimony that the sections of this bill which promote Federal-State cooperation we endorse heartily. The bill requires that the Secretary have a plan from the State and, if there is a failure to comply substantially or failure to afford reasonable cooperation in the administration of the act, the Secretary shall notify the State agency of withdrawal of approval of such plan. It also specifies that there will be joint inspection for the most part by a State inspector and a Federal inspector, but not the other way around, unless it is not carried out by the State.

I think you should get any detailed discussion of this from the Department of the Interior, since it is the Secretary of the Interior's function. Our function in this bill is to furnish criteria for the health standards.

Senator **Eagleton**. Doctor, based on your expertise in medicine, I presume either you or the members of the Public Health Service staff have gone into coal mines and visited in States that are coal mining States in order to gather some of this information that you have in your center in Morgantown, and what have you.

Has it been the experience of your Department that the State inspectors do a more persistent and thorough job in examining into the health and safety hazards in the coal mines than the U.S. Bureau of Mine inspectors?

Dr. **Stewart**. I can't answer that question.

Senator **Eagleton**. But it is your testimony, since you testified, I think, on page 15 of your prepared statement that you wish to encourage Federal-State cooperation on coal mine inspection, in the development of other programs relating to the health and safety of coal miners, and I take that statement to mean that you support section 104 as being the preferable method of enforcing mining and uniform mine safety and health regulations in this country?

Dr. **Stewart**. We think the Federal-State cooperation in enforcing these standards is highly desirable, yes.

Senator **Eagleton**. That is all.

Senator **Williams**. Senator Randolph did want to inquire of Dr. Morgan. I would like to clarify Dr. Morgan's position. I was under a misunderstanding when you came forward with your colleagues. I thought that he worked with the Department generally and he is not an employee of your service?

Dr. **Stewart**. Oh, yes he is.

Senator **Williams**. There was misinformation here.

Dr. **Stewart**. Dr. Morgan is the chief of our Laboratory, the Laboratory of the Public Health Service in Morgantown, W. Va.

Senator **Williams**. You lured him from the British Isles to your service?

Dr. **Stewart**. And we are very grateful that he came.

Dr. **Morgan**. I wear a double hat. I also have an appointment with the University of West Virginia Medical School, and I point out that I am quite proud of that as well.

Dr. **Stewart**. I am sorry I failed to mention that.

Senator **Randolph**. That is what I wanted Dr. Stewart for the record to indicate.

Senator **Williams**. Whatever hat you speak from under, do it with a British accent.

Dr. **Morgan**. Thank you, Mr. Chairman. I am afraid you are going to have to put up with it. I have tried to change.

Senator **Williams**. We approve entirely.

Senator **Randolph**. I am sure it is a white hat.

Dr. **Morgan**. I think so, sir.

Senator **Randolph**. I have checked, Dr. Morgan, and I found that you have a familiarity with the British conditions of coal mining and of what they call their threshold limit value.

Now, please discuss that for the subcommittee.

Dr. **Morgan**. Sir, Senator Randolph, that was the threshold value that the Surgeon General and Dr. Key referred to, and this is the 700 particles per cubic cc,—ppcc it is expressed, for bituminous coal mines and 500 for anthracite. And these are measurements made with the long running thermal precipitator.

As the Surgeon General and Dr. Key have indicated, this is not such a satisfactory instrument as the MRE instrument that the National Coal Board are now using. And as they have indicated, they are going to change over.

However, they have devised a way which is roughly accurate and acceptable to convert measurements made with the long running thermal precipitator to the metric standard.

The information that these current British standards were based on is many years old and, as the Surgeon General and Dr. Key both stated, the standard is probably going to be changed.

I am not an engineer but I feel that the long run thermal precipitator is not the most satisfactory instrument.

Senator **Randolph**. Dr. Morgan, we have had testimony, I recall, which indicates that at least one witness advocates a performance test. He seemed to believe it was preferable to an X-ray test in connection with periodic examination of coal miners.

Would you have comment on that point? We discussed this with Dr. Stewart prior to this question.

Dr. **Morgan**. Yes, Senator, I would. I am not quite certain what the term performance refers to here, but I assume that it is some form of common function testing in particular studies made while the subject is exercising.

Now, I would stresss and, from the Surgeon General's statement this is very evident, that there are no specific symptoms of coal workers' pneumoconiosis and there is almost no physiological impairment which is specific to this condition. One cannot look at a bunch of pulmonary function tests and say this man has coal worker's pneumoconiosis and this man has chronic bronchitis and emphysema and this man has fibroid tuberculosis. It is not possible to do that at present.

If we are talking about performance, this is a satisfactory way of measuring respiratory impairment and thereby awarding disability, but it does not tell you the cause of the disability.

Now, I would point out in connection with the X-ray diagnosis of pneumoconiosis, that I feel it is absolutely essential that the X-ray should be retained. I feel this because this is the teaching of the World Health Organization, the International Labor Organization, and in fact of every country that has done work on this subject throughout the world.

So I feel one cannot diagnose the disease in the absence of an X-ray unless one is to take a portion of the lung out and look at it under the microscope, and that is not feasible and should not be recommended unless there are very special circumstances.

Senator RANDOLPH. That goes to the procedure, so-called performance test procedure, that was indicated, I think. Mr. Chairman, I stop at this moment to say how helpful it is to have any physician who testifies here, and in this particular, Dr. Morgan, be able to clarify this for me.

I think as we go through rather laboriously a hearing such as this we must not overlook bringing these points to the attention of the subcommittee.

We have heard testimony, Dr. Morgan, about the so-called cor pulmonale, c-o-r p-u-l-m-o-n-a-l-e. Is that the right pronunciation?

Dr. MOGRAN. Well, sir, I would call it cor pulmonale.

Senator RANDOLPH. It is, as I understand it, the right side of the heart that has enlargement, and it is said to cause the lung disease of which we speak.

Now, is this something that substantiates your findings, this right side of the heart instead of the left side?

Dr. MORGAN. Senator, this, I think, needs a little clarification. This condition has been known for a long time in progressive massive fibrosis. That is the type of disease where there are large X-ray opacities. If the members of your committee would like to see an X-ray of such a patient, we have one here. But it has been known for a long time that progressive massive fibrosis obliterates the pulmonary capillary bed and blood vessels there. This has not been associated with simple pneumoconiosis, where there are only pinpoint X-ray opacities.

The original work on this was done in Professor Gough's department some 10 years ago and he was able to show that the cor pulmonale, which is right heart failure due to increased pressures in the right side of the heart, was associated with progressive massive fibrosis but not with simple pneumoconiosis.

Of course, cor pulmonale is also found with chronic bronchitis and emphysema, which, as you know, are very common diseases throughout the States and in the non-coal-mining population, and these are by far the commonest causes of cor pulmonale.

In general, I think it is true to say that if there are no X-ray changes present on the film and there is cor pulmonale present in the patient, then you had better look for another cause of the cor pulmonale.

In other words, it is not likely to be due to coal worker pneumoconiosis. It is likely to be due to chronic bronchitis or emphysema or some other condition.

Senator RANDOLPH. We recall that Dr. Laqueur from Beckley, W. Va., reported works of a Dr. Gough—would that be the pronunciation? It is spelled differently?

Dr. MORGAN. Yes; he pronounces his name Goff, G-O-F-F.

Senator RANDOLPH. I understand that he testified before members of a committee of the West Virginia Legislature, in recent weeks, and he used the language "We have licked the problem in our mines by strict enforcement of dust control"—referring to the black lung problem. "New cases," he said, "of the disease are in constant decline and pose no problem any more. The problem for us which remains is simply one of just compensation for existing cases."

Now, of course, you have knowledge of the British conditions. Would you verify the evaluation of the doctor and discuss it here, because Great Britain apparently is ahead of us in many of these fields.

Dr. MORGAN. Yes, Senator, I have known Professor Gough for about 8 years. And to a large extent I think what he has said is entirely true.

I would comment though that some of his testimony, as I have heard it relayed second hand, has been taken out of context.

There is no doubt that the British methods of dust control have lowered the prevalence. Whether it is quite as low as reported is a matter of debate.

If one listens to the National Coal Board and their medical officers, there is almost no problem. If one goes to the Safety in Mines Research Establishment in Sheffield and talks to the professional staff there, there are still some problems. And I would point out that they come under a different Ministry so perhaps there may be some element of difference of opinion related to this fact. But in general the statement is true, that with dust control the prevalence of the disease has been greatly reduced.

Senator RANDOLPH. Did you have something further at that point?

Dr. MORGAN. Was there a second part to your question, Senator?

Senator RANDOLPH. No, that answers the question. I just asked you if you felt that it was sound.

Dr. MORGAN. Yes; I think so.

Senator RANDOLPH. I think you said that in an earlier statement.

Referring again to Dr. Gough, I don't know whether he is familiar with the thesis of Dr. Rasmussen and others in the Beckley group. We have had some reports both ways on this situation.

I would like to see it clarified. That is all I am attempting to do.

Do you know of any answer?

Dr. MORGAN. Well, I do. Professor Gough, after he left Charleston, having testified to the West Virginia Legislature, stayed with Dr. Hunter and then he stayed with us for a night. And I broached this very subject, whether this small vessel disease as has been described by the Beckley group seemed likely to him, knowing also that the publications previously from his dpartment, which I have here, did the exact opposite. In fact, they refuted the Beckley group's work.

And he said that he had been asked several questions by the Ministry of Pensions or the medical advisors about this hypothesis of small vessel disease and he, as their medical advisor, had suggested that they ignore the paper that was published in the American Review of Respiatory Disease.

I can only add further that we have tried on the same patients who had previous tests in Beckley, to duplicate these things and have been unable to do so.

Senator RANDOLPH. Thank you, Dr. Morgan.

Tell me, what is the activity carried on in the so-called Alford Laboratory? I have heard it referred to and I would like to hear more about it.

Dr. MORGAN. We are currently involved in a multifaceted approach to this problem. In particular we are admitting miners through a contract with West Virginia University to the medical service there. They are, during their time there in the hospital, looked after by Public

Health Service physicians. These miners are volunteers and we do the most complicated pulmonary function tests available.

If they also volunteer, we do measurements by cardiac catheterization. I would stress that we have been unable to duplicate the Beckley findings when we have done the catheterization. We have not found significant pulmonary hypertension except in a few instances where there was another obvious cause, such as chronic bronchitis or emphysema.

These miners are in the hospital for 3 days and these tests take quite some time.

Progress has not been as good as I first hoped, because there was a delay in getting the catheterization lab available, but it recently became available and we have been testing miners as fast as we can within the limitations of our staff.

Before the end of last year we started testing patients but we did this by virtue of the fact that West Virginia University lent us their facilities.

We are also involved in various biochemical studies. In particular, we have been measuring the amount of urinary hydroxy proline which is secreted by miners who have this disease. In progressive massive fibrosis there is marked fibrotic tissue present from which this substance might come. This study has been completed and is shortly going to be published in the British Journal of Industrial Medicine.

We have also looked at various symptomatic biochemical abnormalities in the miner as a whole and such data are presently being analyzed.

We have done two field studies. One was a comparison in the southern part of the State in Pineville of a group of miners and a comparable group of nonminers. We measured pulmonary function in both groups. We also took X-rays and a questionnaire about respiratory symptoms was completed. The data for this are also being analyzed at the present.

We have also studied a group of miners in the Consolidation Coal Co. before they went to work and after an 8-hour shift, and we measured their pulmonary function tests.

Senator RANDOLPH. Doctor, not to interrupt, but to keep it in a way that will be helpful to me, you speak of Pineville; were all of the miners employed in Wyoming County?

Dr. MORGAN. Yes, Senator, they all lived in Wyoming County. I can't guarantee that they had lived there the whole of their lives. They may have moved. But they currently live there.

Senator RANDOLPH. Then you come later on to the northern part of the State. The Consolidation Coal Co. You did not identify the area or the county.

Dr. MORGAN. It is not the No. 5 mine. It was the other one.

Senator RANDOLPH. That would be in Monongalia County?

Dr. MORGAN. Yes. It is in Monongalia. It is not in Marion.

Senator RANDOLPH. Both studies, then, are not in southern West Virginia. One of them is there and one is in northern West Virginia, and there is a difference here.

Dr. MORGAN. Yes, indeed there is, and there is a difference probably in the prevalence of the disease and also in the amount of respiratory symptoms between the south and the north.

We measured their pulmonary function before and after an 8-hour shift including a night shift, afternoon shift, and morning shift.

The results have been to a large extent analyzed and suggest there is an acute effect of coal dust so that their pulmonary function, their ability to get air in and out of their lungs, is to a certain limited extent impaired by an 8-hour shift.

In other words, it seems that dust, even in an acute effect over an 8-hour shift, does minimally—and I would stress it is minimally—but significantly impair their ability to get air in and out.

Senator **Randolph**. Are you saying, Doctor, that the 6-hour or 5-hour day may help eliminate this situation, rather than the 8-hour day?

I am not sure you are saying that.

Dr. **Morgan**. No, Senator, I don't think I am. I am just recording a fact. I don't even know that it is caused by dust for certain. It may be some other factor, but there is a variation in function over an 8-hour period.

We also have various pathological studies going on whereby we are trying to correlate the amount of coal dust and silica present in the lungs with the amount of bronchitis and emphysema. This is currently in progress.

Lastly, we have just completed a study of pneumoconiosis associated with beryllium, which is another occupational disease. We have done some serological studies on this condition. I think that gives you a fair idea of most of our program.

One other study I should mention is the oncoming prevalence study, which is a joint study with the Bureau of Mines, to correlate the progression of the disease with the prevailing dust levels in the mines. This is the study to which the Surgeon General referred earlier in his testimony.

Senator **Randolph**. Mr. Chairman, I thank Dr. Morgan and I thank all of the gentlemen who were at the witness table today. This is making a record. It is very helpful. You have responded here today and brought some freshness and new light to shine on this subject, Dr. Morgan. There is a contrast between countries, even within our own country, and with respect to the studies within a State.

Senator **Williams**. What was the last part of your program you mentioned, Dr. Morgan?

Dr. **Morgan**. Mr. Chairman, we recently did a study on the serum pathology of certain patients. The serum is that part of the blood from which the blood corpuscles have been removed. We were studying the protein components and other things in subjects who have beryllium disease, a condition which occurs in the beryllium industry.

Senator **Williams**. Your last observation, that was coal dust?

Dr. **Morgan**. The prevalence study. This study really is an attempt to duplicate what the British National Coal Board has done.

We are hoping to X-ray all the miners at certain selected pits throughout the United States and concomitantly with our medical examinations and X-rays the Bureau of Mines will measure the prevailing dust levels in those mines. We hope to do this as soon as possible, and repeat this study in 5 years and again in 10 years, and hence be able to correlate the progression of the disease with the prevailing dust levels as the National Coal Board have done in their 25 pits.

Senator **Williams**. In Great Britain?

Dr. **Morgan**. Yes.

Senator **Williams**. Is it proper to say that from all of this, as it relates to the miner's disease of black lung, you can't depend on one kind of examination, you need the range of examinations, X-rays, as well as the functional? Is that the conclusion we can make?

Dr. **Morgan**. Mr. Chairman, I don't quite know whether that is the conclusion that we can draw. As of now, coal worker's pneumoconiosis is defined as a condition with an abnormal X-ray, with certain abnormalities present on the X-ray, associated with a history of occupational exposure.

If a man has been in a coal mine for a reasonable length of time and, as the Surgeon General pointed out, 10 or 15 years, plus the fact he has an abnormal X-ray, then one can assume he has this disease, in lieu of actual tissue availability, such as the portion of the lung taken out at biopsy. This is the only way and this is how it is defined by the World Health Organization and the International Labor Organization.

Senator **Williams**. Others have suggested that a third factor should be included in the comprehensive examination, and one described it as a functional examination.

Dr. **Morgan**. Most certainly, providing one remembers that it is difficult to attribute abnormalities of function to a specific disease, and that there are other diseases which will cause this. There is no abnormality specific to this condition.

Senator **Williams**. And that is why you need all three to say to that miner, yes, it was your occupation that is giving you these empirical symptoms that you see on the X-ray as well as from the functioning finding; is that it?

Dr. **Morgan**. Yes, sir.

Senator **Williams**. Senator Bellmon.

Senator **Bellmon**. I have no questions.

Senator **Williams**. Senator Schweiker.

Senator **Schweiker**. Just one other question, Doctor.

Dr. Stewart, I understood you to say in your earlier testimony that the British are converting from one measuring standard to another measuring system.

Did I understand correctly that they are going to convert to the 3-milligram measurement? What are they doing? What is their new measure going to be?

Dr. **Stewart**. No, they are changing their instrumentation of measurement to the one that measures mass, which would be the same instrument we are talking about.

We do not know what level they will be setting.

Senator **Schweiker**. You don't know what the standard for dust mass will be at this point?

Dr. **Stewart**. We don't know what the level is that they are going to set. We do know they are changing their measurement instrument.

Senator **Schweiker**. The instrument they will use, is that the same instrument that we will be using to measure 3 milligrams?

Dr. **Stewart**. That is right.

Senator **Schweiker**. And I gather from that fact, I guess, therefore, you feel that this method is a much better method of pinpointing the problem than the other method; is that correct?

Dr. **Stewart**. Yes. Their survey showed that the best correlation of progression of pneumoconiosis in the X-ray is the correlation with the mass of coal dust that has been inhaled, so, therefore, it is better to measure the mass than to count particles.

Senator SCHWEIKER. That is all, Mr. Chairman.

Senator WILLIAMS. Thank you very much.

Senator WILLIAMS. Doctor, let me welcome officially, Dr. Murray B. Hunter, who comes from Fairmont Clinic, Fairmont, W. Va., and, as we say, you are vouched for by Senator Randolph most strongly, and that means a great deal in this forum, believe me.

Senator RANDOLPH. Thank you, Mr. Chairman.

Dr. Hunter has had a long experience with occupational disease as it affects coal miners; I know this, and I think his testimony can be of value to us.

I wasn't sure whether or not he was going to make a formal statement and I am delighted that he is.

STATEMENT OF DR. MURRAY B. HUNTER, FAIRMONT CLINIC, FAIRMONT, W. VA.

Dr. HUNTER. Mr. Chairman and members of the subcommittee my name is Murray B. Hunter, M.D., medical director of the Fairmont Clinic, Fairmont, W. Va. I am a graduate of the Duke University School of Medicine. I took my internship and part of my residency at the Duke Hospital and completed my residency at the research division of the New York University School of Medicine. I am certified in the specialty of internal medicine by the American Board of Internal Medicine.

For 16 years I have devoted the overwhelming bulk of my professional time to the care of coal miners and their families and to the management of respiratory diseases of coal miners in particular. Fairmont is 8 miles from Farmington, W. Va., and 5 miles from Monongah, W. Va., site of the great 1907 disaster. I was one of two physicians present at the site of the Farmington mine disaster who examined the few survivors and I was totally responsible for organizing supportive services of a medical and nursing nature to the families of the victims through their agonizing vigil, in the ensuing days.

I have long been familiar with the clinical problems of coal miners with respiratory disability and I have made a modest contribution to the existing research on coal workers' pneumoconiosis.

I am neither a mining engineer nor an occupational hygienist. I am not a cost accountant and my familiarity with the profit structure of the coal industry is probably no more than that of the average semi-informed citizen. I am not a spokesman for the United Mine Workers of America.

It is by accident that coal mine health and safety legislation are up for consideration at this time. It was the Farmington disaster that focused national attention not only on coal mine safety but on the general socioeconomic status of the coal miner, on his physical and material well-being.

Another committee of the Senate is currently investigating television practices and I would like to say that were it not for the attention the mass media, and television in particular, devoted to the problems of the coal miners in the wake of the Farmington disaster, this session might not be held today. The media is the message. Before television, the United Mine Workers of America did in fact stand alone. Coal mine dust and coal mine safety were not household words. Perhaps it is because they are totally unaccustomed to having any support from other quarters, that the union officials seem stunned and overreactive to criticism today.

It has been sad practice in our history that only certain disasters become traditionalized. Everyone, all our schoolchildren, are taught to remember the *Maine* which in 1898 cost the lives of 260 Americans. Not 10 years later over 300 were killed in the Monongah, W. Va., coal mine fire. Perhaps few people in this body ever heard of the Monongah disaster and fewer still in the Nation at large.

"Appropriate response" is the expression in vogue in Washington today. The appropriate response to the Monongah disaster was the creation of the Federal Bureau of Mines. The appropriate response to the West Frankfort, Ill., disaster was Federal mine safety legislation.

In order that the victims of the Farmington disaster shall not have died in vain, it is incumbent upon the Congress of the United States to come forward with an appropriate response which is the passage of effective mine health and safety legislation which takes into account the total impact of the industrial process upon the well-being of the miner.

In my testimony today, I will address myself to sections 4, 13, 14, and 15 of the dust standards bill. I shall not indulge in a numbers game. I cannot make an accurate statement as to how many coal miners die or suffer with respiratory disability as a result of their occupation. Ethically and philosophically it really doesn't matter.

We may put up with an acceptable casualty rate in war but we ought not to be thinking in those terms in a basic American industry. There is an aura of tragic drama that has surrounded coal mining in this country that inures us to a daily casualty rate. Film and story and song help to harden us to ill health and disaster as being inevitable accompaniments of coal mining. It need not be so and ought not to be so. Our aim ought to be to make coal mining as decent and safe as any other occupation and if it deprives coal mining of its danger and its mystique, so much the better.

It is obvious that we cannot totally avoid the numbers game because it has become a part of the debate before you. On both sides of the question numbers have been thrown in the air in order to enlist passion in support of the issue or on the other hand deflate it.

The late Dr. Albert Kistin of Beckley, W. Va., in a meticulously designed study of Raleigh County, W. Va., coal miners, found 46 percent of miners and ex-miners with X-ray evidence of coal workers' pneumoconiosis of all grades of severity. Dr. Jan Lieben, surveying miners in central Pennsylvania, found a prevalence of pneumoconiosis of 39 percent. Other studies have placed this figure as low as 10 percent. I suspect that the difference in prevalence from one coalfield to another depends on the rank of coal, geologic variation, and differences in mining technique.

On February 2 of this year, in preparation for the legislative hearings in West Virginia, our own clinic conducted a survey of 246 ambulatory miners and former miners. I might add there was no effort to control this group. Two-hundred and forty-six miners were invited to come to the clinic. Obviously, this did not include people already dead of this disease or so disabled as to be bedridden or hospitalized.

The sample consisted of miners able to be up and about, for the most part working, and able to come to the clinic by car. The average age of the group was 58 years.

In evaluating the data obtained, we weighted the scales heavily against the miner in that we took as a definition of respiratory disability a 1-second vital capacity of 1,700 cubic centimeters irrespective of age and height, which is a figure below which no one is regarded by contemporary authorities to have normal or even near-normal ventilatory function.

Of this group of 246 miners, 54 or 22 percent were found to have 1-second vital capacity below 1,700 cubic centimeters. Of the entire group, 52 percent had some evidence of coal workers' pneumoconiosis by X-ray and 12 or 5 percent had the complicated form.

Of our group of 246 miners we found 74 who had never smoked cigarettes. This is high and I suppose that it is because we did the survey on Sunday. We got a lot of faithful churchgoers. The rate of respiratory disability as measured by 1-second vital capacity less than 1,700 cubic centimeters in the nonsmoking group was 23 percent, or identical to the group at large.

Can dust suppression reduce this toll? I believe the experience of other countries is that it can. I was privileged to be the host of Dr. Jethro Gough, whose appearance before the West Virginia State Legislature was sponsored by the organization with which I am affiliated. Dr. Gough, who is the professor of pathology at the Welsh National School of Medicine in Cardiff, Wales, is generally recognized as the world's leading authority on dust diseases in coal miners.

The lung sections which I am certain that members of this committee have seen in previous testimony are called Gough sections. If it were deemed appropriate, I believe an appearance by Dr. Gough before this committee would be most edifying. As his last host in the country, I would be most happy to extend an invitation to him in your behalf. He was certainly kind enough on short notice to come to West Virginia.

Senator RANDOLPH. Where is he now?

Dr. HUNTER. He is at home in Wales.

I am in favor of the 3 milligram per milliliter standard, not as an independent industrial hygienist with any expertise in this field, but because my colleagues in Britain tell me that as a result of the successful adoption of such a standard by the technique of water infusion of the coal face, cases of coal workers dust diseases have been reduced fivefold and that present surveys indicate an even greater reduction to be anticipated in the future.

Mr. Boyle has, I think wisely, indicated that the union is in the process of reevaluating its position on automation, in view of what has been learned about the prevalence of dust disease in coal miners.

I would like to direct the remainder of my remarks to sections 13, 14, and 15 of the dust standards bill dealing with advisory committees, X-ray programs, and research programs. I would emphasize that periodic X-ray survey of coal miners, while laudable and necessary, is certainly not enough. I take the position we ought in this day and age, if we are going to go to the extent and trouble of looking at the coal miner by X-ray, we ought to do a better job and see how much respiratory disability exists in coal mining, because although I agree with Dr. Morgan, certainly they are not synonymous. It is my very distinct impression and I believe this has been substantiated by doctors in the Public Health Service that coal miners have a fivefold increase in incidence of respiratory disability compared to the population at large, and whether or not one can relate this to X-ray, I do believe a function study ought to be included.

Periodic survey of pulmonary function, of the rate of decline of breathing ability with the passage of time, of the incidence of emphysema and chronic bronchitis and right heart failure and accurate death data are of the essence. I know from personal experience that death certificates are notoriously inadequate as valid statistical tools. A central registry to review all autopsies on coal miners ought to be established. Coal mining families are not reluctant to consent to autopsy, there is often a compensation interest, but all too often the proper technique for study of the lung of the deceased is not available at local facilities.

An interval of the 3 years between X-rays is certainly sufficient for survey of dust opacities, but I would emphasize the necessity for in the field continuous survey of the total spectrum of chronic respiratory problems of coal miners.

Senator WILLIAMS. Maybe I shouldn't interrupt, but I was puzzled the other day because death can be attributed to heart failure. The reason for the change in the heart can go back to the lung problem that doesn't bring proper oxygen to the heart; is that right?

Dr. HUNTER. That is correct.

Senator WILLIAMS. What would be the proper cause of death?

Dr. HUNTER. The proper way to write a death certificate, corpulmonale, which has been referred to today, or right heart failure, which is hypertension or high blood pressure in the lung. You commonly think of high blood pressure in the peripheral, in the left side of the heart, the kind that is taken in your arm, but high blood pressure in the lung is because of lack of oxygen. If you go to a high altitude, to Pikes Peak, you will get high blood pressure in the lung without any physical change in the lung. This is a physiological response and there is also a pathological response when there is disease that affects the transfer factors, the transfer of oxygen into the blood.

Senator WILLIAMS. I hate to interrupt, but this is so important. Can a more accurate description of the cause of death be made without autopsy?

Dr. HUNTER. In certain cases it cannot. But I also would like to suggest, and it is in my printed statement to you, that a central registry to review autopsy on coal miners ought to be established.

You know, coal families are not reluctant to consent to an autopsy, particularly now with State compensation laws being enacted, because there is often a compensation interest on the part of the widow. So it is not difficult to get the autopsy consent from coal miners, but the difficulty is that it is done in the local hospital without the proper facilities and the lung cannot properly be examined. And I would like to see that there is some kind of coordinated effort to coordinate the information from autopsies, to send lungs and study lungs similar to Dr. Gough's own personal experience of 20,000 autopsies done with his technique. It ought to be established in the United States.

Senator WILLIAMS. Senator Randolph made an observation to me while you were speaking that possibly one of our subcommittees of the Labor Committee, the Health Subcommittee, would be well advised to consider your testimony in this regard. Thank you very much.

Dr. HUNTER. Now, let us go to the X-ray question.

The U.S. Public Health Service, or whatever health agency the Secretary of the Interior wishes to establish to carry out the research and development program with respect to mine health, ought to be closely coordinated with the many excellent facilities in the field which have been established, primarily with the help, support, and stimulation of the United Mine Workers of America welfare and retirement fund.

I need not remind you gentlemen that the fund in the 1950's produced a virtual revolution in health care in Appalachia by the construction of facilities and the recruitment of specialists to that area, many of whom still remain. I would strongly urge the coordination of efforts of the Federal health apparatus with the already existing facilities in the field.

I think the framers of this legislation, and particularly people who are going to administer it, ought to pause for a moment and consider and contemplate what an X-ray survey means and what it entails. Because it is going to create problems and I think people who execute these programs are going to have to face that and I hope that they will.

The first problem is that the miner is going to have to be informed about the results of his X-ray. You know there is an ethical consideration. Mass screening is in vogue today, and proposals for mass screening are emanating from both levels, Federal and State. After you establish your mass screening, what do you do about the abnormalities you find? It is one kind of neglect not to know that something exists, but it is neglect compounded to have found disease by X-ray and have no means of following up on it and advising and making recommendations what is to be done in terms of shall I work, shall I not work?

Remember there are many coal miners whom you are going to uncover with mass X-ray screening who want to educate sons and who would rather stay in the mine, in spite of their disability, for a year or two or three or four.

There are very few nondusty jobs in American coal mines. Bidding on nondusty jobs is very difficult. It involves the union contract and there are very few of these jobs. I would like not to have to solve all of these questions. My only function here is to raise them, and I think you ought to seriously consider them. This is not meant to say we shouldn't do it. Obviously we should do it. It has to be done with sensitivity. This is of extreme importance.

Let me give you an example of what I mean by the value of coordination of effort with existing facilities in the field. Leading personnel at the Appalachian Research Laboratory in Morgantown, who are currently studying this problem, have indicated to me that they cannot find nonsmoking coal miners. As a result, in my opinion, an undue overevaluation of the contribution of cigarette smoking to disability in coal miners has been tentatively suggested. In our own survey, on one Sunday, we turned up 74 men who had never smoked cigarettes and 30 of these had never smoked a cigar or pipe.

I am not disposed to give out bad marks for neglect. I believe it to be a futile exercise. I think too much of this debate is centered about who got there first and who is Johnnie-come-lately. Nor do I believe in agitation for its own sake over and above that necessary agitation that traditionally has been required for coal miners to draw public attention to their problem. Nor do I feel that this or any legislative body can look to organized medicine for help in this area. All we have gotten from that quarter has been a call for further studies couched in the most general terms, which in effect is analogous to the usual caution against sin and for motherhood, but doing little about the substantive issues that now confront us.

Really gentlemen, in historical perspective what we are talking about this morning is the relationship of the industrial system to Government and to the public's health. The history of that relationship is in some measure the history of this Nation. The industrial system, by its mastery of technology, has produced an affluence of material that despite problems of distribution is the envy of the world.

But our national ethic commits us to the principle of the sovereignty and sanctity of the human person. By what means is the health of our citizenry to be saved? The industrial system by and large has won an accommodation by Government to its needs that is highly favorable to it. I refer to mining rights, tax structures, use of the public land, railroads and highways. There must be some political force for accomplishing what the industrial system ignores.

When there is a conflict between industrial and human priorities it is Government which must assert the human priorities against the industrial need. The very survival of the industrial system itself depends on the assertion of this priority. Thank you.

Senator WILLIAMS. A powerful statement, Doctor. We are very grateful to you. You are very fortunate Senator, Senator Randolph, to have him as a constituent.

Senator RANDOLPH. Thank you. I suggested that we invite Dr. Hunter, as you know, to testify. I have known of his work in the fields he has discussed knowledgeably and helpfully with us today.

Just one question, Dr. Hunter. It comes back to Marion County where I have heard and read of a Dr. Higgins.

Now, I presume you are acquainted with the work that he has been doing that centers around the so-called breathlessness of miners and nonminers. Only because of what he has brought to public discussion would I ask you today, coming from the same County, to clarify this subject to the subcommittee.

Dr. HUNTER. Well, as to Dr. Higgins' study to which Senator Randolph refers, I am very familiar with. In fact, I was Dr. Higgins host in Marion County and introduced him to the people and I enlisted their cooperation with him so he could carry out the study.

He characterized the question in his paper as yes, there is an increase in breathlessness among coal miners as opposed to noncoal miners, but of a small magnitude.

My answer to the question is, "No. I don't agree with his findings." I think it would be unfair to Dr. Higgins, because he is not here and can't answer for himself, for me to go into detail as to why I disagree with him in terms of the content of his study, because I watched it being done and I think it did have weaknesses. But I think it would be absolutely unfair to him to comment now.

All one does in the absence of Dr. Higgins is point to the statement of Dr. Stewart this morning, data from social security disability statistics on coal miners by those criteria show that miners have more respiratory disability than nonminers.

I am impressed by the extent of their disability but my opinion is that his statement understates the case considerably. I would like to point out something else about statements made to the committee by certain people which I must have glossed over in my remarks; that coal miners' life expectancy is on the increase, and I think there is no question about this. And that this increase is comparable to the general population.

But what you must understand is that if the coal miner has five times the respiratory disability of the nonminer, you also have to understand that respiratory disability is like no other. Respiratory disability is the most agonizing kind, because respiratory death is preceded by 20 odd years of respiratory disability in some cases. And it is one thing to die at 75 of a stroke or a coronary after the productive life of a physician or U.S. Senator, and another thing to die after 20 years of breathlessness where you couldn't mount the stairs without stopping two or three times.

So I don't think you can just take crude death data on the coal miners. They may die in their seventies, but as Dr. Gough well pointed out, from 55 to 75 they are not like you and I.

Senator **Randolph**. Thank you, Doctor. I thought this was important to ask you, just as I asked Dr. Morgan this morning, whether he agreed with Dr. Rasmussen in reference to his thesis. There was a disagreement between Dr. Morgan and Dr. Rasmussen. Here there is disagreement between you and Dr. Higgins. And it is not confusing to us.

Dr. **Hunter**. Senator, that teaches you that the profession is not really a conspiracy against the laity. George Bernard Shaw said that.

Senator **Randolph**. What was that statement?

Dr. **Hunter**. George Bernard Shaw said of us doctors, we constitute a conspiracy against laity. All this disagreement among experts teaches us that is not so.

Senator **Randolph**. I thank you very much, Dr. Hunter, for your contribution.

Senator **Williams**. Senator Bellmon.

Senator **Bellmon**. Dr. Hunter, in your statement you mention the organization with which you are affiliated. I didn't catch the name.

Dr. **Hunter**. Well, I am director of the Fairmont Clinic which is an association of physicians, and the facility is owned by a nonprofit corporation of citizens of Marion County, analogous to the ownership of a hospital by a board of trustees, and it was that organization which invited Dr. Gough to this country.

Senator **Bellmon**. The organization is not affiliated with either management or labor?

Dr. **Hunter**. No.

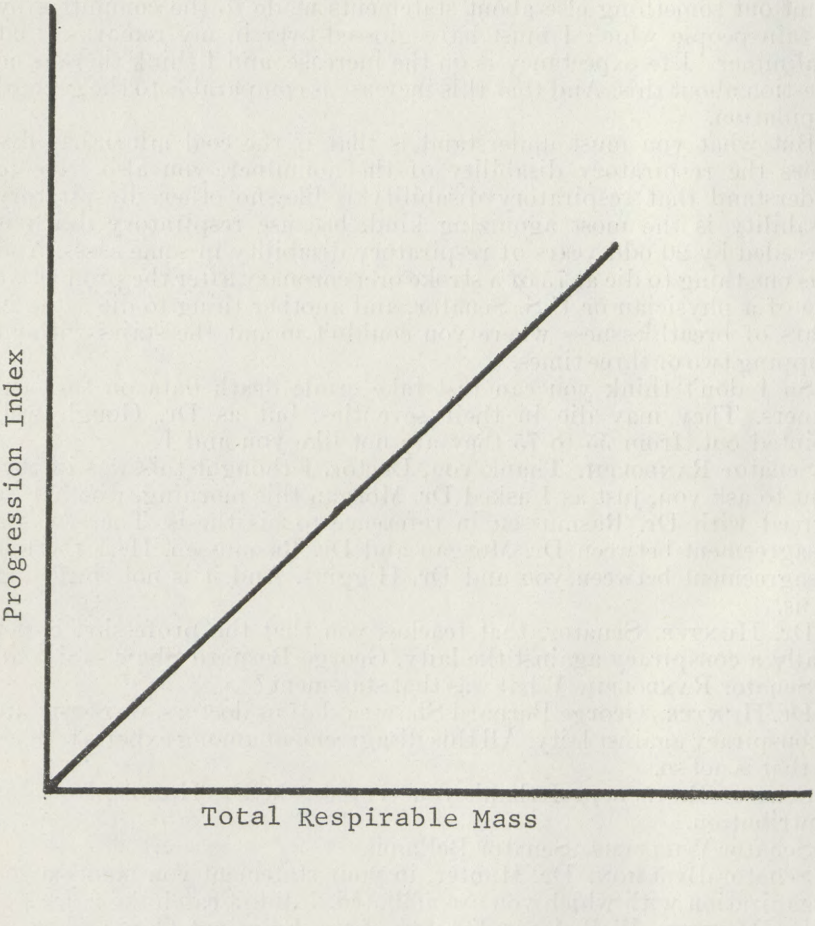
Senator **Bellmon**. I have no further questions.

Senator **Schweiker**. No questions.

Senator **Williams**. Well, thank you again, Dr. Hunter.

We announce now that on Thursday we will go back to what has been established as 9:30 as the starting time. Is that agreeable, gentlemen? It seems as though we get started more certainly on time when we start at 9:30 and then can get to other business after the hearing. 9:30 on Thursday. No hearing tomorrow.

(The table referred to on p. 726 follows:)



PHS Analyses of National Coal Board Data

(Whereupon, at 12:50 p.m., the hearing recessed, to reconvene on Thursday, March 20, 1969, at 9:30 a.m.)

COAL MINE HEALTH AND SAFETY

THURSDAY, MARCH 20, 1969

U.S. Senate,
Subcommittee on Labor of the
Committee on Labor and Public Welfare,
Washington, D.C.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 4232, New Senate Office Building, Senator Harrison A. Williams, Jr. (chairman of the subcommittee) presiding.

Present: Senators Williams, Randolph, Javits, Saxbe, Bellmon and Schweiker.

Committee staff members present: Robert O. Harris, staff director; Frederick R. Blackwell, counsel to the subcommittee; and Eugene Mittelman, minority counsel.

Senator Williams. We will reconvene the Subcommittee on Labor on our coal mine safety legislation.

We are honored to have our hearings begin this morning with Congressman Daniel Flood. I think your tenure dates back to 1944 in the 79th Congress, does it not?

STATEMENT OF HON. DANIEL J. FLOOD, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF PENNSYLVANIA

Mr. Flood. 1944.

Senator Williams. Carbon County, Pa.

Mr. Flood. Carbon is now one of my counties, Mr. Chairman. My base county is the County of Luzerne with Wilkes-Barre the county seat.

Senator Williams. I personally know from discussion with you how much you know about the subject today. We are honored to have you here. So you may proceed in your own way.

Mr. Flood. Mr. Chairman, you are very kind and very gracious, especially to let me go on as the first witness because I do have hearings in a few minutes.

I am especially pleased that you are acting as chairman because you are from the great State of New Jersey, practically adjacent and contiguous, over the hills, so to speak, from the anthracite coal fields in my district.

I did come here first in 1944. I was born and raised with the problem. My father was a coal miner. My great-grandfather was a coal miner. My grandfather was a coal miner. I worked on the outside, if you know what I mean, driving a "loci"—that is a small locomotive in the coal fields—hauling cars of coal after they surface although I never worked inside the mines.

I know most of the attention will be given to the soft coal, so-called bituminous. I know a number of the soft coal people are here this morning but I would like to point out to you, Mr. Chairman, who really do not know the mines too well, that in the anthracite coal fields, the hard coal, we have collie dogs who with their hind legs can scratch out bigger holes than they have in the entire soft coal bituminous fields.

I am pleased to see Senator Randolph here because it was his bill that I sponsored last year in the House and again this year in the House.

Now a gradual improvement in coal mine health and safety legislation was, of course, inevitable. Only the timing was questionable because the accident trends stabilize indicating that a new approach or intensified action under existing methods is necessary to again start the trend in motion.

Stability usually indicates stationary or complecency which is a dangerous situation regardless of the endeavor involved as we must progress, however slow the rate of progress begins.

For example, let us review coal mine legislation from 1932 to 1941. The fatality frequency rate over that period averaged 1.50 and the nonfatal rate was 72.78. This caused a wide public clamor for Federal legislation and the first mine inspection law was passed.

Now, the innovation of the inspection started the trend downward and the averages for the next 10 years were 1.18 for fatalities and 59.39 for nonfatal injuries. This clearly shows the results of new and converted drive on accidents, and it shows you what mine enforcement and mine laws, if enforced, will do, dramatic reductions in injury and fatality rate.

I am as sure as night follows day that that will happen again if and when the Congress in its good judgment makes this law.

An increase in disasters—you mark this—an increase in disasters during the period 1941 to 1952 again aroused public indignation, and the Federal Mine Inspection Act in 1941 was amended making certain safety provisions mandatory, authorizing Federal inspectors to close mines for infractions of the mandatory provisions.

Again, this new inspection legislation and increasing activity in mine safety activity had a very dramatic effect on the disaster rate as well as an incidental improvement in fatalities and nonfatal accidents.

Now, the next move we made was to bring in the small mine, those employing less than 15 persons underground and which number about three times those of the larger categories under mandatory authority because of the very high injury rate in these small pits.

Public Law 89-376 was passed in early 1966, and the effect was the reverse, although it was loudly and blatantly claimed by the small mine operators that half of those mines will be closed. Of course, that was unadulterated nonsense.

We said so at the time, and it proved so. Actually, very few were abandoned. Half such mines, they told us, or more, would be closed.

Senator Randolph. Mr. Chairman, could I interrupt the distinguished witness at this point?

Representative Flood is referring to the amended act of 1966. He will recall that in 1965 the Senate passed the measure but it was unable to be brought to passage in the House. During those 2 years, the matter was in the committees and in the Congress and there was intense study.

What you have said is true. It was necessary to strengthen and broaden the act at that time just as you come today with your persuasive testimony urging us to further amend and strengthen the act in 1969.

Mr. Flood. I might say, Mr. Chairman, that Senator Randolph is no newcomer to this kind of law and this kind of program. He was in the House with me, it seems like a hundred years ago now, but you know what we always do there. Of course, you are one. We bring you fellows in the House, train you, polish you up and put shoes on you and the first thing you know, you go to the Senate.

So, Senator Randolph went through these things with me a number of years ago. Now, I repeat, actually very few of these mines were abandoned, the small pits, and the number of fatalities and the fatality frequency rates were reduced I believe it was 40 percent in the first full year of operation under the amended act, the fatalities were reduced 40 percent.

However, the trend began to stabilize again as it always does and then this horrible and shocking Farmington disaster occurred which was widely publicized by all the news media. That spurred the public to again demand public health and safety law.

The health aspect, although receiving some attention over the years, becomes a focal point now in the demand for new laws to control airborne dust, since exposure to dust through the years was now becoming frequently evident in the increasing number of miners incapacitated with their lungs filled with this dust.

This undoubtedly improved legislation will result in improved mine health safety. Legislation, although necessary, is not the ultimate answer to any problem shown so forcefully by the number of highway accidents. Even though good highway laws exist in most States, and highway patrols cannot be considered remiss in the performance of their duties, accidents continue and they occur since human beings with their many frailties operate motor vehicles.

Thus, we must dig deeper to find the real solutions to our mine safety problems, Automation and coordination seem to present possibilities if these are used to the fullest extent.

Our ultimate answer probably lies in research whereby machine efficiency can be coordinated with effective safety. Unfortunately, too many machines, too many systems, too many methods in mining have been designed without incorporating the necessary safety measures, leaving these items to be added, and added as accidents and accidents make safety features necessary.

Now, in dust collection, methane remover and machine operator safety had received equal attention with the mining performance in the planning and design stages.

Our coal mining methods and machinery would not have required legislation to attain a safe and healthy working environment.

The solution to our present problem, then, seems to evolve into one of passing the legislation necessary, to provide the authority and the funds that are required to devise safe methods and equipment with the inspection necessary and to enforce, I repeat for the purpose of emphasis, to enforce the proper maintenance of what we know can be used safely.

Now, a few remarks about my own anthracite region. I am probably the only hard coal miner left in Congress today. There are approximately 260 underground coal mines and 150 strip coal mines operating today in the anthracite region of Pennsylvania.

These mines and related facilities employ close to 10,000 men and produce more than 12 million tons of coal annually.

I think you know that when I first same here we had 35,000 men working in the hard coal fields. Now, whereas employment and production have dropped gradually over the past years, the sale of anthracite still contributes a sizable amount to the economy of the area and to the welfare of its people.

The number of fatal injuries per million man-hours of exposure in the anthracite mines dropped a dramatic 60 percent between 1964 and 1965, and the favorable trend has continued through 1968.

The fatality rate in the anthracite mines was 0.37 in 1968, which is 73 percent less than the fatality rate for the Nation's soft coal mines during the same year, and there has not been a major disaster in the anthracite mines of Pennsylvania since 1959.

It is evident from these data that the anthracite mines are not contributing significantly to the unacceptable accident record in the Nation's coal mining industry.

Actually, the more favorable anthracite record is making the whole coal mining industry record look better. That should be looked at very carefully. Just because of the extraordinary record in the hard coal, those records should not be tagged onto the soft coal records and make the soft coal bad records look better.

Evidence indicates that approximately 15 percent of present and former bituminous coal operators in the United States are victims of a chronic chest disease known in the scientific world as coal worker's pneumoconiosis but more fequently referred to as the present black lung.

That is a new phrase to me during these recent disasters, black lung.

This is by no means a new problem since studies by the Public Health Service in 1933 demonstrated a large percentage of anthracite miners in eastern Pennsylvania were affected by a most serious lung disease which we call anthrasilicosis.

This disease was presumably caused by an inhalation of a mixture of anthracite and quartz. I am informed that the investigators at that time were unable to demonstrate a similar disease in American bituminous coal mining.

It was presumed that the low quartz content of bituminous coal accounted for the absence of the disease in bituminous coal workers. However, in the 1940's British and European investigators demonstrated clearly that bituminous coal workers do suffer from a chronic chest disease which they call coal worker's pneumoconiosis.

Little or no work was done in the United States on the definition of this disease until 1963 when the Public Health Service undertook a study of the prevalence of this disease in the Appalachian coal miners. Based on X-ray studies performed by this organization, it was found that approximately 10 percent of the active miners had evidence of pneumoconiosis or black lung.

The problem was even more serious in the inactive worker since almost 20 percent of this group was similarly found to be affected by this disease. In both groups there was a definite relationship between the prevalance for different age groups and the number of workers and the number of years worked underground.

Prevalence increased sharply among workers with 20 or more years of underground mining and in the over-50-years age group. Studies by other investigators both in this country and in Europe leave little doubt that the dust in the coal mine is the primary cause of this deadly, incurable, very disabling disease.

Other studies, and this point I have not noticed being marked very much, and it is a very important one, other studies point a rather disturbing picture in terms of the general health problem of our bituminous coal miners.

Statistical studies indicate that the death rate for respiratory diseases in bituminous coal miners was about five times that of the general male population. When this was compared with similar British studies it was evident that the death rate of the American coal miner was approximately twice that of the British miner for all age groups.

Another study based on disability claims to the Social Security Administration indicates that occupation respiratory diseases among coal miners is almost 10 times that which was expected, almost 10 times.

Thus, there is a severe health problem among our coal miners, both anthracite and bituminous. These problems will not be solved until sufficient research has been done to define the problem in specific terms, to develop the necessary control procedures.

Paramount among these problems is the necessity to learn how to control coal mine dust to that point where it no longer causes biologic changes in our coal miners.

I am told that other coal-producing countries have gone a long, long way toward the solution of these problems, therefore, I see no reason why the United States should not move ahead very rapidly in developing preventive measures.

In terms of disability, compensation, cost of compensation, the economic impact, this is without a doubt the most serious industrial disease problem in the entire United States at this time. Thank you, Mr. Chairman.

Senator WILLIAMS. Thank you very much, Congressman Flood. I will only take a moment. That was a very helpful statement. I will observe that the measures before the Senate are moving along through these hearings with dispatch.

We are working in parallel course with the House of Representatives. Legislation is moving there, too.

It is our earnest hope, based on progress in these hearings, that we will bring these measures to the floor without too much delay after the Easter period.

Mr. FLOOD. Senator, I hope you get your hope.

Senator WILLIAMS. I have just one observation. In your statement you referred to a study, which had not been brought to my attention before, that based on disability claims to the Social Security Administration, occupational respiratory diseases among coal miners is almost 10 times the expected number. Exactly what is the impact of that?

Mr. FLOOD. The point of this is that in Pennsylvania, this is how we unearth these figures, at least in my area, we have in Pennsylvania the Miner's Asthma Act, a special State law.

It calls for a certain percentage in the medical examination of the infection. The medical procedure, you take a large balloon or bag and the miner exhales into this, then a chemical analysis is made of the breath which indicates the percentage of infection, first degree, second degree, and third degree asthma, as we call it.

Now immediately, many of these men began applying under the disability section of the Social Security Act. Of course, that is a total and permanent disabilty act. There we found under different degrees of asthma whether or not they would be eligible for permanent disability under the social security law.

Of course, when the expectancy tables were made the social security statistics and experts were trying to prognosticate or project forward what could be expected as a disability rate for various types and kinds of industrial disease and they missed their point by eight to 10 times on coal mine respiratory infections which was this disease about which they did not know very much and about which we now know a great deal. That is a point.

These experts, these statisticians who almost were on the button down through the years on all other industrial occupational diseases missed coal mine pulmonary respiratory infections by eight to 10 times what they thought it would be.

How shocking, how prevalent, how unknown the extent of this infection was and how incurable.

As far as we know, there is no cure. It can only get progressively worse. It is a tragic thing.

Senator Williams. You have opened for me a new area of statistical background and a base for what we are trying to do here. I thank you very much.

Senator Randolph.

Senator Randolph. Mr. Chairman, Representative Flood, I recall your very important testimony on December 12, 1968, at the meeting called by then Secretary of the Interior Stewart Udall.

You spoke as one knowledgeable on the subject then, and you speak knowledgeably again today. Experience is a great fountainhead of knowledge, and certainly you are a person of real experience in the field of our consideration here today.

Therefore, your experience in the House and your contribution as one who is knowledgeable helps this subcommittee and I thank you very much.

Mr. Flood. You are very kind. I have complete confidence in you, sir, and the committee.

Senator Williams. Congressman Flood, do you have time for other questions?

Senator Schweiker. I just want to say I am delighted to have Congressman Flood here. I am one of the young fellows he helped train in the House. I hope he did a good job.

I want to say that Dan has been a great leader in this field of mine safety and health for many years. I think the thing that Dan brought to our hearings was the contrast between the anthracite and bituminous figures. We have had no witness testify to this.

I think it shows what can be done when you look at the anthracite figures and see what has happened. I see your point.

The point that the anthracite figures have diluted the higher figures from the rest of the coal industry is a very pertinent one. We ought to consider that when we look at the figures and maybe we ought to departmentize them so that they are not overlapping in the way you suggest. Thank you for coming here.

Mr. Flood. Senator, I am glad you are here because I am sure you will carry our message from Pennsylvania to the Senate.

Senator Williams. Thank you again, Congressman Flood.

Dr. Paul Gross.

STATEMENT OF DR. PAUL GROSS, RESEARCH PROFESSOR OF PATHOLOGY OF INDUSTRIAL DISEASES AND DIRECTOR OF INDUSTRIAL HYGIENE RESEARCH, DEPARTMENT OF OCCUPATIONAL HEALTH AT GRADUATE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF PITTSBURGH, PITTSBURGH, PA.

Dr. Gross. Honorable chairman and members of the subcommittee, I am Paul Gross, M.D., research professor of pathology of occupational diseases of the Graduate School of Public Health, Department of Occupational Health, University of Pittsburgh, and director of that department's industrial hygiene research unit, which receives full support from the Industrial Hygiene Foundation of America, Inc. (IHF), to conduct experimental and toxicological studies sponsored within IHF by industry and the Federal Government in the form of research contracts and grants.

I have served continuously as director of the IHF Research Laboratory since the laboratory's origin in 1948. Whereas a small portion of my time has been set aside for teaching graduate students in occupational health, most of my efforts since 1948 have been devoted to the conduct of research.

As a result of these activities, I have contributed over 100 articles to the professional literature on pathology of the lung and its relation to the materials encountered in man's industrialized, urbanized environment.

As a byproduct of my work and experience in this area, and also partly because of the fact that so few research pathologists have devoted their chief interest to the lung, I have been invited to participate in numerous scientific efforts outside of the IHF and university settings.

Senator Williams. Is it exclusively in the industrial coal mine field that you did your environmental studies work?

Dr. Gross. No, sir; I have worked with silicosis which, of course, is found in industries other than coal as well, and I have worked with emphysema which affects all categories of occupations; I have also worked with such dust as clay, antimonytrioxide, and a large number of other dusts of industrial importance.

Senator Williams. Do you, in your statement, particularize your study in terms of the coal dust that we are concerned with?

Dr. Gross. Yes; I am stating these facts in order to indicate that I have the experience and I am not talking through my hat when I make that statement.

Senator Williams. I am not suggesting that you are talking through your hat.

I want to know whether your studies relate exclusively or in part or not at all to coal dust.

Dr. Gross. Not exclusively. In part.

Senator Williams. What part? How many particles of coal dust or how many particles of silica?

How do you divide your research time, Doctor? Pathology is not centered upon coal dust and upon silica dust and the other things.

Dr. Gross. I don't believe one can separate the effect of various dusts by the dust.

Senator Williams. The only thing is that we are not legislating across the whole board of occupational disease, respiratory disease.

We are legislating only in this one area, the legislation at this time being legislation dealing with coal mines and coal dust.

Dr. Gross. Mr. Chairman, I realize that. What I shall say is pertinent to the subject at hand.

Senator Williams. It certainly will be if your figures and findings deal with coal dust, it surely will be pertinent.

Dr. Gross. Since 1963, I have been a member of the Threshold Limits (TL) Committee of the American Conference of Governmental Industrial Hygenists and have participated actively in its standards settings.

I have served as consultant to the Federal Government in making onsite inspections for purposes of evaluating requests for NIH grants for lung research and have helped represent the United States in international meetings concerned with pathology of the lungs. Approximately one-third of the funds received by IHF to support my research has come from the Federal Government.

I have been coauthor of publications with numerous scientists in Government and private universities and research institutions at home and abroad.

In 1964, at the request of the American Industrial Hygiene Association, I was coauthor with Prof. T. F. Hatch of the University of Pittsburgh, of a textbook, "Pulmonary Deposition and Retention of Inhaled Aerosols"—and coal dust, Mr. Chairman, is an aerosol. This book is the first of a series of scientific and technical publications sponsored by the Atomic Energy Commission.

I am a fellow or member of professional and technical associations too numerous to list here, most of which are related in one way or another, to pulmonary research, pathology, and the prevention of disease.

I was honored to be chosen as recipient for the Industrial Medical Association's Award for Meritorious Authorship in the field of occupational medicine in 1966.

In view of the fact that I have spent the major portion of my professional career in studying the lung and its reaction to environmental contaminants, I feel I am well equipped to discuss what we know and what is not known regarding the effects of coal dust, a major industrial contaminant, on the lungs, and to help the committee differentiate "facts" from "fancies" concerning matters now under its consideration.

In the course of my testimony, I shall give the committee my evaluation of the degree of risk involved in exposure of miners to coal dust in order to assist the committee in deciding on the relative seriousness of the existing health hazard, so that it can have a better basis for deciding which of the several alternatives open to it will best serve our work force and the public in general.

Whereas the testimony I shall give is my own, it also reflects the best judgment of leading scientists and professionals in this country and abroad. I am serving as chairman of a committee on the pneumoconioses in the American Conference of Governmental Industrial Hygienists and have been in communication with peers in Canada, Britain, Germany, France, South Africa, Sweden, and India, as well as the United States on the matters I shall now discuss.

First of all, disabling lung disease in a coal miner may or may not be of occupational origin. When it is occupational in origin, it is usually a particular form of coal worker's pneumoconiosis. CWP exists mainly in two forms: simple, and complicated pneumoconiosis. The complicated variety is more commonly termed progressive massive fibrosis (PMF) of the lungs.

Simple pneumoconiosis is not associated with disability or shortening of life expectation even though the lungs may be quite black.

However, men with severe or advanced simple pneumoconiosis have an increased risk of developing PMF. PMF may cause little or no disability in its early phases.

The fibrosis is, however, progressive and in its advanced stages, is associated with disability and a shortened life expectancy.

A study of over 1,400 British coal miners published in 1962 showed that about 4 percent had developed PMF of the lungs. A more recent study of West Virginia miners showed that less than 1 percent of 446 coal miners, who had not also worked in potteries, had PMF.

Senator Williams. What is that?

Dr. Gross. Progressive massive fibrosis of the lungs, another name for complicated pneumoconiosis.

Senator Randolph. May I interrupt?

Dr. Gross. Certainly.

Senator Randolph. You speak of the West Virginia study. Could you identify it? When and where?

Dr. Gross. Yes, sir. Study made by Prof. Ian Higgins who is now at Ann Arbor, University of Michigan.

Senator Randolph. When was it made, sir?

Dr. Gross. The report was published in, I believe, February of 1968.

Senator Randolph. Thank you very much. I want the record to show that there was such a study.

Dr. Gross. Chronic bronchitis and emphysema are lung diseases that are separate and distinct from coal worker's pneumoconiosis. Nevertheless, many coal workers who are breathless are disabled from chronic bronchitis and emphysema.

These two conditions are often found coexisting in the same lungs and are spoken of collectively as "chronic obstructive bronchopulmonary disease."

Chronic obstructive bronchopulmonary disease; namely, chronic bronchitis and emphysema, affects people in all occupational categories, including miners.

It causes disability and shortens the expectancy of life. Epidemiologic surveys showed that miners had a slightly higher risk of developing chronic obstructive bronchopulmonary disease than nonminers; but at the same time, it was found that cigarette smoking was a much more important factor than the exposure to coal dust in the development of this disabling disease.

It is possible to find miners disabled from chronic obstructive bronchopulmonary disease who have little or no evidence of pneumoconiosis.

Senator WILLIAMS. Have you ever found one, yourself?

Dr. GROSS. No, sir.

Also, it is common to find miners with severe simple pneumoconiosis (category 3) who have no disability attributable to the state of their lungs.

I am now quoting the work of Dr. Cochran of Great Britain having to do with the sampling of the 1,400 coal miners and the work done by Professor Higgins on 446 West Virginia miners.

From the point of view of preventive medicine, it is paramount to differentiate sharply between the pulmonary disability caused by PMF and that caused by chronic obstructive bronchopulmonary disease.

The disability from coal workers' pneumoconiosis can be prevented by preventing a simple pneumoconiosis from converting into PMF—and there is evidence that reduction in dust exposure plays an important role here.

On the other hand, for the prevention of disability from chronic obstructive bronchopulmonary disease, cessation of cigarette smoking is, in the light of our present knowledge, the most important step in that direction.

Mr. Chairman and members of the subcommittee, I would like to summarize by saying that I believe there is no dust which when inhaled is good for the lungs.

It is extremely important to lower the dust exposure to the lowest level possible.

It is also important to recognize that all pulmonary disability of miners is not caused by dust; that chronic bronchitis or emphysema should be recognized primarily as nonoccupational in origin, that an educational anticigarette smoking campaign be instituted to diminish the ravages produced by these diseases; namely, chronic bronchitis and emphysema, and hopefully to diminish the development of these diseases in miners' children.

There is no question but that disabled miners and their families should receive necessary economic support but a clear distinction must be made so that proper preventive measures may be instituted, a clear distinction between disability that is occupationally produced like complicated pneumoconiosis and the disability caused by diseases not occupational in origin such as chronic bronchitis and emphysema.

Senator WILLIAMS. Dr. Gross, we will try to be as brief as possible here.

I gather you have relied heavily on the studies of Dr. Higgins in your statement as it relates to coal miners?

Dr. GROSS. Only insofar as statistics are concerned, Mr. Chairman.

Senator WILLIAMS. May we get a little closer to home. You are from Pittsburgh. My information is that the Pennsylvania Department of Public Health reported in 1967 that 19,175 coal miners had X-ray evidence of coal worker's pneumoconiosis and 12,768 more were disabled by the disease.

Have you worked with the department of public health in Pennsylvania at all?

Dr. GROSS. I have had close contact with Dr. Lieben who was in the main responsible for the passage of that particular act.

Senator WILLIAMS. The findings in Pennsylvania are quite contrary to the findings that you report from Dr. Higgins on the incidence of coal miner's pneumoconiosis.

In Pennsylvania, the incidence is very high.

Dr. GROSS. Mr. Chairman, the figures you quote are for pneumoconiosis. The figures I quoted are for the complicated variety of pneumoconiosis which has only a 1- to 4-percent prevalence rate.

Senator WILLIAMS. Is the complicated pneumoconiosis disabling?

Dr. GROSS. Yes, and the simple is not.

Senator WILLIAMS. I think we are talking about the same thing. The figures I have, is that the disability in Pennsylvania from this coal worker's pneumoconiosis, are 23,768.

It must be rather reliable because in Pennsylvania there is a program of compensation and it is not just a study. It relates to compensation being paid for disability.

Dr. GROSS. Mr. Chairman, may I point out that the 23,000 people who are disabled have not been necessarily disabled because of the fact that they inhaled dust. That includes pneumoconiosis, disabling pneumoconiosis and the disabling chronic bronchitis and emphysema.

In order to differentiate the two diseases, chronic broncho pulmonary disease from pneumoconiosis, it is necessary to do pulmonary function tests which are far too expensive, I believe, to have been done on the basis of 23,000 people.

Senator WILLIAMS. Our figures show 8,535 men are drawing under the Compensation Act of 1955 in Pennsylvania because of the finding that it is coal miner's pneumoconiosis. That means, as I understand it, that their disease was caused by coal dust.

Dr. GROSS. Mr. Chairman, the reason for my presentation is to make a plea for a sharp differentiation between two entirely different diseases and the fact that the State of Pennsylvania is compensating these men is not a guarantee that such differentiation has been made.

There is an entirely different background of causation in the two types of diseases.

Senator WILLIAMS. It seems unlikely to me that in Pennsylvania they are paying money that should be paid only under certain conditions and paying it for situations that arise from other quarters that are not covered by the act.

I can't believe that that is possible. I am sure that there is more than one doctor, and I think Senator Schweiker will know a lot more about this, in the State of Pennsylvania.

Isn't there a panel or board of doctors that makes a decision on these things, Senator Schweiker?

Senator SCHWEIKER. Thank you, Mr. Chairman.

I think what maybe the doctor is getting at here is that you are just identifying one disease occurring in miners which is the direct outgrowth of coal mining.

Dr. GROSS. That is right.

Senator SCHWEIKER. You are saying that there are other miner's diseases with similar symptoms that may be identified by different ways from pneumoconiosis.

Is that correct or not?

Dr. **Gross**. That is correct. They may be identified as different diseases if the effort is made and, unfortunately, the effort is not usually made to differentiate the two.

Yet the two diseases have entirely different causal backgrounds.

Senator **Schweiker**. Were the figures you cited on results bases on autopsies or X-rays?

Dr. **Gross**. The chronic bronchitis and emphysema diagnosis is made reliably only by lung function studies. Pneumoconiosis is made reliably only by X-ray except when a lung biopsy is taken.

Senator **Schweiker**. Isn't there some medical difference of opinion over whether simple pneumoconiosis eventually is disabling or not?

You are saying it is not, but aren't there some physicians who say intermediate stages of the disease might have other undesirable effects when these stages are not quite identifiable as PMF?

Dr. **Gross**. Category 3 of simple pneumoconiosis, when it is uncertain whether it has gone into the complicated variety, may have symptoms.

Senator **Williams**. Senator Randolph.

Senator **Randolph**. Mr. Chairman.

Dr. Gross, prior to your testimony today, we have had several men of the medical profession as witnesses who are qualified to speak, as are you, because of experience and work in the areas that you are discussing with the members of the subcommittee.

There were differences of opinion among these men who testified. There were differences of opinion as to the validity of the findings of Dr. Higgins. You seem to think well of his work.

Mr. Chairman, is it my understanding that we will have Dr. Higgins testify?

Senator **Williams**. It is not my understanding. Is that your understanding?

Senator **Randolph**. I have asked that Dr. Higgins be invited to testify personally.

Senator **Williams**. I asked earlier and I received a negative. Now I get an affirmative from our counsel that Dr. Higgins will be here on Wednesday, March 26.

Senator **Randolph**. Thank you, Mr. Chairman.

The reason I ask whether Dr. Higgins would be testifying is because there are differences of opinion expressed by qualified medical people, including differences on some aspects of his West Virginia study.

Dr. Gross, I personally am not too discouraged by differing opinions because we can have our differences as medical men or as legislators on this subcommittee.

It is only when we are indifferent to the subject matter, when we are indifferent to the need for amending safety and health laws that I would become worried.

Now I ask you this question: Even though there are differences existing in medical testimony, do you believe that in the year 1969 the Congress should pass strong, well-reasoned, effective legislation amending present laws or perhaps adding a new body of law, at least in the health area?

Dr. **Gross**. My answer would be decidedly "yes."

Senator **Randolph**. Thank you, Doctor.

Mr. Chairman, I would like to ask Dr. Gross another question: Is all inhaled dust actually deposited in the lungs? Is that where it goes when it is inhaled through the mouth?

Dr. **Gross.** Dust that is inhaled in the lungs, a good part of it, is exhaled. Approximately 50 percent lands on the respiratory membrane, the membrane through which gaseous exchange takes place.

Now, of that 50 percent, some of it is cleared from the lungs. There is a self-cleansing mechanism in the lung and some of this dust which comes to rest upon the respiratory membrane is thereby removed.

It has been estimated by Policard, who is the dean of French investigators on pneumoconiosis, that a French coal miner during a lifetime of work of 30 years inhales approximately 6 kilograms of coal dust.

Yet, his lungs at death will contain only 60 grams. This means that the lungs are capable of eliminating 99 percent of the inhaled dust.

In other words, the self-cleansing mechanism of the lung is 98 to 99 percent perfect. Now, it is this 1-percent deficiency that causes pneumoconiosis. I think that answers your question.

Senator **Randolph.** Thank you.

Dr. Gross, we have been told that so-called lung clearance is effective or not effective, depending on conditions.

What is meant by lung clearance?

Dr. **Gross.** It is the ability of the lung to remove particles that have been deposited in the innermost recesses of the lung and then to be transported to the region of the mouth where it is either swallowed or spit up.

There is also another route and that is the dust that is deposited in the deep recesses of the lung is transported to the lymph nodes of the lung.

Senator **Randolph.** Thank you, Dr. Gross.

A simple case of black lung, you have indicated, can change to a complicated disease. Please give us an explanation.

Dr. **Gross.** Ordinarily, soft coal, depending on how much silica it contains, does not provoke the formation of scar tissue in the lung.

However, for reasons that are as yet not completely understood, when there is a large amount of dust in the lungs—it does not have to be coal, it can be clay, it can be silica—when a sufficiently large amount of dust is present the picture changes and scarring does take place.

The air spaces which are responsible for the gaseous exchange are destroyed by invasion of scar tissue and then one is simply dealing with an inadequate amount of lung tissue capable of ventilation.

Senator **Randolph.** Thank you, Dr. Gross.

We have heard discussion of other diseases that bear either directly or indirectly on this area of consideration—emphysema, bronchitis, and others. Is there any relation to dust in these diseases?

Dr. **Gross.** From an epidemiological point of view, there is a slight increase in the prevalence or incidence of these two nonoccupational diseases; namely, chronic bronchitis and emphysema, among miners than there is among nonminers.

Senator **Randolph.** Will you make a comment on how many miners you believe have pulmonary diseases?

Dr. **Gross.** If I were to accept as real, and there is no reason for me not to accept as real, the figures I have been given; namely, there are 130,000 miners, active and inactive, in the United States.

Also, I have been told that 50,000 of them are disabled. This is a percentage of somewhere around 40 percent.

On the other hand, surveys in Britain as well as here show that the percentage of cases of complicated pneumoconiosis is between 1 and 4 percent, probably closer to 4 percent.

Then of those 130,000 active and inactive miners, 1,300 to 5,000 would have the complicated or disabling type of pneumoconiosis. Subtracting those figures from the 50,000 disabled miners leaves around 45,000 coal miners who are disabled from causes other than complicated pneumoconiosis.

Senator **Randolph**. Dr. Gross, are pneumoconiosis and bronchitis and emphysema related or would you say there are distinctions that are apparent, insofar as relates to the coal miner?

Dr. **Gross**. Yes; the diseases are distinct both as to lung function and as to causation.

Senator **Randolph**. Thank you, Dr. Gross.

Mr. Chairman, this final comment before I conclude with the witness.

He mentions certain types of dust that come from occupations in addition to coal mining, such as quarrying—I am not sure he used that word—but limestone production.

I want the record to show that Public Law 89–577 was passed by the 89th Congress. That legislation was brought into being because we realized that we needed to promote health and safety in metal and nonmetallic mineral industries.

Thank you, Mr. Chairman.

Senator **Williams**. Just one observation, Dr. Gross. You did candidly say that the figures you used on the incidence of complicated coal miners' pneumoconiosis were figures that came to you. They were not your findings. Is that right?

Dr. **Gross**. Yes.

Senator **Williams**. Of course in later discussions here in the committee and perhaps on the floor, your reported findings of other people have to be put side by side with the findings of the U.S. Public Health Service, Dr. Stewart did testify last week. There is considerable variance.

The figures you reported were from other sources. Public Health Service reported that throughout the entire Appalachian soft coal mining area one out of every 10 active and one out of every five former miners had X-ray evidence of coal miners' pneumoconiosis. Senator Saxbe.

Senator **Saxbe**. Doctor, do you think there is an acceptable standard for dust in a mine? We talk about 3 milligrams or 4.5 per cubic meter.

Dr. **Gross**. Mr. Chairman, I am not qualified to answer that question at this time.

Senator **Saxbe**. Thank you.

We talk about the other deaths caused by lung problems. Where does coal dust stand in relation to, say, clay, asbestos, silica?

Dr. **Gross**. Senator Saxbe, the position of coal dust in relation to other dust depends upon its silica content. The higher the amount of silica in the dust, the closer it is to the hazard that pure sand dust poses.

On the other hand, coal dust without a significant silica content, that is less than 1 percent, would be about as harmful as clay and clay is considered a nuisance dust.

Senator SAXBE. In other words, the lung would expel better than the 98 or 99 percent on clay?

Dr. GROSS. No, the 98 or 99 percent is maximum.

Senator SAXBE. But the clay that remains in the lung does not have the irritating capacity.

Dr. GROSS. That is correct. And also, Senator Saxbe, a dust like bituminous coal without significant silica content has the ability to be spit up again once it has become deposited.

The proof of that statement is the fact that a coal miner who retires to the country will continue to spit up black sputum for years or for the rest of his life, indicating that the coal which has been securely locked in his lungs is gradually being given up.

Senator SAXBE. Thank you, Mr. Chairman.

Senator WILLIAMS. Mr. Blackwell suggests a question raised by your earlier computations and in part based on Dr. Higgins, I believe.

You said that 45,000 disability cases, pulmonary were not related to coal dust. Was that the figure you used?

Dr. GROSS. Mr. Chairman, that was based on the assumption that the 50,000 disabled coal miners is a correct figure.

Senator WILLIAMS. Are you saying that in the 45,000 residual figure, assuming 50,000 is accurate, the disability is not related to coal mining at all?

Dr. GROSS. Only insofar as the inhalation of dust from an epidemiologic point of view causes a slight increased prevalence of chronic bronchitis and emphysema among miners than it does among nonminers.

Senator WILLIAMS. Is this a synergistic effect you are talking about now?

Dr. GROSS. The nature of this effect of the inhalation of dust in the production of chronic bronchitis and emphysema is not known.

Senator WILLIAMS. Thank you very much, Doctor.

You are from Pittsburgh?

Dr. GROSS. Yes.

Senator WILLIAMS. That is a beautiful city. We are going back next week, to one of your coal mines. Which ones have you been in that you recommend for us?

Dr. GROSS. I have been in a J. & L., Jones & Laughlin coal mine.

Senator WILLIAMS. Is that near Pittsburgh?

Dr. GROSS. Yes.

Senator WILLIAMS. We will remember that.

Mr. James K. Rice, president of C. W. Rice & Co., also from Pittsburgh.

We welcome you before us.

STATEMENT OF JAMES K. RICE, PRESIDENT OF CYRUS W. RICE & CO., PITTSBURGH, PA.

Mr. RICE. Thank you, sir.

Senator WILLIAMS. Proceed any way you want to, Mr. Rice.

Mr. RICE. Mr. Chairman, members of the subcommittee, I am a chemical engineer by training and am president of a firm of consulting engineers and scientists who specialize in the study and solution of environmental pollution problems, particularly those relating to water.

My interest in coal mining originates professionally from my experience with the water pollution caused by acid mine drainage; further interest comes from my experience as an amateur aquanaut, and thus from a modest familiarity with the capability of man to survive and work in a hostile environment such as the sea.

Both of these interests led directly to our proposed application of life support technology to the mining of coal.

It has been noted previously in statements before this committee that fire and explosions, dust inhalation, water pollution, high sound levels, and cave-ins are major problems involved in mining coal today.

We are proposing that the use of an oxygen-free atmosphere in the mine, together with a life-support system for the miners operating the equipment, holds the promise of solving all of these problems except cave-ins; and even in this latter instance, of reducing the amount of nuisance falls.

Many studies made by my company and others have shown that the exclusion of oxygen from the pyritic material that is associated with coal will prevent reaction of the pyrites with water and thus prevent the formation of the acid iron salts responsible for acid mine drainage pollution.

In addition to the probability of eliminating the cost of acid mine drainage treatment plants, it is anticipated that the quality of the drainage that comes from the mine will be near to that of the natural ground water.

Exclusion of oxygen from the mine atmosphere will obviously prevent fire and explosion; but, just as obviously, it will require that men must mine coal using a suitable system to supply their breathing requirements.

Such a life support system, by its very nature therefore, excludes the inhalation of any dust-laden atmosphere. Thus, if it can be shown that men in life support suits can operate and mine coal in this oxygen-free atmosphere, two of the hazards of very great concern today may be eliminated.

In order to exclude oxygen from a mine, it is planned to seal the mine and to pressurize it slightly with an inert gas such as nitrogen.

Since ventilation by air is eliminated, the alternate drying and wetting that occurs in winter and summer, respectively, is prevented; since alternate drying and wetting is responsible for gradual fracturing of the rock roof, continual falls of loose rock will thus be significantly reduced.

Modern high-speed mining equipment generates very intense sound which also can be a health hazard. By working in a life-support helmet or suit and by communicating electronically, a large portion of this sound may be excluded from the miners.

Specifically, the Island Creek Coal Co., with Cyrus Wm. Rice & Co. as its systems engineers, has drawn up plans for a demonstration program in a test mine to determine the applicability of inert gas blanketing and the required life-support technology to deep coal mining.

It is proposed that this demonstration program be a joint Federal-industry project and hence, a formal proposal for a supporting grant has been submitted to the Federal Water Pollution Control Administration with review by the U.S. Bureau of Mines.

Conferences on the proposal have been held with representatives of both organizations, with representatives of the United Mine Workers of America, and in addition, with personnel of the Apollo Test Division of the National Aeronautics and Space Administration.

It must be emphasized that we are attempting to apply current life-support technology to mining coal with conventional modern machinery.

We do not know how well the available suits and life-support hardware will work in a coal mine, nor do we know how efficient men will be under such circumstances, nor what costs will ultimately be involved if the system is otherwise successful.

We will never learn these things unless we try, and that is what we propose to do.

We believe that we can learn these things within the constraints of the demonstration project as we have planned it. We hope that we will be able to get the necessary Government and industry support and to proceed with this important program. That is my statement.

Senator WILLIAMS. Very well. Yours is a most creative pioneering idea, Mr. Rice.

Senator Saxbe, of our committee, has taken an interest in the entire subject matter of this hearing but particularly in the possibility that you suggest. Senator Saxbe.

Senator SAXBE. Thank you, Mr. Chairman.

I am aware that you are an engineer and we do not expect you to have the knowledge of the pathologist, the doctor, as to the hostile nature of the environment which we have spent quite a bit of time on.

We developed here in these hearings I believe a conclusion that under the best conditions it still is a dangerous occupation with the danger of fire and explosion, of flooding, the danger of maybe not as rapid a death but almost as certain incapacitating illness and shortness of life by the breathing of the coal dust, about which you have heard here this morning.

Now, you have taken a rather adventurous jump to say that this is a hostile environment just as the man who is in space or the man who works in water, an environment that will kill him very rapidly.

This may not do it as rapidly but it still is just as hostile. I think we are all fascinated by new ideas. You have testified here that in projecting this you believe that this would give him the protection from fire, from explosion, from lung damage, from traumatic noise as well as preventing the shale, the fracturing.

Have you projected this to the point where you believe it to be feasible?

Mr. RICE. We believe on the basis of the information that is available from both the space program and from industry that there is adequate technology available to make the project successful.

As I tried to point out in my statement, there are many things to be learned. If we knew these today we would not be proposing a demonstration program.

We have to learn how well man can function in what will be even then a hostile atmosphere, since in the absence of his life-support suit it would prove most hostile.

Senator SAXBE. Do you believe that a suit like a space suit would be necessary or would it just be a breathing apparatus?

Now, a space suit constitutes a pressure problem. There would not be any serious pressure problem. He is not like a sandhog down there under pressure. So would it be a breathing apparatus or a space suit?

Mr. RICE. The type of suit to be used is one of the items to be determined, whether a suit or a simple covering over the head and the upper part of the body. In any event, a breathing apparatus would be used, whether carried by the individual or installed as a manifold that would supply several people from some central supply source.

There are engineering trade-offs to be studied. There are suits that have been developed by others and are currently in use in industrial hazardous atmospheres that are lightweight, impermeable to a noxious gas, for example, and that protect the individual while servicing certain fuels such as are used in rockets and while working in other industrial atmospheres that are dangerous.

How well these suits will wear in what is a very abrasive environment and how well they will work in the confined dimensions of working in a mine we do not know.

We do not know whether a man would be willing to work for a full day with simply a mask. There is much evidence that he would not. I know from my own experience in diving that a mask is a very painful thing to wear for an extensive period of time, such as working a full shift in a mine.

These are many things we have to study. We are convinced that from industrial programs and from space programs there is much hardware in the form of suits and life-support systems that we can use with proper adaptation to the problems in the mine.

Senator SAXBE. You say nitrogen is an inert gas. Is it expensive? Would it be difficult to maintain in the mine?

Mr. RICE. We do not believe so. Nitrogen is obtained simply from the air surrounding the mine by combustion with natural gas as fuel and removal of the carbon dioxide as a combustion product.

This is a simple and expedient method of producing a relatively impure but safe nitrogen gas that is used widely in industry for blanketing all sorts of processes where oxygen must be excluded.

The hardware for this is right off the shelf. The amount of nitrogen required to make up for leakage from the mine and to purge the gaslocks that would be necessary between the interior atmosphere and the exterior air, is modest.

Senator SAXBE. Would there be a locking system for your men and coal?

Mr. RICE. Yes, sir. There would be a locking system at the main entrance or whatever entrance to the mine is used. All entrances would be sealed in that sense. The material must be taken out through a lock.

There are very simple ways of doing this. One of the features I did not mention in my prepared statement that is part of our plan is the provision of what we have called way stations within the mine. These literally are refuges.

Much has been said about the possibility of using refuges in mines. We need them for this program simply to supply a place near to the working area in the mine that can be maintained in a normal air atmosphere into which the miner can go to eat, to remove his suit, or his helmet, and to make repairs to his suit or his breathing apparatus.

The way stations or refuges would be supplied with air from the surface, with communications, water, and other necessities independently of the mine.

Senator SAXBE. How important would be this control of fracturing, for instance, by eliminating temperature changes and moisture changes, humidity?

Mr. RICE. I am not a mining engineer. I have been told by men who are well experienced that the gradual fracturing of the roof is largely a nuisance that can be a problem since it tends to block passages.

We are not supposing nor proposing that the provision of this constant atmosphere within a mine would have any effect on major roof falls since this comes from structural considerations and not from a simple alternate wetting and drying action on the roof.

But the nuisance falls, are, I understand, a costly maintenance item for a mine.

Senator SAXBE. Now, as we leave what is directly a lifesaving, health area, at the present time we are all aware that the water pollution in the mining areas is an environmental factor that depresses the area, that has resulted in destroying of trees, of wildlife, fish, and has made the country bleak and certainly desolate.

Is there any question in your mind that this type of operation would prevent this sulfuric acid and other material from entering these streams as they do today?

Mr. RICE. The research evidence that is available indicates that it will be successful in doing at least most of that job. One of the things to be determined in the project is just how far it will go in that direction.

We believe that it will make a very substantial reduction in the acid; better than 90 percent. How far it will go beyond that, we do not know. There are many factors involved. For example, the amount of oxygen that will necessarily leak out from the suits or the helmet will be available to oxidize the pyritic material.

How important this will be must be determined. But on the overall evidence available, blanketing with inert gas will have a major impact on the quality of the drainage from an active deep mine.

Senator SAXBE. Now we know that there are certain gaseous mines that today cause explosions and fires. This methane gas has a value. Could it be salvaged?

Mr. RICE. It is interesting that you touch on that point. A large mine in a gassy field may produce as much as 16 to 17 million cubic feet of natural gas a day, methane. Under current practice this gas must be swept out by the ventilating system in order to keep the atmosphere in the mine from becoming explosive.

We believe that it will be possible to capture all of that gas and to have the mine operate, instead of in a nitrogen atmosphere, in a methane atmosphere. This is a later phase of the program that we have been discussing. It is definitely in mind since the 16 million cubic feet of natural gas a day has a value, of approximately $2,000 a day.

Even with methane in the mine we would be forced to provide nitrogen for purging the gaslocks that must still be at the entrance to seal the mine since we could not have an interface directly between an atmosphere of methane and the outside oxygen atmosphere.

Thus some nitrogen must still be provided for our system, even though the mine would contain only a methane atmosphere. The use of a methane atmosphere raises many engineering questions for which we do not have answers right now; this matter would be studied in a later program, as the one that we have proposed jointly with the Island Creek Coal Co., does not contemplate any experimentation in a methane atmosphere at this time.

Senator SAXBE. Would the absence of oxygen have any effect on the machinery, on the equipment, on the mine posts of steel, the roof hangers, and so on?

Mr. RICE. I will answer separately the parts of that question. Operation in a nitrogen atmosphere will pose no problem since, after all, our normal atmosphere is largely nitrogen.

The exclusion of oxygen may have an effect in reducing corrosion of metallic structures within the mine. Obviously, if it will reduce the production of mine acid the corrosiveness of the water coming out of the mine will be greatly reduced.

Senator SAXBE. I want to commend you and Island Creek and the Federal Water Pollution Board which is considering this grant and which I certainly hope will go through with it for your interest in meeting a problem by what I believe are the 21st century methods and not the 18th century methods.

Mr. RICE. Thank you.

Senator SAXBE. That is all, Mr. Chairman.

Senator WILLIAMS. Senator Randolph.

Senator RANDOLPH. Mr. Rice, you speak about the technological breakthroughs which you hope are on the horizon. How long have you been working on the subject matter you discussed with us today?

Mr. RICE. I have been working on this concept, talking to people about it, and drawing together details on it for almost 3 years.

Senator RANDOLPH. Mr. Rice, do you feel that we have been less than creative and not as resourceful as we should have been in the business-industry segment of our society from the standpoint of research on items such as you believe are very feasible?

Mr. RICE. I would hesitate to go quite that far. As with many events in a man's life there is a time and a tide that have come together and that is why we really are where we are.

A proposal such as this fell on many deaf ears 3 years ago. It does not today. The events that have transpired have altered a great deal of thinking, have placed an emphasis on problems that had not been emphasized before. I do not think there is any place to point a finger at.

Senator RANDOLPH. I have no desire to lead you to the pointing of a finger. We have discussed with the medical men a situation which apparently exists in this country. Apparently we are behind, several years at least, in the area of prevention of occupational lung diseases. I was asking the questions for that reason.

I think you placed it in proper sequence when you said that a series of events sometime bring us to a realization of the need for action.

Certainly we all understand the imperativeness of the problem of the need for a well-reasoned, strong solution to it at this particular time.

I remember a time when we tried to pass wage and hour legislation in the Congress of the United States. We were only asking for 25 cents an hour. There were some segments of industry that thought this was too much and that business would be injured.

All along the way we have these high spots in legislative history where we responded to need. When the so-called sweatshop situation came to the attention of Congress we dealt with it through the Fair Labor Standards Act.

Mr. Rice, it has been amended and amended and amended. We are going through the same situation with respect to the Mine Safety laws.

I agree with what you have said. We have these times when we must pay attention to special problems because of the catastrophic events. tragic events, which point up a very real need.

Is that your feeling?

Mr. RICE. Yes, sir; it is.

Senator RANDOLPH. Thank you, Mr. Rice.

Senator WILLIAMS. Senator Saxbe.

Senator SAXBE. Mr. Chairman, I just want to point out that at a time in our history when we are examining very closely our entire environment, I think that it is important, and while our hearing today concerns only coal mine safety, we are going to have to recognize that this hostile environment exists in many industrial areas which we are now accepting but we will not accept in the future; and that the lung is the means by which the hostile environment does attack the body and while the rest of our system can protect itself the lung is incapable of doing this.

So, while we came into this through the back door, or you have, through an effort to control the destroying pollution of our streams, it is going to result, I believe, in eventually correcting the things that we started to look into here, the poisoning of man through his lungs as well as his environment.

Senator RANDOLPH (presiding pro tempore). Senator Bellmon.

Senator BELLMON. Mr. Chairman.

I want to congratulate Mr. Rice on the creative thinking and the research which has gone into his proposal. It is one of the most revolutionary I have ever had the privilege to hear.

I would like to call attention to the fact that you have mentioned you have conferred with many organizations on the project and inquired whether or not you are getting cooperation from the different groups that you have discussed it with.

Mr. RICE. I certainly have been getting cooperation; yes, sir. I would say the proposal has met, certainly within the last year, with very considerable enthusiasm.

Senator BELLMON. And it is your feeling that the project is going to move ahead and finally be put into operation?

Mr. RICE. We have every hope that it will be.

Senator BELLMON. The reason I raise the question is to ask whether or not there are provisions in the laws we are considering or the amendments we will be making in these laws which will limit your ability to move ahead in this area.

For instance, if we adopt the standard for dust in the air, will this affect the work you do in connection with this project?

Mr. RICE. Not in the strict sense of the project, itself, since the men themselves will be operating with a highly purified atmosphere for their life supply.

Senator BELLMON. It seems to me if you provide a man with a self-contained breathing apparatus that the level of dust in the atmosphere around will be of very little consequence.

Mr. RICE. If our program is successful, that is correct.

Senator BELLMON. Let me ask another question.

This bears not necessarily on the work you are doing as relates to our law but how will you provide the oxygen for the internal combustion engines in the mine?

Mr. RICE. We would not use internal combustion engines in the mine.

Senator BELLMON. You will use electrical energy?

Mr. RICE. Electrical equipment.

Senator BELLMON. Thank you.

Senator RANDOLPH. Thank you, Senator Bellmon.

We are always stimulated by such testimony as you bring, Mr. Rice, and I thank you very much for whetting the appetite of the members of our subcommittee to work further with you in this pioneering. We will attempt to keep current. I am sure you will want to keep the subcommittee advised.

Mr. RICE. I will.

Senator RANDOLPH. There may be some experiments within the next week, 2 weeks, or 3 weeks, that come to focus. Please keep us informed. Will you?

Mr. RICE. Yes, sir; I will.

Senator RANDOLPH. Thank you very much.

Mr. RICE. Thank you, Senator.

Senator RANDOLPH. Representative Hechler, will you please bring your associates and friends to the witness table to testify at this time.

Congressman Hechler has been in attendance at all of our hearings and is here this morning to present his statement and also has with him some of our constituents.

Congressman Hechler, will you proceed to introduce your constituents from West Virginia.

STATEMENT OF HON. KEN HECHLER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WEST VIRGINIA

Mr. HECHLER. I point out also, of course, these are Senator Randolph's constituents. Whenever we discuss legislation of this nature, Mr. Chairman, we hear a great deal about the economic impact or technological feasibility.

I submit that this Congress should look at this problem from the basic premise of the individual human being, how it affects a human being, and then go on from there with the consideration of the other factors.

I think that process occasionally gets overlooked in writing legislation when people put emphasis on economic or technological or other factors, first.

Mr. Chairman, at the time of the Farmington disaster on November 20, 1968, West Virginia's distinguished senior Senator, the Honorable Jennings Randolph, made the very pertinent observation that when hearings on coal mine safety were held in the U.S. Congress it would be most appropriate to hear from some of those who actually have worked in the mines.

In addition to the active miners who will have some remarks to present and be available for questioning, we also have present three miners from Logan County, W. Va., in my congressional district—a county which produces about 10 percent of West Virginia's total annual tonnage of coal and has annually been among the four largest coal-producing counties in the Nation.

Logan County is also where Jack Dempsey as a young man worked in the mines when the miners were making a little over $2 per day.

Before introducing these gentlemen, however, the active miners, and also those miners who have advanced stages of pneumoconiosis and are currently disabled and not working, I would like to present to the committee three courageous ladies who are here today because of their deep interest in working for the future so that what happened at Farmington will not be repeated, and so that coal miners everywhere can live and work in a safe atmosphere which is not injurious to their health.

I would like to present first the cochairman of the Widows Mine Disaster Committee, Mrs. Sara Lee Kaznoski.

Mrs. Kaznoski, would you care to make a statement to the committee?

STATEMENT OF MRS. SARA LEE KAZNOSKI, COCHAIRMAN OF THE WIDOWS MINE DISASTER COMMITTEE, BARRACKVILLE, W. VA.

Mrs. KAZNOSKI. Mr. Chairman and the members of the subcommittee, today is 4 months since the terrible tragedy happened. Seventy-eight men are still entombed in the Farmington No. 9 mine, our husbands, sons, and fathers of over 135 children.

We must be courageous. We must carry on for them because if certain things had been done and everyone had acted for these men, they would still be here today.

You must all see that the laws are strengthened for the future of all the coal miners.

I, myself, care much for the individual, for the person. I care for each of you here. We are all human beings regardless of our profession. My husband was a coal miner since the age of 14. He put many, many years in the mines.

My father was a coal miner. My grandfather was a coal miner. My husband was injured twice in the mines. But still he was brave because he had a job to do.

It is very necessary that we have a good administration and definitely a strong legislation. As you all know, it is up to each and every one of you, from the Federal Government and in each legislature of States where coal mining is done as an industry.

There are several States throughout the United States who have coal mining as their chief industry and way of living.

One thing, too, one very important factor. We should reduce the coal dust. Coal dust not only causes explosions and takes lives but it causes lung diseases such as pneumoconiosis.

I have a brother-in-law here with me today, Mr. Frank Kaznoski, who is suffering from this lung disorder. He has worked in the coal mines for many years.

When we have all these evidences, why are you people so reluctant in debating about what you should do for humanity?

The men should not work ahead of air. Another thing, whenever a cable is broken it should not be taped, it should be vulcanized.

These are some of the things that cause lung disorders and fires and explosions.

We should all reach out to help others and in order to help others we are in turn helping ourselves.

The coal companies, as you can see, many of them are first in the Nation for production, so, therefore, from all indications it shows directly they are concerned with production before safety, before lives, and before health.

We are the ones directly affected, our families. Through our loss, through our recent loss.

The companies will say, "We want coal, we want coal, we don't care how you get it, but we want coal."

So there are pressures, there are pressures with the bosses, the section bosses, they are pressured.

I am not hostile, not in the least, because I care too much about each and every person. My purpose in life even after what we have all gone through recently, is to do all that I can in every way to help each and every individual.

My husband was a man of very few words. He was a kind man. He was a gentleman in every way. He was an image of a real humanitarian, he was really an image of what all America should be like. He loved all human beings.

Each and every one of the widows and mothers that lost the same as I have lost and the children in losing their fathers through this terrible tragedy do not want a repetition of what we have gone through.

Then, too, not only in a mass form of 78, but one by one taken, burned to death, crushed to death. My sister lost her husband and was left a widow with five children. Her husband was crushed to death some years ago.

There are men whom I know well and their families who have lost one or both legs. They have lost fingers, they have lost so much, so many parts of their body which God gave them which, if you would only stop to think, the coal operators and the Federal Government and these State legislatures could help how important all these things are to humanity.

There is so much that you all should do. Believe me, the voice of experience is a great teacher.

Rock dust is very essential. Oftentimes they have worked the mines without rock dusting because there was no rock dust. Then if there were rock dust it would be hard and it would be wet and, of course, it would be of no importance to keep down a fire or keep down coal dust which would injure your health and take lives.

Sometimes when the supply of rock dust in the mine was depleted, those men assigned to rock-dusting would be sent home. And yet, they did not send the other men home, leaving them to work under dangerous conditions, in the absence of the proper amount of rock dust.

Now, these are problems which are really your problems. Like I said, my husband was a man of a few words. But November 19, the last morning he came home from work, he called me to the basement because he always bathed at home. He said to me, "I have something to tell you." Probably all this had been on his mind for a long time. He was never one to worry his family. He kept things close to his heart.

But evidently this deeply concerned him. He said, "There is too much carelessness and too much gas." He feared for what might happen. They know as well as we know that there was a lot of gas. There was an awful lot of gas in that mine.

My husband has done nearly every job in the mine. He was a brilliant man when it came to mining. He cared for each and every miner in that mine.

If you don't help, after what we have gone through, then I would say there is definitely too much apathy. As I said, I am not hostile because I am a great humanitarian.

We have with us my brother-in-law and he may want to say something. His name is Mr. Frank Kaznoski. I thank you.

Mr. **Hechler.** Mr. Kaznoski?

Mr. **Kaznoski.** I have no statement.

Senator **Williams.** I would like to express my gratitude to Mrs. Kaznoski for this statement to us. It helps us, Mrs. Kaznoski, to do what our Nation is now demanding, the right thing for people working in the mines and for their families.

For from being reluctant to act, we are seeking your help so that we will be assured that proper action will come. Obviously, it is late, but better late, I guess, than never.

Certainly it is much too late for you, particularly, Mrs. Kaznoski.

Mrs. **Kaznoski.** You are right, Mr. Chairman, negligence is a crime. The company has caused wrongful deaths to our spouses.

Senator **Williams.** Senator Randolph.

Senator **Randolph.** We talk about the lateness of action. I saw a neatly printed sign the day before yesterday. It said "Give a damn. It is not too late."

I call attention to this, today because the attitude of the writer was that it is not too late, you can always reach another level of responsibility.

As we listen to Representative Hechler and those associated with his testimony today we are very grateful for their response to the suggestion that Representative Hechler indicated I made last November; namely, that people from the mines, the wives and widows, be heard. We are grateful that you accompanied Representative Hechler to this meeting.

Thank you very much.

Mr. **Hechler.** I think, Mr. Chairman, also perhaps Mrs. Snyder and Mrs. Rogers may care to say a brief word to the committee.

Mrs. Snyder.

STATEMENT OF MRS. NORA SNYDER, MEMBER, WIDOWS OF THE FARMINGTON DISASTER, MANNINGTON, W. VA.

Mrs. SNYDER. I feel our cochairman, Mrs. Kaznoski, has explained everything. We would like to see all these safety and mine health bills passed.

Senator WILLIAMS. Thank you, Mrs. Snyder.

Mr. HECHLER. And Mrs. Rogers.

STATEMENT OF MRS. MARY KAY ROGERS, MEMBER, WIDOW OF THE FARMINGTON DISASTER, MANNINGTON, W. VA.

Mrs. ROGERS. I haven't much to say. Mrs. Kaznoski said about all there is to be said. We do feel there should be stronger health and safety bills passed for all the miners. Of course, my husband is gone. Today is the fourth month. He is entombed in the No. 9 mine but I still feel that a bill should be passed for more safety for all the miners. Thank you.

Mr. HECHLER. Thank you, Mrs. Rogers, and Mrs. Snyder.

Mr. Chairman, these three gentlemen from Logan County, W. Va., who have advanced stages of pneumoconiosis, are here today. They have a combined total of 132 years of service in the mines.

Mr. Huda Bailey from Mount Gay, W. Va., Mr. Henry Mann from Amherstdale, W. Va., and Mr. Otis Ratliff over here from Davin, W. Va.

All of these three are now retired on advice of their doctors because of progressive massive fibrosis, which has been mentioned before this committee. This is a lung impairment.

It gives them only 15 percent of their normal lung function. Two of the miners are over 60 and one over 50. The three receive social security. Two of the miners took it at age 62 at reduced benefits. The other miner received his social security because of disability. Each of these miners has paid into the United Mine Workers welfare and retirement fund during their working days.

At age 55 under the UMWA's pension plan, a coal miner can retire and receive a pension of $115 a month for life. This amount, plus social security, provides the sole income for these miners except in the case of one whose wife is currently employed and provides a portion of the family income.

These men, Mr. Chairman, have spent their entire working lives in the coal mines. They have worked under some of the most extreme health and safety hazards and have the scars of their labors to prove it.

In addition to the large accumulation of coal dust in their lungs which reduces their lung function to 15 percent of normal capacity, they have suffered numerous other accidents during the course of their employment.

If anybody should know and be able to speak with some experience on underground mine conditions, particularly levels of coal dust, these men should, because they have been exposed to it all their lives, are now carrying quantities of it in their lungs.

These men probably cannot qualify for any additional compensation benefits that might be provided by any State legislation because they are no longer working and the statute of limitations has already expired.

While they will not directly benefit from subsequent health and safety legislation, they can and want by their presence here today to help in some way to provide increased health and safety standards for those miners now working under substantially the same conditions that forced them to leave the coal mines.

The most significant part of our deliberation today has been discussion of coal miners' pneumoconiosis or so-called black lung. These men have it, Mr. Chairman. They are slowly being strangled by it. It is an incurable disease, eventually killing its victim if exposure to dust is continued.

These men had to leave the mines or be slowly choked to death because of coal dust.

It is hard to tell the extent of their disease just by looking at them. Mr. Bailey looks very vigorous. The others look very vigorous and perhaps talk vigorously, also. I know, because I have participated in many discussions of many different types with them.

Senator **Randolph**. Representative Hechler, what are the ages of the gentlemen present?

Mr. **Hechler**. I think it would be useful for each of them to tell their name and age.

Mr. **Bailey**. Sixty-four.

Mr. **Mann**. Sixty-two.

Mr. **Ratliff**. Fifty-one.

Mr. **Hechler**. We have with us this morning, Mr. Chairman, a medical officer of the Public Health Service, Dr. Lawrence Osborn, who is a medical officer of the Bureau of Occupational Safety and Health of the Public Health Service Environmental Control Administration of the Department of Health, Education, and Welfare.

If it is in agreement with the committee, I would like to ask Dr. Osborn to administer a standard function test usually administered by a doctor in his office to give an indication of pulmonary function.

Basically, the test requires hopping up and down for a period of 2 minutes for a normal person. But it may be that Dr. Osborn will decide that this type of test is too much for the kind of condition they have.

Is Dr. Osborn here?

Dr. Osborn, do you want to proceed. Dr. Osborn wants to say a few words about the test.

Senator **Williams**. Yes; I would appreciate that. Dr. Osborn, maybe you can tell us the method of testing to be used here. Can you do this in comparison with someone who has not been exposed or someone who is not exposed to coal dust, or do you not need a comparison?

STATEMENT OF DR. LAWRENCE OSBORN, BUREAU OF OCCUPATIONAL HEALTH AND SAFETY, U.S. PUBLIC HEALTH SERVICE, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Dr. **Osborn**. You do not need a comparison. I am neither an expert in occupational diseases nor an expert in pulmonary physiology. I am a 2-year medical officer on active duty with the Bureau of Occupational Health and Safety. I was asked to be in attendance today because these miners were present with known degrees of physical disability, and might experience some discomfort as a result of their travels and the strain of testifying before this subcommittee.

I can, however, administer a relatively simple test that a physician might do in his office to demonstrate the gross status of cardiopulmonary function. The results might lead a doctor to order more sophisticated studies to determine the cause of any observed disability.

The test consists of taking a patient's pulse several times, which I have already done, to establish a baseline.

Then I will ask the patient to perform a simple exercise test. It can be walking up a ramp, hopping up and down for 25 times, or for a 2-minute period. In the literature there are several standard tests described. I am going to ask the patient to hop up and down 25 times. He may not be able to complete all 25 times. There is some degree of risk in doing this test with people who have such known impairment. I will ask the patient not to stress himself beyond very mild discomfort.

We have oxygen with us and the gentleman has consented to do it.

Then, after the patient has completed the exercise, I will take his pulse again. Then, I will wait a period of 2 minutes and take his pulse again.

The normal person after such a period of mild exercise and subsequent rest is back to normal with his pulse and respiratory rate almost always within 2 minutes and certainly within 5. I suggest this gentleman will not be. I am not familiar in detail with his medical record but I understand he does have a significant degree of pulmonary impairment. I will be happy to perform this test.

Senator WILLIAMS. Mr. Mann, could you come over here? Do these men exercise together at the same time?

Dr. OSBORN. No.

Senator WILLIAMS. Mr. Mann, will you come over here? Who else do you need, Doctor?

Dr. OSBORN. I am going to use the youngest gentleman, Mr. Ratliff, his age is 52.

Senator WILLIAMS. Do you want to come around?

Mr. RATLIFF. Yes.

(Demonstration conducted by Dr. Lawrence Osborn.)

Senator WILLIAMS. You are now taking the normal pulse.

Dr. OSBORN. I have taken it several times before so that there is a baseline established. The pulse rate is 64 which is low, well within the normal range. Between 60 and 100 is generally considered normal.

(Demonstration by witness hopping up and down 25 times after which pulse is taken. Pulse being taken again.)

Dr. OSBORN. His pulse is now 140. I would like to have him sit down.

Senator RANDOLPH. Doctor, what would be the pulse of the person not suffering from the disease who would have a 64 and then would go through the jumping motion? What would probably be at age 51 his reaction as to a higher pulse?

Dr. OSBORN. I am not familiar with all the scientific data. I would have to say, however, that 140 at this point might fall into a normal range. The crucial thing is now going to be to see whether it drops back down near normal within a 2-minute period. I instructed him not to push himself too hard.

Senator RANDOLPH. Yes; I remember your saying that.

Dr. **Osborn.** He was, however, and still is breathing visibly more than he was before the test. The interpretion of the results of these tests has a base in both scientific fact and clinical judgment.

Senator **Randolph.** Representative Hechler, I think it is very good for you to bring this type of demonstration to us in connection with our consideration of this problem.

Mr. **Hechler.** Thank you, Senator.

Mr. Chairman, were there any other questions that the committee cared to ask the doctor?

Senator **Williams.** We will wait while he is taking the pulse again.

Dr. **Osborn.** The gentleman tells me he feels exhausted. The pulse now is between 90 and 100 which is probably elevated above the normal for a man of his age. It is going back to normal more slowly than it would for a 52-year-old man in a dust free occupation, other factors being equal.

Senator **Williams.** You waited 2 minutes with the patient seated. Now, what would you normally expect on the return to an average pulse?

Dr. **Osborn.** I would expect a closer return to normal after the 2-minute interval. His normal was 64 under the circumstances. After 5 minutes this man was still not back to his normal pulse rate and breathing rate.

Senator **Williams.** Would a person without the lung problem be back to 64 after 2 minutes?

Dr. **Osborn.** In the absence of other diseases or disabilities, most likely, yes.

He would certainly be back to his normal within 5 minutes.

Senator **Williams.** Mr. Ratliff, I think your ordeal at this point is over.

Mr. **Hechler.** Mr. Chairman, briefly, I would like to ask also the other two gentlemen here, without taking the test, simply to describe very briefly to the committee the day-to-day effects of this disease.

The reason that the test was not administered to them on advice of the doctor was that their age has advanced to a state that it might be dangerous to administer such a test.

I would like to ask Mr. Mann and Mr. Bailey briefly to tell the committee how many years they have worked in the mines and in addition to that, what the effect of this is in their average day-to-day activity.

Mr. Bailey, do you want to come up.

Senator **Williams.** Mr. Bailey?

STATEMENT OF HUDA BAILEY, FORMER COAL MINER, MOUNT GAY, W. VA.

Mr. **Bailey.** I am a West Virginia coal miner. I have spent 50 years in the coal mines. When I first started it was in the horse-and-mule days. There wasn't too much dust at that time. But when this new equipment arrived and went into production it stirred up all the dust which is what is causing so much black lung and silicosis.

I ran a trip motor for 8 years, main line haulage motor. I have been in the smoke from these cables. I was on the electric force for 27 years.

I have seen all the equipment; torn down and repaired it all. So if there isn't something done for this dust in the coal mines around the State of West Virginia they are all going to die.

Senator WILLIAMS. Mr. Bailey, when was it necessary for you to retire because of your lung condition?

Mr. BAILEY. I retired last October a year ago.

Senator WILLIAMS. Then you were 62?

Mr. BAILEY. Sixty-two.

Senator WILLIAMS. You are not able to do any other work?

Mr. BAILEY. I am not able to do any other work.

Senator WILLIAMS. Your compensation now is the mine workers' fund and your disability payments under social security?

Mr. BAILEY. I get what we call the John L. Lewis pension and social security.

Senator WILLIAMS. That is what I meant; the John L. Lewis pension and social security.

You were not brought under the recently enacted West Virginia compensation law?

Mr. BAILEY. No.

Senator WILLIAMS. Is that what you were saying before, Congressman Hechler?

Mr. HECHLER. That is correct.

Senator WILLIAMS. What is your monthly return from those two programs?

Mr. BAILEY. I get $152 under social security and $115 under the other.

Senator WILLIAMS. Could you describe what normal walking in daily life does to you?

Mr. BAILEY. I can't walk too fast anymore. Where I live I use a coal stove, one of these little coal barges holds only two gallons and a half of coal. I can carry that 30 feet and have to sit down and rest. I have no air to carry it with.

Senator WILLIAMS. Senator Bellmon.

Senator BELLMON. During the time you were working in the coal mines were you furnished a respirator by the operators and did you use any kind of breathing device?

Mr. BAILEY. No. I never was furnished a respirator.

Senator BELLMON. When did you become aware that your breathing was becoming impaired? About how many years ago?

Mr. BAILEY. About 10 years ago my breathing went dead on me little by little.

Senator BELLMON. Even then you were not furnished a respirator?

Mr. BAILEY. No.

Senator BELLMON. Did you ever ask about the respirator?

Mr. BAILEY. I tell you about the respirator. The coal dust is so thick and heavy in the mine the respirator will choke up on you after a few draws. Then you can't wear it; you have to throw it off.

Senator BELLMON. Mr. Bailey, we had testimony from the doctor this morning that said even after the miner left the mine and did not inhale dust any longer he might cough up black dust for some time afterward.

Mr. BAILEY. I don't cough up anything. Mine is all solid, I guess, cemented over.

Senator **Bellmon**. You have been out of the mine now for some time?

Mr. **Bailey**. I came out last October a year ago.

Senator **Bellmon**. Has your condition improved?

Mr. **Bailey**. No.

Senator **Bellmon**. Is it noticeably getting worse?

Mr. **Bailey**. Some days it does; it seems like it chokes me up more.

Senator **Bellmon**. Are you able now to do any kind of work at all.

Mr. **Bailey**. No.

Senator **Bellmon**. That is all, Mr. Chairman.

Senator **Williams**. Thank you very much, Mr. Bailey.

Mr. **Blackwell**. Mr. Bailey, have you personally observed a roof-fall accident or been in the vicinity of one so that you would know the facts causing the roof fall?

Mr. **Bailey**. You mean like a peanut machine?

Mr. **Blackwell**. Yes, sir. Well, specifically when on a field trip to a Pennsylvania mine, I observed the roof-fall operation with the machine and the roof being bolted up. Yet, the statistics show that a great many of the single and two-men fatalities are in roof falls.

I wondered if you have familiarity with this. Do you know whether any of these roof falls occur where the roof is bolted with the steel bolts?

Mr. **Bailey**. It depends on the length of your bolt now. If you use a bolt 4 feet long and your mine top starts from 6 foot, that 4-foot bolt does not do any good. You have to have a longer bolt to hold the top above.

Mr. **Blackwell**. Regarding the one-man roof bolt fatalities included in the statistics submitted to the subcommittee by the Department, would you know, personally, whether these involve roofs that are supported with a bolt of inadequate length?

Mr. **Bailey**. No, I wouldn't.

Mr. **Hechler**. Mr. Chairman, Elijah Wolford here at the left has testimony on that later on. We can do that now or finish with Mr. Mann, depending on the committee's pleasure.

Mr. **Blackwell**. It can come in your planned order, Mr. Hechler.

STATEMENT OF HENRY MANN, FORMER COAL MINER, AMHERSTDALE, W. VA.

Mr. **Mann**. Mr. Chairman, I am Henry Mann. I am a coal miner, I have worked in mines 42 years, 3 months in one mine. I have been out of it 8 months. My hearing is bad.

I ran a cutting machine for 25 years. After running that I can hardly hear anybody. Any kind of legislation you prepare will help the men because the dangerous area in the mine in this day and time is in the face area, within 25 foot of the face.

That is the most hazardous place in the mines in this day and time.

Senator **Williams**. At the face?

Mr. **Mann**. Yes, sir; 25 foot of that face is your dust and everything. At times you can't see nothing or hear nothing or nothing else.

There is so much noisy machinery you can't hear it. I can't hear this day, gentlemen, on that account.

Senator **Williams**. So every danger that exists in the mine is accentuated right at the face?

Mr. **Mann**. That is right. That is your most dangerous area, 25 foot of that face.

Senator **Randolph**. Mr. Chairman, just one question.

How many years did you work as an active miner?

Mr. **Mann**. 42 years, 3 months.

Senator **Randolph**. Was all of this work done in West Virginia?

Mr. **Mann**. In West Virginia right in one mine.

Senator **Randolph**. That is in Logan County?

Mr. **Mann**. Yes, sir.

Senator **Randolph**. Mr. Chairman, I think it is very helpful for a witness who has had experience to testify.

Mr. **Bailey**. I had 47 years with one company.

Senator **Randolph**. These statements, Representative Hechler, are helpful to us. These are the men who have had the experience. We appreciate having the men come and discuss their problems.

Senator **Williams**. Mr. Mann, Senator Bellmon has a question.

Senator **Bellmon**. Mr. Mann, in the 42 years you worked in the mine, did you ever go through a disaster similar to the one we have heard described here this morning?

Mr. **Mann** At one time.

Senator **Bellmon**. Did it start at the face of the mine where you worked?

Mr. **Mann**. Started on the pillar line.

Senator **Bellmon**. On the pillar line?

Mr. **Mann**. Yes, sir.

Senator **Bellmon**. Do you feel that the reason for the disaster was an explosion that caused it?

Mr. **Mann**. Insufficient air.

Senator **Bellmon**. And a high level of dust?

Mr. **Mann**. That is right. They let the dust accumulate.

Senator **Bellmon**. This was because of a lack of ventilation in the mine?

Mr. **Mann**. That's right.

Senator **Bellmon**. This caused an explosion?

Mr. **Mann**. Sure it did.

Senator **Bellmon**. You were present when this happened?

Mr. **Mann**. I was right there. I was one who done some running, too.

Senator **Bellmon**. Were you actually injured in this mishap?

Mr. **Mann**. No; I wasn't injured but it was awful warm, brother.

Senator **Bellmon**. Do you note that the companies are being any more careful now to avoid recurrences?

Mr. **Mann**. You wouldn't have known it was coming because I had a flame lamp back on the timber. It had not been 15 minutes before the boss went through and he had checked it and the machine man had come through, he had cut it and he had checked it.

I went in there to help him shoot it. The drill was in there, the hydraulic drill was drilling with the boom against the top.

When it was against the top it made sparks against the top and it set the whole thing off.

Senator **Bellmon**. The safety checks had been made and it was pronounced to be safe?

Mr. **Mann**. That is what they said.

Senator **Bellmon**. It would seem, then, that the regulations are not sufficiently strict to assure the safety of the people who work in the mines.

Mr. **Mann**. That is it. That is your whole trouble. And the air is not sufficiently kept up. If you drive into place on 8-foot centers as long as you break up through 8 foot you have air. As quickly as you leave and drive on for the next 8 foot you don't have one bit of air and dust is all over everything.

You can't see nothing half the time. They do not put curtains on the face to push air up there. They say you are going to suffer for air until you get to the next break.

Senator **Bellmon**. Thank you very much.

Mr. **Hechler**. Thank you, Henry.

Mr. Chairman, I am advised by the doctor that Mr. Ratliff is just now coming back to feeling comfortable after the one minute of hopping up and down exercise. For a long period he had great difficulty breathing, at least 15 minutes.

I might say also, although I do not want to submit all these to the committee, this represents all the correspondence that Mr. Ratliff had with the West Virginia State Workman's Compensation Board in an attempt to prove that he had a compensable disease.

Senator **Williams**. You have, I estimate, about 50 communications in your hand. Is that about right?

Mr. **Hechler**. This is right. In order to prove it he had to on his own, at his own expense, go to a private hospital and have a rib taken out and have a biopsy taken of his lungs to get across the point that he had pneumoconiosis, which they call silicosis because it is the only thing that is compensable.

This shows you the kind of very strict standards, unfortunately, that our State legislation has.

I have with me also at the end of the table a member of the State Legislature of West Virginia, Robert R. Nelson, who introduced the Black Lung Compensation bill which recently passed the State legislature. I want the record to show that he is present.

Senator **Williams**. Now, do I understand that the examination Mr. Ratliff went through was going to the extreme in proving the disease? X-rays and functional testing, generally will do it, but if you really want to prove it you go in and have the biopsy?

Mr. **Hechler**. You have to.

Senator **Williams**. He did that and without success in terms of compensation, is that right?

Mr. **Hechler**. I think Mr. Ratliff ought to talk to that point directly.

STATEMENT OF OTIS RATLIFF, FORMER COAL MINER, DAVIN, W. VA.

Mr. **Ratliff**. I went to the doctors and kept going to other doctors.

I have two reports from the doctor at the Pulmonary Research Center that it definitely was silicosis. I have one from Dr. E. S. Hamilton.

About the third or fourth time, next to the last time, I went to the doctors they came by and told my lawyer, "The only way the Board will ever consider this case anymore is through a biopsy."

I had no welfare card. I had nothing. It costs me $1,332 to have a biopsy and pay the hospital bill. I thought if we could get something done about this, although if I didn't benefit, maybe it will help someone else.

They awarded me 40 percent silicosis as a result of the biopsy. I thank you all.

Senator WILLIAMS. That was silicosis.

Mr. HECHLER. This is right, because pneumoconiosis up to the recent passage of the act of the legislature was not recognized as a disease.

Senator WILLIAMS. Now that has been passed and signed into law. Is that right?

Mr. HECHLER. That is correct.

Senator WILLIAMS. In other words, today it would be different in West Virginia and there would be compensation?

Mr. HECHLER. I woud like to ask Delegate Nelson to comment on that.

STATEMENT OF ROBERT R. NELSON, MEMBER OF THE LEGISLATURE OF THE STATE OF WEST VIRGINIA

Mr. NELSON. Mr. Chairman, the recently concluded session of our legislature did for the first time recognize occupational pneumoconiosis as a disease, and classified it as such by law and provided that miners or others exposed to hazardous conditions where the inhalation of dust is heavy would qualify simply by exposure over a long period of years to be compensated for any disability.

Prior to the enactment of this legislation we had in West Virginia a law which was based on silicosis, and all the awards were made strictly on a determination of silicosis, which is dust, but not necessarily coal dust.

It was the result of a tunnel accident in West Virginia some 20 years ago that brought about the silicosis law. But the miners had to qualify under silicosis to receive compensation when in fact many of them, as in the case of Mr. Ratliff, had black lung.

We have now tried to reconcile this difference. We do recognize this now. We probably have enacted a stronger law, I believe, than they have in Pennsylvania on this matter but we do have what we feel is an adequate law on occupational diseases, but in terms of mine safety legislation and health standards we have a very long way to go and one of the arguments against mine legislation in the field of safety and dust control, especially coal dust control, is the argument you can't do this in one State and not in another because this makes it economically incompatible.

So the argument then is pass it on to the Federal Government, we need a uniform standard. This is where we stand in West Virginia in our fight for improved health and safety standards. Unless we have a uniform, say, dust level control we will have a long, hard fight in the legislatures, those that support it in enacting that kind of legislation. That is why I feel it is important that attention be given to the uniform dust legislation.

Mr. HECHLER. Not only uniform dust level to prevent, but also the kind of Federal standards for compensation that would make sure that the standards were uniform and preserve a high enough level from State to State.

Senator **Williams**. Senator Bellmon.

Senator **Bellmon**. I would like to ask Mr. Nelson a couple of questions.

The legislation you passed which makes it possible for miners who suffer from black lung disease to receive compensation, is this retroactive? Will this cover the men who have already retired?

Mr. **Nelson**. We have a statute of limitation in our State. Any miner who has been out of work over 3 years will not become covered under this act. It becomes effective July of this year. So you would say July 1, 1966.

In the case I believe of Mr. Mann, who has submitted a claim for pneumoconiosis, he submitted it this past February, he would qualify in all probability for a retroactive claim. We do have a 3-year limitation. I might add as a matter of information that if you have received an award under silicosis such as Mr. Ratliff here finally received, if he should qualify for an award under the new legislation on occupational pneumoconiosis, before they make that award they will deduct from that award the amount that he was paid for the silicosis award or any other compensatory disability award.

So, it reduces over all the amount that one might receive, which is greatly different, say, from social security benefits or something. They deduct that amount so it usually will come out maybe 60 percent on a 100-percent award if he had a first-stage award on silicosis in the past.

Senator **Bellmon**. This award is a lump sum and not a monthly payment of any kind?

Mr. **Nelson**. It will be a monthly payment but over the life of the payment these deductions for the first stage award under another claim would be deducted.

We also changed in West Virginia this time the flat rate per month of a fixed amount of the award under silicosis to an escalation proviso which we have now under social security, a kind of cost-of-living increase each year over a period of years. As the wage earnings go up, and as the amount the employee receives goes up, then the amount of his award will go up accordingly as they figure this on a formula basis.

Senator **Bellmon**. How are the costs of this program borne? Where does the State government get the money to pay the expenses?

Mr. **Nelson**. Paid by the coal operators into a workmen's compensation fund, with a contribution made by the State. These funds are maintained and expenses are paid out of the fund. In Pennsylvania I believe they are paid out of general revenue.

Senator **Bellmon**. This then becomes a payroll tax?

Mr. **Nelson**. It amounts to that, because the overall cost of the operation by the operator includes the amount he pays into this fund. That is picked up in the cost of the production.

Senator **Bellmon**. Let me ask another question: I am sure the State of West Virginia has a death benefit to pay the miners who lose their lives in an accident?

Mr. **Nelson**. There is a lump sum payment, but it is paid by the UMW welfare and retirement fund and not by the State.

Senator **Bellmon**. What is the level?

Mr. **Nelson**. It is $2,500 flat payment, plus a burial expense of $750.

Senator **Bellmon**. Do the survivors of the miners receive compensation over a period of time?

Mr. **Nelson**. Yes. When there is total disability or death there are benefits to widows and to children up to a certain age under the new law. Widows would receive $110 a month, the children would receive a fixed amount of money up until their 18th birthday while continuing in school. This is under the new act. Under the old program there is substantially less.

Senator **Bellmon**. Can you tell us what the level compensation of these ladies is as a result of the husband's accident?

Mr. **Nelson**. I saw the figures on this. I think the settlement was $90 for each widow and $25 for each additional dependent. I know the settlement in terms of the life expectancy of the widows was very small.

Senator **Bellmon**. How about the lump-sum settlement?

Mrs. **Rogers**. We get workmen's compensation of $90 a month plus the insurance, $75 a month, which really pays—the first payment was $300 and for 59 months, $75. The 60th month it is $200 some. We have no hospitalization after 5 years and we will only receive $90 a month after 5 years.

Senator **Bellmon**. Thank you.

And was there a lump-sum settlement?

Mrs. **Rogers**. $2,000.

Mr. **Hechler**. The $2,000 evidently was from a private insurance company.

Mrs. **Kaznowski**. We each received $1,000 from the United Mine Workers of America. But we won't get any social security or anything like that which our husbands paid into. We will have to wait for several years. I myself will have to wait 12 years. My husband was a good provider because we worked together on things. There wasn't any need because it didn't take that much to satisfy me. But now that he is gone, our husbands are gone, we certainly will have to make every penny count.

Mr. **Hechler**. Mr. Chairman, could Mr. Nelson supply for the record the specific answer to the question Senator Bellmon asked concerning compensation, to correct the record and indicate the specific figure?

Senator **Williams**. Not at this point, Congressman, but later could you get the ages of the miners who were lost, for the record.

Mr. **Hechler**. Yes.

(The material referred to will be found on p. 814.)

Mr. **Hechler**. Mr. Chairman, I also have Mr. Elijah Wolford and Mr. Elmer Yocum, who spent 20 and 23 years, respectively in the mines. Mr. Wolford is a member of the safety committee of Humphrey No. 7 of Consolidation Coal Co., site of the January 2, 1969, fire which trapped a number of men for several hours. Mr. Yocum is secretary-treasurer of the UMWA Local 1058, and a former member of the safety committee. He is on the temporary disabled list, as the committee can see, and will return to active duty when able.

I would like to ask Mr. Wolford to give a statement to the committee.

Senator **Williams**. Mr. Wolford.

STATEMENT OF ELIJAH WOLFORD, A COAL MINER OF MORGANTOWN, W. VA.

Mr. Wolford. Mr. Chairman, I have a prepared statement here. I am very strong in favor of fining the individual miner as well as the coal company, the operator.

Senator Bellmon. You say you are in strong favor of fining?

Mr. Wolford. Yes, sir; there should be a penalty for the individual miner as well as for the operators of the coal company. In the beginning Mr. Boyle was opposed to this. He testified before this committee: "Let it be known that I have consulted with the head of the Coal Operators Association and when he testifies before you today or whenever he testifies, he concurs, and the industry concurs that the penalty should be imposed upon the coal operators, and not the coal miner." Mr. Steven Dunn, head of the National Coal Association, agreed with him on this point.

I heard the president of the Consolidation Coal Co. make the statement that they did not put the dollar sign on safety. Now I agree with that. They have reduced this down to S. & H. green stamps.

I have a letter here from the president of the Christopher Coal Co., the division of Consolidation Coal Co.

> Dear Fellow Employee:
>
> During the month of August, Christopher Coal Company suffered three lost time accidents.
>
> Edgar W. Statler, shuttle car operator at Osage mine, received a neck injury. His hat caught a roof bolt and he was knocked out of the shuttle car seat.
>
> Lewis Snow, another shuttle car operator at Osage mine, received a fractured vertebra. He was thrown against the roof as the shuttle car he was operating ran over a roll in the bottom.
>
> This is the third lost time accident of this type to shuttle car operators at Osage mine this year.
>
> The use of good judgment and common sense cannot be over emphasized. Close clearance around moving equipment makes it necessary to stay awake and alert at all times to protect you and your fellow employees from injury.
>
> Charles Haas, mechanic at Arkwright mine, sprained his back while lifting a part for a machine. He missed two weeks work.
>
> These injuries are painful and costly. Safe Work Habits Will Prevent Injuries.
>
> * * * * * * *
>
> Due to accidents at Arkwright and Osage mines, they will not receive green stamps this month. Eligible employees at all other operations will receive 400 green stamps.

Senator Williams. I missed the point of the green stamps.

Senator Bellmon. They are given green stamps if they have a good safety record.

Senator Williams. A bonus for safety is given to the workers and the bonus is paid in green stamps?

Mr. Wolford. These are the 400 green stamps I received for the month of August last year.

Senator Williams. How do you qualify to get the green stamps?

Mr. Wolford. If the individual miner does not have an accident or his fellow worker does not have too many lost time accidents, then you receive the green stamps for that month.

Senator Williams. In other words, it is worked on a group basis. You work with a group.

Mr. Wolford. Yes.

Senator Williams. If there are no accidents within that group then you receive that bonus?

Mr. Wolford. Yes. It is at each individual mine.

Senator Williams. The entire mine?

Mr. Wolford. Yes. I think this mine employs 480 rank-and-file miners, somewhere near that.

Senator Williams. You, on the other hand, would penalize the worker, the miner, who is guilty of an infraction of the rules of safety, and fine him; is that correct?

Mr. Wolford. Yes. And also would have a penalty set for the operator.

Mr. Hechler. Mr. Chairman, I think Mr. Wolford might tell the monetary value over a year of this total amount of green stamps.

Mr. Wolford. $24.50, if I don't have an accident all year, and my fellow workers don't have an accident.

Senator Williams. Has that happened within your mine. Has it gone an entire year without accidents?

Mr. Wolford. No. It doesn't happen that we go a whole year without accidents. Although in 1967 we had five non-fatal accidents reported.

Now I am saying that the five nonfatal accidents reported, you say this is about 30 percent of the nonfatal accidents that really occurred at the mine.

Senator Bellmon. Are you saying now that some accidents are not reported because the miners want to go ahead and get the green stamps by keeping the record clear, is that it?

Mr. Wolford. No, that is not it. But I am quite sure that when a president of Consolidation Coal Co. can come in and say our accident frequency was down to eight, I think they would purposely forget to report a few in order to keep it down there.

Mr. Hechler. Mr. Chairman, may I interrupt to point out that last year, in 1968, in West Virginia, there were 3,845 reported nonfatal accidents, which means that nearly one in every 10 miners suffers a nonfatal accident of the reported type. What Mr. Wolford is saying is that many cases occur where the miners are encouraged not to report such an accident. So the actual violations of safety and the expense of the men is far higher.

Mr. Wolford. I will explain to you how they encourage these men not to report the accidents.

The only accidents that I can find Consolidation Coal Co. in my area reporting are lost time accidents. On several occasions at the mine where I worked men have been given light jobs. At times they have been brought out on the job with no duties whatsoever. Men who are not able to perform their regular duties are brought out and given real light duties. Some of them, just one particular case I know of, he just sat in a chair so that he would be there. He does not lose any pay so therefore it is not considered a lost time accident.

Mr. Blackwell. Under the reporting system it is not just the lost time accident that should be reported, is it?

Mr. Wolford. My understanding of it is that all accidents should be reported.

Mr. Blackwell. Even in a case where the man is able to continue on his same job but he has had an accident. That is a reportable accident.

Mr. Wolford. Yes, it should be reported.

Mr. HECHLER. I might point out, Mr. Chairman, the administration bill tightens this up a little bit. I was glad to set the requirement of tightening in the administration sponsored bill requiring the operator to report all accidents directly to the Bureau of Mines.

Mr. WOLFORD. I would like to answer the question you asked one of the other miners about the roof falls. The roof falls contribute to most deaths in the coal mines.

Mr. BLACKWELL. It is about 80 to 90 percent of the national statistics on fatalities, I believe.

Mr. WOLFORD. Now, the cause of this is in the Federal laws or the Federal Safety Code and State mining laws. Now the word "adequate" appears 34 times in the safety code, in the Federal Safety Code. Now this leaves a good bit of imagination to the individual inspector or member of mine management as to just exactly what is meant by "adequate."

I imagine you get a lot of differences of opinion in this room as to what is adequate and what isn't. I think that it is time now to point out that if the roof was supported adequately, like these laws point out it should be, then there wouldn't be any roof falls.

It is words like "adequate," "dangerous accumulation," "proper", and "safe" that cause several accidents in the coal mines today.

Mr. BLACKWELL. Now, talking about the roof fall causing a one or two man fatality, since that is where the great bulk of the fatalities are. Are those occurring in the case of a roof that has been shored up permanently? This is not questioning the adequacy of that but do these things happen where in the mine operator's judgment he has established a permanent roof support mechanism? Or are these occurring at the face of the mine before they have determined that permanent support bolts are to be inserted, while there are temporary supports there?

Mr. WOLFORD. I am not sure where most of the accidents occur from roof falls but they do occur all over the mine. Some of them occur on the haulage ways, some of them occur on the actual working face. So they do occur all over the mine.

In the mine where I work we have a twin bore machine. The tunnel is cut in an arch. They call it a self-supporting roof. It is not supported by any artificial means. Now there are tons and tons of this self-supporting roof that has fallen—it is not supporting itself. I don't think any man should work under any roof that is not supported by some visible means.

I realize that an arch will hold a small bridge up. I have seen that done. But you don't have anywhere from 600 to 800 feet of rock and earth piled on top of the bridge, either.

Mr. BLACKWELL. In the mines visited by the staff in Pennsylvania there are what I call entry passages, which apparently had been dug out, with roof supports put in there years ago; there were no mine operations there, and you go for 20 or 30 minutes before you reach the mining work area.

Do these entry passages have roof falls too?

Mr. WOLFORD. The entries that they use for the intake of air and haulage ways, they keep timber with crossbars, metal I-beams, roof bolts, falls in them are not too common. But in the headings that you use for the return air, that will be used as an escapeway in the event of a fire in the mine, quite a few falls occur in there. If you would go you would see tons upon tons upon tons of self-supporting roof down, so-called self-supporting roof.

Mr. **Blackwell.** That is roof falls occurring in the return passages? That is not at the working face?

Mr. **Wolford.** No, this is not at the working face. Mr. Mann said the most dangerous place in the coal mine today in at the working face. This is where the most dangerous place is from falls, fire, or what have you.

Senator **Bellmon.** Mr. Chairman, I would like to ask a question when he has finished his testimony.

Senator **Williams.** Have you reached the end of your direct statement, Mr. Wolford?

Mr. **Wolford.** Yes.

Senator **Williams.** Senator Bellmon.

Senator **Bellmon.** Mr. Wolford, according to the statement we have here you are a member of the safety committee of Humphrey Mine No. 7. Is that right?

Mr. **Wolford.** Yes. sir,

Senator **Bellmon.** How are you selected for this position?

Mr. **Wolford.** You are elected.

Senator **Bellmon.** Elected by the other miners?

Mr. **Wolford.** By the other members in your local union.

Senator **Bellmon.** Is this the only responsibility you have, or do you work as an active miner?

Mr. **Wolford.** I work as an active miner. The safety committee work is done aside from my other duties.

Senator **Bellmon.** Are you given time off from your other duties to perform the safety function?

Mr. **Wolford.** No. This must be done either during my work shift, for which I would not be paid by the operators, or afterwards.

Senator **Bellmon.** Can you tell us just how the mine safety committee operates? How do you go about deciding when the mine is not safe?

Mr. **Wolford.** First, you have to be acquainted with some of the mining laws, Federal and State mining laws. I think our rules say 5 years experience in the mine. When we go in we don't particularly pay too much attention to the smaller violations because we can get those things taken care of. But we go in and make a regular inspection, section by section.

Senator **Bellmon.** When you say we, you mean whom?

Mr. **Wolford.** There are two other members of this committee. It is a three-man committee.

Senator **Bellmon.** You make a regular inspection, you mean every day or every week?

Mr. **Wolford.** Since the Farmington disaster we have been trying to make one inspection every week, but in one 8-hour shift we cannot cover the whole mine, so we take different sections each week.

Senator **Bellmon.** How often would you inspect the same section? Do you get back once a month?

Mr. **Wolford.** I would say about once every 5 weeks.

Senator **Bellmon.** What does this inspection consist of? Do you have devices to test the levels of methane or dust? What do you do?

Mr. WOLFORD. We don't have any devices to test the level of the methane or any way you could get an accurate check on the dust. The only thing we can do is see if they are leaving an accumulation of dust on the floor of the mine. We can check to see if they are rock dusting properly, to see if the cables are installed properly, that the fuse in the cable isn't too high amperage. There are several things that we can do. Mostly we look for things that are an immediate danger to the men, like something that would cause an explosion, a fire, or something of that nature.

Senator BELLMON. Do you issue a report as to your findings?

Mr. WOLFORD. Yes; we write up a copy of our findings. One copy is given to the management at the mine and the other copy is retained by the chairman of the safety committee.

Senator BELLMON. What authority do you have if you find a condition that you consider dangerous? What can you do to see that it is corrected?

Mr. WOLFORD. If we find a situation that we think endangers the lives of the men, this is imminent danger, we can ask that the men be removed from the area.

Senator BELLMON. Have you ever found such a condition?

Mr. WOLFORD. On one occasion we found such a condition.

Senator BELLMON. And you made the report to management?

Mr. WOLFORD. Yes.

Senator BELLMON. Were the men removed?

Mr. WOLFORD. Well, we made this inspection on a Sunday afternoon. There were no men in this particular area of the mine at the time. We requested management not to put anyone in there to work until the condition had been corrected.

Senator BELLMON. Did management cooperate?

Mr. WOLFORD. Yes; they cooperated with us.

Senator BELLMON. Let me recap just a moment.

This inspection is made on a Sunday. It is made on your own time, you are not compensated for the inspection by the company?

Mr. WOLFORD. Not by the company. We are compensated for it by the local union.

Senator BELLMON. We had testimony before the subcommittee some days back that sometimes safety committees were reluctant to report an infraction of the safety standards for fear of losing their jobs. Is this problem in your mines?

Mr. WOLFORD. It has been a problem but I can say that has never been a problem with me. I have right here something near 190 violations and recommendations compiled over a period of about 3 months. So I don't think that calling their attention to these violations has had any effect on me. The threat of losing the job has not had much effect on me.

Senator BELLMON. It would seem to me if you had this many violations in this brief period of time that the company may not be as safety minded as would be desirable.

Is this your conclusion?

Mr. WOLFORD. These mining practices are not nearly as safe as I think would be advisable.

Senator BELLMON. I am sure that the men are vitally interested in safety, they are down there and their lives are at stake. Do you feel that the companies are not properly aware of the dangers or are not properly concerned about the safety of the men?

Mr. WOLFORD. I think that the men who are immediately connected with the mine are aware of the dangers in there, both rank and file coal miners and members of management. But I am sure that somewhere between the local management of a coal company and the true ownership there is a loss of communication somewhere. I don't believe that the true story is getting all the way to the top.

You asked about the differences in the mines. Now, safety in the mines has improved since Mr. O'Leary was appointed Director of the Bureau of Mines; since he has been in that job. It is visibly noticeable in the mine where I work. Since there have been some different changes on the method of inspection and things they do manage to keep up a little bit better. I would say they could do a lot better than they are doing. Unless you have some other questions that is about all the statement I would like to make.

Senator BELLMON. I am curious, perhaps Mr. Wolford would not wish to do this, it might not even be helpful, but I would be interested in this report of the infractions that he has in his possession and wonder if it would be of any value to have this in the record.

Senator WILLIAMS. I believe it would be helpful. Could you do that, Mr. Wolford?

Mr. WOLFORD. It could be done. They are quite lengthy.

Senator WILLIAMS. What would we want, the description of each?

Senator BELLMON. It would seem to me that if these infractions are being repeated time after time without any correction being made that this might have some weight as far as our ultimate decision is concerned.

Senator WILLIAMS. I think you are right. If Mr. Wolford could cooperate in that respect it would be very helpful to the committee.

Mr. WOLFORD. You would like to have this written up and put into the record; is that right?

(The material requested follows:)

IDENTIFICATIONS

Mr. Mark Sansone, General Superintendent.
Mr. Amick, Inside Superintendent.
Mr. Simmons, Mine Foreman.
Mr. Rozance, President of Christopher Coal Co.

WEDNESDAY, NOVEMBER 27, 1968

Need cable on 2 East Rock Duster—13 Splices.

Air in-mains trackmen cutting said air was so dusty trackman could not tell which way air was going. Trackmen do not know escapeways in mains.

10 Right and 2 West belt line dirty. 10 Right return dirty.

A–1 Duster: Duster Nip fused with wire tape fillers on nip holder check Duster? Corrected.

A–1 Bolter centerlizer out of alignment on operators side.

#9 Portal Bus not fused.

A–9 Tipple Dirty ground up coal dust on track for one car length.

Shuttle cars leaking oil B–5.

A–1 real bad.

B–5 not Rock Dusted last 70 feet Friday afternoon Shift.

Escape way at 7 South not walked.

Sections not Rock Dusting within 40 feet of face 3 South, 13 right B–5.

Spillage along 5 South Haulage.

Open pitch on clearance side 13 R.

Haulage not being watered regularly.

Men are to be notified in case of fire or fan stoppage or other danger.

Accidents to be reported to safety committee—Eddy Smith burnt hands turning heater switch off with heater on.

Try to get permanent markings pointing to air shafts off main line.

Phone to be moved to ends of tunnel.

31, 32, 33, 34, 35 Motors create to much dust (Health Hazard).

No wind up brakes, motors can not be parked without blocking. Skids should be carried on these motors but not on top of motor.

8 :A.M. Trouble with Phones not working.

10 :A.M. Empty and load loops not cleaned up A–9?

Met Amick.

No. 25 motor bad points and brakes. Corrected.

7–So. No jacks on miner. Corrected.

Lampmen had no respirators to give men. Talked to Bill Simmons.

Talked to Hersel L about water in 13 right escapeway. No results.

3 No. East load track spillage?

2 Ea. to 13 Rt. idle heading not dusted.

Didn't work Goodman loader Sat. Nov. 30.

Switch on No. 2–No. 3 track should be lined for No. 1 or No. 4 track instead of being lined for dump.

Put brakes between trips.

December 11, 1968—Safety meeting with Mark.

Ask for meeting with Rozance about crossing at tipple being blocked.

In case of fire put in Fire Boss Book.

Co. train men to operate bucket at shafts.

Section crews are not walking belts at the end of shifts.

Fire Bosses not enough time to cover whole mine?

Put on more rock dusters.

2 Ea. not setting breaker post.

Want 20 lbs. Fire extinguisher on Boore.

Put boards in escapeways where men have to detour.

Move miner back of last open cross cut at weekends.

Are they walking B–8 escapeway? Walked December 3, 1968.

Why is dispatcher turning off phones? Take switch out of dispatcher office.

Bosses not shutting down to Rock Dust.

Driving Boore sec. to far ahead of air.

Clean up coal dust and junk on bottom.

Put no more rock dust in walkway on botton.

Post out from under beams and bars 5 No. haulage.

5 No. west load track spillage.

Ask for all service gas mask for all men.

3 So. never cut clearence properly.

3 So. empty track dirty each direction from switch.

2 Ea. load track want 24 inch clearance all way to bottom.

5 So. sidetrack Number 2 track need cleaned up.

Mine coal today then clean up 5 So. Junction haulage.

Water down all haulage.

December 13, 1968—Met Mark

Talked to Mark about 10 Rt. melt dirty and need rock dusted.

Talked to Mark about safety grievances sent into district.

On Dec. 9 we sent in 3 grievances. One on putting fire extinguishers in insulated box or boot on tool car. One about 7 South haulage needs timbered and 2 S load track needs cleaned up and rock dusted.

December 17, 1968

Holley not putting on enough rock dust 10 right section.

3 N. belt drive wired up straight.

Need miner plub on Miner 3 N.

Put hose on rock dusters motor to blow dust off motors.

December 17, 1968—Rockdusting.

Met with Andy Morris, Mark, Amick on safety grievances. Mark told Andy Morris working around clock on rock dusting. Management promised us they will do a good job on rockdusting.

Timbering 7 South haulage Mark told us they will put up lots of I beams. They have up more than 30 beams now. Worked 18 men on it Sat.

Gas and Air Tanks.

Tanks are wrapped in rubber belts now. But they have insulated boots ordered. Should be here Dec. 19, Thursday or soon after.

Was agreed water will be put on haulage when needed.

December 17, 1968—Toured preparation plant

Need extra head lamps at tipple.

Loose coal under belt at entrance to tipple heavy coating of dust on structural steel beams. Corrected.

Poor lighting. Working on light.

Dust on top of housing of elevator shaft motor. Corrected.

Station 55 oil spilled on floor mixed with coal dust. Corrected.

Floor #62 entire floor needs cleaned up, grease and dust on floor near machinery. Corrected.

Distributer floor dust on top of control panel switches. Bare electrical leads to welders and boxes open. Corrected.

December 17, 1968—Tipple Tour

Extremely heavy coating of dust on everything in Blending Bin.

Dirty cat walk (loose coal) to slate bin.

Open flame oil burner at top of slate bin in heavy dust area?

Open grating along side of slate bin.

Coal on cat walk leading from slate bin toward dumping point. Corrected.

Dumping bin heavy coating of fine coal dust. Open electric connections. These boxes contain large amounts of fine dust in them.

Tunnel from dumping bin extremely dusty. Lights that do not burn?

Blending bin house containing electric equipment has about 4 inches layer of loose coal and dust on top of it. Corrected.

Stairs and landings leading to blending bin have loose coal on them. Corrected.

Basement of silo heavy coating of dust. Corrected.

Transformer yard gates open?

River dumping point. Control panel has doors open or removed. Corrected.

Untended open fire burning in 5 gallon bucket near loose coal also another 5 gallon bucket of oil sitting on floor about 10 feet away in open container. Corrected.

Open switch box same floor. Welding lead hung across top of stairs makes an ideal trip wire. Corrected.

No guard on chain and sprocket next floor up. Corrected.

Holes in deck floor below panel board. Corrected.

Loose coal on deck at floor cat walks. Head houses open wires at junction boxes. Corrected.

Steps need repaired from main floor to 2nd floor. Corrected.

Chains unhooked at top of ladder on cells?

Junk on floor below main deck?

Roof leaks on main floor near control panel. This could create hazard of electric shock when wet.

Cat walks need repaired to head houses loose coal on cat walks screws off of railings holding cat walks?

Head house have junk stored in them, also gear guards have been removed and replaced.

February 20, 1968—Met with Amick.

We told Amick to clean up and rock dust 10 Rt. belt line.

Told Amick to clean up 4 No. belt.

Told Amick to cut clearance A–1 tipple car spotter, and A–1 supply track.

December 23, 1968—Met Amick and Mark.

2 East need rock dusted. Corrected.

Found gas tank on bottom. Corrected.

Keep dinner hole and portal busses clean.

December 22, 1968—Tour Sunday.

Portal busses running in dust on track. Going into corders corner.

Need timbered about 3 block past rock dust loading point.

5 No. Junction rib sheared off coal and dust along track on wire side.

B 5 Switch take down bad rock.

1 block in by B–5 switch coal and coal dust in /X cut.

December 23, 1968—Met Amick and Mark.

X cuts full of coal and coal dust at water car switch.
Need new posts under beams at old B–5 tipple site on haulage.
Need I beams one block this side of old B–5 empty loop switch.
B–4 Junction. Coal dust on wire side and in X cut.
B 7 tail track loop recut man hole.
B–8 load track cut new man hole.
B–7 empty and load track lots of coal and coal dust all the way.
Tell dispatcher not to turn off radio while talking on phone.

December 23, 1968—Met Amick and Mark.

Give track men gas test and assign them their own safety light.
Talk to dispatcher about alerting men in case of fire.
Water on haulage 4 No. Swag 3 No. east.
2 Ea. over head belt float dust.
Between 340 and arches need scaled.
Bad top near 7 So. switch.

December 30, 1968—Federal inspector close out

Report on spot inspection Nov. 29, 1968, 13 Rt.
Reported on regular inspection monotor checked once a week.
19 air samples. 15,183,000 cu. ft. gas in 24 hrs. 1½ million cubic feet air per minute.
When one fan goes down every man out of mine in ½ hour.
All bosses and men doing a good job checking for gas.
Found 35 buggys coal in shoot A–9.
Twin cable on shuttle car 5 splices permissible.
7 buggy cables had 15 splices and taped places.
Have sec't. to write letter about not watering buggy road.
7 So. timber job supposed to be completed.
Talked to Mark about hand brakes on 35 ton motors.
Talked to Mark about oil leak and steering on No. 1 buggy and oil leak on No. 33 buggy.
Talked to Mark about fixing rock dust tanks.

January 8, 1969—Safety tour.

7 So. coal raking off cars low beams. #61 in. from track to beam.
7 So. beam need strapped.
7 So. no lights on No. 10 buggy.
7 So. need bumper fixed 11 B. U. Loader.
7 So. need gas and air tank rack tool car.
No. 3 portal bus need glass.
4 No. need gas and air tank rack on tool car.
4 No. lots of spillage all over section.
No. 26 motor no brakes, bad controller, reel messed up.
No. 2 portal bus no brakes.

January 2, 1969.

Met Johnny Stevens about tipple tour at tipple.
Met Bob Minor about 35 ton motor hand brakes.
4 No. transfer lots of float dust.
Walk and line A–1 belt.

January 10, 1969—Met Mark.

A–9 powder left on sec. between shifts where does Jim Wolf service safety light?
7 So. spillage loaded track.
Put car of gravel load track 7 So.

January 10, 1969—Met Mark.

Men cutting too much coal behind miner.
Spilling 3 No. East load track.
No. 7 portal bus need points fixed.
2 East not cleaned up.

January 10, 1969—met Mark.

Put nothing on load center.
Want coal out of 2 East load track.
Bolters track men to be given gas test.

January 10, 1969—talked to Mark.

Spillage 3 No. East load track.

A 9 leaving powder on sec. between shifts. A shift.

13 Rt. A or C shift never used rock dust or water on buggy road for whole shift, no rock dust on section for two whole days.

3 So. two splices in miner cable.

3 So. blocking in bean pump switch.

January 16, 1969—Talked to Mark about Bert Degauer whose crew went in with safety committee.

All men on crew testified only one man said Bert was an unsafe boss his testimony was that Bert hauled oil in portal bus.

Drove 45 ft. before rock dusting.

Doesn't put line curtain in idle heading.

Used only 9 bags dust in whole shift.

January 16, 1969—Talked to Mark.

Talked to Mark about marking escapeways. He said they were working on them.

Still spillage 5 So. haulage.

3 No. haulage cars dragging on bottom.

We told Mark haulage needed watered.

Told them to rock dust idle hds. between Nos. 30 and 70.

Hauling coal with one motor. No light on rear.

January 22, 1969—Met with John Rozance—Mark—Amick.

We asked Mr. Rozance about the back road at Maidsville—he said it was passable.

We asked Mr. Rozance about giving all men at No. 7 all service gas mask. He said why give men all service gas mask when men won't come to self rescue classes.

We talked about wetting down buggy road. He said he didn't see any thing wrong with putting water on buggy road.

We talked about where would be the best place to leave 200 lb. fire extinguisher. Mark is checking on that.

January 23, 1969—Met Amick.

Controller bad on No. 14 motor.

3 No. East Bore set gas on fire on the afternoon shift, Mon. Jan. 20. The safety committee was not told about that. That fire was put out with water from small hose on bore. It was entered in the Fire Boss Book but the safety committee isn't satisfied with the way it was wrote up.

3 No. East Bore set gas on fire on the cat eye shift Jan. 21, Mon. Safety committee was not told about it. We talked to men on 3 No. East sec. They said water would not put out the fire. They put the fire out with 150 lb. fire extinguisher. We were not satisfied with the way that was wrote up.

We asked Mark to alert the whole mines when there is a fire and not try and keep it a secret.

January 23 ,1969—Met Amick on tour.

Bosses not having fire drill.

3 No. East tipple slippage switch dirty.

3 No. East load track dirty.

3 No. East load track float dust.

3 No. East dead roller in conveyor belt.

Cut string off belt rollers. 3 No. East A–9.

No mat at buggy box 3 No. East.

A 9 spillage all over section.

A 9 belt dirty.

Rock dust on only one buggy, A 9.

A 1 check blower.

No post in No. 3 Hd. A–1.

A 1B shift, 70 feet. No rock dust.

January 23, 1969—Met Amick.

3 No. straight. No clearance empty loop.

Extra loader B 7 making lots of dust.

February 20, 1969—Met Mark.

Safety committee went to see Mark about keeping haulage watered Mark agreed to water haulage Sunday and Wed.

Loose ribs near 218 and other places along haulage.

Talked to Bud Sorrow about changing tram lever on goodman loader B 7 section.

Still cutting too much coal behind miners and bore.

Bolts loose on pan on No. 13 motor.

All escapeways well marked we are now marking from man doors to marked escapeways also marking wire switches with reflector tape.

February 21, 1969—Met Mark.

Back gate at Maidsville locked Tues. 21, Jan. Thurs. 23 Jan. Fri. 24 Jan. We want the gate left open during the week so ambulance can get in if some one is hurt it is about ½ mile to walk for the key.

No man holes cut on A 1 supply track. We want man holes cut as Section is drove up.

Why are they taking men to section and taking portal busses away? We want a portal bus on section at all times.

Men and forman taking portal busses off bottom with no brakes or lights we want this put in safety topic next week.

Water in escapeway 13 Rt. swag keep the big pump running.

Put this in safety topic:

Tell bosses and miner operator not to pile up coal behind miner.

February 21, 1969.

Friday 24, B shift dead latch lined for straight.

Friday 24, B shift one motor on empty trip—lost empty—knocked out 2 I beams 5 No.

Track men using one motor and it is next to rail car.

We want a motor on back of load trip coming out of 5 So. jct. No. East.

A shift moved miner out of No. 1 Hd. with plastic over monitor when they had the gas on fire Jan. 20.

February 21, 1969—Met Mark.

Keep rock dust on track train.

Section boss and men walk escapeway all the way to shaft.

Corders corner need timbered.

Timber portal track where fire was.

January 16, 1969.

December 11, 1968.

December 4, 1968.

Safety meeting with Mr. Sansone.

Discussion on part loads overloading and covering up tipples.

Gas and Air tanks not covered on tool cars.

5 South haulage 13 Rt. ditch needs covering.

7 So. escapeway has not been walked for 2 months.

700 platform built of boards hanging needs some work done on it.

Track men do not have first aid kit or self resucers.

3 N. E. spillage and poor rock dust job (cleaned up) bad buggy cable.

3 N. E. fletcher bolter leaking oil and Bad Cable—too many splices.

Spillage A–9 empty track—around switches—abandoned man holes gobbed.

Dispatchers shutting off phones through out mine.

Ax pick and hammer Saw on supply car or section.

Emergency brakes needed on portal busses.

Mark escapeways better and Air shafts.

No. 7 portal bus only bad controller No. 2 portal bus shunted.

Senator **Bellmon**. One other question, Mr. Chairman.

You mentioned under Mr. O'Leary conditions in your mines as far as safety is concerned are improved. Have you ever had any active participation on the part of the State mine safety authorities?

Mr. Wolford. That is a question I wish you had not asked.

Senator Bellmon. But we really need to know if there is a State enforcement agency and how effective they are.

Mr. Wolford. We have a State enforcement agency. When the State mining law comes, the same words as adequate, sufficient, it comes to a place where you can't put too much pressure on a company that you once worked for, a company which you bought stock in while you were employed by them, the same company that matched 7½ percent of your salary that you put into stock. There is a little bit of that going on.

I know I am not going to find too many dangerous conditions in a coal mine that I and my wife or son and daughter have stock in because I do want them to produce coal just as cheap as possible.

Senator Bellmon. So you feel there may be a conflict of interest between the State mine inspectors that keeps them from doing their job. Is that right?

Mr. Wolford. Yes. I would like to have Mr. Yocum talk to you on this. He knows more about this subject than I do. He was on the safety committee years longer than I was.

Mr. Hechler. Mr. Elmer Yocum of Jere, W. Va., who is employed at the same mine; he is now on the temporarily disabled list.

STATEMENT OF ELMER YOCUM, A COAL MINER OF JERE, W. VA.

Mr. Yocum. Gentlemen, I am an official of my local union; have been for the past 12 years. I am not certified by the State mine department as an inspector or as a supervisor. I am not certified by the Federal Government as a supervisor or a Federal inspector. I speak only by virtue of my experience in the coal mines. I have been through every condition in the coal mines from the sublime to the ridiculous in 31 years, 23 with the same company. From the best conditions to the worst. I think I speak with some authority.

Recently the 59th Legislature of the State of West Virginia passed a black lung law. That is fine; that was a step in the right direction. However, that affected only the miners in the State of West Virginia. We need a black lung law or a law concerning respiratory illnesses nationwide.

Now I have several recommendations that—I don't like to use the word "recommendations"—I have several items here that I would like to talk on concerning the conditions. Did you ask a question about the inspectors?

Senator Bellmon. I was asking about the effectiveness of any State mine inspection system.

Mr. Yocum. Yes. I have this further down here. But since you have asked I will talk about it now.

I don't know about all the companies but Consolidation Coal Co. has an incentive plan whereby a man who works as a supervisor in a supervisory capacity on any level, he may be only a supply clerk, but he may be a foreman, whereby they deduct 7½ percent of his gross salary and match that out of their pocket with the 7½ percent to make a total of 15 percent of his gross salary which they turn over to him in the form of stock; company stock.

Now he is making a good wage already and as time goes on and these stocks mature and he begins to receive dividends, realize dividends from these stocks, he takes these dividends and plows them back in in return for more stock. He is not held to a 7½-percent total, he can buy more if he wants to. He plows these dividends back in return for more stock.

Over a period of 10, 12, 15 years, that man has accumulated a pretty nice block of stock in the coal company.

As I say, it is compounding all the time, as you know. Then comes the time that this man decides that he wants to be a State inspector. Now he does not have to serve as a supervisor in order to be appointed as a State inspector. There is no law that says he does. However, if he has served as a supervisor it has a large bearing on whether he receives his appointment as a State inspector.

So he receives his appointment. As times goes on, there comes a time for him to come into a mine owned by a company in which he has stock and he is receiving dividends or possibly may have hidden those stocks and hidden those dividends he is receiving some way, some way, we don't know how he might hide them. As you all know, it is easy to hide them.

Anyway, he is called on to make an inspection of that mine. I don't think any man in here is naive enough to believe that that inspector is going to shut down a mine for a safety hazard and risk the censure of his fellow inspectors, lose his dividends, besides the repercussions he might possibly get from the State department of mines. Therefore, he lets it go over his head.

Does that answer your question?

Senator BELLMON. How are these State mine inspectors selected?

Mr. YOCUM. They are appointed by the State mine chief.

Senator BELLMON. How is he selected?

Mr. YOCUM. He is appointed by the Governor.

Senator BELLMON. That is all, Mr. Chairman.

Senator WILLIAMS. You talk from experience in Pennsylvania?

Mr. YOCUM. West Virginia.

Mr. HECHLER. The mine entrance is located just over the border in Mr. Morgan's district.

Senator WILLIAMS. I have it here, Mount Morris, Pa.

Mr. YOCUM. That is the mine entrance.

Senator WILLIAMS. So you go in on the Pennsylvania side but you work on the West Virginia side?

Mr. YOCUM. The main portal for the mine is in Pennsylvania. However, the coal comes out of a drift over on the West Virginia side. Therefore, it is technically classified under the law as a West Virginia mine.

Senator WILLIAMS. I wanted to get to this situation you described. Are the inspectors appointed by the West Virginia government or the Pennsylvania government?

Mr. YOCUM. West Virginia, because technically it is a West Virginia mine since the coal comes out in West Virginia.

Senator WILLIAMS. The coal does come out in West Virginia. You go in in Pennsylvania, but the coal comes out in West Virginia.

Mr. YOCUM. When you say me—I go in in West Virginia, where I am working, but the bulk of the men go in on the Pennsylvania side. There are just a few men going in where I do since I am a flatbed motorman and haul coal to the outside.

If there are no more questions about that, I have several other items which I would like to talk about. I can't go into all the hazards and things that we encounter in the coal mines, there are a thousand related variations. It would be too lengthy. But I am going to read off a few of the things we do need and at the end I am going to bring it to one basic focal point on which we need Federal legislation.

Now the Federal inspectors, as the law is, cannot make the coal company do anything. They don't have the authority. We need laws with teeth that will tell the Federal inspector, his boss can tell him to go to the coal company and go anywhere on or in that coal operator's property and don't say as it is now, "I recommend this" or "I recommend that." The coal company doesn't care anything about recommendations. Recommendation is a dirty word to me. We want him authorized to go there to say "do this," or "do that." We don't like the word "sufficient" inasmuch as ventilation is concerned, or "clearance," and a number of other things. We don't like the word "adequate," as far as ventilation is concerned. Instead of using the word "sufficient" we want so many feet, cubic feet of air per minute spelled out.

As technological changes come along it may be necessary to raise it from time to time, which would be left up, of course, to the Bureau of Mines and the recommendations of their inspectors.

We don't want "adequate" clearance, we want so many feet and inches of clearance. Again it would be left up to the Bureau of Mines.

These words such as "adequate," "recommend," and "sufficient" are too loose. They are as wide as a mountain. They leave too many loopholes for the company to creep through in order to save a few dollars.

We have another thing, and that is the matter of lack of braking on our trips. It used to be that a coal train was hauled by one motor weighing possibly 10 tons, or 12 tons, which was a big motor a few years ago, and they had maybe 20, 25 one-ton cars. It is a different story now. You have trains weighing in the aggregate of 1,000 to 1,500 tons, handled by two locomotives, weighing in the aggregate possibly with one motor fore and one aft, weighing in the aggregate as little as 40 tons, with the two motors up to a maximum of possibly a hundred tons, two 50-ton locomotives, one fore and one aft.

The only braking effort you have is on the locomotives proper. You have no braking effort through the length of the train. If you have to make an emergency stop you can't make it. On a level with two 20-ton locomotives or maybe two 30-ton locomotives on a level, after you get your speed up to 20 to 25 miles an hour, it will take you from 2,500 to 3,000 feet to bring that train to a stop. You are going to bring it to a stop if it is not an emergency stop. If you know where you are going to stop you can bring it to a stop at that time but in an emergency stop you can't. Therefore, it is out of control.

What we need, and there is no trouble putting it on there, you have two different types of braking systems. You can have air as we have on the railroad, or you can have electric brakes. We have air in our locomotives. It could be installed throughout the length of the train or you could use a simple device which is no more or less than an electric solenoid over each rail just exactly as a streetcar brake which you have seen, except it would not be operated by air. It is an electric solenoid. When you turn the power on, the electromagnetic system grips the rail and stops that particular car. It would only need to be energized by a switch from the locomotive and have that train under control all the time, not to be expected to run 3,000 to 3,500 feet to stop.

I will give you one instance. Last September where a man went to the United Mine Workers International Convention in Denver, Colo., and another motorman was put on his main line motor to take his place while he was gone, and they came out with a train of coal, I don't know how many cars they had on it but, at any rate, this man came around the curve and the top was falling. He grabbed his radio and said, "Hold it, Buddy, hold it." He did everything he could to stop; he couldn't stop. He went under the fall. The fall continued down on him and he was killed.

They had a perfunctory investigation. That is the only time they have an investigation, in case of a fatality. In fact, the safety committee is hardly informed even of an injury but on a fatality they have a perfunctory investigation. And at that investigation the outcome, which I understood by word of mouth, I didn't see the report, was that the man was killed because he didn't have his locomotive under control. Can you beat that? Can you imagine that?

Senator WILLIAMS. That meant they were putting the burden on him; he was going too fast. The fact of the matter was he was probably going at average speed but he didn't have the braking power to stop.

Mr. YOCUM. He didn't have the braking power nor do any of us. We are always out of control when we are hauling coal.

Senator WILLIAMS. Mr. Blackwell wondered whether the braking power is only on the locomotive, or are there brakes on the cars?

Mr. YOCUM. No; the brakes are not on the cars. The only braking effort we have is on the locomotive proper.

Senator WILLIAMS. Our staff counsel knows something about this, having been a brakeman. Could I ask Fred Blackwell what does this mean in terms of safety?

Mr. BLACKWELL. With brakes just on the locomotive, because of the weight of the coal cars, it would happen quite frequently that you would not be able to stop the train, even on a level. It requires an experienced man to know how little braking power he has. He starts very early and he won't always do it.

Mr. YOCUM. It is an everyday occurrence. Now it does not always necessarily mean that somebody is injured or killed. However, it does always create the possibility that when the train runs away and the locomotive is derailed and the cars are derailed and they come in contact with the high amperage trolley wire that runs within a matter of inches above the top of the car, you could in the turbulence created by the derailment, the turbulence would put in suspension coal dust, and with the fire being there from the high amperage trolley wire could conceivably, and may have in the past, all the evidence was blown away, but may have in the past caused dust explosions or mine fires.

Possibly that might have been the cause of the Farmington disaster, we don't know. Nobody knows yet until we get in there to see, but there is a definite possibility. Nobody who is not familiar with coal dust can appreciate the volatility of coal dust.

I had last year, shortly before this injury, a dust explosion underneath my motor out in the open air, on the outside. What happened there was that there was some loose coal spilled on the track and I happened to run across it and as I ran across it I had a slight spark from my wheels and I heard a "whoosh" and the fire and smoke and dust rolled out from under by motor. I had run 300 feet on up the track before the dust and the cloud of smoke had cleared away enough for me to set our workmen down there in the vicinity of the blast. Had that blast been on the inside where it was confined in all likelihood myself and possibly some more would have been killed or injured. You just can't appreciate the volatility of coal dust until you have seen it demonstrated.

And you can't appreciate the fury with which coal in its natural state and in the seam will burn. Coal immediately it is torn loose from the face, in its natural state, loses approximately 90 percent of its volatility. Just as quickly as it hits the earth, the pavement, the gases bleed off and it loses 90 percent of its volatility, but when the fire gets far on the rib of the side wall in 10 minutes that fire will be out of control and it will race up this rib, not only up this rib around that corner but back down, it will eat back into the rib. I have seen it eat back into the rib faster than you could cut it out with a powerful cutting machine. We had to work like the devil to outrun it to get under control. We only got it under control then because it was along an old heading that had been sitting there for many years and much of the gas had seeped off where the coal had become air slack, you might say. That way we were able to put that fire out. There were a number of fires that happened inside that if they didn't get to them in a matter of minutes they would get away, as happened in this case here at the Humphrey mine in January.

Now we have another thing, this self-rescue. Here is a self-rescue unit. This was demonstrated yesterday. I will show it to you again today.

Mr. HECHLER. It was demonstrated before the House subcommittee yesterday, Mr. Chairman.

Mr. YOCUM. This is what we know as self-rescue. This apparatus contains a chemical called hot powder. When you get into a fire you immediately put this on. You don't wait because carbon monoxide is a sneaky gas, no smell to it, as you know. It takes only two-tenths percent of carbon monoxide to be fatal.

Immediately you know there is a fire, you clip your nose shut with this nose clip here. You put this mouthpiece in your mouth. Before you do that you reach under here and you push this button in until it clicks twice, not the first time but the second time, it has to click twice. This energizes this unit here. This hot powder converts carbon monoxide to carbon dioxide which can be inhaled and exhaled harmlessly.

This machine is good for a half hour at 1 percent carbon monoxide. It is good for an hour at half that. However, at 2 percent carbon monoxide it is good for only 15 minutes. You can't go very far in a coal mine with the smoke so close in front of you that you can hardly see from here to that corner there, in 15 minutes.

This machine is our first line of defense now in case of a fire. I am not going to say, throw this away. We need to preserve the machine but not as a first line of defense.

We need and want the MSA–1. This MSA–1 will handle 1 percent carbon monoxide for 2 hours or longer and, in addition to that, it will handle smoke, it will filter coal smoke or any other kind of smoke up to 79 percent by volume indefinitely, up to 79 percent. Whereas, opposed to this machine, it will not filter out coal smoke or cable smoke, and coal smoke or cable smoke will kill you.

If you get one breath of cable smoke from this synthetic cable insulation they use now, you take one breath, the next one you don't get. If you don't get out of there and get in the air you will die.

We had one man die in West Virginia not too long ago that got into the smoke; he couldn't get his breath. You take that breath, it goes part way and stops. I have had it several times. And you will fall and then you begin to choke and gasp for your breath and finally, after a while you get it. Then you begin to cough and choke and the water will run out of your eyes and out of your nose. It is really bad stuff. It is worse than coal smoke and does not take much of it.

We don't wish to use this as the first line of defense. We want the MSA–1. The MSA–1 has a fullface mask that covers your face completely so that you can go through smoke or anything without having it in your eyes and you don't have to breathe it.

Mr. HECHLER. Let Mr. Wolford explain the MSA–1.

Mr. WOLFORD. The reason that we don't have the MSA–1 instead of the self-rescue is that the self-rescue costs approximately $4.50. The MSA–1 costs $85.50. You can't get them with green stamps.

Mr. YOCUM. Now, if I may go on.

Mr. HECHLER. We just have a few minutes, I understand. Is that right?

Senator WILLIAMS. We are still in session over there. We don't know how long. I have some questions.

Mr. HECHLER. If we may have permission also to put some material in the record.

Senator WILLIAMS. You certainly do.

Mr. YOCUM. I may have taken a little longer than I intended to take.

I have one or two more items I would like to mention.

What I am going to do now is bring it down to the focal point I mentioned to you to begin with. All these things can be taken care of if we have one simple law. We want the Federal Bureau of Mines, Mr. O'Leary, who of course you know, works under the Department of the Interior, we want a law that will give him the authority, as I said, to send his inspectors to the coal company and tell them not "I recommend," but to say "You do." "You do this" or "You do that." That will cover the whole thing. And then we will let Mr. O'Leary, or whoever is in charge, take it from there. I am sure Mr. O'Leary will do a good job. If he should be replaced, of course, there will be another man in there who will do a good job or he will be removed.

Senator WILLIAMS. Presently, there are three required inspections a year; is that right?

Mr. YOCUM. I am not sure what they require.

Senator WILLIAMS. That is what we have provided, I think all the bills provide that. The question is, Is that adequate?

Mr. YOCUM. No, sir. That is not adequate. I really don't know how you could have enough inspectors to make it adequate.

A coal mine can be cleaned up and be in perfect condition now, and 6 or 8 hours later it will be in an imminently hazardous condition for every man in there.

I know of one case a few years ago where a coal mine inspector stepped out of a coal mine, walked up into the superintendent's office and said, "This is the safest mine in the State of West Virginia." While he was talking, the mine blew up and killed 56 men. This was on May 12, 1942, in Osage, W. Va. The name of the inspector was Alex Brash, now deceased.

Senator BELLMON. Mr. Chairman, may I ask a question?

Mr. Yocum, you mentioned you don't feel any number of inspections will insure the safety of the mine. This is what you just said.

Mr. YOCUM. The point I wanted to make was that the more inspections of it the better.

Senator BELLMON. Do you feel that our law should specify a number of inspections? The problem is that if we do this, this number is met, we are going to have the impression that the mine may be safe when perhaps that impression is not accurate.

Mr. YOCUM. I don't think that your law should specify a certain number of inspections per year. I think that your Federal inspectors should have the authority to go there any time they think is necessary.

Senator BELLMON. Do you have an impression as to the effectiveness of State inspections?

Mr. YOCUM. Pardon me.

Senator BELLMON. What is your impression of State mine inspections? Are they effective or helpful?

Mr. YOCUM. Today?

Senator BELLMON. Yes; in the mines you know.

Mr. YOCUM. No, no; they are not effective. They do not do a good job. The Federal inspector does a good job when he comes there but he doesn't have the power to say, "You do this," or "You do that." However, the State inspector does have that power, but he doesn't do it. As Mr. Wolford will tell you, he has gone in the mine and I have gone into a mine immediately following a State inspector and found violation after violation, and I am not a trained inspector, nor is he.

Senator BELLMON. So your testimony is that the present State inspection system that exists—is this in the State of West Virginia or Pennsylvania?

Mr. YOCUM. West Virginia.

Senator BELLMON. It is not effective?

Mr. YOCUM. It is not effective. The State inspection is not effective.

Senator BELLMON. How many miners are there in Consolidation, the mine you gentlemen know so well?

Mr. YOCUM. The mine where I am employed? The last count I had at the local union meeting, it was 492 rank-and-file miners, and there are about 25 or possibly 30 supervisors, making a force of a few over 500.

Senator WILLIAMS. That is Consolidation Coal Co.?

Mr. YOCUM. Consolidation Coal Co. It is Christopher Coal Co., a subsidiary of Consolidation Coal Co., which, in turn, is a subsidiary of Continental Oil Co.

Senator WILLIAMS. That is one of the large mines. It seems to me with these large mines, that it would not be impractical to have more frequent inspections. With a large mine you could almost have an inspector in residence. It would be better than what our bill provides, a minimum of three inspections a year.

Congressman Hechler, you know about these things. Do more inspections make any sense?

Mr. HECHLER. Mr. Chairman, we need a will for safety, that is what we need, a will for safety on the part of Congress, on the part of the United Mine Workers, on the part of the operators, on the part of those who work in the mines. It can't be done exclusively by policemen or inspectors acting as policemen.

Senator WILLIAMS. Assume there is a will, there has to be a way. One of the ways is through inspectors, am I right?

Mr. HECHLER. This is one of the ways but we can't rely exclusively on an army of inspectors. We have to do other things. This is perhaps not within the scope of legislation, but I feel very strongly that if the United Mine Workers were doing its job and representing the men who are the ones who suffer from safety and agitating for the things that are needed, I think we would have more safety.

We need tough laws in the first place, effective laws, we need good administration of those laws by men like Mr. O'Leary and following up that we need a will for safety and an insistence that the human principles be adhered to rather than the emphasis we have had up to now on production and profits and things which bring return to the coal mines.

I would just like to summarize in 1 minute. I would like to ask consent that my entire statement be put in the record.

Senator WILLIAMS. It will be received for the record.

(The prepared statement of Representative Hechler follows:)

PREPARED STATEMENT OF REP. KEN HECHLER (D-W. VA.)

Mr. Hechler is accompanied by the following individuals:

1. *Active Miners.*—Elijah Wolford, Morgantown, and Elmer Yocum, Jere, W. Va., who have worked as coal miners for 20 and 23 years, respectively. Mr. Wolford is a member of the Safety Committee of Humphrey #7 Mine of Consolidation Coal Co., Mount Morris, Pa., site of the January 28, 1969, fire which trapped a number of men for several hours. Mr. Yocum is Secretary-Treasurer of United Mine Workers Local #1058 and a former member of the Safety Committee at this mine. He is on the temporarily disabled list and will return to active work when able.
2. *Widows of the Farmington Disaster.*—Mrs. Sara Lee Kaznoski, Co-Chairman of the Widows Mine Disaster Committee, Barrackville, W. Va.; Mrs. Nora Snyder, Mannington, W. Va.; and Mrs. Mary Kay Rogers, Mannington, W. Va.
3. *Miners Afflicted with Pneumoconiosis.*—Henry Mann, Amherstdale, W. Va.; Glen Adkins, Accoville, W. Va.; Huda Bailey, Mt. Gay, W. Va.; and Otis Ratliff, Davin, W. Va.

Mr. HECHLER. Mr. Chairman, at the time of the Farmington disaster on November 20, 1968, West Virginia's distinguished senior Senator, the Honorable Jennings Randolph, made the very pertinent observation that when hearings on coal mine safety were held in the United States Congress it would be most appropriate to hear from some of those who actually have worked in the mines. In addition to the active miners who will have some remarks to present and be available for questioning, we also have present 3 miners from Logan County, W. Va., in my Congressional District—a County which produces about 10% of West Virginia's total annual tonnage of coal and has annually been among the four largest coal-producing counties in the nation. Logan County is also where Jack Dempsey as a young man worked in the mines when the miners were making a little over $2.00 per day.

Before introducing these gentlemen, however, I would like to present to the committee three courageous ladies who are here today because of their deep interest in working for the future so that what happened at Farmington will not be repeated, and so that coal miners everywhere can live and work in a safe atmosphere which is not injurious to their health. Mrs. Sara Lee Kazonski is Co-Chairman of the Widows Mine Disaster Committee, and she has a statement for the committee. * * *

No nation in the world can even approach the United States in the tremendous speed with which coal can be mined, and the onrushing technology of the coal industry which defies imagination. I extend my congratulations to the officials of the coal industry, and to those Federal officials who have helped spark this successful research and development program.

Now the eyes and conscience of the nation are focused on some 144,000 human beings, the individuals who work in the coal mines. They are the forgotten men of American industrial development.

Whenever legislation of this nature is discussed, a lot of attention is put on the economics of the industry and what it will cost the industry to clean up the mines and take strict safety precautions. The phrase "technologically feasible" is used to describe limits beyond which some people claim it is impossible to go. There is a tendency to look at this problem in terms of certain entrenched forces and practices which some people claim are immutable. Therefore, some people claim we had better not do anything unless there is full agreement throughout the industry.

I submit that we ought to start with an entirely different premise—the individual human being. We ought to find out what is necessary to protect the life, the health and the safety of these 144,000 human beings who work in the coal mines. And *then* we ought to go ahead bodily and take the measures necessary to protect these human beings.

I believe we can not only achieve a high degree of health and safety for the individual coal miner but also keep the industry prosperous. I am encouraged in this belief by the progressive coal operators, the new breed of young and imaginative coal operators who are convinced that this approach is not only possible but essential for the survival of the industry.

Today, more than ever before, the people of this nation are concerned with their environment—how they live, the air they breathe, and the water they drink. That is why in recent weeks over 40,000 coal miners in West Virginia, against the opposition of their own union, rose up and said: "We want something done about these conditions, and the disease of black lung from which coal miners suffer." Some observers marvelled that the miners weren't satisfied just with high wages—they wanted freedom to breathe fresh air, and they were willing to give up their pay to fight for fresh air. The old rules of economics and politics are being swept away in the surging drive for a better life, for the dignity of the individual, for the quality of life which a human being lives here on earth. The coal miner has been watching the grandeurs of science and technology bring a new life to millions of Americans, and gouge out more coal per minute, while doing nothing to improve his health and safety. In fact, science and technology has brought greater threats to the health and safety of the coal miner.

In his message to the Congress on March 3, President Nixon expressed the determination of all concerned to end the fatalism which has gripped all associated with the coal mining industry, including workers, operators, inspectors, the Bureau of Mines, and Congress up until recently.

The administration bill, S. 1300, contains many excellent provisions, and many improvements over the bill which Senator Williams introduced, S. 1094, as a companion to a bill I originally introduced in the House. There are also some provisions which I frankly feel merit improvement.

The main point I want to make, Mr. Chairman, is this: year after year, we have compromised this issue at the expense of the human beings who suffer the consequences of injury and death in the coal mines. We have allowed loopholes to be driven into the legislation which have made a mockery of effective mine safety regulations. Down through the years, we have tolerated a Bureau of Mines which has been subservient to every special interest except the man who mines the coal. The Bureau of Mines has been moribund, a colossal failure when it came to protecting the men in the mines, production-oriented, filled with dead wood, backward and bureaucratic, stifling the initiative of any imaginative official, leaderless, having the backbone of a chocolate eclair, and rarely challenged either to do its job or seek more effective tools to do a better job.

Each of us remembers what we were doing on a red-letter day. I recall talking with two or three officials on the day of the Farmington disaster. Director O'Leary was easy to reach, and he ticked off clearly and crisply what had to be done to strengthen the enforcement of existing regulations, and what needed to be done in the future. To a friend of mine, all one official could say was: "This was a great mine, it produced 9,600 tons a day." High up in the Department of the Interior, another official warned me on November 20: "Don't let an accident like this excite you. After all, nobody did this on purpose. And please, Mr. Congressman, don't indulge in any recriminations against anybody on account of this."

In discussing the provisions of various bills, I think it would be simplest if I referred only to one bill, the administration bill, S. 1300, and directed my comments to what I consider to be the strong points, weak points, and points which might deserve to be included in legislation recommended by this committee.

1. I like the idea of providing minimum qualifications for inspectors, as contained for the first time in the administration bill. However, I believe the language of Section 405 on page 82 is worded in such a way as to be prejudicial against inspectors being drawn from the ranks of miners.

2. The administration bill provides for a minimum of three inspections a year for each underground mine. (p. 9, Sec. 103-a.) This is a stronger provision than in the other recommended bills. Perhaps it might be strengthened even more by writing in a provision than more frequent inspections be made at those mines which show a higher than average accident rate or a higher than average series of safety and health standard violations.

3. I am pleased to note that the administration bill contains the same criminal penalties as in my bill (S. 1094)—twice the monetary penalties contained in the Johnson Administration Bill or the UMW-drafted safety bill. This means a $10,000 criminal penalty for the first wilful violation, and $20,000 for the second offense. I agree with Secretary Hickel that the higher criminal penalty is a better form of deterrent for that type of violation.

4. Secretary Hickel has referred to the "bill's single most important feature" as the provision empowering the Secretary to promulgate and develop by regulation mandatory health and safety standards for all coal mines. I agree with that statement. Rapidly advancing technology demands that this power be vested in the administration official responsible, so that we do not have to go through the agony of a new piece of basic health and safety legislation whenever the technology improves.

5. Secretary Hickel stated that he would "recommend and strongly urge one bill covering both" health and safety. I agree 100 per cent, and trust that this argument has now been laid to rest.

6. I agree with the administration that the inspector force must be increased, although the policeman concept of inspectors constantly watching and monitoring mining operations cannot supplant a new sense of responsibility on the part of operators, miners, and administrative agencies.

7. Although I agree with the statements of those advocating increased emphasis on research, I would warn that all too often fervent pleas for research have been used as an excuse for inaction. It has always surprised me that both the Bureau of Mines and many coal operators suddenly take a vigorous interest in new safety and health research at a time when they are being pressed to initiate positive health and safety measures. One can only hope that they will agitate just as strenuously for research once the Congressional and public pressure for action has slightly abated.

8. The administration bill in Section 103(e) on page 10 contains a very good provision which requires notification to the Secretary by the operator in the case of any accident—not necessarily a disaster. This is extremely helpful because reporting of accidents is very loose.

9. Section 103(f) in the administration bill, requiring the operator to obtain the approval of the Secretary for rescue, recovery and reopening of the mine, is a very good provision.

10. I am pleased to note that Section 105(c)(1) of the administration bill requires re-inspection within 90 days where a notice of violation has been given.

The following are some of the points of disagreement with the administration bill:

1. Section 104 (pages 11–13) on "State Plans" in the administration bill has been effectively criticized by the Chairman of the House Subcommittee, in comments made during the March 4 hearings. The lax methods of state inspections and safety standards, along with inadequate salaries and politics-ridden

departments, have contributed to the ineffectiveness of state enforcement. I would favor retention of the state inspection departments and functions, but believe that effective enforcement must depend primarily on Federal standards and Federal inspectors.

2. The enforcement and administration of laws to protect health and safety are the key to their success. This is the central reason why I believe that although research on these matters should remain with the Bureau of Mines, enforcement should be placed in the Department of Labor. The history of the Bureau of Mines and the Department of the Interior has clearly shown that they are production-oriented in their approach. Even an aggressive leader like John F. O'Leary, who has done so much in his short tenure since October 20, 1968 as Director of the Bureau of Mines, has to contend with entrenched bureaucrats. The Department of Labor is an employee-oriented agency. I believe that we need a fresh start which can only be obtained by transferring the enforcement powers to a new Department which by its point of view, traditions and mode of operation is primarily interested in the human equation.

3. I feel that the Federal Coal Mine Health and Safety Board of Review, which is provided for in Title I, pages 5–7 and pages 21–30 of the administration bill, is cumbersome, complicated, burdensome and would contribute to ineffective enforcement of the law. It seems to me that sufficient review and protection against arbitrary action are fully provided in Section 9 of a bill I am supporting, S. 1094. My bill permits administrative review of such orders and notices by the Secretary of the Interior upon a timely application by an aggrieved mine owner or operator, and authorizes the Secretary to (1) cause appropriate investigations to be made; (2) hold hearings for the purpose of enabling the applicant and miner's representatives to present information relating to the issuance and continuation of any order; and (3) to vacate, affirm, modify or terminate such orders, with the appropriate action being dependent upon the investigation's findings as to whether an imminent danger or health and safety violation did or did not exist or has or has not been since abated. Additionally, under my bill, decisions of the Secretary issued under Section 9 of S. 1094 are further reviewable by the United States Court of Appeals for the Circuit in which the affected coal mine is located. On the other hand, the administration bill, in addition to providing mandatory dual inspections by State and Federal mine inspectors with consequent delay in the correction of imminent dangers, introduces the complicated review procedure which could pull the teeth of the legislation. Mine owners and operators may appeal notices and orders directly to the Coal Mine Health and Safety Board of Review. On such appeal, in a reversal of the usual appellate practice in the courts, the initial burden of proof is placed upon the Government and not on the appealing mine owner or operator, i.e., the Board is not bound or guided by the Government's findings, and the Government must proceed first to prove the then existence of a violation or danger specified in the appealed notice or order.

4. The civil penalties against operators contained in the administration bill have no minimum. I believe this invites continued violation of health and safety standards by the operators. I strongly urge that reasonable and adequate minimum fines for civil penalties be written into the legislation.

5. When a company operator does everything necessary to protect the health and safety of his workers, and when an overwhelming majority of the workers are scrupulously obeying the standards, I do not believe that the health and safety of the men should be jeopardized by a few careless miners. That is why I favor modest fines to be assessed against coal miners who violate the health and safety regulations. Firing a man for smoking may not be an extreme penalty, but firing a man for a careless and unintentional but unsafe action is far too extreme. A fine will be the kind of deterrent which will prevent the men from cutting corners in their observance of health and safety rules.

6. Maximum utilization must be made of the great scientific knowhow developed by the National Aeronautics and Space Administration, the research agencies of the Department of Defense, and other top-level scientific agencies, in applying our technology to mine health and safety. With this in mind, my bill, S. 1094, empowers the Office of Science and Technology in the Executive Office of the President to formulate general research policy and furnish guidance in coal mine health and safety research. We ought to insure that related or applicable research in other nations gets quickly transmitted and applied. There's no excuse why Great Britain, for example, should be years ahead of us in its work on "black lung", and also years ahead of us in devising means to limit the amount of coal dust in the mines.

7. I believe there should be a Coal Mine Disaster Evacuation Center to prepare contingency plans for the procurement and airlifting of necessary rescue, communications, safety and medical material, equipment and personnel, including high-speed drilling equipment.

8. When coal miners have to be withdrawn from a mine because of the violation of health or safety standards which are clearly the fault of the operator, I believe it should be made clear in the law that the operator should compensate the employees for such time as they are barred or withdrawn from the mine.

9. There ought to be some over-riding incentive for the operator to make an extra, additional effort to protect the health and safety of his employees. Perhaps the formula is to authorize suits for recovery of damages from employers by injured employees. If an operator knows that his best defense to a law suit is to run a safe shop, he is more apt to do so than if he knows he cannot be sued. We should attempt through law to make it cheaper to carry out strictly the safest standards, rather than run the risk of having to pay a large verdict at the hands of a jury.

10. Certainly the most critical feature of the bill before you is the dust standard. I am pleased that the administration bill recognizes that those miners who show "substantial evidence of the development of pneumoconiosis" shall be assigned to areas where the concentration of respirable dust is lower. However, I would prefer that such affected miners be exposed to atmosphere no greater than 1.0 milligrams per cubic meter rather than the 2.0 milligrams per cubic meter contained in the administration bill. Obviously, the most serious issue confronted by this Congress is whether or not to accept the administration-recommended dust standard of 4.5 milligrams per cubic meter of air, as against 3.0 milligrams as recommended by all competent medical authorities. I strongly support the lower standard, and cannot understand the philosophy of those who would give up the fight before it starts, on some vague assertion that it is neither "technologically possible" or "economically feasible" to try and obtain a mine atmosphere of 3.0 milligrams.

The Surgeon General has clearly stated that the British experience indicates a "straight-line relationship between the amount of dust breathed and the progression of pneumoconiosis in miners." The Surgeon General also states quite accurately that "the United States is the only major coal-producing nation in the world which does not have an official Government standard for coal mine dust." In advocating the standard of 3.0 milligrams last December, the Public Health Service made a clear recommendation which must be followed if the health of the men is to be safeguarded. The Surgeon General has stated before this committee that, viewed strictly on medical and health grounds and from the standpoint of the protection of the coal miners from pneumoconiosis, he favored and strongly recommended the 3.0 milligram standard.

I am impressed by Dr. Lorin Kerr's testimony that the British experience "has convinced them that the safe level of dustiness in coal mines is 3 milligrams per cubic meter of respirable dust. Above this level, the early X-ray changes of coal workers' pneumoconiosis develop as well as X-ray progression of the disease. At 3 milligrams or less these changes do not seem to occur. . . . All available information seems to indicate that there is a direct correlation between levels of dustiness in excess of 3 milligrams and the prevalence of coal workers' pneumoconiosis. For example, at 4.5 milligrams there is 50 percent more disease than at the 3 milligram figure." Dr. Kerr is one of the most knowledgeable experts in this entire field.

In deciding whether it is possible for industry to meet the 3.0 milligram standard, this committee must weigh carefully whether the predictions of gloom in the past are justified when efforts have been made to protect the individual. When a workmen's compensation law was proposed in New York in 1923, F. J. O'Neil, the Vice-President of the Royal Indemnity Insurance Company predicted that "the whole structure of insurance will fall. . . . Tell your clients that this move is simply the opening wedge to get the state in every kind of business." When the Guffey Coal Act to stabilize the bituminous coal industry was proposed, the American Liberty League in 1935 termed it "socialization of industry" and darkly predicted it "would drive the American flag from the seas." On the other hand, American industry in war and peace has always responded to and risen to the challenge of leadership. When President Franklin D. Roosevelt discovered that submarine warfare was seriously depleting merchant tonnage, he called in those responsible, and according to his press conference of January 6, 1942, the conversation went like this: "And I said to them: 'What are you making now?' 'Well, we are making over one million tons this year.' I said, 'What can you step it up to?' 'Well,' they said, 'we can step it up to five million tons.' I said: 'Not enough. Go back and sharpen your pencils.' So they went back and sharpened their pencils, and they came back, and they said: 'It will hurt terribly, but we believe that if we are told to we can turn out six million tons of shipping this year.' I said: 'Now you're talking.' And I said: 'All right, now, for '43 what can you do? Can you turn out four million more tons, to a total of ten million tons of shipping?' And they scratched their heads, and came back and said: 'Aye, aye, sir, we will do it.' "

This committee and the Congress, in conjunction with the coal industry and the miners, face an awesome responsibility which involves an age-old question: Just what is a human being worth? Is he really worth concentrating our fullest efforts to insure that he lives a healthy life here on earth? I hope this committee and the Congress ponder that issue seriously. And if we go back and sharpen our pencils, I am convinced we will do it.

Mr. HECHLER. Like Mr. Bailey here, he went to the mines at the age of 12, the most dangerous occupation we have in this Nation, under laws that are loose, under inspection practices that are loose, under administration that is loose. And then with one out of every 300 West Virginians last year killed and one out of every 10 injured, they work under these conditions and after they retire they are thrown out on society like derelicts on the ocean bouncing and bobbing without any protection.

This Congress must take some action not only to insure that safety and health standards are protected, but to be sure that the compensation standards are raised.

Mr. Chairman, I will be pleased to come back later if it is the pleasure of the committee, and you care to ask any questions on my statement.

I want to thank the committee for its indulgence.

Senator WILLIAMS. You have certainly arranged for us a most productive and informative and useful morning, Congressman Hechler. We are very grateful to you and all the folks that you arranged to bring to us for our deliberations.

Senator BELLMON. Mr. Chairman, could I ask some questions before we break up.

Congressman Hechler, we have had testimony, and I am sure you heard it, that the mine operators pay 40 cents a ton into a mineworker's retirement fund.

Mr. HECHLER. That is correct, since 1952 it has been 40 cents.

Senator BELLMON. Has there ever been any effort so far as you know on the part of the operators and the unions to set up anything like a mineworker's safety fund that would provide funds to pay inspectors and make certain inspections occur, not periodically or three times a year, but regularly?

Mr. HECHLER. I have never heard of any such proposal, Senator. As you mention the retirement fund, I hope that this committee and this Congress would also perhaps look into private pension funds like the retirement fund and see if it is doing an adequate job.

Senator BELLMON. It would seem to me that safety in the mines is a concern equally of the operators and the workers, perhaps more workers than the operators.

I am not sure that we will ever get a governmental function that is adequately financed to do the kind of job that has to be done in mine safety.

We have heard testimony, as you know, showing what a small fund the Bureau of Mines has to work with in mine safety. I know in our own State of Oklahoma that our State mine inspection agency is badly underfinanced. You measure the pennies that are spent for mine safety by the Department of the Interior against the millions that are spent for production research that has made us get 21st century methods in mining coal and 18th century safety and health standards, that is not treating these people like human beings.

Senator BELLMON. Thank you.

Senator WILLIAMS. Thank you again, Congressman.

I would like to state that, without any objection, we will be including in the record right after Dr. Gross' statement a report from the Public Health Service, dated February 1969 that shows 28,000 certified cases of black lung disease in Pennsylvania. The annual cost of the disease in Pennsylvania where it is compensable, is $41 million.

Mr. HECHLER. Mr. Chairman, may Mr. Wolford's entire statement be included in the record?

Senator WILLIAMS. It will be. We will certainly do that, and thank you.

(The prepared statement of Mr. Wolford follows:)

PREPARED STATEMENT OF ELIJAH WOLFORD, MORGANTOWN, W. VA.

I am very glad that a rank-and-file soft coal miner has been given an opportunity to appear before a Congressional Committee which is trying to make the nation's coal mines a safer and healthier place to work.

You will doubtless get many proposals aimed at achieving this goal. Some of these will be offered by persons who never set foot inside of a coal mine; still others will come from persons whose mining industry activities haven't afforded them the opportunity to be fully conversant with mining as it exists today.

I have spent something in the neighborhood of 20 years in the coal fields of Kentucky and West Virginia, with active work experience in both the northern and southern parts of West Virginia. It is against this background and as a member of a mine safety committee that I would like to share some thoughts with this committee of Congress.

As hearings on this subject started in the U.S. Senate, the president of the United Mine Workers of America announced his opposition to proposals calling for penalizing individual coal miners who violate mandatory health and safety standards. He said representatives of the coal industry would join him in that view. And they did.

Safety is a two-way street. The miner must be afforded a degree of protection against the unsafe acts performed by a fellow miner on his own or by encouragement of his employer as well as the unsafe practices generated by the coal operator.

I would suggest that any rank-and-file miner who violates a mandatory health and safety standard promulgated under the federal law be assessed a civil penalty amounting to his exact wages on the day such violation took place. This would be the minimum penalty and could extend to two days' wages, depending on the nature of the rule violated. This penalty standard would be doubled for subsequent violation of the same law or rule.

Should any member of mine management knowingly violate, fail or refuse to comply with orders issued under the act, the owner or operator would be assessed a minimum civil penalty of one dollar ($1.00) per ton of coal produced in the 24-hour period surrounding the time of violation. This would be the minimum and would extend to two dollars per ton, depending on the nature of the violation. Penalties would be doubled for subsequent violations.

Money received from the assessment of these penalties should be deposited in a special account dedicated to furthering research in the development of improved safety and health techniques.

One of the bills before the Congress deals with the subject of lighting inside the mine. Along with this comes the word "adequate." This word appears several times in the Federal Mine Safety Code. In the application of enforcement of the standard it is meaningless. In the case of lighting, for example, a degree or specified percentage of light should be spelled out.

I am sure that proper lighting in the coal mines would prevent accidents to some degree.

Common sense must be made the order of the day, rather than the exception.

I am reminded of an incident which actually took place in a West Virginia mine. An inspector suggested that a light bulb near a conveyor belt be removed on the basis that if the bulb broke it might trigger a coal dust explosion. Yet, the very same inspector did absolutely nothing to curb or control the amount of coal dust surrounding the conveyor belt.

We do not need laws that use the words "adequate" or "dangerous accumulations." This leaves too much to the imagination of the individual mine inspector and mine management as to what is meant by these words. Standards should be clearly defined, leaving no room for misinterpretation.

Under the guidance of the new Bureau of Mines director, Mr. John O'Leary, many long overdue changes have been made in the methods and timing of mine inspections. This is good. Still further changes are required to obtain the maximum benefit of good law enforcement.

It is not enough, for example, for the inspector not to announce in advance that he will visit a certain mine. He should not, I believe, confer with company officials or anyone above ground and using a map to indicate what section or sections of the mine he will inspect.

The inspector should be armed with sufficient authority to go where he wants and when he wants.

By taking the same man-trip that the miners take, for example, he will be able to see what conditions are actually faced by the miners.

It is a well-known fact that under present conditions a mine inspector can be purposely delayed for as much as an hour underground while workmen correct some of the more obvious violations of the law.

Standards applicable to other industries should and could be applied to the operations of certain facets of coal mining. The larger mines cover areas as large as some of the major cities of this country and yet the occupants of these underground cities don't have anywhere near the amount of safeguards that those who toil above ground have.

Take the matter of coal mine trains as an example. Is it unreasonable to suggest that the front end of a train bear a white headlight and green running lights and the rear of the train be indicated with a red light? We do it outside, why not inside the mine?

Then there is a matter of adequate brakes and load restrictions. None of this applies to the mines. Reasonable standards should be enforced for both the safety of the miner and to prevent damage to the coal operators' equipment.

Conveyor belts might be fine for moving coal or supplies, but their use as a source of transportation for humans should be prohibited. A man is required to jump on and off these belts while they move. He must flatten himself on the belt, lying on his stomach, and try to hold onto his dinner pail and the belt at the same time. His miner's lamp is of little help in telling what dangers might lie ahead, because of the position he must assume.

Not only does he face the constant danger of being snagged by some obstruction along the course of the conveyor belt, but also he is put in the position of inhaling coal dust along the way.

How much room does he have? Most of you gentlemen are familiar with The Washington Post, your morning newspaper. The size of a single page in that newspaper is 15½ inches wide and 23½ inches deep. The minimum overhead clearance for a conveyor belt is 18 inches and if the circumstance of the mine will permit it—the clearance is increased to 24 inches.

If the subways to the Capitol were built on the same specifications, how many members of the Congress, lobbyists or guests would be able to make the trip? Not many, I would venture to guess.

Men have died in mines needlessly from smoke inhalation. I say needlessly because haulage roads in which power lines supplying power to sections or face areas are installed should be isolated from headings carrying fresh or intake air into the actual working places. Belt-headings should be isolated from the main fresh air intake.

This would keep dust from the belt from being carried back to the working area for workers to breathe. This would also decrease the chances of an explosive mixture at the face.

With no electric locomotives, belts or conveyors, in intake air headings, it would assure a better quality of air at the working face. This would mean that no smoke or dust would reach the men at the working face and that main intake air headings could also be used for communication lines.

In such an intake, communcation lines would be safe from destruction as the result of a wreck on haulage ways or being burned in two—causing a lack of communications—from fires which are caused by wrecks, grounded wire hangers and so forth.

In case of fire on belt headings or haulage ways, the main air intake would provide an excellent escapeway. This would mean that men would walk out of mines that were on fire—if the fire occurred on haulage ways or belt headings—where most fires do occur. They would walk in fresh air, not return air where they would be in danger of being overtaken by smoke from fires.

The track, roof, and rib conditions, in my opinion, are not kept in a safe condition in most mines. I refer to loose roof and ribs, loose joints in tracks, kinks in the track that can and often do cause wrecks. Coal, sand and rock dust being allowed to accumulate on haulage roads to such an extent that the flanges on the car wheels are turning in this accumulation of dust and the bottom of cars used for transportation of coal are rubbing or dragging this dust. These things are, in turn, causing dust to be suspended in the air that contributes to silicosis and coal workers' pneumoconiosis.

It is a rare day that goes by without a car being off the track in the mines. And the dust accumulation in some mines is such that it is impossible to see a car 20 feet ahead of you—and this is the very same air that men at the face of the mine get to breathe later.

There is not enough attention paid to mine roofs. Mining laws are not followed. In more than a decade, I have never seen them scaled (loose particles removed).

I don't believe that a haulage way can be properly inspected by a man in a vehicle moving at 10 miles an hour. It should be walked and done on every shift.

Mine foremen—who have the overall responsibility for the condition of a mine—should be on their feet, rather than sitting in a vehicle or at some stationary point.

The main haulage way at the mine I work is five miles long—and if the mine foreman examined this properly once every 24 hours, it would fully occupy his time.

A lot has been said about self-supporting roof. This really bothers me because I see so much of it at the bottom. Men shouldn't have to work under a roof which is not supported by some means.

And now a word about mine accidents and safety.

I once asked a mine foreman to move some spillage. He said his assistant said it didn't need to be moved. Ultimately, a coal mine inspector ordered it removed.

Subsequent to that I suffered an arm injury. The same foreman said—point blank—that he had allowed other men who were injured perform light jobs or some cases just stand around so they would draw full pay and not be counted as a lost-time accident.

He said that such a practice didn't apply to my case and to let him know when I was ready to return to work.

At the start of my remarks, I talked about safety and penalties. Mr. Boyle feels that miners are penalized through death and injury—and that's enough. We have a different form of penalty at my company.

If the monthly accident rate isn't too high—that includes all accidents—each miner gets 400 S&H Green Stamps for the month. If the frequency rate is too hight in the eyes of management—the miners get no Green Stamps for that particular month.

At the end of the year, each miner gets 5,000 Green Stamps based on the same criteria.

This has a strange effect on the wives of miners. But I wonder how much safety it produces. It doesn't stamp out a single unsafe piece of equipment or unsafe practice.

(The following letter was subsequently received by the chairman:)

JERE, W. VA., *March 24, 1969.*

Senator HARRISON A. WILLIAMS, JR.,
Chairman, Labor Subcommittee,
New Senate Office Building, Washington, D.C.

DEAR SENATOR WILLIAMS: Regarding mine safety legislation on which I spoke before you Thursday March 20th, 1969. As you know time prevented me from making a full statement and you asked me later to fill you in on dust problems, which are increasing day by day. In years past prior to that time miners depended on wood timber for roof support. About 1950 a system of roof bolting was introduced whereby a steel bolt was inserted in the roof and tightened, thus bolting the rock strata together for the length of the pin. This necessitates drilling a hole up to seven feet or more into silica bearing rock. No effort is made in controlling the dust liberated in drilling the hole, with the result that miners working two or three years on that drill are finding it necessary to change to other jobs or leave the mines altogether.

Consider the turnover of miners when this case is multiplied by thousands all over the country.

The next item is refuge chambers. In case of fire in a coal mine, miners have nowhere to go for refuge or to escape the fire and noxious gases except outside. When their exits to the outside are blocked, disasters such as that at Mannington No. 9 or Pursglove No. 15 on January 14th, 1945 when thirteen men lost their lives in a mine fire result. There is no reason why air tight and blast proof refuge chambers could not be built inside a coal mine with a hole drilled from the outside for air, food, water, and communication. The mine then could be sealed immediately and the men moved by means of a lift.

These points along with others will be gone into in greater detail with Mr. John O'Leary in a separate letter in which he asked me to write.

In passing. I have just heard on the radio where a man named Paul Riley has just been appointed state miners chief for W. Va. This man is or was a stockholder in Consolidation Coal Company. It would be interesting to know whether he has disposed of this stock or hidden it somewhere.

Trusting this will be of some help to you in your efforts to improve the health and safety of all workers engaged in industries which have respiratory disease problems.

I am sincerely,

ELMER W. YOCUM.

Senator WILLIAMS. The subcommittee is now in recess.

(The material referred to on p. 786 follows:)

AGES OF MINERS WHO DIED IN THE FARMINGTON MINE DISASTER

20	1	38	1	50	4
22	2	39	1	51	2
24	2	40	2	52	1
25	1	42	7	53	3
27	2	43	6	55	1
30	3	44	4	56	1
31	2	45	1	57	4
32	2	46	1	58	3
35	1	47	3	59	2
36	2	48	4	61	1
37	1	49	6	65	1

(Whereupon, at 1 p.m. the subcommittee was recessed subject to call of the Chair.)

COAL MINE HEALTH AND SAFETY

WEDNESDAY, MARCH 26, 1969

U. S. SENATE,
SUBCOMMITTEE ON LABOR OF THE
COMMITTEE ON LABOR AND PUBLIC WELFARE,
Washington, D.C.

The subcommittee met at 9:35 a.m., pursuant to recess, in room 4232, New Senate Office Building, Senator Harrison A. Williams, Jr. (chairman of the subcommittee) presiding.

Present: Senators Williams, Randolph, Bellmon, and Schweiker.

Committee staff members present: Robert O. Harris, staff director; Frederick R. Blackwell, counsel to the subcommittee; and Eugene Mittelman, minority counsel.

Senator WILLIAMS. We reconvene our subcommittee hearing on the coal miners health and safety legislation. This is our 8th day of hearing on this measure and to begin our deliberations this morning we are honored to have Senator Robert C. Byrd of West Virginia as our opening witness this morning.

STATEMENT OF HON. ROBERT C. BYRD, A U.S. SENATOR FROM THE STATE OF WEST VIRGINIA

Senator BYRD. Thank you, Mr. Chairman. I appreciate this opportunity to appear before the subcommittee. I know of the diligent efforts put forth already by the subcommittee in the conduct of hearings on mine health and safety, and I am particularly cognizant of the keen interest which has been manifested by my senior colleague, Mr. Randolph, a member of this subcommittee.

These efforts by my colleagues and by you and the other members of the subcommittee are to be highly commended, Mr. Chairman, and I want to assure you that I will exert every effort and utilize the full capacity of my office as a Senator toward the enactment of whatever Federal law may be considered feasible and necessary, in addition to State laws, to improve health and safety in our mines.

I was raised in the home of a coal miner in a mining community of West Virginia. From the time I was a child I have been conscious of the mining accidents that exact a heavy toll of human life.

I have seen automation relieve the physical strain of men whose principal tools were the pick and shovel, but I have been disappointed because improved safety has not kept pace with mechanization.

It is past time for Congress to demand immediate safety progress in every way possible and simultaneously to develop a blueprint for a long-range program which will serve to eliminate the dangers that have always been a threat to life and limb in the mines.

It is sad, indeed, to reflect on the senseless waste of life and impairment of health experienced by miners in this country. In spite of our advances in industrial technology and our great achievements in the natural sciences, we have allowed thousands of our citizens to die and many more to linger with poor health because of intolerable health conditions in the mines.

I am deeply concerned, particularly about the harmful effects of coal dust pollution that exists in America's coal mines today. In addition to being a serious safety hazard, coal dust has serious effects on the health of coal miners. Thousands have developed the terrible disease of pneumocoiosis.

This disease not only causes miners to suffer for years with a serious impairment of health, but it has also resulted in the premature death of many of them.

Last December, Charles C. Johnson, Jr., Chief of the U.S. Consumer Protection and Environmental Health Service, emphasized the health hazards of coal dust. He stated that at least 100,000 miners are running the risk of developing pneumoconiosis. Approximately 1,000 coal miners in Pennsylvania alone die each year from the disease.

Although we have no reliable estimates on the death rate from the disease in West Virginia, we could certainly expect it to be intolerably high, since employment in the coal mines has been substantially higher in West Virginia than in Pennsylvania for many years, and the coal dust problem is similar in both States.

The results of a U.S. Public Health Service study of the extent to which miners in certain leading bituminous coal areas were afflicted by pneumoconiosis appeared in the Mining Congress Journal in 1965.

It was reported that nearly "one out of every 10 soft coal miners working in the coalfields of Appalachia has radiographic evidence of coal workers' pneumoconiosis."

The study revealed further that approximately one out of five inactive miners was afflicted. Moreover, the prevalence rates for those who worked in the mines for over 20 years showed sharp increases.

The symptoms of the disease are painful and often dibilitating. Moreover, many of the affected workers will have other associated respiratory problems which include emphysema, silicosis, and chronic bronchitis.

Once the progress of the lung disease sets in, there is no medical treatment known to alter its course. After the process starts, its progression is steady and rapid. It results in a disabling breathlessness that usually results in death from heart failure, asphyxia, or pneumonia.

The testimony presented to date here by representatives of both industry and the United Mine Workers of America has been highly gratifying. Both the industry and the union are demonstrating a new determination to safeguard the health and safety of mine personnel.

A few days ago, for example, I was shown photographs of a number of safety devices that have been developed recently and are not in general use, but which have been discussed before your subcommittee, and which will reduce the number of mine accidents.

It would also appear that dust particles, which present a menace to health, can be reduced if more care is given to ventilating systems and if water sprays are brought into wider use at the face. These are other precautions which, I am told, can be applied at once.

The mining industry has further indicated additional safety devices in the development state, and I favor whatever research or demonstration experience is necessary to bring them into use without delay.

I believe that, for the long term, the Federal Government must utilize scientific and engineering talent to develop systems engineering for coal mines.

Using the "systems" approach, the mining, processing, and use of coal would be seen as a single continuum in which every operation is linked to all the others. The goals of the system would be to produce adequate quantities of low-cost fuel while minimizing hazards to the health and safety of those employed in the industry, as well as the environmental pollution associated with coal. Every operation in the system would be designed with these goals in mind.

For example, mining methods would be selected, not merely for high productivity, but to reduce mine safety and health hazards as well.

Today, by contrast, many hazards are actually caused by the mining methods used, and techniques have had to be developed to cope with problems that need not ever have arisen.

The systems concept has been most spectacularly applied to the Nation's space program, and the recent flights of Apollo 8 and 9 show how well systems engineering can work.

It is time we applied it on and under the earth to solve problems that are rooted in the haphazard and undirected growth of today's technology.

Problems like mine safety are not the inevitable results of industrialization; they are instead the undesirable by-products of an unsystematic technology.

I made a statement on this subject on the floor of the Senate on February 28 of this year and I ask that it be included in the record of the hearings. It is not lengthy.

Senator RANDOLPH (presiding pro tempore). Without objection, that will be done.

(The statement referred to follows:)

[From the Congressional Record, Feb. 28, 1969]

COAL MINE HEALTH AND SAFETY

Mr. President, the tragic coal mine explosion that occurred last November near Farmington, W. Va., has made it certain that this session of the Congress will consider several new proposals for coal mine health and safety legislation. The scale of the Farmington disaster, which claimed the lives of 78 miners, inevitably has raised many questions concerning the adequacy of the present Federal Coal Mine Safety Act.

I am certain that all of us here in the Senate will want to consider carefully any reasonable proposal for more effective health and safety laws. Hearings on the legislative proposals now being submitted will enable us to reach objective conclusions concerning any changes that should be made in the existing act.

My purpose today, however, is to urge all of my fellow Senators to consider every possible way in which our coal mines can be made safer and more healthful for the men who work in them. New and stronger laws, however, necessary and effective they may be, provide us only with a means of coping with hazards. I contend that the time has come for us to do more than cope with menaces that can wipe out 78 lives in a single, horrible accident. We can, and must, eliminate these hazards.

The former Secretary of the Interior, Stewart Udall, a forceful advocate of stronger law in this critical area of industrial health and safety, recognized the limitations that are inherent in law. He made that clear at his December Conference on Coal Mine Safety, when he said:

"Even in a coal mine that is a model of compliance with the most rigorous safety regulations that can now be devised, the elements of danger will be present."

The adoption of additional mandatory safety standards my help to curb the threats posed by these elements of danger but will never completely eliminate them. No law can make methane and coal dust less explosive; and no law can remove them from the places where coal is mined. The most stringent laws, however rigorously they may be enforced, cannot assure stability of the rock formations that typcially overlie a coal seam. And laws will never protect men fully against the hazards that exist when huge, powerful machines are operated in the confines of an underground mine.

Nevertheless, these hazards can be minimized. How? By developing a better and safer technology for mining coal—a technology that retains the good features of equipment and methods now in use, and even improves on them. But a technology that also brings health and safety provisions into better balance with productive capability.

The Congress traditionally has sought to promote the development of improved mining technology. In fact, the congressional role in promoting such improvement antedates by three decades the passage of the first coal mine safety legislation. In establishing the Bureau of Mines in 1910, the Congress directed that agency explicitly "to make diligent investigations of the methods of mining, especially in relation to the safety of miners." It is time that we renewed this mandate. We must provide the resources that are needed to develop a coal mining technology that is intrinsically safe and healthful.

What is wrong with the coal mining technology we have today? In some respects it is the world's most modern—a result of the intensive mechanization process through which the industry passed after World War II. Spectactular breakthroughs were achieved in coal cutting techniques—breakthroughs that have made the American coal miner by far the most productive mine worker in the world.

These advances, however, did not incorporate methods for dealing with mine hazards, which are intimately related to mining methods. Centuries of exposure to these hazards have obscured this relatonship. As a result, coal mining technology has advanced, but in a lopsided way, and 20th-century mines sometimes use 19-century safety procedures. American coal miners are the world's most productive, but they work in one of the Nation's most dangerous industries.

The hazards of coal mining are linked so closely to the methods used for recovering this fuel that development of proper mining techniques can make the Nation's coal mines significantly safer. But, first we must rid ourselves of the notion that safety and health are "optional extras."

Our energies have been misdirected in trying to cope with hazards that need not have arisen. It is all too apparent that we have failed to keep pace with the dangers of mining, and as a result coal miners are dying today from many of the same causes that killed their fathers, grandfathers, and great-grandfathers many years ago.

The ultimate and lasting solution to this problem lies in the development of a coal mining technology that is intrinsically safe—a technology that has provisions for the health and safety of coal miners built in, rather than added on.

There may well be some astonishment at this proposal. The idea that "coal mines are inherently dangerous" has been repeated often following and prior to the Farmington disaster. Yet, I am convinced that we mine coal in ways that are often needlessly dangerous, and that coal mine hazards can be traced in large part directly to the methods by which coal is mined.

For example, consider the continuous mining machine. This impressive device may be up to 38 feet long, and capable of tearing coal from a solid seam at rates in excess of 8 tons a minute. Its efficiency is in no small measure responsible for the remarkable productivity of the American miner, and many view it as an outstanding example of advanced technology. As it has increased productivity, however, the continuous mining machine has also aggravated some of the most serious health and safety problems known to coal mining.

Because it cuts through coal so rapidly, this machine makes possible the liberation of methane gas at a high rate, thereby increasing the danger of explosions. Because it breaks the coal into such fine particles, it creates more dust, generating an added explosion hazard as well as a threat to the miners' health. Finally, its speed of advance can outstrip the adequacy of methods presently used to support the roof it exposes and to haul the coal that it mines.

Our traditional response to such problems has been to accept them as inevitable, adding safety options to control the hazards whenever possible. Experience has shown us that this approach just does not work. In fact, it has even introduced new hazards while in the very process of minimizing old ones. For instance, the accepted way of coping with the explosive methane liberated by continuous mining machines is to dilute it and remove it from the mine with a rapidly moving current of ventilating air. But the moving air current stirs up and distributes coal dust, actually intensifying the dust-related hazards of explosion and lung disease, such as black lung.

This is no isolated example of a self-defeating cycle. Many of the techniques now used in coal mines are equally dangerous, and cannot in any realistic sense be called modern. Coal mining technology, like so many other technologies in America today, has advanced rapidly on some fronts while falling behind on others. Throughout American industry the growth of technology has, with few exceptions, been characterized by spasmodic and uncontrolled progress toward the goals to which technology is supposed to carry us.

In many cases the resulting side effects have assumed greater significance than the original purpose. Environmental pollution, for example, is an industrial side effect which is becoming almost as noxious as the products of industry are desirable. The ultimate cause of pollution is the failure of technology to provide waste-disposal methods that are as effective as production methods. Similarly, today's coal mining technology fails to guarantee the safety of miners almost as effectively as it guarantees the Nation a supply of low-cost energy.

Why this imbalance in technology? Why has progress in some areas caused unexpected problems in others? Perhaps because many persons believe that technology advances through some mysterious evolutionary process that cannot be controlled or predicted. As a result, technology is allowed to create unforeseen problems, like the dust hazard associated with continuous coal mining machines, and the more widely experienced air pollution problems of our big cities.

The advance of technology can be directed, however. It is necessary only to identify the goals of technology clearly, and to think through implications of the methods chosen to reach these goals. In engineering language this is called "the systems approach." Systems engineering methods have arisen as a response to the chaotic growth of today's technology, and they are designed, in part, to eliminate the undesirable side effects that have accompanied such growth.

Systems engineering was first applied in fields where technological complexity was extreme, such as weapons research and development and space exploration. Using the systems approach, space engineers have gone far toward guaranteeing that their complicated rockets and space capsules will function smoothly. The flight of Apollo 8 around the moon is clear testimony to the advantages of systems engineering. Is it not time that we begin applying it to the age-old process of coal mining?

The Interior Department's Bureau of Mines has, in fact, been carrying out a modest mine systems research program for several years. The basic concept underlying the Bureau's work is that mineral recovery is not a series of separate and unrelated operations, but a single integrated system, of which extracting the mineral, moving it to the surface, and controlling the mining environment are interrelated and interdependent parts. The Bureau's ultimate goal is a kind of master formula which, when applied to a given mineral deposit, would enable an operator to balance alternative combinations of subsystems against one another and come up with the safest and most healthful, and at the same time the most efficient, mining method for that deposit.

Applied to coal mining, such an approach can yield many tangible advantages over the methods used today. For example, before mining even began, the operator would determine how gassy his coal deposit was, and then choose mining equipment and techniques that would minimize the explosion hazard. He would also choose equipment and techniques best suited to the geology of the formations surrounding the coal seam. Thus, from the beginning, safety and health would be considerations equally as important as production.

In the long run, of course, the whole nature of coal mining as we know it today may well be drastically changed. But that change, in a systems-oriented industry, can be planned and carried out in a way that makes sense from both the humanitarian and the economic point of view.

The systems approach can also benefit mines in which operations already are well established. An immediate objective should be to devise techniques of roof support, haulage, ventilation, and other mining procedures that are either wholly compatible with the methods and equipment now used, or would require at most only minor modifications of such methods and equipment. The essential difference is in the approach to the problem. Coal mining must be looked at as a system of interrelated and interdependent functions, rather than a series of separate and unrelated operations. Consequently, if we have a machine that can mine coal at the rate of 8 tons or more per minute, we must consider the implications this machine holds for all the related parts of the mining cycle. We must, for example, find ways to move the broken coal, and the coal dust generated by the machine, more rapidly away from the face of the seam. And we must also develop roof-support subsystems that are more compatible with a rapidly advancing mechanized miner.

By concentrating on this kind of approach, I'm convinced that we can make coal mining, at an existing mine as well as at new mines, far safer and much more healthiful, and at the same time increase even more dramatically the productivity of the American coal miner.

A great deal of research and development will be needed, however, before we will be able to mine coal with such truly modern methods. Application of the systems approach requires, among other things, a fund of basic knowledge about the geology and physics of coal and coal-bearing formations—knowledge that is lacking today. It requires the availability of alternate mining methods, more flexible than today's, so that the goal of high productivity can be met without undue reliance on a single type of equipment which, like the continuous mining machine, may have as many drawbacks as advantages in some deposits. The Bureau of Mines is convinced that such requirements can be met—but only with an expanded research effort. I strongly support the allocation of more research funds to the Bureau to pursue this important work.

Highest on the Bureau's list of priorities is research on applying the systems approach to the methane gas hazard. The Bureau contends that several alternate ways of dealing with methane must be developed, to permit maximum flexibility and to free operators from their dependence on ventilation as the sole means of coping with the danger of explosions. For example, draining the coal seams of methane in advance of mining might prove the best method for some of our highly gassy mines. Or the rate at which methane is liberated from a coal seam might be reduced by controlling the pressures exerted by surrounding rock formations—a possibility indicated by the results of recent Bureau research. Another possibility would be the development of ways for making methane chemically inert as it emerges from a coal seam, before it has a chance to explode. Any one of these approaches it should be noted, would be compatible with the methods and equipment now in use.

The Farmington disaster has told us in terms of stark tragedy that research toward goals like these can no longer be deferred. The Bureau should be given adequate funds, not only to conduct research in its own facilities, but also to award research grants and contracts to schools of mining engineering and similar institutions where pools of knowledge and professional talent lie waiting to be enlisted in this urgent enterprise. The Bureau's staff is too small, and the problem too large, to ignore the contributions that can be made by the many excellent academic and research institutions already operating in this field. I have heretofore supported increased funds for coal research, and shall continue to do so.

The coal mining industry can also make a major contribution to the effort. It can send its most creative and skillful engineers to work in Bureau laboratories on a cooperative basis, and it can make its mines available for research and testing that will have to be done in the field. In this way, development of new coal mining systems would become a joint industry-Government venture, and many of the results could be put into practice by industry almost as quickly as they emerged. The Bureau's understaffed corps of scientists and engineers would be supplemented by talented industry personnel who, returning to their companies, would be qualified and ready to adapt systems technology to individual mines without delay.

If these steps are taken, we can look forward to the emergence of modern coal mining systems that can ultimately reduce our reliance on legislation as a cure for ills that will one day cease to exist. Such systems will not, of course, come into being quickly. Several years of concentrated effort will be needed, for we have delayed too long already. But no field of technology has as much to gain from the systems approach as does coal mining with all its hazards.

The highly successful application of systems engineering to the space program has begun to encourage its use in other fields. For instance, the complicated modern problems of data processing are handled by systems, of which the electronic computer is but one of many subsystems. Authorities now are advocating the application of systems engineering to solve the Nation's staggering waste disposal and environmental problems, which are, like the hazards of coal mining, largely the products of a literally unsystematic, highly sophisticated technology.

If we can afford systems that send men to the Moon, or process inconceivable volumes of data with superhuman competence, surely we can afford and develop systems that will conserve our most valuable resource—skilled manpower. The cost would be relatively low; especially when we remember that two-thirds of America's energy is supplied by coal, and that coal mining is America's most dangerous major industry. In the current uproar over coal mine safety, there can be no disagreement on the desirability of the systems approach as a solution. Only our willingness to make possible the application of this modern concept remains in question.

Senator BYRD. Techniques of roof support, haulage, ventilation, and other mining procedures must be devised which will remove health and safety hazards from our mines at the earliest possible moment. Then, and only then, will we have fulfilled an obligation long overdue to a vital segment of our citizenry.

In the past several months, during which mine health and safety have come into national prominence, the coal industry has been exposed to considerable criticism from every direction.

The industry is responding in a constructive way, and eagerly seeks solutions to the many health and safety problems inherent in the mining of coal. This is gratifying. Coal mining is a dangerous work, and it is of vital importance to the Nation.

Although relatively few homes are heated by coal furnaces, a majority of our residences would be without heat were it not for this source of energy. Most home heating systems, whether they be gas or oil, are activated by thermostats requiring electricity for their operation.

In addition, an increasing number of homes, schools, churches, and office buildings are heated by electricity. For the record, it should be stated that coal generated 63.6 percent of all electric power produced by fossil fuels in 1968.

Recently, the Monongahela Power Co. announced that a new 1.3-million-kilowatt generating plant would be constructed near Shinnston, W. Va. It is another of a series of power stations arising in the rich coal fields of the Appalachian range.

A complex of power plants in West Virginia and Pennsylvania is connected with long-distance transmission lines to bring energy into the large metropolitan areas extending from New York to Virginia.

At the same time, unit trains laden with thousands of tons of coal are leaving West Virginia's mines daily to bring energy to electric stations as far away as New England, Florida, and the Great Lakes.

Coal is a necessary ingredient of the steel-making process and of numerous other industrial activities. If coal output were terminated, America's economic progress would halt and our defense structure would be weakened.

Coal is the foundation of the defense effort, for without it there would be no steel for weapons or equipment. Coal is, in addition, a source of explosives, synthetic rubber, and countless other war products of the chemical laboratory. So long as communism attempts to encroach upon free peoples, coal will remain a vital component of our national security.

We must have coal, but it need not come at the unnecessary sacrifice of the men who mine it. The spectacular increase in productivity of mines in the past quarter-century is a tribute to mine operators and workers, and I am confident that by continued cooperation and determination they will achieve safety standards heretofore assumed to be unattainable.

Mr. Chairman, I know that your subcommittee will adopt whatever amendments to the mine safety laws may be considered necessary, and I assure you that I shall do everything I can to insure that your proposals will be acted upon with expedition when they reach the Senate floor.

The subcommittee has already conducted careful and thorough hearings, and its work is not yet done. Undoubtedly, the information you will have accumulated, as a result of the hearings, will be valuable in your approach to the preparation of legislation for consideration by the full committee and the Senate.

Through the collective judgment of the members of your subcommittee, therefore, you will arrive at conclusions based on the evidence that has been submitted during the hearings.

In this respect you will be in a far better position than I—or perhaps than any other individual who has appeared before you—to determine what is needed in the way of new legislation to protect the health and safety of the men who work in the mining industry.

I merely want to state that there is an evident need for Federal legislation and that I have confidence in the membership of this subcommittee to point the way.

I want to support you as much as I can in reaching that objective.

I do wish to propose, Mrs. Chairman, that a Federal law be enacted to provide compensation to disabled coal miners suffering from "black lung" who are not covered by State laws.

This may or may not be a legislative matter over which your particular subcommittee would have jurisdiction, but I believe that here is a legislative gap which should be bridged, and it seems to me the only way to do it is through the enactment of Federal legislation.

If you will indulge me for a few additional minutes, I shall outline the general idea of what I have in mind.

For example, the West Virginia Legislature recently enacted a new compensation law covering pneumoconiosis, but I am advised that some of the "black lung" sufferers may not benefit from it because such workmen's compensation legislation cannot be retroactive.

So, unless a Federal law is enacted to include those who may have retired before the new State law goes into effect, or for whom the statute of limitations may have expired, I am told that some of these people may not have recourse to compensation.

Therefore, I propose that legislation be enacted to authorize compensation in such cases on a Federal/State matching basis.

Such legislation would only affect those miners disabled from pulmonary diseases contracted through exposure to coal dust and silica, and so forth, and who are not covered by State laws.

Such a law could run for, say a 20-year period, with the Federal Government providing 100 percent of the compensation and administrative costs the first year, with a provision for decreasing each of these categories by 5 percent annually.

This would take care of most of the miners who have been forced to retire already, and would gradually shift the burden to the States.

However, by the end of the 20-year period, I think one could properly assume that there would not be much of a burden remaining outside a State's normal workmen's compensation fund caseload.

The benefits could be $25 per week—which would be lower than the benefits to which such miners would be entitled under the compensation laws of any State, but this amount would at least provide an income of from $100 to perhaps $115 per month.

This would prevent some of the families from having to depend on public welfare, and it would also encourage miners to act before a State's statute of limitations expires rather than take the chance of receiving benefits under the Federal/State program at a level lower than those provided in a State's workmen's compensation program.

As the Federal contribution decreased, the State's contribution would increase under the program I propose.

Such legislation could leave the definition of pneumoconiosis to the respective State laws, and the operation of such Federal law would be based on an agreement between the Secretary of Labor and any State for the purpose of assisting such State in providing compensation to individuals who, as a result of their employment in the mining industry, are suffering from pneumoconiosis, who are disabled, and who are not entitled to receive compensation under any State workmen's compensation law.

The State agency administering the compensation law of a State would be responsible for all payments of compensation made pursuant to the Federal/State agreement.

I am glad that you have given me the opportunity to make this statement today, and I appreciate the courtesy accorded me. I deeply thank Senator Randolph for working out the arrangements with you, Mr. Chairman, for me to be present at a scheduled time.

My colleague and I see eye to eye on many things, and in our several discussions concerning mine health and safety we have agreed that the possibility of Federal legislation on the subject is one which should have high priority.

Senator Williams. Thank you very much, Senator Byrd. You have given us a great deal to think about and certainly it is a most helpful statement. Your systems approach to progress, as it comes, and must come, in advancing productive methods, with concern for the conditions of the workingmen in the mine, is particularly important, in my view. Health and safety would be the handmaiden of progress in efforts to increase production, as I understand the recommendation.

Senator Byrd. Yes, sir.

Senator Williams. The idea of workmen's compensation for pneumoconiosis has been raised in these hearings, not in equal depth to your statement but certainly it is a matter of great concern to this committee.

Senator Randolph and Senator Javits have a bill that is before the committee which would put us as a committee into the further study of what is, as you suggest, a terrible yawning gap in bringing the compensation to the mineworkers that they desperately need. Senator Randolph.

Senator **Randolph**. Mr. Chairman, the statement of my able colleague from West Virginia contributes very much to our constructive consideration of proposed safety legislation to meet the increasing occupational health and safety needs of the miners in the coal mining industry of the United States.

Senator Byrd would not wish me to dwell on the fact that he comes from an area where coal mining is perhaps the most important industry. That area is Raleigh County in West Virginia.

I would imagine that there is no Member of the Senate of the United States or no Member of the U.S. House of Representatives who knows more miners personally, Mr. Chairman, than Senator Byrd.

It is helpful that he is here today to discuss with us, the need, the imperative need, for action in the area in which we are moving forward, and I hope speedily.

We would like, Mr. Chairman, to have this legislation reported to the Senate floor as quickly as we can do so without short changing the important mission that is ours.

I know that you want this done after there is a well-reasoned consideration in the subcommittee following our hearings. Then, of course, there will be consideration in the Parent Committee on Labor and Public Welfare.

Senator Byrd, I am especially interested in your proposal as it relates to workmen's compensation with Federal cooperation and assistance.

I want the record to show, Mr. Chairman, that S. 1106, introduced by Senator Javits, is also sponsored by Senator Byrd of West Virginia, Senator Yarborough of Texas, and myself.

This legislation was introduced in the 90th Congress and is now before the 91st Congress. S. 1106 does not go as far as Senator Byrd has proposed this morning because it is a measure to provide for a study of State workmen's compensation laws to ascertain what areas of concern might properly be supplemented by Federal action.

It seems to me, Mr. Chairman, that at the present time, the only persons who are covered under workmen's compensation in the Federal Government or through the Federal Government are Federal workers in the District of Columbia and stevedores. I believe these are the two areas.

The National Labor Relations Board has the power to deal with labor relations, Senator Byrd, such as wages and hours. It would again be my opinion, and I am not certain that I am right, that we could also handle in this committee the area of compensation along the lines you have so appropriately and cogently discussed.

I think that we have that broad enough base on which to operate. It would seem to me that such proposal as my colleague has made this morning would also be referred to this committee, Mr. Chairman. So I think that this is a further valuable contribution that Senator Byrd makes, namely, the compensation suggestion, in addition to the health and safety aspects.

I appreciate, Mr. Chairman, the opportunity to comment on the very valuable testimony of our distinguished colleague.

Senator WILLIAMS. Senator Bellmon.

Senator BELLMON. I have no questions.

Senator WILLIAMS. Senator Schweiker.

Senator SCHWEIKER. I just appreciate the fine testimony of the Senator from West Virginia. It is very helpful.

Senator BYRD. Mr. Chairman, anent the remarks by my colleague Senator Randolph, I thought it well to call attention to this area, which I have referred to in my speech, I believe, as a gap, in the compensation laws covering pneumoconiosis.

I am sure that many of the coal miners who were active in urging that the State Legislature of West Virginia enact a new compensation law covering pneumoconiosis were under the impression that they were going to be covered by that law.

As a matter of fact, many of those coal miners who visited the capitol in West Virginia had retired and will not be affected, I am told, by the new law passed by the West Virginia Legislature. For them and others, the statute of limitations may have expired.

I have talked with members of the legislature and I have gotten a copy of the new State compensation law covering pneumoconiosis and I shall be very glad to supply this to the subcommittee in the event it does not already have access to such a copy.

I have given considerable study to this matter over the past several days and I believe, Mr. Chairman, that here is a gap into which the Federal Legislature could step and provide a great service for the retired miners; miners who have been suffering from various kinds of pneumoconiosis and who will not derive any compensation benefits, if my information is correct, from the new compensation law passed in West Virginia. I am led to believe that many of these miners are going to be disappointed when they learn that they are not going to be covered by that law.

Senator WILLIAMS. Senator Randolph.

Senator RANDOLPH. Mr. Chairman.

Senator Byrd, do you propose to place your proposal in the form of a bill or is it more for our consideration at this time?

Senator BYRD. Mr. Chairman, I did join in the cosponsorship of S. 1106, as you have indicated. I am not wedded to all of the particular provisions of that bill. I have proceeded to work on the draft of a bill. I want to discuss this draft with you before I proceed to introduce it because I feel that I should have your advice and counsel.

I have the drafted bill in my pocket at the moment but I want to go over it with you, after which I hope we may introduce it together and, hopefully, with the cosponsorship of other Senators.

Senator RANDOLPH. Mr. Chairman, I commend my colleague for his initiative in this area. I shall appreciate the opportunity of working with him and with others on the compensation legislation.

Senator BYRD. As you know, Senator Randolph, you and I have discussed this matter on numerous occasions. You would be of great assistance in the enactment of effective legislation, and I hope that I can be of some little assistance.

Senator WILLIAMS. If I could make one observation at this point.

The whole question of workmen's compensation coverage for a disease called "black lung" or pneumoconiosis or coal miner's disease has been brought up at these hearings.

It is a question which has received a great deal of attention nationally. It is in the public domain.

I have had suggested to me the possibility of the propriety of your idea, Senator Byrd and Senator Randolph, the idea of workmen's compensation coverage being offered as an amendment to the coal mine health and safety bill that we certainly hope to bring to the floor of the Senate.

It would not come like lightning because it has been quite thoroughly discussed here and across the country. This has been brought to me as a suggestion. It was not my genius by any means.

Senator Byrd. I felt, Mr. Chairman, that we ought to devise some way of reaching the people to whom I have referred. This suggestion would not constitute any additional burden on the workmen's compensation fund of any State.

This would be a Federal-State matching program. Consequently I do not think that we would have opposition from the industry. Otherwise, some opposition might develop if additional cost burdens were to be placed on the industry alone.

Through this Federal matching program, the Federal Government would be taking a major portion of the burden in the early stages of a certain period, and the burdens would shift slowly to the States as the years progressed. I feel that in this way we can spread the burden of cost and as the years go by those miners who have retired and who are disabled and who have not been able to be compensated and who will not have any opportunity to come under the new laws passed in the various States, will have gotten some compensation. These miners have reached an age, for the most part, which would indicate that the period of time in which this program would be necessary would not be long.

Senator Williams. Thank you.

Senator Byrd. Thank you, Mr. Chairman.

STATEMENT OF HON. EDWARD M. KENNEDY, A U.S. SENATOR FROM THE STATE OF MASSACHUSETTS

Senator Kennedy. Mr. Chairman, it is a particular privilege for me to present testimony to the Subcommittee on Labor, because the hearings on coal mine health and safety are the first set of hearings under your new chairman, Senator Williams. As a member of the full Committee on Labor and Public Welfare, I am aware of the great contribution Senator Williams has made to promote the health and safety of all of our Nation's citizens. The fact that the subcommittee has initiated hearings early in the session on such a timely and urgent subject as protecting our coal miners indicates once again the chairman's deep concern and commitment to the welfare of the workingman. I certainly look forward to working closely with Senator Williams in the full committee on all legislation reported from the Subcommittee on Labor.

This committee is engaged in the most important work that Congress can perform— the saving of human life.

The record of death and disease suffered by the Americans who go down in the coal mines has now been documented beyond any doubt.

The tragedy of last fall, the shocking stories and statistics which have recently come to light, the hearings before this committee—all have underscored the need for immediate and effective action to improve conditions in the mines. For the sad fact is that the health and safety of our coal miners have been too long ignored—indeed too long unknown—and all of us in a position to contribute should press forward to correct an unacceptable situation.

The first step is to insure that the many measures which are available today to cut down death and disease in the mines are implemented at once.

In a sense it is a commentary on our times that it took a tragic accident last fall—when 78 men lost their lives—to alert us to the death and disease which occur almost daily in our coal mines. But it is also a commentary on our times that this issue has not gone back underground as has happened after past disasters.

Since the tragedy at Mannington, W. Va., on November 20, 1968, two Presidents from our two major parties have proposed similar legislation to cure glaring defects in the present law—a law which President Truman pointed out was grossly deficient when he signed it in 1952. Several other strong bills have been submitted in both the Senate and the House.

The coal miners themselves have taken heart from the expert testimony of scientists and technicians which has shown that death and disease in the coal mines are not inevitable. Rather, they are all the more intolerable because we now know that they can be substantially reduced. Coal miners expect, and rightfully so, that this Congress will act responsibly—to save literally the lives of hundreds and the health of thousands.

Only recently has the extent of the coal mine safety problem been brought home to citizens across the Nation. We have been shocked to learn that underground coal mining is our Nation's most hazardous occupation; that the incidence of "black lung" directly attributable to coal dust is going up; and that the Federal Government is virtually powerless to require the mine owners to take the necessary remedial measures. As a Federal legislator dedicated to the well-being of all of our Nation's citizens, I feel that it is my duty to take a stand and to speak my conscience.

Having learned of the brutal problems of coal mine safety, no longer can we ask new generations of Americans to go down in the mines when to do so means roughly one chance in 15 of being killed in an accident, a high probability of serious lung disease, and the sure expectation of suffering many lost-time injuries. The fact that many brave Americans—in West Virginia, Kentucky, Pennsylvania, and other parts of the Nation—have made courageous sacrifices in the past is no justification for requiring that they take needless risks in the future.

We must make coal mining as safe as possible, not only to protect the miners, young and old alike, but to also insure that the coal industry and the regions where it is found can prosper and share in the economic benefits of supplying the growing fuel requirements of our high-energy civilization. Coal constitutes our Nation's largest reserve of fossil fuel, with a future potential for many purposes, including conversion to a gaseous or liquid form to supplement natural gas and oil. But none of these new markets for coal can be tapped unless we make coal mining safe.

The road to progress on coal mine health and safety is a combination of rigid enforcement of strict standards coupled with research to perfect safer mining techniques. The Congress can and must provide authority to enforce the standards and money to assist in the research.

Several bills have been proposed to this committee, to put into effect measures which are presently known but are not being utilized to save lives in the mines. I believe the committee has before it the ingredients of a bill that will do the job. Certainly final legislation should at least reflect the common features of the bills proposed by this and the previous administration. But in several respects—especially in setting standards for coal dust—stronger provisions are essential.

Rather than going into details of each of the many bills which have been proposed, however, I would like at this time to stress several key features of health and safety legislation which may be in dispute and which I feel are important for inclusion in the final version of an effective coal mine bill.

First and foremost, we must delegate to the Secretary of the Interior authority to make rules and regulations for the health and safety of coal miners. Such a provision is absolutely necessary, and indeed is boilerplate in statutes for those agencies which are charged with responsibility for safety. Without such authority, the Secretary is powerless to require owners to utilize new technology or to lower the dust level if a lower level becomes feasible, or to make any of the myriad of changes in the safety code that certainly will be needed as more experience and understanding are gained.

Surely, we must recognize that Congress is not equipped to pass a law every time a new safety measure is needed. The Secretary must be armed with the flexible power to do the job and make the standards stick. Indeed, delegation of such safety authority is the principal reason for creating agencies such as the Bureau of Mines in the first place.

Second, the Secretary must have authority to fix standards for both health and safety. Both are major problems and are interrelated. Because the high levels of coal dust which create explosions also cause "black lung," corrective measures cannot be separated. If either authority is omitted we shall have failed to do our duty.

Third, it has been suggested that we do not have sufficient scientific evidence to include in legislation a standard for maximum concentration of respirable dust. The short answer is that those who have studied the matter impartially have strong evidence—

> That inhalation of coal at existing levels is causing "black lung" in at least one out of every five miners who spends many years in the mines;
>
> That many miners are especially susceptible and become diseased after only a short exposure at existing levels; and
>
> That the standard of 3 milligrams per cubic meter of air is technically feasible.

Even if there were doubt about the severity of "black lung" at different coal dust concentrations, our first consideration should always be not production and efficiency, but the health and safety of the men working in the mines. In many cases coal dust at levels below 3 milligrams has been harmful. In all cases only a standard of "zero point zero" (0.0) is entirely safe.

If anything, if we are to choose where to draw the line in an uncertain area, we must allow a healthy margin of protection. Safety factors are mandatory in designing buildings where the strength of steel is known precisely. They are even more important in fixing a dust standard, where the threshold of danger is more uncertain and the stakes in human health and safety are just as great.

A standard of 3 milligrams per cubic meter to be enforced within a short time period specified in legislation is a reasonable requirement. And we should continue to seek an even lower maximum as soon as feasible.

Fourth, I have heard suggestions that the Secretary should be required to prove that violation of safety standards is "knowing and willful" before he can take remedial action. Such a drastic provision would simply make the bill an empty gesture—requiring the Secretary to prove a criminal case before he could enforce his standards.

Safe operation of the mines should be a matter of fact—not intent. For certainly mine operators would not be so callous as to knowingly and willfully disregard the code. The important question is simply whether or not the mines meet safety requirements, and it matters not one iota to the miners who may suffer from violations whether they were willful or just plain negligent. The dire consequences are the same.

It would be nothing but a charade to give the Secretary authority that is virtually unenforceable because it requires unnecessary proof of criminal intent.

Finally, beyond the restrictions of the bills we are considering today, all persons connected with coal mining must expand research and development in ways to make it safer. In the past, both the industry and the Bureau of Mines have completely misplaced research priorities—spending meager sums on safety research as compared to what was spent on increased productivity and efficiency.

What is needed now is an overall approach to the research and development effort that will look at safety in the context of maintaining—and even improving—productivity, as well as solving the associated environmental problems of mining. If necessary Congress must be prepared to take the initiative and to appropriate the needed funds to realize the Government's priorities.

Mr. Chairman, I finally would like to emphasize that the strongest legislation and restrictions we can pass will be of no benefit unless they are firmly and vigorously enforced. In this regard, we are fortunate to have at present a strong and effective Director of the Bureau of Mines, John O'Leary. I wish to compliment Mr. O'Leary for his dedication and efforts on behalf of coal mine health and safety over the last several months. I certainly hope that the present administration will continue to keep, as Director, Mr. O'Leary, who has so successfully rejuvenated the Bureau of Mines and redirected it to protect coal miners as well as to promote productivity.

Mr. Chairman, it is almost certain that coal mine health and safety legislation in some form will be passed during this session of Congress. It is our obligation to insure that the final legislation is constructive and adequate.

No longer can we tolerate the death and disease, the tragedy and suffering, in our coal mines. For too many miners, time has already run out. We must act quickly and effectively, before time runs out for even more.

Senator WILLIAMS. Our next witness will be Dr. Paul Cornely, president-elect and appearing on behalf of the American Public Health Association.

Dr. Cornely, you are a professor and head of the Department of Preventive Medicine and Public Health, Howard University, I understand.

We are honored to have you help us in our legislative deliberations on the health and safety of coal miners.

STATEMENT OF DR. PAUL CORNELY, PRESIDENT-ELECT, APPEARING ON BEHALF OF AMERICAN PUBLIC HEALTH ASSOCIATION (PROFESSOR AND HEAD, DEPARTMENT OF PREVENTIVE MEDICINE AND PUBLIC HEALTH, HOWARD UNIVERSITY COLLEGE OF MEDICINE)

Dr. CORNELY. Thank you very much, Mr. Chairman, and members of the subcommittee.

I am pleased to represent the American Public Health Association before this subcommittee. You have my statement which I would like to submit, make comments on it, summarize it, if you please.

Senator WILLIAMS. All right. Your full statement will be included in the record and you may proceed as you want to and sum up.

(The prepared statement of Dr. Cornely follows:)

PREPARED STATEMENT OF PAUL CORNELY, M.D., PRESIDENT-ELECT, AMERICAN PUBLIC HEALTH ASSOCIATION

Mr. Chairman and members of the subcommittee, I am pleased to represent the American Public Health Association before this committee. I wish to make it clear at the outset that I am not an expert on coal mine health and safey. I have never been in a coal mine nor because of my medical specialty, have I had the occasion to be personally acquainted with the physical manifestations of the deleterious and in too many instances the deadly effects of unsafe conditions which have been allowed in this nation's coal mining.

The American Public Health Association is a 97-year-old professional society comprised of almost 22,500 members whose vocations are devoted to the improvement of the public's health. Members of the Occupational Health Section of the APHA devote not only their professional lives but their APHA activities to improved health conditions in the work environment. Our Association supported Congressional efforts last year to enact more realistic occupational health and safety legislation. Unfortunately, the Congress in its wisdom deemed the proposal unnecessary. We believed there was good and sufficient reason to act affirmatively then and we still do.

Now the Nation is brought face-to-face with another important scandal within our time. We all are now made aware of the unforgiveably unsatisfactory health and safety conditions which exist in our coal mines. Death and disability from coal workers' pneumoconiosis are as predictable as is the prevention of such conditions if proper preventive measures are instituted. Prevention—the watchword of public health and of the APHA—could save so many lives and so much suffering if we as a civilized Nation would just make applicable the then present state of the art. We have the knowledge to prevent many deaths and disabilities but because we do not apply that knowledge there are tragic results. The history of public health is replete with examples of advances predicated not on availability of adequate knowledge but on catastrophe. The time has come when Congress must address itself to this problem.

The indictment against dust in the case of coal miners' black lung has been well documented in the medical literature and already presented to this committee. I concur in the thorough and authentic account of the development of medical knowledge about black lung, the actions taken in other countries to combat it, and the beneficial results of preventive measures presented by Dr. Lorin Kerr, one of our APHA members.

There are many points which could be made re occupational health and safety but in the present situation there are two particular recommendations we wish to make. First because dust suppression has been proven an efficacious procedure in preventing coal workers' pneumoconiosis, the APHA supports a maximum level of three milligrams per cubic meter of respirable dust in coal mines where men work. The APHA wishes to make it clear that this should be considered an interim level of measurement and that every effort be made to obtain a level of dustiness lower than this three milligram maximum. It is long past the time when human health is given less than prime consideration. Any possibility of error or any question must be resolved in favor of human life and health.

In respect to the administrative setting for this needed program, it is high time for Federal health protection responsibilities to be centered in the Federal Government's health protection agency, the U.S. Public Health Service, and not create schizophrenic situations where within one single Federal agency a direct conflict of interests results from both its promotional and policing duties. Frankly, Mr. Chairman, this situation has all of the ingredients of that egregious example of administrative bungling—transfer of the Federal Water Pollution Control Administration from the Department of HEW to the Department of the Interior. Proof positive of this error was presented off Santa Barbara, California, a few weeks ago.

The APHA recommends therefore that responsibility, not just a consultative role, for the establishing of standards pertinent to the protection of the health of coal miners *and* the responsibility for actually monitoring the working conditions in coal mines to make sure standards are being complied with be given to the U.S. Public Health Service. This we believe is the orderly procedure to take and will do much to insure necessary improved conditions.

Thank you for this opportunity to present the APHA's views on this important health problem.

Dr. CORNELY. I would like to say to you at the very start that I am not an expert on safety and health in the coal mines.

However, I have taught public health at Howard University for 35 years and, therefore, I have some acquaintanceship with some of the important health problems in our country.

The American Public Health Association is almost a hundred years old. It has about 23,000 members. It has a very important occupational health section; the members of which have devoted their professional lives to the problems of the workers of this country.

The American Public Health Association has as its key the principle of prevention. We believe this principle is the important and best approach for the control of many of the diseases in this country.

This is particularly true of environmental health and of occupational health. We have appeared before congressional committees to present this point of view and last year Dr. Hanlon, the president of the American Public Health Association, appeared to support legislation for occupational health and safety.

Unfortunately, this legislation did not pass. Therefore, in 1969, right now, we are faced with a scandal in which this continues to be a major problem in terms of ill health in coal miners in our country.

Senator RANDOLPH. Mr. Chairman?

Senator WILLIAMS. Senator Randolph.

Senator RANDOLPH. I do not wish to break the continuity of the doctor's statement. You used the word "scandal" in your statement.

Dr. CORNELY. Yes.

Senator RANDOLPH. What is the meaning of the word "scandal"?

Dr. **Cornely**. I had reference to the fact that here we have a problem which has been before our country for some 30 years or more.

Senator **Randolph**. You are conscious of laws that have been enacted along the way?

Dr. **Cornely**. Yes; I am.

Senator **Randolph**. Are you using the word "scandal" properly, Doctor?

Dr. **Cornely**. Possibly this might not be a good term. What I wanted to convey, Senator Randolph, is the fact, as has been presented before this committee, that we have some 125,000 miners who have been afflicted by this condition, some 50,000 of whom are disabled, and yet there has not been legislation in terms of coal miners' pneumoconiosis. I believe this is an important problem and one with which we should be concerned.

Senator **Randolph**. I am not critical. I am saying that is perhaps the use of a word that you do not really mean.

Dr. **Cornely**. I would accept your correction because I am not too well versed in the English language.

Senator **Randolph**. You know what the word means.

Dr. **Cornely**. I am using the word because I believe that it is relevant.

Senator **Randolph**. I am just asking you if you think it is the proper word.

Dr. **Cornely**. I think it is the proper word.

Senator **Randolph**. Then you should not withdraw it. I just suggest it might not be the best word.

Senator **Williams**. I happened to be conferring with counsel and I did not hear all the colloquy. In your statement you say now the Nation is brought face to face with another important scandal within our time.

Dr. **Cornely**. This is the term.

Senator **Williams**. What were you referring to, the Mannington disaster?

Dr. **Cornely**. I was referring to the point, Senator Williams, that we have at the present time in our country the problem of coal miners' pneumoconiosis, that we do not have regulations governing this particular problem. Therefore, this is an important problem.

Senator **Williams**. You are referring to what we know is the situation; namely, that we have not dealt with pneumoconiosis as a matter of national health standards in the coal mines notwithstanding the fact that we have had considerable evidence that this has been dealt with in other countries.

Dr. **Cornely**. Exactly.

Senator **Williams**. I see.

Senator **Randolph**. Mr. Chairman, I do not want to belabor the point, but I think we observe too freely used words of this type in testimony. I want the record to show exactly how I feel in the matter. It is a pressing problem; there is no disagreement between the doctor and the Senator from West Virginia on that. It is a very pressing problem. It is imperative that we act.

We are attempting to do so as we have acted time and time again on problems in the United States.

Senator **Williams**. I think this has resulted in a suitable word amendment, but it is certainly a clear expression of what we all know; that pneumoconiosis is a disease of coal miners and it is caused by coal dust and we should see what we can do to prevent it to the extent possible.

Is that what we have all concluded?

Dr. **Cornely**. This is my concern.

To continue, the American Public Health Association would like to present amendments on two major concerns, and I think that we have already discussed one of these.

The American Public Health Association believes that coal workers' pneumoconiosis or black lung is an important problem. Testimony has been presented before this committee which would support this particular fact.

Dr. Lorin Kerr, on March 14, presented testimony showing the history, the problem, what other countries had done about this particular condition, and he showed very well that our country was some 30 years behind in terms of legislation.

The American Public Health Association supports this conclusion of Dr. Kerr and wishes to support the standard which has to do with establishing the level of 3 milligrams per cubic meter of respirable dust.

The American Public Health Association also would like to state that this is just an interim proposal, that we should do everything that we can in order to bring this level of 3 milligrams even lower.

We hope that this will happen in this country.

The second point of concern has to do with the matter of administration. We believe that the responsibility for health protection at the Federal level should be centered in the agency at the Federal level which has to do with health, and that is the U.S. Public Health Service.

We would hope that this Public Health Service would have the responsibility not only for setting standards for coal workers' safety and health, but would also be given responsibility to monitor the working conditions in coal mines to make sure that the standards are being maintained.

We would hope also in this context that each miner would be subjected to a periodic physical examination, that they would be subject to a detailed occupational history, and that this periodic examination would include an X-ray of the chest.

I think this would be important in giving protection to the workers in coal mines.

Mr. Chairman, this is a summary of my statement. I want to express my appreciation to the chairman of the committee for the opportunity given the American Public Health Association to make this presentation.

Senator **Williams**. This is a very powerful statement. It is most clear and precise, and it will contribute a lot to our thinking here. Of course, from your position of eminence at Howard University's Department of Preventive Medicine—you have been on the teaching faculty for how long, Doctor?

Dr. **Cornely**. For 35 years.

Senator **Williams**. Are you still teaching?

Dr. Cornely. Yes. As a matter of fact, this is one of the reasons why I cannot stay too long, because I have a class at 1 o'clock this afternoon.

Senator Williams. I was interested in your suggestion of preventive medicine for the Department of the Interior.

You are trying to protect the Department from schizophrenia, are you not, being charged with one responsibility and given another responsibility that could be considered antithetical in a sense?

Dr. Cornely. Yes.

Senator Williams. As we observe in your statement, in the area of water pollution, HEW, the guardian of health and the environment, including water, lost this to the Department of the Interior and now the Department that is the guardian of bringing forth the oil is also the guardian of health when the oil comes forth the wrong way.

Is that the kind of schizophrenia you are talking about?

Dr. Cornely. "Schizophrenia" is a good term for this particular situation. I would hope that this would not happen in terms of this particular situation.

I think there are two aspects in our Federal situation that we must guard against in the health field. First, there is quite a bit of fragmentation in terms of health care at the Federal level and, secondly, there is this sort of schizophrenia which occurs in the placement of responsibility.

This is true in the Department of the Interior. It is true in the Department of Agriculture in respect to the hunger and malnutrition problem, and I would not want to see it happen in terms of this particular situation.

Senator Williams. You certainly persuade me. I hope that we can arrive at the conclusion you suggest that one agency is not running a collision course within its own four walls.

Dr. Cornely. Yes, sir.

Senator Williams. Senator Randolph.

Senator Randolph. Mr. Chairman, the testimony of Dr. Cornely brings to our attention not only the problem of mine health and safety but, also, the failure of the Congress to enact the occupational health safety legislation which was not confined, as the doctor knows, to any particular industry or work conditions.

We did have extensive hearings. We laid the groundwork and I think we can proceed with that legislation, too, in due course. I hope so.

I use this reference that you have made, Doctor, to occupational health to give you the opportunity to comment on this point: As serious as the coal mine problem is—and it is a serious problem—there are other occupations in this country in which there are hazards and disease. Is that correct?

Dr. Cornely. This is quite true, Senator Randolph. If we had had the time we would have liked to have had a lengthier statement to talk about some of the other problems in occupations in terms of asbestosis, in terms of lead poisoning, and so on.

There are many problems in many industries. As a matter of fact, we are having so many new materials being introduced in occupational situations that we are not well aware of all the consequences which may take place in the occupational environment.

It appears to me that a great deal more needs to be done in the whole field of occupational health in our country, a great deal more.

However, we have to take steps one at a time, it appears.

I believe that the hearings that were held last year, as you said, Senator Randolph, laid the groundwork for moving toward better approaches to the problems of occupational health in this country.

Senator **Randolph**. Mr. Chairman, I have this further comment.

I was talking within the last week with a Federal worker who was discussing with me the subject that we have before us. Not facetiously, but really earnestly, this person said that in the particular office where he works the lighting is very poor.

His eyes, a good pair of eyes, are used on rather fine figures and with concentration over periods of time. He said that an eye surgeon had told him that if he continued this type of work his eyes would have a lesser useful life by about 5 years than would be the case if he were in another type of work where lighting conditions are better.

It brings to our attention, and we must not overlook it, that there are very few jobs that do not have hazards and disease problems attached to them.

I think this is very important for us to keep in context here even though we are discussing this subject. We have a broad field that has hazards, many of them. Coal mining certainly is one of them.

Senator **Williams**. Senator Bellmon.

Senator **Bellmon**. No questions.

Senator **Williams**. Senator Schweiker.

Senator **Schweiker**. No questions.

Senator **Williams**. Thank you very much, Doctor.

Dr. **Cornely**. Thank you.

Senator **Williams**. Dr. Ian Higgins, School of Public Health, University of Michigan, Ann Arbor.

Dr. Higgins, we certainly welcome you before our committee.

Senator **Randolph**. His name has been used many times in our hearings, as you know, Mr. Chairman.

Senator **Williams**. Yes, Dr. Higgins, in your absence we did mention you on occasion. Some of your published work was discussed by Dr. Murray Hunter and I know you know Dr. Hunter. You have talked to him.

At one point in our hearings, 2 weeks ago I believe it was, Dr. Hunter, as I recall it, was asked for his evaluation of some of your judgments and he declined, as I recall it, to comment on it.

Senator **Randolph**. Mr. Chairman, you will recall we have had at least four witnesses who have referred to the works of Dr. Higgins in connection with a survey that he conducted. And, because of differences of opinion, I am gratified that we arranged for Dr. Higgins to appear in person.

Senator **Williams**. Now as I recall more precisely, Dr. Hunter did not want to comment in the absence of Dr. Higgins, which is very fair play in every way.

So, in order to give Dr. Hunter that opportunity, he is here today.

Senator **Randolph**. You will remember the comments of Dr. Gross, who was our last medical witness, I believe.

Senator **Williams**. We did not invite Dr. Gross. In your absence he did comment. So we did not have to have him here today. He is fully on the record in connection with your published works, on the basis of your finding he made judgments. So we have had Dr. Gross, Gross on Higgins; now we have Higgins; and next we will have Hunter on Higgins. There we will have the whole medical picture as you gentlemen see it.

STATEMENT OF DR. IAN HIGGINS, SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF MICHIGAN, ANN ARBOR, MICH.

Dr. Higgins. Mr. Chairman, members of the subcommittee, thank you very much, indeed, for this opportunity that you are giving me to come and defend my honor.

My credentials are that I have carried out research on chronic respiratory diseases and other chronic diseases in mining communities since 1953, first at the British Medical Research Council in Cardiff and subsequently—as has been mentioned, I gather—in northern West Virginia.

Miners may become disabled either because of the specific occupational disease, pneumoconiosis, or because of all the other causes of disability to which men who have never worked in the mines are liable.

The most important of these other disabling conditions is now often referred to as chronic nonspecific obstructive respiratory disease or, more simply, chronic bronchitis and emphysema. Pneumoconiosis, chronic bronchitis, and emphysema will be the main conditions considered in my testimony.

PNEUMOCONIOSIS

Pneumoconiosis can be detected in life only by means of the chest X-ray. The possibility of biopsy, or cutting out a small piece of lung tissue and examining it under the microscope, is not a practicable procedure in the great majority of cases.

Chest X-rays of good technical quality can be classified into a number of categories indicative of the stage of the disease. Experienced readers of X-ray films are able to classify the films reasonably reproducibly themselves on two occasions and reasonably reproducibly as between each other.

A number of classifications have been suggested through the years and attempts to obtain international agreement have been made since 1930.

Most X-ray readers now use the suggested 1958 International Labor Organization's classification or some slight modification of it.

Two types of change may be seen on the chest X-ray. In the first, called simple pneumoconiosis, small opacities, or spots, of about one millimeter appear in the lung fields.

These opacities increase in size, number, and to some extent in radiological density, until the whole of both lung fields are thickly covered by opacities of up to 1 centimeter but usually in the range of 0.5 to 3 millimeters.

These are classified in three categories, 1, 2, and 3, on the basis of increasing profusion of opacities, 3 being the most advanced.

In certain cases, usually with a background of simple pneumoconiosis of category 2 or 3, additional X-ray changes appear. These consist of localized, larger, more homogeneous opacities which usually progress to form large massive shadows which later tend to contract and produce distortion of the lung and surrounding tissues.

These shadows are called massive fibrosis or, because they tend to progress, progressive massive fibrosis—PMF.

The two types of X-ray change; namely, the small opacities and the large opacities are together called complicated pneumoconiosis.

PMF is classified in three categories, A, B or C, according to the area of involvement of the X-ray lung field.

A great deal of work has been done to investigate these two processes. It has usually been found that simple pneumoconiosis appears and progresses only in miners who are exposed to coal dust.

The rate of appearance and degree which is found depends on dust dosage; that is, the concentration of the dust in the air breathed and the time for which a man is exposed to this concentration. Simple pneumoconiosis per se does not reduce expectation of life. Nor, as we shall see later, does it cause much disability. It does, however, precede the development of PMF and the liability to PMF depends on the amount of simple pneumoconiosis. The more simple pneumoconiosis is, the greater the liability of developing PMF.

Progressive massive fibrosis, in contrast to simple pneumoconiosis, may appear long after a man has left mining. Its appearance seems to be independent of dust exposure once a certain degree of simple pneumoconiosis has been reached.

It must therefore be due to something in addition to dust exposure, and there is pathological and experimental evidence in animals that this other factor is often tuberculosis.

It is also thought that it may sometimes be due to other infections and occasionally to silicosis.

Once PMF has appeared, 10 percent of the cases tend to progress—that is to say, get worse, each year. There is considerable variation in the frequency of pneumoconiosis in different places. This is especially so for the more serious form of the disease PMF.

The coal miners may also be exposed to rock dust with a high degree silica content because the coal lies between layers of rock. It is possible, therefore, for him to develop classical silicosis.

This is, however, uncommon. When it does occur, the reaction in the lung differs from the more usual one resulting from the inhalation of coal dust.

CHRONIC NON-SPECIFIC OBSTRUCTIVE RESPIRATORY DISEASE

This is the condition which the British refer to as chronic bronchitis and Americans as emphysema. That is a slight overgeneralization but it roughly differentiates it on both sides of the Atlantic.

It can be detected by asking questions about respiratory symptoms or by carrying out simple tests of lung function. It is usually a much more important cause of respiratory disability than pneumoconiosis, with which it should not be confused.

The crucial question is: To what extent do coal workers—and, I might add, parenthetically, other workers exposed to other dusts or fumes or irritant gases—have a greater liability to this type of disability than comparable workers who are not exposed to such substances?

Much of the research I shall now describe to you has been aimed at answering this question.

RESEARCH FINDINGS IN BRITAIN, AND MARION COUNTY, W. VA.

During the years 1953–63, I worked at the Pneumoconiosis and Epidemiological Research Units of the British Medical Research Council in Cardiff, Wales.

The major part of my research was into the causes of respiratory disability in miners and ex-miners.

Because of the danger of selection in patients coming to hospital, men applying for compensation and men actively engaged in mining, we decided that the only way to evaluate the importance of mining and of exposure to coal mine dust in relation to occupation was to compare miners and ex-miners with nonminers of similar age living in the same geographically defined community.

During the course of my 10 years with the MRC we defined a number of communities by carrying out our own private censuses. From the communities so defined we drew representative samples of miners and ex-miners and nonminers for more intensive study.

In one area, a Welsh mining valley with some 30,000 inhabitants, the census was followed by a chest X-ray survey of the whole population aged five years and over. Over 90 percent of the community was X-rayed.

In this area we were able to classify the miners and ex-miners on the basis of their chest X-rays into those with and those without pneumoconiosis and further subdivide those with pneumoconiosis into the various categories of the disease.

As a result of this X-ray survey in this particular area, we were able to sample miners and ex-miners by presence or absence and stages of pneumoconiosis.

Put in the simplest terms, we were really trying to answer the following questions:

1. Do miners and ex-miners have more bronchitis, emphysema, and impaired lung function than men of similar age who have never worked in the mines but who lived in the same area? If so, how much more?
2. Do miners and ex-miners with pneumoconiosis have more bronchitis and emphysema and impaired lung function than miners and ex-miners without pneumoconiosis? If so, how much more?
3. What is the influence of stage of pneumoconiosis on the frequency of bronchitis, emphysema, and impaired lung function?
4. Can we relate bronchitis, emphysema, and impaired lung function to the dose of coal dust that a man has been exposed to during his working life?
5. Can we allow in such comparisons for the other factors which are known to cause bronchitis, emphysema, and impaired lung function—for example, cigarette smoking?
6. We were also, of course, interested in measuring the amount of pneumoconiosis and the factors which influenced its appearance, course, and outcome.

In each of our surveys we obtained information in a standardized way:

1. We used a carefully worded questionnaire to record the presence or absence of respiratory symptoms—cough, sputum, chest illness during the past 3 years, breathlessness, and so on—the occurrence of various respiratory illnesses in the past and smoking habits.

2. We obtained a detailed account of the jobs which a man had done since he left school. In the later surveys we also recorded where he had lived throughout his life.

3. We carried out simple tests of lung function which previous work had shown were the most practicable and informative measures which were available. These were essentially, (i) the volume of air a person could blow out in a given time—three-fourths or 1 second—after a maximal inspiration, (ii) the volume he could blow out after a similar maximal inspiration in as long a time as he needed, and (iii) the ratio of the two measurements.

4. Because these lung function tests are dependent on height, we measured height both standing and sitting. We also measured weight but this was subsequently found not to be an important variable in relation to the lung function test.

5. Chest X-rays were available for every man in each survey. They were either available from the initial X-ray survey I have already mentioned or else we included an X-ray when the man in the sample was examined.

Many of our surveys included observations on other chronic diseases; for example, on coronary heart disease, blood pressure, anemia, and arthritis.

Other tests which are appropriate to the investigation of these conditions were therefore included in these surveys; for example, electrocardiograms, blood tests, X-rays of various bones and joints and so on.

Since I have been in this country I have carried out a survey of several mining communities in northern West Virginia. The object of this study was to obtain information for this area which would be as comparable as possible to the studies carried out in Britain.

Our aims, therefore, were to compare (*a*) miners and ex-miners with nonminers, (*b*) miners and ex-miners with and without pneumoconiosis, (*c*) assess the effects of dose of coal dust exposure as in the British studies, and (*d*) measure the amount of pneumoconiosis.

But, in addition, we wanted to compare miners and ex-miners and nonminers in the United States with their counterparts in the United Kingdom.

I can summarize the findings of all these surveys fairly briefly as follows:

1. Comparison of miners and nonminers: In every survey, miners and ex-miners have been found to have a higher prevalence of respiratory symptoms than nonminers of comparable age. They have also been found to have lower average lung function values.

The magnitude of these differences have, however, varied considerably in different areas. The largest differences were found in the Welsh mining valley that I referred to.

The smallest differences were in an industrial town in the center of England. Intermediate values were found in a mining and cotton town in the Lancashire cotton area in northwest England. There is rather better information in Britain than is available in this country on the national mortality rates for coal miners living in different coal mining areas.

It is interesting to note that our surveys rated the three areas in the same way as these national mortality statistics do, for the whole coal mining industry. We were only studying samples, you understand.

In West Virginia, we also found that the prevalence of respiratory disease and disability was higher in the miners and ex-miners than in the nonminers. But here the differences were small except in the oldest age group of men aged 60 to 69.

2. Comparison of miners with and without pneumoconiosis: We may divide the miners and ex-miners into the two broad categories of pneumoconiosis; namely, those with simple pneumoconiosis and those with progressive massive fibrosis, or complicated pneumoconiosis.

When we started our studies in 1953, it was generally agreed that complicated pneumoconiosis, or PMF, caused respiratory symptoms and disability and shortened life. We concentrated our attention, therefore, on simple pneumoconiosis, though not exclusively.

In our studies in England there was very little difference in the frequency of respiratory symptoms or in the average lung function of those with and those without simple pneumoconiosis.

There is, however, a good correlation between the stages of simple pneumoconiosis revealed by the chest X-ray and the amount of dust which is found in the lung, subsequently, at autopsy. But there is a very poor correlation between total lung dust and the prevalence of respiratory symptoms or level of lung function.

These studies confirmed the higher frequency of symptoms and disability in PMF but indicated that these could be slight or even absent in the early stages.

In the later stages of PMF, categories B or C, there was usually moderate or severe disability and considerable reduction in lung function.

Expectation of life was also found to be reduced progressively in PMF as the area of lung involvement, as indicated by the chest X-ray, increased.

The larger the area of chest X-ray involvement, the higher mortality rate at all ages.

In northern West Virginia, there was again very little difference between the miners and ex-miners with and without pneumoconiosis, either in the prevalence of respiratory symptoms or of average lung function.

In this area there were very few miners with PMF but their lung function was low in conformity with findings in Britain.

3. The relation of coal dust exposure to respiratory symptoms and lung function: The dose of coal dust a miner breathes in a lifetime depends on the concentration of dust in the air and the time he is exposed. His lifetime dosage is the product of concentration in particles per cubic centimeter—or milligrams per cubic centimeter—times the duration of his exposure in years.

Unfortunately, we do not usually have measurements of the dust concentrations to which a man has been exposed at different times during his working life.

We are usually forced to use indirect measures to arrive at an approximate lifetime dose. Two indirect indexes may be used: (1) The number of years a man has spent working at the coal face and (2) the number of years he has spent working underground.

One might expect that if the total lifetime exposure were important the prevalence of respiratory symptoms would increase and the lung function values would decrease the longer a man had worked in dust.

Our findings, however, have not been consistent, and although we have sometimes noted the expected trends, these have often not been demonstrable.

A possible reason for this is that men who are still able to work at the coal face or underground after 20 to 30 years must inevitably be a healthier survivor proportion of the men who originally started to work at the face and consequently the expected trends may be concealed by different types of selection.

4. Do other factors such as smoking explain the greater amount of respiratory disease and disability experienced by miners and ex-miners? Smoking is a more important factor than mining in the causation of respiratory symptoms and disability.

In our surveys it has, however, been possible to standardize for smoking habits and compare miners with nonminers for equivalent smoking habits.

When this is done, miners have been found to have lower lung function values than nonminers in comparable smoking classes.

So that smoking does not explain this.

5. Pneumoconiosis prevalence was found to vary in different areas, the most likely reason being variation in the dust concentrations, in the working lifetimes of men in the different areas.

Comparison of our research findings with those of others:

1. Comparison of miners and ex-miners with nonminers: Most workers who have compared miners with nonminers have found a higher prevalence of symptoms and lower lung function in the miners. In countries where national statistics are available miners have usually been found to have higher bronchitis rates.

2. Comparison of miners with and without pneumoconiosis: Most people have found that respiratory symptoms and bronchitis and lung function do not correlate at all well with X-ray changes. The X-ray changes, however, do increase fairly consistently the longer a man has worked underground or at the coal face. They, therefore, do give a fairly good indication of the size of the dose of coal dust a miner has received in his lifetime.

3. The relation of coal dust exposure to respiratory symptoms and lung function: Other workers appear to have found rather more consistent results than we have in this respect. For example, in a large survey of Appalachian coal miners carried out by the Public Health Service—some details of which I have handed out—but I think this is perhaps the best estimate of the frequency of pneumoconiosis that we have for a large proportion of mining communities; this survey found that breathlessness increased progressively the longer the miner had worked underground.

It was more consistent than our findings, I would say.

4. Differences in the amount of disease in different areas: The striking variation which I referred to in the frequency of respiratory disease disability and death in different coal mining areas in Britain also seems to be true in this country.

Miners in western Pennsylvania appear to have less pneumoconiosis and less respiratory symptoms than miners in central Pennsylvania.

Similarily, miners in southern West Virginia appear to have higher disease rates than miners in the area we studied in northern West Virginia.

The reasons for these differences are not entirely clear. To some extent they may be due to differences in the concentration of dust which have existed over the years. To some extent, also, they may be due to differences in the quality of the coal dust.

Some have claimed that in this latter respect "rank of coal" is an important quality and that high-ranking coals tend to cause more disease than low-ranking ones.

My experience has been that it is usually difficult to differentiate between rank or other qualitative features of the coal and quantitative aspects of concentration of dust in the air.

The reason anthracite coal dust has usually been found to be more dangerous than bituminous coal dust is usually because the dust concentrations are higher.

IMPLICATION OF THESE FINDINGS FOR COMPENSATION

The specific occupational disease pneumoconiosis causes disability in its advanced stages and also reduces expectation of life. But most of the cases which are found in X-ray surveys are examples of the disease at earlier stages, often of simple pneumoconiosis, which does not cause much disability and does not reduce life expectancy. A certain proportion of miners with simple pneumoconiosis go on to develop PMF.

The degree of simple pneumoconiosis is fairly well related to the duration of dust exposure.

Chronic bronchitis and emphysema are more important causes of disability than pneumoconiosis in the great majority of cases. These conditions are not unique to coal workers but occur in any occupation.

The most important factor in their causation is cigarette smoking. Miners and ex-miners do, however, seem to have a consistently higher frequency of bronchitis and emphysema than other workers. Bronchitis and emphysema are often poorly related to the duration of exposure.

It is impossible in the individual to say how much his bronchitis and emphysema is due to his work or to this smoking or to other factors in the cause of these diseases. It is not practicable to compensate all persons who have bronchitis and emphysema.

It is not desirable to compensate persons who have pneumoconiosis but no disability, because such compensation may lead to disability through the compensated man believing he ought to be breathless and consequently becoming so. We have some evidence of that in Britain.

It is desirable that disabled men should receive adequate compensation. Many of my colleagues in Britain believe that the Industrial Injuries Act, which links pensions with specific occupations, should be abolished and that a man should receive a National Health Service pension which is adequate and commensurate with his disability.

In this country this would be through social security or some similar system, and I am thinking of a more adequate pension than social security now provides. I realize this is an impractical suggestion at this present time but I think the problem is one which some countries are already beginning to tackle.

This is not just a question for miners but applies to many other occupations as well. Adequate pensions for all who need them is the only real way that social justice can be attained.

SAFE DUST LEVELS IN THE MINES

The solution to the problem of respiratory disease in the miner, however, is not through compensation. It is clearly to make his job as safe as possible by reducing the dust in the air to safe levels.

The Surgeon General has testified on what he considers to be safe levels and I am not competent nor do I want to say more about this topic in detail.

It does, however, seem to me to be desirable that there should be some acceptable agreed standard based on sound scientific evidence which should be enforced and that the dust levels in coal mines should be regularly and adequately checked.

As far as the coal miner is concerned, I think it is sound practice to examine him by periodic chest X–rays and simple lung function tests in order to determine any evidence of early disease which might make one recommend that he should change his job or work in a less dusty area of the mine. There are two reasons for these periodic chest X-rays:

1. They provide a valuable check on the dust concentrations which are believed to be safe, and

2. There is always the possibility that some men are more susceptible to dust than others and that despite a generally safe dust concentration they will develop pneumoconiosis or chronic bronchitis and emphysema. We should be alert to detect any unduly susceptible men.

It cannot be too strongly stressed that any chest X-rays which are taken should be for the benefit of the miner. They should be completely confidential. Should X-rays suggest that he should change his job, he should be advised, but not forced, to do so.

Thank you very much.

(The document referred to follows:)

Annex 1

In a paper in 1964, Trasko (2) summarized the socio-economic aspects of the pneumoconioses in the USA. The laws of individual States vary in respect of compensation for pneumoconiosis. For the period 1950 to 1962 the total number of cases receiving compensation for 18 States was 27,146. Further details about the differences between States and trends in numbers of cases over the last 15 years are given by Trasko.

The US Public Health Service carried out a survey of coalworkers' pneumoconiosis in the Appalachian region in 1963–1964. A summary of the most important findings is given below.

(1) PERCENTAGE INCIDENCE OF PNEUMOCONIOSIS IN WORKING MINERS BY AGE

Age	Simple	Complicated	Total
Under 25	0	0	0
25 to 34	1.2	0	1.2
35 to 44	2.8	1.4	4.2
45 to 54	7.5	2.6	10.1
55 to 64	12.9	7.8	20.7
All ages	6.5	3.0	9.5

(2) PERCENTAGE INCIDENCE OF PNEUMOCONIOSIS IN WORKING MINERS BY YEARS UNDERGROUND

Years	Simple	Complicated	Total
0 to 9	1.6	0.4	2.0
10 to 19	2.8	1.2	4.0
20 to 29	6.5	2.1	8.6
30 to 39	13.5	7.1	20.6
40 and over	14.3	9.9	24.2

(3) PERCENTAGE INCIDENCE OF PNEUMOCONIOSIS IN INACTIVE MINERS, BY AGE

Age	Simple	Complicated	Total
35 to 44	2.7	0	2.7
45 to 54	10.5	9.4	19.9
55 to 64	9.4	10.3	19.7
All ages	9.2	9.4	18.6

(4) BEST ESTIMATE OF THE TOTAL POPULATION OF WORKING MINERS IN THE UNITED STATES, 1963–65

	Bituminous coal		All other mines	
	Deep mines	Surface mines	Deep mines	Surface mines
1963	119,410	24,218	46,952	118,947
1964	113,948	23,669	47,740	123,902
1965 [1]	113,000	24,000	46,955	124,507

[1] Provisional estimate.

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1. Brown, M. C. (1965) Pneumoconiosis in bituminous coal mines, *Mining Congress Journal.*
2. Trasko, V. M. (1964) Socio-economic aspects of pneumoconiosis, *Arch. environm. Hlth, 9,* 521.
3. Lieben, J. (1967) *Coalminers' pneumoconiosis in Pennsylvania* (presented at the National Conference on Soft Coalminers' Pneumoconiosis, Morgantown, West Virginia, May 1967).

Senator RANDOLPH. Mr. Chairman.

I am in general agreement with you, Doctor, but I am a layman. I am not a medical expert. You close your statement by saying, "It is sound practice to examine him"—the miner—"by the periodic chest X-rays and simple lung function test in order to determine any evidence of early disease which might make one recommend that he should change his job or work in less dusty area of the mine."

Now, Mr. Chairman, I have made some study of this situation. I don't believe that has been done.

Dr. HIGGINS. In this country.

Senator RANDOLPH. That is what I am saying; it has not been done here. Where shall we place the fault at the moment? Of course, there are several places to condemn. But I think you have given to this subcommittee, regardless of what we do in the language of the bill, a proposal here that must be incorporated, as I see it, in whatever is done—in inspection, in testing, in studies, or in diagnosis, whatever procedure.

I am really wondering why we have not done this, Doctor. What is your feeling about this?

Dr. HIGGINS. I think there is no doubt about the value of periodic chest X-rays. This was a suggestion my colleagues at the pneumoconiosis research unit made, I think, in 1948. It was incorporated into the British coal mines. It has proved extremely useful in that it has revealed evidence of the development of pneumoconiosis in areas where the dust concentrations were thought to be safe. I think one possible reason for its not being done in this country might be the fear of the miner that, if changes in the X-ray are found, he might be compelled to change his job. It was for this reason I stressed that the miner should only be advised and not forced.

Senator RANDOLPH. Doctor, at this point I would observe that not all miners are physically the same persons.

Dr. HIGGINS. That is right. That is the second point.

Senator RANDOLPH. There is a miner who, frankly, is susceptible to a much greater degree than another miner might be susceptible. This is understandable. Here is a plan by which we can find this out and not subject, we will say, the person who is highly susceptible to the dangers and the hazards of overexposure to high concentrations of dust. At least we give him the opportunity, Doctor, to know the chance he takes. Is that right?

Dr. HIGGINS. That is right.

Senator RANDOLPH. It might be, Mr. Chairman, that some men would not understand those conditions and would want to begin or to continue mining, notwithstanding the manifest dangers.

I think, Doctor, that you open up a very important area here; namely, the voluntary understanding on the part of the miner, himself, of the conditions under which he might work. Of course, we want to improve those conditions.

Senator WILLIAMS. I wonder if our feeling, that we should make mandatory an annual physical examination, fits in here at all?

Dr. HIGGINS. This is more frequent than I think is necessary. In fact, in the British mines I think the general view is about once every 5 years is probably sufficient.

The development of pneumoconiosis is so slow, given reasonably safe dust levels, that annual X-rays are unnecessary and probably not worth the cost. On the other hand, I think if one is dealing with an area where the dust levels may be less certain, which may be the case in this country, then something more frequent than 5 years might be desirable and possibly 3 years would be a safer time.

Senator WILLIAMS. Following up Senator Randolph's observation, what would be, in medical terms and medical methods, the approach to an early warning of a man who might be highly susceptible in relative terms to another worker whose tolerance was greater to coal dust? What would be the early warning? How would you find that out?

Dr. HIGGINS. The periodic chest X-rays would reveal the development of simple pneumoconiosis after a miner had been on the job for a relatively short time. This would mean either one or two things. It usually means the dust concentrations to which he is exposed are higher than they should be. It may also mean he is exceptionally susceptible.

Many people believe variation in susceptibility is important. It may be. My experience has been, however, that when one gets apparently great differences that one is tempted to attribute to susceptibility between two men, these are often explainable on the basis of differences in dust dosage between them.

I am not saying the individual susceptibility does not exist nor that it may not be important. But only that its importance has sometimes been exaggerated.

Senator WILLIAMS. Is it possible, do you think, to get what I call an early warning, to catch a man in time so that he could be withdrawn from employment at the face or maybe out of the mine altogether?

Dr. HIGGINS. I think there is no doubt detecting the early X-ray changes, the early warning as you call it, is sound preventive medicine and effective.

I strongly believe, however, that compulsion should not be instituted. It may be in the man's best interests to leave the mines. If he does not want to do so, he should not be compelled to do so. I think Britain is unique in Europe in that no man is made to follow any advice he is given. The only justification for suspending him is active tuberculosis which would make him a risk to his fellows. I believe that only by stressing advice and avoiding compulsion will one get full cooperation from the miners for periodic X-rays.

Senator WILLIAMS. He makes the judgment, but he makes it based on information.

Dr. HIGGINS. He makes it on the best evidence that can be given to him.

Senator WILLIAMS. We are doing this all the time, those of us who smoke. We are making a judgment.

Dr. HIGGINS. That is right.

Senator RANDOLPH. Mr. Chairman, the reference during Dr. Gross' testimony had to do with this observation, which I quote:

> A more recent study of West Virginia miners showed that less than one per cent of 446 coal miners who had not also worked in potteries had progressive massive fibrosis of the lungs.

That was a complication of black lung disease. You have indicated this morning, Doctor, that that study was in northern West Virginia; is that correct?

Dr. HIGGINS. That is correct.

Senator RANDOLPH. A 1-percent prevalence rate. Dr. Gross reached that, based on your study. In a sense he agreed with you. Is that right?

Dr. HIGGINS. Yes. I think so. Perhaps I could amplify on this 1-percent figure in our survey.

It is perfectly true that we found four cases in the 440 miners and ex-miners, aged 20 to 69, that we studied that weren't associated with pottery dust exposure. All these four cases were in the rather small group of men aged 60 to 69 years of age. I think there were about 87 men in this particular age group. Within this one age group, 60 to 69, therefore the prevalence of PMF was not 1 percent but something nearer 5 percent. Even this is lower than the figures that I have given you from the Public Health Service. I think our findings indicate that the prevalence of pneumoconiosis was relatively low in this particular area.

But I think it is important to bear the age consideration in respect here. This is a disease that tends to come, I think, in this country more in older men who have done 20 years or more in mining and if you relate it to the appropriate age group, of men age 60 to 69, it works out nearer 5 percent than 1 percent. So this is a slightly different way of looking at our figures.

But the implication in Dr. Gross' testimony that we found relatively low frequency of this more serious form of pneumoconiosis—namely, PMF—in the areas we studied is true. But when you take age into consideration it may not be as low as the 1 percent he quoted might lead you to believe.

Senator **Randolph.** Dr. Higgins, you know Dr. Hunter, he is here today in the hearing room. He said when he was before the subcommittee that he did not agree with your findings. Now Dr. Hunter is here and it might be helpful if, Mr. Chairman, there could be some discussion in reference to this matter.

Senator **Williams.** Will you isolate which findings we are talking about? You did read the record. Can we get the record on that?

Senator **Randolph.** I read that.

Senator **Williams.** That was Dr. Gross you were reading?

Senator **Randolph.** I mentioned Dr. Hunter's statement.

I don't mean, Dr. Higgins and Dr. Hunter, we are, in a sense, somewhat confused. We need clarification. You are the men who can give that to the members of the subcommittee.

I raise this question for the members of the subcommittee because I think it is very important that we clarify the points in question already in the record.

STATEMENT OF DR. MURRAY B. HUNTER—Resumed

Dr. **Hunter.** I don't recall exactly the language I used, but I would like to emphasize I have known Dr. Higgins for a long time and I have a great respect for the caliber and quality of his work, not only here, but I am very familiar with his work elsewhere. I hope my remarks will indicate this. And I don't mean to be a hostile questioner at all. We are just trying to build the record and elaborate the points at issue.

I might add, also, that my criticism is less directed at Dr. Higgins and his work than at the uses to which it has been put. I have recent experience with that in the West Virginia Legislature.

Now I think there are some points of difference. I would like to ask Dr. Higgins some questions. He has had a chance to peruse them. Then I would like to make a brief statement to try to indicate, clearly I hope, what outstanding points of controversy may remain after this hearing is concluded.

My first question to Dr. Higgins concerns a matter of fact which I think he can answer. I call his attention to the American Review of Respiratory Disease, volume 98, a note from Dr. Keith Morgan, in reference to Dr. Higgins' study.

In that paper, incidentally, Morgan was attempting to confirm the theory that there is a relationship between the rank of coal mining and the incidence of pneumoconiosis. In that particular paper, the Pittsburgh seam was described as a medium or low rank, but the question at issue is that Dr. Morgan makes reference, Dr. Higgins, to your final report to the Division of Occupational Health.

The percentage given in his reference is 18 percent of active working miners and 14 percent of retired miners. Now the figure that is widely quoted in your work is 7½ to 10 percent.

I have two questions. One, which is correct? Is this preliminary or is this final? And my second question is this: If, indeed, the retired miners have a lower percentage than the active miners and if we can assume that the retired miners have had a longer exposure, may not in fact we be dealing with a relatively healthier survivor population?

Because, if with age we are seeing less pneumoconiosis, perhaps the older age individuals with the most severe disease have either died off or are resident in nursing homes and various hospitals in the area not accessible to your survey. I wonder if you would care to comment?

Dr. HIGGINS. Dr. Morgan used the final report of my study to the Division of Occupational Health for his figures. In that report I included a category of pneumoconiosis less than category I—suspect pneumoconiosis, if you like. Such a category is not included in the International Labor Organization's classification. It is of questionable validity in that I read an appreciable proportion of nonminers' films as having these minimal changes. In my published paper, therefore, I omitted this category. That is why my figures differ from those given by Dr. Morgan.

Dr. HUNTER. Now, I have another question for Dr. Higgins and he knows I think he can answer this very directly.

Dr. Higgins, taking a critical look at your own study, you did indicate your miners in Marion County did have more respiratory disability than nonminers, but you characterized the difference as not of high-level significance. Yet when the data of Dr. Enterline are compared, I think your findings do bear some explanation. If I am correct, I believe in your own report you made reference to Dr. Enterline's estimate that there was a ninefold rate of respiratory death in coal miners and nonminers.

I, myself, interpret his figures as a fivefold increase. In any case, you characterized the difference in respiratory disability between miners and nonminers as definite but slight magnitude.

Dr. Enterline would indicate that the magnitude is considerable.

Dr. HIGGINS. I have been interested in these death rates for some time. They were one of the reasons that I wanted to study miners and other workers in this country. The death rates as published do suggest that miners have a greatly increased mortality for respiratory diseases compared to other workers.

There is a very good reason for distrusting these figures. There is a bias in the way the figures are collected. This is slightly technical but I hope that I can make it clear to the committee.

At the time of the census, current occupation is recorded. The population of miners is therefore men who are currently working in mining. At the time of death, however, it is usual occupation which is recorded. This would include not only men who said they worked in mining at the census, but also men who had previously worked in mining but who then worked in some other job. A larger number of men are said to be miners at death than reported themselves to be miners at the census.

This is particularly likely to occur in any industry in which the total number of people has been declining. In working out the death rates, the number of deaths among miners are divided by the number of miners as established at the census. The way the occupation is recorded at the census and at death would inevitably lead to a bias, in which the death rates are unduly high.

Senator WILLIAMS. When you say bias, what do you mean?

Dr. HIGGINS. Well, a statistical error due to the fact that the deaths are not being related to the appropriate population.

Dr. **Hunter.** My only comment on that is I would like to say for the group that the study we are referring to is 1950, which I believe was before the great decline of coal employment in the United States. Some of you gentlemen may have better data on this, but the great exodus from the coal industry took place in the early mid-1950's.

Dr. **Higgins.** The bias will occur, it seems to me, through men leaving coal mining to work in other jobs. This will occur irrespective of the decline in coal mining. But it will be increased by such a decline.

I find it hard to believe these statistics. One reason is they are quite out of line with statistics in England and Wales where I should have thought in the twenties, thirties, and forties coal mining was every bit as dangerous as in this country. In the Rhondda, for example, where half the mining population over 35 has X-ray evidence of pneumoconiosis, the mortality rates for bronchitis and emphysema are less than twice the national average.

Dr. Enterline also studied two communities in southern West Virginia in a very smiliar manner to the way we did.

Dr. Enterline found a slightly increased amount of disability amongst the miners in one but in the other he found no difference at all. He also found that disability and symptom prevalence were related to educational status. I am not clear from his paper how much of the difference between the miners and the nonminers was due to mining and how much was due to a difference in educational level.

Dr. **Hunter.** I wonder, Dr. Higgins, it will save us time, so that I don't become redundant, if you would make a comment on this question of the survival population and also if you would make a comment as to whether because of the importance which has been attached to your study, and I keep coming back to that, whether it would not have been helpful to have gotten death data from Marion County for the previous 5 or 10 years to help settle this question of whether we are dealing with health of the survivors.

Dr. **Higgins.** I don't know about the previous 5 years. This would obviously be difficult to do. As you know, I am planning to follow up the population that we studied in Marion County after nearly 5 years in order to find out who has died and who has left the area. This would show if there is a difference between the miners and the nonminers in their death rates and to throw some light on the question you have raised.

As you point out, what we did was to study a cross section at one moment in time. Now if during the previous 5, 10, 15, or 20 years miners have been dying in West Virginia in these areas, Marion County miners have been dying at a higher rate than the nonminers, then as you point out we would be examining a fitter survival population of the miners.

I think by getting deaths over the last 5 years we will make at least some attempt to check up on this. I think it is an important point.

With regard to any emphasis which may have been put on my paper, to prevent just control, I am sorry that this should have been so. I was careful to point out that our findings might not be typical of all mining areas in the United States. I think you could find that exact sentence in my paper.

Dr. **Hunter.** It is.

Dr. **Higgins**. I have given you the Public Health Service pneumoconiosis rates in my testimony because they are obviously more representative of the country than my own particular survey. I believe that there are these regional differences and that possibly I picked an area where there was relatively little disability from mining.

On the other hand, Dr. Hunter as a practicing physician believes that the miners in the area do have a lot of disability. I think in this connection it is important to realize the amount of disability that people who are not miners suffer from.

Dr. Hunter, whose practice is largely with miners, may note a large amount of disability among them and conclude this is due to mining. In fact, there is a lot of disability in elderly men irrespective of whether they have worked in mining or not. This question of the amount of bronchitis, emphysema, and disability attributable to mining and other industrial exposures is being considered at present by a committee of the Medical Research Council in Britain.

I think miners do suffer from an excess of chronic bronchitis and emphysema and have worse lung function than other men.

I don't think we should grossly exaggerate this, though. I have said I believe in every area I have studied they have been found to have worse lung function and higher disease rates, but that these vary from area to area, and I think that this is the best balanced scientific statement of the situation that I can make.

Senator **Williams**. Do you have anything further?

Dr. **Hunter**. I have two more questions, if I might.

I am sure Dr. Higgins will agree with me whoever does X-ray survey on the coal miner under the terms of the dust-suppression legislation ought to be cognizant of the need for technical standards. I have the impression that, if Dr. Higgins' incidence was low, it is possible that because of the equipment that he had to work with that he might have missed a small percentage of pneumoconiosis on account of the X-ray.

I did bring in a film in which Dr. Higgins' survey was read as normal, and we feel shows the pneumoconiosis. I don't think it is necessary to show it unless you want me to.

Dr. **Higgins**. No.

Dr. **Hunter**. I would like to ask two more questions so that we can go on. These have nothing to do with the criticisms of the study. The cigarette question I think Dr. Cander is going to address himself to. But I would like to ask Dr. Higgins to comment on the paper of Hendricks and Claus, British Journal of Industrial Medicine in 1963, with which I am sure you are familiar. In this report from Holland the authors indicate that Dutch miners have been X-rayed seven times since 1949. The results show that the number with pneumoconiosis has decreased since dust suppression was introduced in 1951.

The authors further indicate, they give figures, 27 percent in 1950 had pneumoconiosis, and in 1960 only 15 percent. Their figures show that pneumoconiosis with large opacities decreased from 5.3 to 2.4.

On the basis of a detailed statistical analysis they felt that this could not be explained on the basis of death or retirement but that it was indeed related to dust control.

My question to Dr. Higgins is really in essence: Does he believe on the basis of the total record of experience in this country and in Glamorgan and elsewhere, whether the problem as he sees it of whether progressive massive fibrosis or bronchitis, emphysema can be to a large extent, if not totally, eliminated by the use of dust suppression in American coal mining?

Dr. HIGGINS. I think pneumoconiosis can be largely, perhaps completely, eliminated by dust suppression. Bronchitis, emphysema, and disability might be somewhat reduced but I don't believe these conditions would be eliminated if all dust were eliminated from mining. In my testimony I indicate I believe very strongly in dust suppression.

This is quite impressive over a short 5-year period. It is not due to differences in the way the X-rays were read. Every effort was made to eliminate this type of error.

I do believe that by dust suppression we can reduce and eventually eliminate pneumoconiosis.

Dr. HUNTER. I have been asked to state a position of my own and I think Dr. Higgins understands we have talked for a long time for many years about these things. A position of my own with reference to the questions that have been posed as controversial areas. It is first that I also have a bias: I do see more coal miners than nonminers in my experience which is considerable, but I see both.

Senator WILLIAMS. You are using bias in a different sense, I think.

Dr. HUNTER. I am. I am not talking about statistical bias. I am talking about an emotional affair. But when I take into account my own emotional bias, I conclude that I do believe——

Senator WILLIAMS. You are soft on people. I spotted that.

Dr. HUNTER. Thank you, that is a compliment. I do believe that miners have increased respiratory disability as a result of their occupation with or without X-ray change.

I think, second, the problem is not only that perecentage, be it 1, 4, 5, or more of miners who have progressive massive fibrosis; this is our consensus belief. Everyone seems to agree that these people are in trouble as a result of their occupation. My belief is that the problem extends beyond those individuals.

Thirdly, I believe that, while smoking undoubtedly affects disability, my impression, and it is based on some work which, with the cooperation of the Appalachian Regional Laboratory, we hope to complete and publish; my own impression is that the effect of smoking is not as great as the effect of occupation. This I think you will hear more testimony on.

Senator WILLIAMS. Thank you very much.

Senator Randolph did indicate before he stepped out for a moment that he had no further inquiry, but wait a minute. He did want me to express his thanks and I am very glad we had this medical exchange and agreement on the correlation of dust and pneumoconiosis and the need for dust suppression. We are in agreement there.

Then we go to standards in terms of dust content. There is some difference in suggesting who decides the standard, the Department of the Interior or whether, because it is basically a health matter, it should be put in high, competent medical hands like the Surgeon General and the Health Service. I happen to favor that. Do you gentlemen have any opinion on that?

Dr. HUNTER. Being a physician, I would favor putting it with the Surgeon General.

Senator WILLIAMS. With the Surgeon General given responsibility in this health area?

Dr. HUNTER. Yes. Again my reason is based on a feeling that I have that this Division is perhaps more responsive to human needs. That may be totally erroneous, but it is just a feeling.

Senator WILLIAMS. Dr. Higgins, do you have any observation on that?

Dr. HIGGINS. I think the Public Health Service with its surveys of the dusty trades has always done an admirable job of relating dust exposure to disease. I think the Public Health Service is in the best position to recommend dust levels. I think we are in agreement.

This is a medical and engineering problem. It is not at all a simple question. As reported in the New York Times, the Surgeon General suggested 3 milligrams per cubic meter as recommended level. In order to assess this recommendation one needs to know a lot more than was reported in the New York Times. You have to know how dust concentrations are to be measured, what instruments are to be used, whether this is respirable dust or total dust and whether this is the average for the whole shift. I presume this would be an average. In other words, there will be times when a spot sample might be more than 3 milligrams per cubic meter, other times when it would be less. It is the average over the shift that the British figures are based on. You also have to consider the size range of the particles that you are concerned with and the quality of the dust.

Senator WILLIAMS. Senator Bellmon.

Senator BELLMON. Dr. Higgins, I would like to compliment you on your testimony. I believe it will be very helpful to us.

Dr. HIGGINS. Thank you.

Senator BELLMON. I would like to ask a question.

You have done a great deal of work in this area. The committee has had a lot of testimony about what level of dust concentration could be tolerated, what it should be. Do you have any figures to indicate the relationship between the level of dust particles and the incidence of black lung disease?

Dr. HIGGINS. Unfortunately, I did not obtain dust concentrations in our study in Marion County. I should hope that the Public Health Service has the essential information to derive a dose/response relationship—between dust concentrations and X-ray changes—from their Appalachian survey. This is exactly——

Senator BELLMON. We have had testimony that if the standard was set at 4.5 milligrams per cubic meter we would have about 50 percent more incidence.

Dr. HIGGINS. I read that in the New York Times. I wondered very much myself when I read it what the evidence was based on. Reading the newspapers, which is where I found most of my information about what has been presented to your committee, I had the impression some of the bases for these statements came from British studies.

I think that it may be dangerous to extrapolate from the British figures. Let me give you an example. Walton pointed out in a recent symposium that a level of a thousand particles per cubic centimeter might vary in different mines from 5 to 40 milligrams per cubic meter.

I haven't seen the evidence for the statement that 4.5 mg./cubic meter leads to 50 percent more miners being damaged. I don't know what this is based on.

Senator **Williams**. Arithmetically would that work out?

Dr. **Higgins**. I don't think you can say that because 4.5 is 50 percent more than 3.0—then there would be 50 percent more disease.

Senator **Williams**. I think most of our testimony that dealt with this did not rely on British statistics where the particular count is used in the measure. In this country it is the mass, and, as I recall Dr. Stewart's testimony, he was only using our country's method of measuring by mass. Britain is going to start using our method, by the way, he said.

Dr. **Higgins**. I know there has been this move in Britain to a weight measurement. It is obviously much easier to weigh the amount of dust than to pore down a microscope and count thousands of particles.

Senator **Williams**. He emphasized that point particularly

Then it was Dr. Stewart who gave us his conclusion on the 3.0 as compared to 4.5. I believe—well, I am certain—that the New York Times reported it accurately.

Dr. **Higgins**. That was quite correct. But as I tried to indicate, one needs to know so much more than just these figures. Certainly I don't want to criticize the Surgeon General. If he says 3 milligrams per cubic meter, I am sure he will have good evidence. I would just like to see the dose/response curves.

Senator **Williams**. Senator Bellmon.

Senator **Bellmon**. I have a couple of other questions.

You mentioned that the standard should be set by the Surgeon General. It has been mentioned many times in testimony before this committee that the standards ought to be written into the law that we finally develop here, because, if we leave too much discretion in the hands of a State body or some Government official, there will be possibility for some injustices to occur and the States will be tempted to set the standards too low to enhance their mining development.

It is not your intention to say that the enforcement will be in the hands of the Surgeon General but the setting of standards? Is that right?

Do you feel that enforcement can properly be handled by the Department of the Interior?

Dr. **Higgins**. Oh, yes. I think enforcement could be handled by the Department of the Interior. I don't think it matters who does it, provided it is well done and there is good communication between engineers and physicians.

Senator **Bellmon**. Does it require a medically trained person to make the checks, to do the testing?

Dr. **Higgins**. Making the dust measurements is an engineering problem. Confirmation that the levels you have set are medically acceptable is a medical problem which can only be obtained as a result of the periodic chest X-rays that I suggested.

Senator **Bellmon**. You feel that once an acceptable or measurable standard is set the enforcement could be handled by the Department of Interior?

Dr. **Higgins**. I am sure it could.

Senator **Bellmon**. One other question. You have made a couple of statements attributing a lot of the problems we have to smoking. Do you smoke?

Dr. HIGGINS. I smoke cigars, one every so often. I shouldn't do that. I think they are not quite as innocuous as the statistics suggest. I have smoked cigarettes. I don't smoke them any more.

Senator BELLMON. Let me ask the same question of Dr. Hunter. You seem to place very little importance on the effect of cigarette smoking.

Dr. HUNTER. I don't want that to be interpreted as an endorsement of cigarette smoking. All I am saying is that in weighing relative effects, our feeling, and some experience, indicates that the effect—you know these are noxious substances we are talking about; tobacco inhaled in the lung is noxious, coal dust is noxious. All I am trying to get on the record is that, in respect to the disability that coal miners have with their breathing, coal dust seems to be more noxious in my opinion. I am not for a minute endorsing cigarette smoking and I don't mean to be so interpreted.

Senator BELLMON. Does there seem to be a cumulative effect? Does cigarette smoking and inhalation of coal mine dust seem to magnify the problem particularly or is there any way to know?

Dr. HUNTER. I don't know the answer to that. I really don't, honestly. I think the answer will emerge, but I don't know the answer.

Dr. HIGGINS. The trouble is that in most of the surveys, particularly in Britain, the proportion of people who don't smoke is so small, I have not been able to look into the effect of mining, dust exposure, pneumoconiosis only in nonsmokers. I can't say, therefore, if there is enhancement of the effect of coal dust as a result of smoking or enhancement of the effect of smoking as a result of exposure to coal dust.

We have some evidence, however, that a coal miner with progressive massive fibrosis, quite advanced pneumoconiosis, who doesn't smoke will on the average be less disabled than he would be if he did smoke.

Senator BELLMON. That is all, Mr. Chairman.

Senator WILLIAMS. Gentlemen, we appreciate your testimony.

We have been in session for almost 2½ hours. I think we will recess for 5 minutes and then we will have Dr. Cander and Dr. Hannon.

(Brief recess.)

Senator WILLIAMS. Dr. Leon Cander, the chairman of the Department of Medicine, University of Texas Medical School, San Antonio.

You have come a long way, Doctor.

We feel it is a most important and worthy cause and evidently you feel the same way in coming to us for the particular purpose of testifying on coal mine health and safety.

Thank you very much.

STATEMENT OF DR. LEON CANDER, CHAIRMAN, DEPARTMENT OF MEDICINE, UNIVERSITY OF TEXAS MEDICAL SCHOOL, SAN ANTONIO, TEX.

Dr. CANDER. Thank you, Senator Williams.

Mr. Chairman and members of the subcommittee——

Senator WILLIAMS. By the way, Senator Yarborough was most anxious to be here to greet you and give us more of your eminent biography but, as you know, it was impossible in this rather hectic world of ours for him to be here.

Dr. **Cander.** I appreciate that. It is a privilege to appear before you today. The term "pneumoconiosis" which was first suggested by Zenker was used to describe any lung disease due to the inhalation of dust. The dusts concerned may be of mineral or organic origin. The overwhelming majority of the pneumoconioses results from the inhalation of mineral dust in this country and they almost universally represent occupational hazards.

Historically, there have been two viewpoints concerning the inhalation of coal dust. One viewpoint holds that the inhalation of coal dust per se does not result in disease. This viewpoint proceeds with the concept that individuals who inhale coal dust and develop lung disease do so because of the presence of quartz which contains silica and if the quartz were not present there would be no disease. Until about 15 years ago, this viewpoint was the one held by most physicians in the United States.

The opposite viewpoint holds that the inhalation of large quantities of coal dust results in lung disease regardless of the presence of quartz. This view was promulgated in a classic report from Great Britain in 1943, and since then has been fully documented by medical investigators in every nation where coal is mined. This view has gained increased recognition in this country and is the prevalent concept today.

I might add parenthetically that the United States is the last major coal-producing nation in the world to accept the fact that the inhalation of coal dust per se produces serious disabling disease affecting primarily the lungs, and secondarily the heart. This view has given rise to the term "coal workers' pneumoconiosis" to designate the lung disease produced by excessive inhalation of coal dust.

I should like to review with you some of the evidence that coal workers' pneumoconiosis is a distinct disease entity.

1. Coal dust alone has been shown to produce distortion of the normal architecture of the lung. The early lesion in coal exposure is quite distinct from that seen in silicosis, the lung disease resulting from the inhalation of excessive amounts of silica. The carbon particles accumulate around the distal ramifications of the airway of the lung, leading to dilatation of these fine ramifications and therefore to discrete, isolated areas of so-called focal emphysema. There is little or no fibrous tissue reaction in these early lesions of coal workers' pneumoconiosis. On the other hand, in classical silicosis, nodules of fibrous tissue are formed early in the disease process, and these nodules frequently are pulled closer together as the result of contraction of the fibrous tissue. The early coal nodules, on the other hand, tend to remain discrete and far apart, owing to the dilatation of the small ramifications of the airway, the so-called focal emphysema.

2. The advanced stage of coal workers' pneumoconiosis is called progressive massive fibrosis. These lesions occur in situations where there is no silica exposure. Thus, progressive massive fibrosis, identical with that seen in coal workers, is seen in carbon electrode workers and in coal loaders working at the dock.

Chemical analysis of lungs from these patients has shown that the dust in the lungs contain zero to insignificant amounts of silica. On the other hand, large quanties of silica are generally found in the lungs of patients with silicosis.

Thus, it seems clear that severe lung damage can occur in individuals exposed to coal dust for suitable periods of time in the absence of silica.

There are several consequences resulting from the fact that the coal workers' pneumoconiosis is a disease entity distinct from silicosis and they are:

1. There is a much larger population at risk since silica contamination may be minimal in a number of industrial operations involving coal. In fact, I believe it is safe to state that coal workers' pneumoconiosis is the most common and serious occupational pneumoconiosis in America today.

2. The natural history of coal workers' pneumoconiosis is quite different from that of silicosis and thus diagnostic criteria, therapeutic measures, and preventive measures might be quite different in the two diseases.

In general, the amount of inhaled coal dust retained in the lung is related directly to the concentration of respirable dust and the duration of exposure. Respirable dust refers to the fine fraction of inhaled dust capable of penetrating the lung. The fine fraction of inhaled dust includes particles 5 micra in size and smaller.

In general, the greater the concentration of respirable dust and the longer the duration of exposure, the more severe the pneumoconiosis. The focal accumulation of coal dust appear as discrete nodules on the chest X-ray. Thus, the simplest definition of coal workers' pneumoconiosis is that it is a chronic, potentially disabling disease of the lungs, noted in patients with an appropriate occupational history and associated with certain well-defined changes on the chest X-ray. It should be noted that this description only defines the presence of the disease; it tells us nothing about the alterations in lung function associated with the anatomic changes in the lung, nor does it tell us anything about the presence or severity of disability associated with the disease, matters of considerable import.

In susceptible populations, the prevalence of coal workers' pneumoconiosis has been reported in the world literature varying from about 10 percent to as much as 50 percent. Using uniform diagnostic criteria, the most acceptable figure would place the incidence at least at 12 percent in the present coal-mining population of about 150,000 men. However, when we consider that coal workers' pneumoconiosis has an incubation period of many years and that there were about 450,000 coal miners in America 20 years ago, the true incidence may be considerably greater than 12 percent.

Coal workers' pneumoconiosis has rarely manifested itself clinically before 11 years' exposure. The disease is associated with significant alterations in lung function separate from those of aging. In addition and of greatest importance is the fact that in the more advanced forms of the disease there is resulting disability, often progressive to total incapacity. The disease occurs in two clinical forms: simple pneumoconiosis and progressive massive fibrosis (complicated pneumoconiosis).

Simple pneumoconiosis represents the most common variety of coal workers' pneumoconiosis. In this form of the disease, as Dr. Higgins noted, one notes discrete, small nodules of varying number and size on the chest X-ray of a suitably exposed individual. Studies done on this group of patients indicate that, in general, pulmonary function changes are usually not significant in this group and that disability is usually not present.

However, all of us who have performed physiologic tests on this group have seen patients with relatively minimal X-ray changes who have severe pulmonary function changes and associated disability. Thus, I must emphasize here that, as is true of almost all intrinsic lung disease, the correlation between X-ray changes and functional impairment is not always a good one and it requires more than an occupational history and a chest X-ray for complete assessment of a given individual.

Of perhaps equal significance is the fact that in some individuals in this group even when removed from their occupation, the disease will continue to progress and the individual will develop breathlessness. Breathlessness is the most important and disabling symptom of coal workers' pneumoconiosis.

Now, in the second major form of the disease is progressive massive fibrosis, and may I add, sir, that progressive massive fibrosis occurs only in patients who have previously had simple pneumoconiosis.

As a matter of fact, in a paper by Cochran published in 1962 he demonstrated that patients with advanced simple pneumoconiosis, as many as 30 percent of them lived long enough to develop progressive massive fibrosis.

Senator WILLIAMS. I am glad you gave us this medical observation on that. We are laymen. Describing pneumoconiosis as simple or complicated is like saying that a guy has a cold or he has pneumonia. That is not it at all.

Dr. CANDER. Not every cold develops into pneumonia. A cold is a self-limiting disease.

Senator WILLIAMS. Massive fibrosis is started with simple pneumoconiosis.

Dr. CANDER. That is right. He first develops simple pneumoconiosis. I think the term complicated pneumoconiosis is an unfortunate one. I frankly wish we would drop it.

Senator WILLIAMS. That is the way it came through to me.

Dr. CANDER. We physicians unfortunately have a tendency to use jargon. I think for years we have attempted to keep everything secret. I think our frame of reference is changing. I think we are coming out in the open now.

Senator WILLIAMS. Wouldn't "advanced" be more descriptive of what it actually is?

Dr. CANDER. You are right and it is far more descriptive because it is an advanced form of the disease.

Senator WILLIAMS. We have two or three doctors remaining. I am going to look for head assent. Does that make sense to all of you doctors? We will bring that up later. Excuse the interruption, Dr. Cander.

Dr. CANDER. In progressive massive fibrosis there is development of severe pulmonary scarring involving small and large segments of the lung from large conglomerate masses of fibrous tissue. Pulmonary function studies usually reveal clear-cut and extreme abnormalities. The patient with progressive massive fibrosis suffers from progressive shortness of breath, at first with exercise, eventually at rest. I think it is important to point out that once progressive massive fibrosis develops in the patient there is no way to prevent its relentless progress. That is a terribly important point which I don't think has been mentioned here. Once progressive massive fibrosis develops, there is no way to prevent its relentless progress. If you remove the miner from the mine, it does not matter; the disease progresses. However, again I must emphasize that X-ray changes alone are not adequate to assess functional impairment because from time to time we have seen patients with progressive massive fibrosis with mild pulmonary function changes and little or no disability. Patients with progressive massive fibrosis, however, usually die of either pulmonary insufficiency or heart failure caused by the pulmonary disease.

Now I should like to enlarge on the problem of heart disease in ppatients with coal workers' pneumoconiosis because I believe it has received inadequate attention.

As you know, the lung is the only organ in the body that receives the entire cardiac output. The pulmonary blood vessels ordinarily offer little resistance to the flow of blood through them. The right side of the heart, which pumps blood throughout the lung, as a consequence is required to do little work and, in fact, unlike the left side of the heart is unable to withstand significant stress thrown upon it for any prolonged period.

In patients with progressive massive fibrosis there is destruction and obliteration of large areas of the pulmonary vascular bed, resulting in significant increases in the resistance to the flow of blood. As a consequence, the right heart enlarges and fails, producing the picture of congestive heart failure.

I would like to stop for a moment and show you the difference between the right heart and the left heart.

The left heart is made to pump blood. It pumps by just contracting around a certain number of cc.'s of blood, forcing them out of the aorta. As it pumps the blood, it pulls the free wall of the right ventrical to it.

The right ventrical does not pump the blood as the left does. The stress thrown against the right ventrical is not withstood very well. If we have any increase in the resistance to the outflow of the blood from the right side of the heart, it throws a tremendous stress on an organ which is really not made to do much work. This is what I am describing here in this patient.

After stress is thrown on the right heart, the pump pressure rises and electrocardiographic changes ensue. However, not all patients with this problem manifest the expected electrocardiographic changes. A more recent method for recording the electrical changes in the heart, vectorcardiography, seems to give better correlation with the presence of stress on the right side of the heart.

I might mention in passing that there is one form of coal workers' pneumoconiosis wherein the fibrotic process involves specifically the medium-sized blood vessels in the lung, causing the right heart to work excessively hard in forcing blood through the narrowed vessels. As a result, heart failure occurs in such patient in the absence of severe lung disease and in the absence of the classic X-ray changes. Although X-ray changes are important and I am not denying the significance, X-ray alone, I don't believe, is adequate to assess the patient with coal workers' pneumoconiosis.

There are other significant clinical correlates in patients with coal workers' pneumoconiosis. Some of these are:

1. There is an increased incidence of acute respiratory infections in these individuals. When one considers that the normal mechanisms to clear foreign material from the lungs, including bacteria, are no longer operative in these patients, it is easy to understand how a large number of inhaled infectious agents would be retained in their lungs, resulting in frequent respiratory infections.

2. In the presence of partially compromised lung function, usually minor respiratory infections often produce severe functional impairment, resulting in increased morbidity and mortality in these patients.

I don't want to become involved in what the exact incidence is but I think when we read the literature and review some of our own data there is no question about the fact that coal workers have an increased incidence of acute respiratory infections and when they get acute respiratory infections they are sicker than people who are never exposed to coal dust. From time to time, we see a patient who seems to be pretty well compensated, gets a severe bronchitis and has severe pulmonary failure develop.

3. Pulmonary tuberculosis occurs more frequently in these patients and there is a greater than average death rate from tuberculosis in coal miners. In fact, one school holds that progressive massive fibrosis represents the combined effect of coal dust and tuberculosis in the lung.

Senator Williams, I suspect that is where the phrase complicated pneumoconiosis comes from. It comes from Britain where the earliest studies seemed to have indicated that patients with simple pneumoconiosis have tuberculosis superimposed and this was looked upon as a complicated form of the disease, complicated by tuberculosis. However, we don't know whether this is true. There are people who suggest this is true. On the other hand, it is difficult to recover the tubercule bacillus from many of these patients. So, I don't think we know at the moment. We do know, however, that tuberculosis is seen more frequently in coal workers and the death rate from tuberculosis is higher in coal workers than it is in the general population.

Now I should like to make a few remarks about chronic bronchitis and emphysema in relation to coal workers' pneumoconiosis. There is little question that the most serious and frequent chronic respiratory disease in our society today is chronic obstructive lung disease, specifically its two variants, chronic bronchitis and emphysema. In chronic bronchitis there is inflammation and distortion of the airway of the lung and in emphysema there is destruction of the fine tissues of the lung. Both of these diseases occur almost exclusively in heavy cigarette smokers which is, in essence, a form of intense individual air pollution. Although the major symptom in a patient with chronic bronchitis and emphysema is shortness of breath, neither disease is associated with the nodularities or progressive massive fibrosis seen in coal workers' pneumoconiosis.

Chronic bronchitis and pulmonary emphysema are seen with increased frequency in patients with coal miners' pneumoconiosis. The increased frequency of acute respiratory infections in individuals with coal miners' pneumoconiosis probably results in repeated episodes of structural damage to the lung superimposed upon the structural distortion of the airway and the focal emphysema produced by the coal dust. In fact, Dr. Gough recently has shown that chronic bronchitis and emphysema in coal miners is more severe for a given exposure to cigarette smoking than in the population at large.

So, I think in a sense we have resolved the problem which we heard argued earlier today; that is, that coal workers do develop chronic bronchitis and emphysema but it is superimposed on the existing coal workers' pneumoconiosis.

It is important to point out that coal miners who have never smoked developed disabling coal miners' pneumoconiosis. In fact, there are some recent publications which permit the separation of the effect of cigarette smoking from those of the pneumoconiosis on the lung.

I mention these facts because I have heard suggested erroneously that coal workers' pneumoconiosis was seen only in coal miners who smoked cigarettes and that the disease was indistinguishable from chronic bronchitis and pulmonary emphysema. Neither statement is true.

Unfortunately, there is no effective therapy for patients with coal workers' pneumoconiosis. However, the fact that medicine is now passing through a phase of therapeutic enthusiasm should not prevent us from recognizing that we are entering a new phase in the history of American medicine; namely, the era of preventive medicine. Any truly comprehensive system of medical care must be based on a sound program of preventive medicine. It is cheaper to prevent disease than treat it. Based upon British experience, we now know that coal workers' pneumoconiosis is a preventable disease. By utilizing mining techniques that reduce the level of coal dust to 3 milligrams per cubic meter of respirable dust in the mine, the British have effected a 500 percent reduction in the incidence of coal workers' pneumoconiosis over the past decade.

I would like to digress a moment here because the arguments that we heard this morning seem to me to be spurious. I don't know what the highest safe level of respirable coal dust is. Nor do we know the exact relationship between the concentration of dust and the development of disease. I think what is far more germane is that it is incumbent upon us to start somewhere and based upon the experience in Britain where they have demonstrated a reduction of at least 500 percent in the incidence of coal workers' pneumoconiosis by a program of dust suppression, I think we in America should seriously consider implementing some program of dust suppression in the mine.

I think what we have to really find now is some level of respirable coal dust which is acceptable. I think the Surgeon General's suggestion is one with which I agree.

Now, I have read J. N. Walton's paper and other papers. It is true we don't know enough about sampling techniques. However, if you specify that you are going to sample particles 5 micra in size or smaller and use a gravimetric technique and get down to 3 milligrams of coal dust per cubic meter of respirable dust, I suspect this to be a good place to start. I cannot defend it rigidly on scientific evidence but I think it is a place to start. We have evidence now that if you suppress dust to that level we can effect a significant decrease in the incidence of the disease. That is far more important today, I believe, in the absence of rigid scientific criteria than anything else.

Senator **Williams**. Doctor, at that point, we had medical testimony this morning that in creating that level our standard should be 3 milligrams. That is a medical judgment.

Dr. **Cander**. Yes. I am not an engineer, Senator Williams. I dabbled a bit in dust sampling when I was a resident in Pennsylvania but I don't consider myself an expert on that.

Senator **Williams**. That is not my point.

Dr. **Cander**. It is strictly a medical judgment.

Senator **Williams**. It is in medicine to deal with the levels.

Dr. **Cander**. Yes; absolutely. I think this is a decision which has to be based on scientific data from the medical profession and medical research worker; yes.

Senator **Williams**. Thank you.

Dr. **Cander**. Several years ago, while still a resident of Pennsylvania, I was appointed by the then Gov. William Scranton to a committee to study problems of coal workers' pneumoconiosis in Pennsylvania and establish criteria for disability evaluation. Based upon the survey of about 13,500 miners in that State, permit me to make several suggestions.

May I suggest first that we establish pulmonary screening centers for coal workers in appropriate areas throughout our country. These centers would be equipped to evaluate carefully the clinical status of a large number of miners by means of the history, physical examination, chest X-ray, objective functional valuation of the lung, and electrocardiogram—preferably the vectocardiogram.

These centers would serve the following purposes: (1) Detect early disease before disability occurs; (2) provide data about the natural history of coal miners' pneumoconiosis and the prevalence of the disease by having each miner studied at periodic intervals. I recommend intervals of 2 to 3 years at the present time; (3) establish uniform criteria for disability evaluation; (4) identify those miners who should be advised to change their occupation because of rapid evolution of the disease; and (5) determine the safe biologic concentration of respirable coal dust.

Where available, I should like to suggest that existing Veterans' Administration hospital facilities could participate as screening centers.

Secondly, may I suggest that we develop a program of firm support for basic research in all of the pneumoconioses, not simply coal workers' pneumoconiosis. We have lagged behind Great Britain in this area despite our greater resources.

Up to the present, major emphasis has been in support of descriptive studies using such techniques as X-ray survey, epidemiological survey, and pulmonary function surveys. As important as these studies are, they cannot define the mechanism and definitive etiology of pneumoconiosis. Until we understand fully the etiology of a disease, prevention and treatment are empiric. Basic research should include studies on the immunochemistry of the lungs, mechanism by which the lung clears itself of foreign particles, metabolism of lung tissue, neural control of breathing, and the quantitative study of the manner in which the lung handles dust particles.

I hope my thoughts on this subject will be of some assistance to you as you consider legislation dealing with coal workers' pneumoconiosis. I would like to thank you for the opportunity to appear before you. I appreciate it.

Senator WILLIAMS. We thank you, Dr. Cander.

I gather that you feel that studies that are now embarked upon really do not cover the range of questions that have been unanswered in all of the areas of respiratory problems. Is that it?

Dr. CANDER. Yes. I guess I am naive about legislation but I think we have enough to write meaningful legislation. I think we have enough of the descriptive data and the epidemiologic surveys for this purpose. We know enough about the relation between the presence of coal dust and the development of serious disease. What we don't know is precisely what happens when the coal particle gets in the lung; how does the lung handle it, why does the lung react the way it does to this noxious particle. Unless we understand that, we don't know enough about the biology. I guess my years of investigation in academic medicine show at a time like this because research is a major interest of mine and vital to our society.

Senator WILLIAMS. We know the origin of coal miners' pneumoconiosis. We know the cause. We know the effect. But we don't know why the dust does what it does do to create the pneumoconiosis. Is that it?

Dr. CANDER. Yes; that is right.

Senator WILLIAMS. That is true, as you suggest, in many of the diseases that come to the lungs.

Dr. CANDER. Yes. We have had an enormous growth of our understanding of how our lung functions over the past two decades. Ever since World War II, the emphasis on chest disease has been on objective functional evaluation of the lung. We now have many descriptive studies describing what happens in lung functions in the presence of pneumonia, bronchitis, emphysema, and in industrial hazards, the pneumoconioses, such as asbestosis, byssinosis, bagassosis, and coal workers' pneumoconiosis. I think the studies have elevated the whole specialty of chest disease from a purely clinical descriptive phenomenon which it predominantly was before World War II to one in which we now understand the function of the lung in relation to disease. I think this is an enormous improvement and an enormous advancement. However, I think now we have to go into the next phase which is the understanding of what happens at the molecular level of the disease so that we can prevent it completely. Perhaps we will have treatment for it. At the moment, we don't have any. I think this is an important point.

Senator WILLIAMS. Within the National Institutes of Health is there one focus, do you know, for respiratory studies? It is sort of divided, isn't it, in three or four places?

Dr. CANDER. I hesitate to say anything at this point because the NIH is under budgetary stress.

Senator WILLIAMS. This is not criticism.

Dr. CANDER. There is no lung institute. The suggestion has been made that there should be a national lung institute as there is a National Heart Institute. All the project research grants I have ever had have come from the National Heart Institute. The Heart Institute has done a splendid job in awarding funds for research in lung disease and in the understanding of how the lungs work. Perhaps it might be better if funds for the sort of research I have discussed here, which is related specifically to an environmental hazard, could come from that part of HEW that deals with environmental hazards. One of the physicians in my department has such a grant where he is studying the effect of inhalation of fumes from teflon coated frying pans. This may turn out to be an occupation hazard. When we were in Philadelphia, we saw two men who apparently had respiratory disease associated with this. In general, what we are dealing with is the broad problem of air pollution. That is really what it is. Whether it is in the mines or from cigarette smoking or from any occupational hazard we are dealing essentially with the broad problem of air pollution which is really an environmental problem.

Senator WILLIAMS. We learned of what was to me a new concern arising out of the lining of air-conditioning ducts with fiberglass products made of asbestos. The fiberglass and asbestos products then would draw through the ducts and into the air we breathe, what for me was an early warning that this was going to be a problem in the construction of new buildings.

Have you been exposed to this particular early fear?

Dr. CANDER. I have not been exposed specifically to the problem of asbestos dust from air-conditioning ducts but I have studied several patients with asbestosis. They were members of a union in Philadelphia when I was one of the members of a medical school faculty there. These men primarily were pipe coverers. They covered pipes with asbestos covering. The incidence was incredible. I also would like to point out that this dease once developed apparently is progressive. Even if you remove the individual from the occupational hazard, the disease progresses.

There is a much higher incidence of lung cancer in these patients. In these patients, there is a rapid evolution of the disease. They develop a specific lung tumor which is rarely seen in the absence of asbestosis. This is really about as nasty an occupational disease as I have ever seen. It disabled the individuals quickly and they were young men, too. I can recall several men who were less than 30 years old who were disabled by the disease.

Senator WILLIAMS. It was described to us. This was a man from the union of asbestos workers. They use masks and protective devices.

Dr. CANDER. Senator, it is difficult to get workingmen to use masks. In the first place, the mask has a high resistance to breathing. I have tried them when I was at the University of Pennsylvania as a faculty member there. They are most uncomfortable. I think they would inevitably have to reduce the efficiency of the individual's capacity to work because the mask will increase the amount of work required for breathing.

Ordinarily, the amount of work that the muscles of respiration use in breathing is minimal; it is insignificant as a factor in total body energy expenditure. Whenever you increase the resistance of movement of air in and out of the lung you increase the resistance to breathing. With most workers in Pennsylvania it was difficult to get coal miners or anybody else exposed to an occupational hazard like that to wear a mask. The only people I think anyone has had any success with are sandblasters who clean the faces of stone buildings.

There the concentration of silica is enormous. They wear the very large masks that look like the ones that welders wear. We have had no success whatsoever in getting workers in occupations where there is a dust hazard to wear masks. It seriously interferes with their ability to work.

Senator WILLIAMS. Masks for coal miners is certainly not the panacea.

Dr. CANDER. No. I think for coal miners the coal mines must be placed on dust suppression. We have no way of treating the disease. We now recognize the fact that apparently certain patients with progressive massive fibrosis have relentless progress of the disease even when removed from the mine and apparently it is quite conceivable that in those with advanced simple pneumoconiosis the disease may be progressive when they are removed from the mines. Years later, they develop breathlessness. I think the emphasis and the entire thrust must be on dust suppression and prevention.

Senator WILLIAMS. The committee is going to one mine up in Pennsylvania tomorrow. I was speculating here that I bet we won't be offered a mask and probably won't see a mask. It has been described to us that breathing is involuntary; it is a natural thing.

Dr. CANDER. Yes.

Senator WILLIAMS. But it is hard work with one of those masks. It builds up to some degree with the dust in the air and it gets harder and harder and off comes the mask.

Dr. CANDER. That is precisely what happens. I have been down in the coal mines and it is hard work. The expenditure of energy is enormous and the amount of dust in the atmosphere is almost beyond belief unless you have seen it yourself. I have been in the mine up in Luzerne and Lackawanna County in Pennsylvania. It is really incredibly hard work. I think if I were a miner I would absolutely refuse to wear a mask. I quite agree with you.

Senator WILLIAMS. Our staff counsel, Mr. Blackwell, has been in the mines. He insists if we really want the experience of being in the mine we should spend a good part of our time at what he calls the face of the mine.

Is that where you want us to spend our time?

I haven't anything further except to thank you, Dr. Cander.

Dr. CANDER. I have strong emotional feelings about this. My father-in-law was a mine foreman and developed progressive massive fibrosis. I have spent a fair amount of time up in the coal mines up there talking to the men, examining them. When I was in Philadelphia, we examined quite a few miners. This is a very serious problem. It is one that I no longer think we can ignore. I think only the Federal Government can deal effectively with this problem. It is a problem of national magnitude. I won't use the word "scandal," but I do think it is a very serious problem.

Senator WILLIAMS. Put it this way. It was a gross oversight after the medical profession did learn that pneumoconiosis derived from coal dust. It was an oversight. Now certainly we have focused sufficient attention here and know enough to overcome that oversight even though it is very late in the day.

Dr. CANDER. It is never too late. I think if you save the life of one miner you have done well.

Senator WILLIAMS. Thank you. Our final witness this morning or early afternoon is Dr. J. W. G. Hannon, who comes from Washington, Pa.

Dr. Hannon, you have been very patient. We appreciate it.

I don't have any further biographical material other than it appears here that you are from Washington, Pa., and you are a medical doctor.

Can you fill us in on a little more of the detail of your professional activity?

STATEMENT OF DR. J. W. G. HANNON, FCCP, WASHINGTON, PA.

Dr. HANNON. I have been interested in occupational diseases of the chest since 1934. The majority of my work has been in the field of silicosis. I have made studies of coal miners during this period of time. I have written papers.

Senator WILLIAMS. Washington, Pa. Is that near Pittsburgh?

Dr. HANNON. It is 26 miles southwest of Pittsburgh.

Senator WILLIAMS. That is close to a productive area of coal in Pennsylvania.

Dr. HANNON. It is.

Senator WILLIAMS. Finleyville is our destination tomorrow.

Dr. HANNON. That is in Washington County.

Senator WILLIAMS. Have you been in that particular coal mine, Doctor?

Dr. HANNON. No.

Senator WILLIAMS. The Mathies Coal Co.

So you can't advise us whether we are wise or unwise to go there?

Dr. HANNON. No; I can't.

Senator WILLIAMS. The Mathies Mine Co. is owned by Pittsburgh Coal Co., a subsidiary of Consolidation Coal Co., which in turn is owned by Occidental Oil Co. With all these big ones watching over us, Fred, why are you so worried about this trip? We are in the hands of some of the largest industries in the Nation.

Dr. Hannon.

Dr. HANNON. May I hit the highlights of this statement?

Senator WILLIAMS. Yes; we discussed that earlier. It is all right with the subcommittee.

Dr. HANNON. One of the things I would like to emphasize and emphasize greatly is that lungs cannot generalize on coal mining exposures.

The mining of coal produces dusts that can vary from relatively pure carbonaceous material on the one hand to relatively pure silica on the other and also with varying mixtures of coal and silica in other exposures.

Because of the many fluctuations that can occur in the aerial dusts of the working atmosphere, the pathological changes in the lung can assume several patterns.

The quality and quantity of dust produced can differ from mine to mine in the same general area, from job to job in the same mine, and even from man to man on the same job. These variations can be accounted for by the following factors:

1. Production methods. The type of production methods has a definite influence on the amount of dust produced. Mechanical mining produces more dust and smaller particle sizes than by conventional methods.

2. Dust control. The high incidence of coal miners' pneumoconiosis in Welsh pits is best explained by the introduction of mechanization without adequate dust suppression. The patchiness of the incidence in the United Kingdom is best explained by differences in dust concentrations.

3. Geology. The geology is important, as the mines with their coal seams necessitate a considerable amount of roof drilling, causing dustiness with an increased silica content.

Faulting of the coal seam by siliceous rock also requires drilling of this rock, and the subsequent production of concentrations of silica dust. The geology can vary greatly from mine to mine in the same general area.

4. The specific job of the miner has a definite bearing on his exposure. Men engaged in uncontrolled rock drilling are exposed to high concentrations of silica dust and a small amount of coal dust. Coal-face workers are usually exposed to pure concentrations of coal dust. Operators of continuous mining equipment receive the greatest exposure.

5. Due to the many variables in the working environment as well as in the grade of coal, one cannot make a general statement regarding exposures to coal dust. However, the environment can be reasonably well controlled by dust suppression and ventilation. The severity of exposures may be listed in their degree of severity as (*a*) mining of anthracite coal, (*b*) mining of low seam soft coal, and (*c*) the mining of thick vein bituminous coal.

Senator WILLIAMS. What does that mean? What was your antecedent for it?

Dr. HANNON. The reason for it, due to the high silica content.

Senator WILLIAMS. In terms of risk?

Dr. HANNON. In terms of risk.

Anthracite, low-seam and then thick-vein bituminous coal.

Senator WILLIAMS. Are you dealing with silica?

Dr. HANNON. Primarily silica. The increased amount in the anthracite coal. The mining of the low-seam coal and drilling of the rock roof, a condition which you do not encounter too much in the thick veins.

The commonly found pulmonary diseases in coal workers are as follows:

1. Anthracosis. Anthracosis, a condition of the lungs due to the retention and subsequent pigmenting of the pulmonary tissues. It does not usually present problems of disability.

2. Focal emphysema. Focal emphysema can occur as a complication of anthracosis, and its incidence and severity are in direct proportion to the concentrations of coal dust and the length of exposure. It does not occur in all coal workers but only in those who have well-developed areas of coal retention around the respiratory bronchioles.

I would like to bring out a point here that it is not the amount of dust that the man is exposed to that harms him. It is the amount that he inhales and retains in his lungs. That retention in the normal individual will run around 1½ percent.

Then after silicosis the condition that occurs is due to mixtures, a high mixture of silica, a significant percent of silica with the coal dust can occur in a mixed dust or changes of jobs, going from one job where the exposure is to relatively pure coal dust and then to a job where the silica content is higher.

Classic silicosis can be found in coal miners on certain jobs. Progressive massive fibrosis is considered a separate entity.

Senator **Randolph**. Are you referring now to both anthracite and bituminous mines in connection with silicosis?

Dr. **Hannon**. Yes; in certain areas where the geology changes, particularly in the Far South where there is more silica rock in the coal than in the North.

The prevention of the abnormality that occurred from the retention of coal dust in the lungs can be prevented by a dust control program and a medical control program. The medical control program should consist of preplacement physical examinations, X-rays of the chest and these examinations should be repeated at periodic intervals.

Senator **Williams**. Do you have anything to suggest as to an appropriate interval?

Dr. **Hannon**. Until such time as we have more information, I think it should be done on an annual basis for 5 years and then select a suitable interval based upon experience.

Senator **Williams**. Thank you.

Dr. **Hannon**. Dust control should determine the concentrations of dust per unit of air and X-ray diffraction patterns should be made to determine the amount of free silica in the airborne dust.

Dust suppression at its source and adequate ventilation plus proper engineering play a great part in this control.

In a study of 561 retired soft coal miners over the last 2 years, the following statistics have been obtained:

The average age was 71.4 years. The average length of employment as a miner was 37.5 years. The average duration of time since retirement was 13 years.

Of the group of 561, 269 were considered as average, healthy males and of those under 65 some were working in steel mills and other jobs requiring good physical condition.

Two hundred and twenty-nine were disabled by heart trouble, mostly coronary disease; 46 by emphysema, and that is the common type of emphysema that we see in the general public; 32 by arthritis; 30 by arteriosclerosis; 10 by stroke; 58 by coal miners' pneumoconiosis; and the rest by many causes such as blindness, cancer of the various organs and mental and neurological disorders.

Of the X-ray studies, and I would like to point out that sometimes it is difficult to show the pathology that is in a miner's lung; it is not as easy as in studying the silicotic; the shadows are not as dense; you must use lower millivoltage and sometimes you will take two or three films in order to demonstrate the pathology. Now, the readings that I present are generous.

In category O or the average healthy case, there were 292.

In Category Z, which is questionable, 45; category 1, 101; category 2, 61; category 3, 31; category A, 11; category B, nine; and category C, four.

Six of the men showed healed tuberculosis.

Now, this study was made on retired miners who had worked in the soft coal mines of Washington County in the State of Pennsylvania. The study would not necessarily apply to other regions.

There were some that had exposures elsewhere but the duration was not long enough to be significant.

I would like to state that coal mine dust, in sufficient concentrations, can produce damage to the lung.

2. Coal mine dust can produce disabling pulmonary disease.

3. Standards of dustiness in coal mines must be set up on an individual mine basis due to the many variables that can occur especially in the quality of the mine dust and the grade of the coal.

4. More details of mine dust should be secured through studies of the concentration of respirable dusts and its percentage of free silica.

5. Each coal miner should have a complete physical examination and X-ray of his chest before employment and these studies should be repeated at suitable intervals.

6. A research council or commission composed of able men should be appointed to research and study the problems created by mine dusts and make recommendations as facts become available as a result of their studies.

Senator WILLIAMS. Does that conclude your statement, Dr. Hannon?

Dr. HANNON. It does.

Senator WILLIAMS. Your statement is very clear. We appreciate your coming to us with this statement. I have no questions. Senator Randolph?

Senator RANDOLPH. Mr. Chairman, I think it is encouraging that Dr. Hannon indicates there have been studies made. I think more studies, Doctor, than we as members of the subcommittee realized are underway as we begin now to bring together the body of information, medical in nature. And that is going to be helpful to us.

More surveys, as you indicate, more research, as you indicate, are desirable. But I do not find comfort, but, frankly I find the information you bring us is obviously based on solid studies and research and this gives us a feeling that the medical profession has not overlooked its responsibility in this very important area of occupational disease.

I think you and other experts who have been before us have indicated that although in some instances differences exist, basically you are agreed on the importance of doing more than we have been doing as quickly as possible.

Your recommendations, Dr. Hannon, will be very helpful.

Dr. HANNON. I might state that as chairman of the Committee on Occupational Disease of the Chest of the American College of Medicine, we put on a postgraduate course on coal miners' pneumoconiosis in Pittsburgh last October. Professor Gove from Harvard, Professor Oldman from Bowdoin, Professor Altman from England, and men in this country spoke and one of the weaknesses that we had was that we did not have enough material to talk about.

In the metal mines you have your preplacement yearly chest X-rays and there is a voluminous amount of material available about the dust counts, medical records. So that you can appraise one of these conditions. But the available material on coal miners is very scant, particularly if you went into the mine and X-rayed each individual in that mine and you get the picture. Whereas some of our studies have been made on a 10 percent of the mining population, maybe 5 percent, I do not believe they are as accurate as where you make a complete study.

Senator RANDOLPH. Inaccuracy, did you say, or what word did you use, Doctor?

Dr. HANNON. I do not believe that you can go into a mine or a group of mines and take 5 or 10 percent of the mining population and study them and come up with an accurate report as if you take all of the people, all of the working population in the mine.

Senator RANDOLPH. Thank you very much.

Senator WILLIAMS. Thank you, Doctor. We will reconvene at 2:15 p.m.

We have three witnesses this afternoon.

(The following letters were subsequently received.)

GROUP HEALTH ASSOCIATION OF AMERICA, INC.,
Washington, D.C., March 28, 1969.

Hon. HARRISON A. WILLIAMS, Jr.,
Chairman, Subcommittee on Labor, Committee on Labor and Public Welfare, U.S. Senate, Washington, D.C.

DEAR SENATOR WILLIAMS: The Board of Directors of Group Health Association of America, Inc., desires to express its concern about the health issues in five Senate Bills on coal mine health and safety (S. 355; S. 467; S. 1094; S. 1178 and S. 1300) which are before your Committee. GHAA is a professional trade association of more than 100 health plans and associated organizations and 400 individual members representing prepaid group practice health programs throughout the United States. The Association was formed in 1959 by the joining together of the Group Health Federation of America and the American Labor Health Association. Throughout their history, these organizations have had a vigorous concern, shared by all their members, with occupational health.

In fulfilling their objective of providing comprehensive health care to their subscribers, group health plans constantly feel the impact of work-connected illness and injury on both the well-being and productivity of the individual and the cost of his medical care.

Our Association numbers among its health plan members the Appalachian Regional Hospitals, Inc., and nine group health plans serving coal miners and their families in Appalachia from Pennsylvania to North Alabama. We therefore have very direct knowledge of and concern with the toll of death and disability inflicted upon the Nation's coal miners by the daily inhalation of coal dust. The testimony of Lorin E. Kerr, M.D., Assistant to the Executive Medical Officer, UMWA Welfare and Retirement Fund, before your Committee on June 28, 1968, stated the dimensions of the problem.

There are currently 125,000 active and former coal miners who on X-ray examination exhibit some stage of coal workers' pneumoconiosis, and it is reliably estimated that 50,000 of these are actually disabled in varying degrees from this man-made disease.

We strongly support enactment by Congress of legislation properly designed to prevent this disease as a significant step toward its eradication. This legislation should embody three provisions: (1) control of dustiness in coal mines; (2) assignment of responsibility to U.S. Public Health Service for developing criteria and standards of health; (3) provision for periodic routine examination of coal miners.

1. The maximum allowable levels of dustiness in the anthracite and bituminous coal mines to be set at 3 milligrams per cubic meter of respirable dust. There is ample evidence to indicate that at the 3 milligram level it will be possible to prevent the development of new disease. In view of the labor shortage currently existing in the coal mining industry today, it is essential that all newcomers realize that Congress, as the voice of the Nation, insists that no new cases of this disease develop among the miners.

2. The U.S. Public Health Service and the Department of Health, Education, and Welfare has had long and honorable experience in the development of criteria for many industries. Their ability to perform this task should be expanded and strengthened, not only by Congressional direction to do so, but by

the appropriation of adequate funds. A greatly expanded research program is of paramount importance in the development of these essential criteria. It has only been in the last two years that Congress has appropriated slightly more than $1 million annually for this research. This is less than 5 percent of the money devoted to research in Europe, the vast majority of which is spent in Britain.

3. The third preventive measure essential for the success of eradicating this disease is the periodic, routine examination of the miners. This must include 14×17 X-rays of the chest, physical examination, clinical history, a detailed occupational history, and appropriate clinical and laboratory examinations such as pulmonary function studies and an electrocardiogram. These examinations should be conducted at least every three years and be correlated with levels of dustiness as determined by instruments. These examinations also will assure the early detection of the disease. This will be an overt assurance to new miners of the Congressional desire to protect their health. It will facilitate the recruitment of new miners, as well as help to allay fears of those already afflicted with the disease. Moreover, these examinations will provide the necessary technical information needed to constantly assess the adequacy of the dust suppression campaigns.

While expert opinions is that coal miners' pneumoconiosis will not appear or progress at the 3 milligrams per meter level, routine examinations will provide the information necessary to validate this opinion or to justify further modification of the allowable level of dustiness.

It is our sincere hope that serious attention will be given by your Committee to these items and that we will be able to report to our members, many of whom are associated with one segment or another of organized labor, that you are actively directing the attention of your Committee to the early elimination of all man-made diseases, but particularly coal workers' pneumoconiosis.

Respectfully submitted.

W. P. Dearing, M.D., *Executive Director.*

Memorial General Hospital,
Golden Clinic and Medical Center,
Elkins, W. Va., March 31, 1969.

Re miners' pneumoconiosis.

Hon. Harrison A. Williams, Jr.,
Chairman, Subcommittee on Labor,
Committee on Labor and Public Welfare,
U.S. Senate, Washington, D.C.

Dear Senator Williams: Because of the enclosures, I feel qualified to express an opinion to your committee relative to the above miners' disease. I do not expect you to read the enclosures but they emphasize the interest of this group to privately finance the meetings dated on the reprints. I can extend this interest further by stating that in the 30's I obtained from Mr. John L. Lewis money to do research on so called "miners' asthma." Because of conditions beyond control this research was not carried out. As a surgeon the complications of pneumoconiosis became extremely important in surgical decisions which aided in morbidity and sometimes mortality.

I will not discuss the disease per se as many of your witnesses have given you sufficient information to qualify it as an industrial entity. However, when I look at the national interest in environmental problems, I would rather place it likewise as a national interest problem. Millions have been spent on the environmental conditions confronting the human in outer space before we sent one man into this area. Today, millions are being spent on environmental problems of man's ability to live under the sea.

Back in the early World War I days research was done among the powder workers in ammunition plants. The aniline dye industry has been forced to spend large amounts of money in the industrial environment of their workers. Today the nation is spending vast amounts of money creating laws and making an effort to make the population conscious of air pollution as an environmental hazard. Yet, the record shows that the known problem of many years existing among the miners of coal has received little attention and merely a token expenditure to study the environmental hazards that produce morbidity and death. There are those who would argue, and unfortunately be listened to, that there is not an environmental physiological and pathological problem among miners.

Yet, these same people are now spending thousands of dollars to curb cigarette smoking because it is assumed and not yet conclusively proven to be a basic cause of lung cancer. It seems a little hard to understand how national interest has been suppressed when over the years, time and time again the plight of the miner has been presented to Congress, to industry, to state legislators and to operators.

It was interesting to note that Senator Mansfield, on a television broadcast, stated that he was against the cancelling of the 27% depletion allowance to oil and gas well operators because he came from a state that produced oil. This depletion allowance is based on dollar value. Here we have a depletion of human lives that the national interest has not found fit to recognize and make an effort to correct. Coal by wire, is the energy of this nation's production. Yet, this all important industry, is allowed to consume human lives with only a passing interest and a disgraceful subsidy for correction. I believe the government has the following obligations.

1. To create a national compensable fund to be retroactive to give a living allowance for those miners now disabled by the present diagnostic standards for pneumoconiosis.

2. That there should be funds made available and a directive to the Public Health Department for intensive research into the environmental conditions under which miners work.

3. That there should be an allowance taxwise with a definite date for completion of the proper equipment in operating mines to meet at least the minimum standards set up by the British government as a protective measure to the workers.

4. That the government should frame a minimum standard law for states to adopt for their coal mining industry.

You, Senator Williams, have an opportunity through your committee to correct a condition that is truly a national disgrace and I sincerely hope you accept this challenge and carry it to fruition.

Sincerely,

BENJAMIN I. GOLDEN, M.D.

NATIONAL INSTITUTES ON REHABILITATION & HEALTH SERVICES,
Washington, D.C., April 1, 1969.

Hon. HARRISON A. WILLIAMS, Jr.
Chairman, Subcommittee on Labor,
Committee on Labor and Public Welfare,
U.S. Senate, Washington, D.C.

DEAR SENATOR WILLIAMS: A number of our Trustees has brought to our attention the fact that you are presently holding hearings on a number of coal mine health and safety bills.

Because of our concern with the paramount health problems of the United States today, chronic illness and disability, we felt it incumbent upon us to advise you of our interest in the subject matter of your present hearings and the seriousness with which we view it, as we believe the Congress and the nation must also.

As you know, coal mining is and has always been an extremely hazardous occupation. It has been estimated that one out of every four coal miners presently employed will be killed or permanently disabled as a result of his occupation. While progress has been made in reducing deaths and injuries from accidents, it is nevertheless possible that as a result of technological innovations in production techniques, occupational diseases, particularly coal worker's pneumoconiosis, may be increasing.

It is our opinion that there are three aspects of this problem which particularly deserve consideration by the Subcommittee. These are:

(1) There is sufficient evidence available now from both research and practical operating experience both in the United States and abroad (and particularly in Great Britain) to establish that the level of dustiness in coal mines should not exceed 3 milligrams per cubic meter of respirable air. Such an initial standard should be included in any legislation which the Congress approves.

(2) The U.S. Department of Health, Education and Welfare is the appropriate federal agency to be assigned the responsibility and authority for the development of health programs and standards applicable to the coal mining industry. In assigning to that Department the responsibility for these matters, the Congress should also provide for an adequate level of funding of research efforts designed to improve the health status of coal miners.

(3) Because of the occupational disease hazards to which coal miners are exposed, including but certainly not limited to coal worker's pneumoconiosis, every miner should be provided a routine periodic health examination not less frequently than once in three years, with particular emphasis on chest X-rays designed to correlate incidence and severity of disease with the degree of dustiness of the mines in which the workers are employed.

Sincerely yours,

TERENCE E. CARROLL, *Director.*

NATIONAL TUBERCULOSIS AND RESPIRATORY DISEASE ASSOCIATION,
New York, N.Y., April 2, 1969.

Hon. HARRISON A. WILLIAMS,
Chairman, Subcommittee on Labor,
Senate Committee on Labor and Public Welfare,
Washington, D.C.

DEAR SENATOR WILLIAMS: The National Tuberculosis and Respiratory Disease Association wishes to express its support for legislation being heard by your committee which calls for elimination of health dangers to persons employed in coal mines.

It is our opinion that too little attention is paid in general to conditions of work which predispose to ill health. If for no other reason than the escalating cost of medical care, it is time that the Federal government exert strong leadership in the matter of industrial health.

In the case of coal mines, there are clear and serious hazards to health. Continuing and overwhelming assaults of dust on the lungs have obvious consequences; studies of the Department of Health, Education and Welfare show an especially high prevalance of coal workers' pneumoconiosis in areas where the coal industry is a major employer. Elimination of heavy accumulations of dust is essential to a good respiratory disease control program.

Our organization is interested in the prevention and treatment of chronic respiratory diseases, particularly emphysema, which has become a major cause of disability and death. Preliminary data for 1968 show that there were over 23,000 deaths from emphysema in that year.

This disease now ranks as the second most frequently reported cause of disability for which workers are retired prematurely.

A recent study by the Public Health Service and the Social Security Administration shows that the rate of disability from emphysema among mine workers was about fifty percent higher than would be expected among all workers of comparable age. These beneficiaries reflect only those persons forced to retire before age 65. Thus it is not enough to evaluate the risk of developing pulmonary disease in the mines solely in terms of penumoconiosis.

We agree that the Secretary of Health, Education and Welfare should have authority for developing health standards; we also believe that his Department should have monitoring authority for seeing that such standards are met.

We question if elements of a respiratory disease control program should be written into the law because advances in knowledge may necessitate changes. However, if requirements are specified, we would advise that, in addition to a chest X-ray, a pulmonary function test be included as part of the examination since this is a definitive measurement of the patient's ability to breathe. In some cases where X-ray may not show lung involvement, it is possible that lung function may already be impaired. Frequency of examinations should be left to the discretion of the Secretary of HEW.

Certainly, occupational influences on pulmonary conditions provide an important area for much more intensive research. Indeed, much more research is needed in the entire area of chronic respiratory disease. It is because of the need to expand the minimal research program in pulmonary diseases now being conducted in the National Institutes of Health that our agency has been actively promoting the establishment of a National Lung Institute.

The National Tuberculosis and Respiratory Disease Association strongly endorses legislation to improve health conditions in mines, including protection against levels of dust considered injurious by present standards, with emphasis on continuing research in all health standards.

Sincerely yours,

JAMES E. PERKINS, *Managing Director.*

April 8, 1969.

MEMORANDUM

To: Senator Harrison Williams.
Reference: Agency responsible for standard setting in coal mine health and safety.

The great intelligence by which the Senate Subcommittee has approached the investigation of coal mine health and safety amidst a climate of emotion is an historic credit to that body. The favorable outlook for this particular occupational health and safety legislation provides a unique opportunity to more efficiently translate legislative intent into actual work with tangible results which can be continuously evaluated and modified according to its demonstrated competence and accomplishment.

The Department of Health, Education and Welfare should quite properly have responsibility for developing health standards *provided that the department demonstrates its desire for the program!* The Department could demonstrate this desire by: (a) submission of a plan to organize an effective agency and (b) a formal agreement to regularly submit this agency and its activities to the scrutiny of Congress and the public.

The Department must recruit a highly qualified individual to head the bureau. His appointment should be at the 208 G level and he should be highly recommended by the peers in his field. It must be mutually understood that this individual would necessarily have to respond directly to a Congressional mandate and to continued Congressional oversight.

Specific activities of the agency must include: data collection from this and other countries, independent "in-house" research on a medically and scientifically unassailable level and a vigorous program of recruitment.

Although industry and labor should be consulted and advised of all studies, the "consensus" method for developing standards should be avoided because a consensus of the occupational health experts in the country is necessarily a consensus of industrial opinion.

The activity of setting standards must be completely divorced from enforcement.

Annual reports to Congress will not provide a sufficient feedback mechanism. A more direct indicator of accomplishment would be annual cost-benefit analysis of existing and projected programs made by private consultants to a specially created joint Congressional committee consisting of members of the House Subcommittee on Labor and a Senate Subcommittee on Labor.

I am aware that there are a tremendous number of complicated relationships to be clarified in such a proposal; however, the overriding consideration is the well being of 80 million American workmen who need the protection of health and safety standards. It is imperative that we explore new ways to ensure their objectivity.

H. Wells, M.D.

Beckley Appalachian Regional Hospital,
Beckley, W. Va., April 11, 1969.

Harrison A. Williams, Jr.,
Chairman, Subcommittee on Labor,
U.S. Senate, Washington, D.C.

Dear Senator Williams: In reply to your inquiry of April 4, 1969, it is my opinion that the responsibility for determining health standards in the coal mines should rest with the most competent medical experts. The Surgeon General would appear to have the medical competency, in general. I favor charging the Surgeon General with establishing health standards in the coal mines. I should make clear, however, that this choice does not reflect confidence in the specific agency within the U.S. Public Health Service currently assigned the investigation of coal workers' health. The latter, including the USPHS facility in Morgantown, West Virginia (ALFORD), has failed to meet its responsibilities despite adequate time and funding.

It is my belief that enforcement of health and safety regulations in the coal mines and in all other industry, should be the responsibility of the Department of Labor. This would avoid duplication of effort and tend to put mining conditions more nearly on a par with other industry.

Sincerely,

D. L. Rasmussen, M.D.

Universal Coal Co., Inc.,
Oakwood, Va., April 11, 1969.

Senator Harrison A. Williams, Jr.,
Chairman of Subcommittee on Labor,
U.S. Senate, Washington, D.C.

Sir: Understand present mine safety bill introduced will put me out of business. If you consider any of the bill, please amend them to have two classifications, gassy and nongassy mines. Do not permit the Director of the Bureau of Mines, the power to make his own rules and regulations. Let congress keep that power. Please do not put a civil penalty on the operator. The health standard should be given to the Surgeon General and not the Bureau of Mines.

Very truly yours,

Robert I. Jessee.

Grundy, Va., *April 14, 1969.*

Senator Harrison A. Williams,
Chairman of the Subcommittee on Labor,
U.S. Senate, Washington, D.C.:

Understand the present mine bills introducing will put me out of business. If you consider any of the bills, please amend them to have two classifications, gassy or nongassy mines. Do not permit the Director of the Bureau of Mines the power to make his own rules and regulations, but Congress keep that power, please. Do not put a court penalty or fine on the operator. The health standards should be given to the Surgeon and not the Bureau of Mines.

Omer M. Bunn,
President, Southwestern Coal Corp.

Vansant Coal Corp.,
Vansant, Va., April 14, 1969.

Hon. Harrison A. Williams, Jr.,
Chairman Subcommittee on Labor,
U.S. Senate, Washington, D.C.

Dear Sir: I understand present mine safety bill introduced will put me out of business. If you consider any other bills please amend them to have two classifications, gassy and non-gassy mines.

Do not permit the Director of Bureau of Mines the power to make his own rules and regulations. Let Congress keep that power.

Please do not put a civil penalty or fine on the operator. The health standard should be given to the Surgeon General and not the Bureau of Mines.

Respectfully yours,

William E. Aughenbaugh, *Vice President.*

Charleston, W. Va., *April 15, 1969.*

Mr. Harrison A. Williams, Jr.,
Chairman, Subcommittee on Labor, U.S. Senate, Washington, D.C.

Dear Mr. Williams: In reply to your letter of April 3, 1969, please be advised that I feel that the Surgeon General should be given the responsibility of determining health standards.

It was indeed a pleasure being with you in Czechoslovakia.

With kindness personal regards,

Sincerely yours,

I. E. Buff, M.D.,
Chairman, Physician's Committee for Miner's Health and Safety.

Dorothy Mae Coal Co.,
Keen Mountain, Va., April 16, 1969.

Senator Harrison A. Williams, Jr.,
Chairman Subcommittee of Labor,
U.S. Senator, Washington, D.C.

Dear Sir: I understand that present mine safety bills introduced will put me out of business.

If you consider any of the bills please amend them to have two classifications: "Gassy" and "non-gassy" mines.

Do not permit the Director of the bureau of mines the power to make his own rules and regulations. Let Congress keep that power.

Please do not put a civil penalty or fine on the operator.

The health standards should be given to the surgeon-general and not to the bureau of mines.

Sincerely,

KENDRIS HARMAN.

APRIL 21, 1969.

Senator HARRISON A. WILLIAMS, Jr.,
Washington, D.C.

DEAR MR. WILLIAMS: In reply to your letter regarding miner's health and safety being placed in the hands of the Surgeon General, I also concur with those men listed even though some of them are coal operators because I believe that the office of Surgeon General would be impartial in his judgment and because he has at his disposal the very best medical minds and research equipment in the world.

I do not believe he should be given the job of enforcement of his rulings nor do I agree wholeheartedly that the enforcement should be left in the Dept. of Interior. I would much rather see the Bureau of Mines taken out of the Dept. of Interior and placed in the Dept. of Labor where it seems to more appropriately belong.

Thanking you for your earnest efforts on behalf of the coal miners.

Sincerely,

ELMER W. YOCUM,
Jere, W. Va.

ENGLEHART, CREANY, ENGLEHART & LEAHEY,
Ebensburg, Pa., April 24, 1969.

Senator HARRISON A. WILLIAMS,
Chairman, Subcommittee on Labor,
U.S. Senate, Washington, D.C.

DEAR SENATOR WILLIAMS: I acknowledge receipt of your letter of April 21, 1969, together with Excerpts from Testimony at Senate Coal Mine Health and Safety Hearings.

In regard to the question that you presented to me, this in effect constituting a policy matter insofar as the United Mine Workers of America is concerned, I would prefer waiting until I consult with my superiors before giving you an answer. However, I can assure you that this will be done within a very short period of time so that there will not be any delay in your final determinations in this very important matter.

I want to thank you for the kind consideration of keeping me advised in this regard.

Sincerely,

EUGENE A. CREANY.

NATIONAL COAL ASSOCIATION,
Washington, D.C., April 24, 1969.

Hon. HARRISON A. WILLIAMS, Jr.,
Chairman, Subcommittee on Labor,
U.S. Senate,
Washington, D.C.

MY DEAR SENATOR WILLIAMS: This is in response to your request of April 21, 1969, relating to "responsibility for determining health standards" and "for the record, your views on this important issue." We understand that you have sent a similar request to other coal industry witnesses who testified before your Subcommittee on March 12, 1969. We respectfully request that this letter be accepted as a joint reply to you from all those industry representatives.

We agree that the Surgeon General's office is most qualified to study health effects relating to coal miner dust exposure and to recommend dust levels for the protection of miner health. Therefore, we concur with the interim dust level recommended to your Subcommittee on March 18, 1969 by the Surgeon General Dr. William H. Stewart. In his prepared statement on page 13, Dr. Stewart said:

". . . We are in full accord with the provisions of S. 1300 which would require compliance with an initial interim standard of 4.5 milligrams per cubic meter within six months after enactment."

The coal industry support for the dust level recommended by Dr. Stewart was evidenced even prior to Dr. Stewart's testimony. On March 12, 1969. Mr. James R. Garvey, our witness on dust control provisions of the Act, in his statement to your Subcommittee said:

"An interim dust standard should be established; one that will result in immediate improvement on dust conditions in coal mines, while at the same time enabling continued operations within the limits of our current technology for control and measurement of dust levels. . . . 4.5 milligrams per cubic meter as determined by the MRE sampler."

We further believe that the Department of Health, Education & Welfare should play a prominent role in the development of future standards relating to coal miner exposure to respiratory dust. As Mr. Garvey pointed out on pages 21 and 22 of his statement:

"While it appears that coal workers' pneumoconiosis may result from long-term inhalation of coal dust by miners, no correlation has been established between dust concentrations and health effects. An effort to obtain that correlation should be initiated immediately through continuation and acceleration of the U.S. Bureau of Mines survey of coal-miner dust exposures which has recently been started, coupled with a study by the U.S. Public Health Service to obtain x-ray and other medical evidence of the prevalence of coal workers' pneumoconiosis which can be related to dust exposure. The Secretary of Health, Education & Welfare should, after consultation with appropriate advisory committees and Federal departments and other agencies, develop and issue as soon as practicable to the Secretary of Interior and his Advisory Committee on Coal Mine Dust such criteria of coal-mine air quality as in his judgment may be requisite for the protection of health and welfare of the miners. The criteria should accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on health and welfare which may be expected from the presence of coal-mine dust in varying quantities, and such criteria should include those variable factors which of themselves may alter the effects on health, including such items as part-time exposure to extremely high dust levels."

The foregoing follows the precedent established in the Clean Air Act of 1967 wherein the Secretary of Health, Education & Welfare was directed to develop scientific criteria for air quality. But, there is no precedent for the office of the Surgeon General or any other office of the Department of Health, Education & Welfare to establish and enforce standards for the protection of the health of industrial workers.

Such standards in the past have been established by the American Conference of Governmental Industrial Hygienists with full participation of representatives of the Public Health Service as committee members in guidance and advisory roles.

The determination of appropriate health standards for mining while involving medical knowledge and opinion also involves expert knowledge of coal mining and coal mining machinery and techniques, and requires judgments not only as to health requirements, but also as to what minimum levels of dust are achievable as a practical matter, by what means and under varying conditions. We believe that if, as applied to coal mining, any change is to be made in past procedure for establishing industrial health standards, the ultimate determination of such standards should be made by Congress or the Secretary of Interior. Through the use of advisory committees and by direct consultation with the Surgeon General and other medical experts, the Congress or the Secretary of Interior can always have access to the most current and responsible medical opinion in determining the appropriate standards.

In addition, the enforcement of any health standards in coal mining will be so inter-related with the enforcement of safety standards and require such knowledge of mining methods and conditions that the enforcement of both health and safety standards should be placed in one agency; and the agency qualified by knowledge and experience is the Bureau of Mines. A bifurcated administration of safety and health standards would involve unnecessary and costly duplication of administration of the Mine Health and Safety Act; would require dual staff of inspectors, dual inspection, etc.

In summary, as this letter will indicate for the record, we believe the Surgeon General's office is the most qualified to determine and recommend levels of dust exposure necessary for health protection; but we do not believe his office is the most qualified to determine how such protection should be achieved. Determining health effects is a medical problem; preventing them is an engineering problem. For the latter, the U.S. Bureau of Mines, with its many years of experience in solving technical problems relating to coal mining, is the logical choice.

As Mr. Garvey explained in his statement, the measurement of dust levels in coal mines, the determination of feasible dust control measures, and the appropriate application of such measures, are not as yet precisely known matters. More technical study still remains to be done before we will know what is the best way to achieve the objective of the proposed legislation, namely, protection of the health of the miner. In fact, Congress might require that the Public Health Service from time to time report on the progress it is making in its studies on occupational health as it relates to American coal mining, and the progress it is making in scientific determination from a health standpoint of the medical criteria to be considered by the standards-setting authority as that authority also considers all of the other relevant factors. We believe that this reporting by the Public Health Service would be in the overall industrial health interest, and would contribute to orderly movement for the setting of proper standards which have taken into account scientific medical research.

But there is no need for delay. There are steps which can be taken now, steps involving the expertise of both the Public Health Service and the Bureau of Mines which will not only provide maximum immediate protection for the miner, but which will also insure the development of a necessary well-planned, long-range program. These were itemized by Mr. Garvey on pages 18 through 22 of his March 12 statement. We urge that your Subcommittee give careful consideration to these seven recommendations in the development of the health section of the proposed "Federal Coal Mine Health and Safety Act of 1969."

Sincerely,

Stephen F. Dunn.

United States Steel Corp.,
Pittsburgh, Pa., April 28, 1969.

Hon. **Harrison A. Williams, Jr.,**
Chairman, Subcommittee on Labor,
U.S. Senate, Washington, D.C.

Dear Senator Williams: Your letter of April 21, 1969 caught me in Harlan County, Kentucky, so it was necessary to effect some coordination by telephone.

As stated to your Subcommittee my presentation dealt with the technical aspects of safety matters and of controlling the work environment, and not on dust levels as such from the health standpoint.

However, your question involved a procedural rather than a medical judgment. After exchange of viewpoints which were in principle alike, the industry group, consisting of Messrs. Dunn, Corcoran, Farmer, Garvey and me, who appeared before you on March 12, 1969, elected to delegate the detailed reply to Mr. Dunn.

Your request for my views is most appreciated.

Yours truly,

Woods G. Talman,
Chief Inspector, Coal Operations.

Morgantown, W. Va., *April 28, 1969.*

Hon. **Harrison A. Williams, Jr.,**
Chairman, Subcommittee of Labor.

My Dear Senator Williams: In regard to who set the Health Standards inside the mines, I feel sure that these standards must be set by Medical Men, not Mining Men.

Might I suggest that the determining of Health Standards be placed under the Surgeon General.

Sincerely,

Elijah Wolford.

CONSOLIDATION COAL CO., INC.,
Pittsburgh, Pa., April 29, 1969.

Hon. HARRISON A. WILLIAMS, Jr.,
Chairman, Subcommittee on Labor,
U.S. Senate, Washington, D.C.

DEAR SENATOR WILLIAMS: I appreciate your letter requesting my views regarding the responsibility for determining health standards for our coal mines.

You have already received from Mr. Dunn, President of National Coal Association, a detailed letter outlining the views of National Coal on this important issue.

You will recall from my testimony before your Subcommittee that in addition to being President of Consolidation Coal Co., I am also Chairman of the Board of National Coal Association. In that capacity, I have reviewed with Mr. Dunn the substance of his letter to you and I can assure you that I am in complete accord with the comments he has made.

If I can be of further assistance to your Subcommittee, kindly let me know.

Sincerely yours,

JOHN CORCORAN.

INDUSTRIAL MEDICAL ASSOCIATION,
Chicago, Ill., May 1, 1969.

Hon. HARRISON A. WILLIAMS, Jr.,
Chairman, Subcommittee on Labor, Committee on Labor and Public Welfare,
U.S. Senate, Washington, D.C.

DEAR SENATOR WILLIAMS: The Industrial Medical Association, of which I am President, has requested me to forward to you its concern about the health issues in five Senate Bills on coal mine health and safety (S. 355, S. 467, S. 1094, S. 1178, and S. 1300) on which you have been holding hearings.

The Industrial Medical Association, founded in 1916, is a national professional society of 4,000 doctors of medicine bound together by a common interest in that branch of medicine called industrial or occupational medicine. The purposes and objectives of the Association are:

1. To foster the study of the problems peculiar to industrial medicine and surgery;
2. To unite into one organization, members of the medical profession whose interests lie in that field and assert their identification with it;
3. To encourage and foster the development of methods adaptable to the conservation and improvement of health among workers; and
4. To promote a more general understanding of the purposes and the results of the medical care and health maintenance of those workers.

Our Association has long been convinced of the need for an active national program concentrating on the prevention of occupational illnesses and injuries. Our interest in such matters is amply manifested in the testimony which officers of our Association presented on the Occupational Health and Safety Act of 1968 before the Select Subcommittee on Labor of the House of Representatives on March 11, 1968, and before the Subcommittee on Labor of the Committee on Labor and Public Welfare of the United States Senate on June 24, 1968.

Our organization is deeply concerned about the health and safety of the Nation's coal miners and believes that legislation which will improve their health and safety is highly desirable. It is our conviction that legislation in this area should include the development of standards for environmental dust control. We believe that the Federal Government has a role in standard setting. We feel that consideration should be given to the establishment of a national council on hazardous agents patterned after the National Council on Radiation Protection and Measurement. Such a council properly constituted with working committees of recognized scientific authorities from government, professional groups, industry, and labor could develop guides, criteria, and standards of great value in improving occupational health and safety programs. It is our belief that the Department of Health, Education, and Welfare should have a primary role in establishing standards in occupational health and safety. We emphasize that standards should be based on scientific fact. In our opinion, they should be subject to public hearings before adoption.

In summary, for over 52 years, the Industrial Medical Association and its members have been actively concerned about the problems now being considered by your committee. The most important resource of this Nation is its working population. We pledge to you our support in maintaining and promoting the health and well-being of that resource.

Thank you for the opportunity to present the views of the Industrial Medical Association.

Respectfully submitted.

D. L. BLOCK, M.D., *President.*

(Whereupon, at 1:05 p.m., the subcommittee recessed, to reconvene at 2:15 p.m. of the same day.)

AFTERNOON SESSION

(The subcommitte reconvened at 2:30 p.m., Senator Harrison A. Williams, Jr., chairman of the subcommittee, presiding.)

Senator WILLIAMS. Our first witnesses this afternoon are residents of Kentucky and Senator Marlow W. Cook is here to introduce them.

STATEMENT OF HON. MARLOW W. COOK, A U.S. SENATOR FROM THE STATE OF KENTUCKY

Senator COOK. Thank you, Mr. Chairman.

I appreciate very much the opportunity to be before your subcommittee this afternoon for the purpose of introducing two natives of my own State of Kentucky. These gentlemen will be testifying before you, as you know, on the general subject of mine safety.

Mr. Cloyd McDowell, who will be making his remarks first, is from Harlan, Ky. He is currently serving as president of the Harlan County Coal Operators' Association, which includes, as he will tell you, 23 small commercial mines in Harlan County. Cloyd McDowell is a civic leader of some distinction serving as director of the Harlan County Chamber of Commerce, a director of the Bluegrass Council of the Boy Scouts of America, a member of the Board of Regents of Morehead State University, and as commissioner of the Harlan Community Water Works. Mr. McDowell has been active also as a member of the Executive Board of the Southern Coal Producers' Association.

Rufus Bailey, who will be presenting testimony also, for a number of years has served as safety director of the Harlan County Coal Operators' Association. He is a member of the Board of Directors of the Kentucky Mine Rescue Association and probably has fought more mine fires than any other professional mine safety man in the United States. And I might add, he has never lost a man.

Mr. Bailey has been in charge of efforts which have rescued 61 people trapped in mines during his career. He has been instrumental in training two outstanding mine rescue teams which have won national awards as the most outstanding teams in 5 different years and the Kentucky State championship in 14 different years.

Mr. Chairman, I am proud to be able to present these outstanding Kentuckians to you and I am sure that their remarks will make a great contribution toward your effort to draft a truly effective coal mine safety bill.

I wish to thank you. They know I am going to excuse myself. I expect you will be called very shortly to join us over on the floor. I appreciate the courtesies of your committee.

Senator WILLIAMS. We are glad to welcome your constituents.

Mr. McDowell, we have your statement, which has been distributed. Proceed in any way you wish.

STATEMENT OF CLOYD D. McDOWELL, PRESIDENT, HARLAN COUNTY COAL OPERATORS ASSOCIATION, HARLAN, KY.

Mr. McDowell. Thank you, Mr. Chairman.

I am Cloyd D. McDowell, president of the Harlan County Coal Operators' Association, which is an unincorporated association of coal operators producing coal from 23 small commercial mines in Harlan County, Ky. The annual production of our mines is just under 3 million tons per year, which represents an insignificant amount of the Nation's output of coal, but to us and to our part of Kentucky it represents our means of livelihood and the investment of our life savings.

Our county's economic well-being is dependent completely upon the welfare of coal mining. There is no other basic industry in Harlan County and all of our 42,000 citizens will be directly or indirectly affected by any legislation pertaining to coal mining.

As a matter of explanation I might add that the annual coal production of Harlan County is about 7.5 million tons, of which the captive mines at United States Steel Co. at Lynch, and International Harvester Co. at Benham account for 3.5 million tons. The remainder of about 1 million tons is produced by other small mines that are not members of our organization. We are the second-largest producer of coal from underground mines in Kentucky. I am referring to Harlan County.

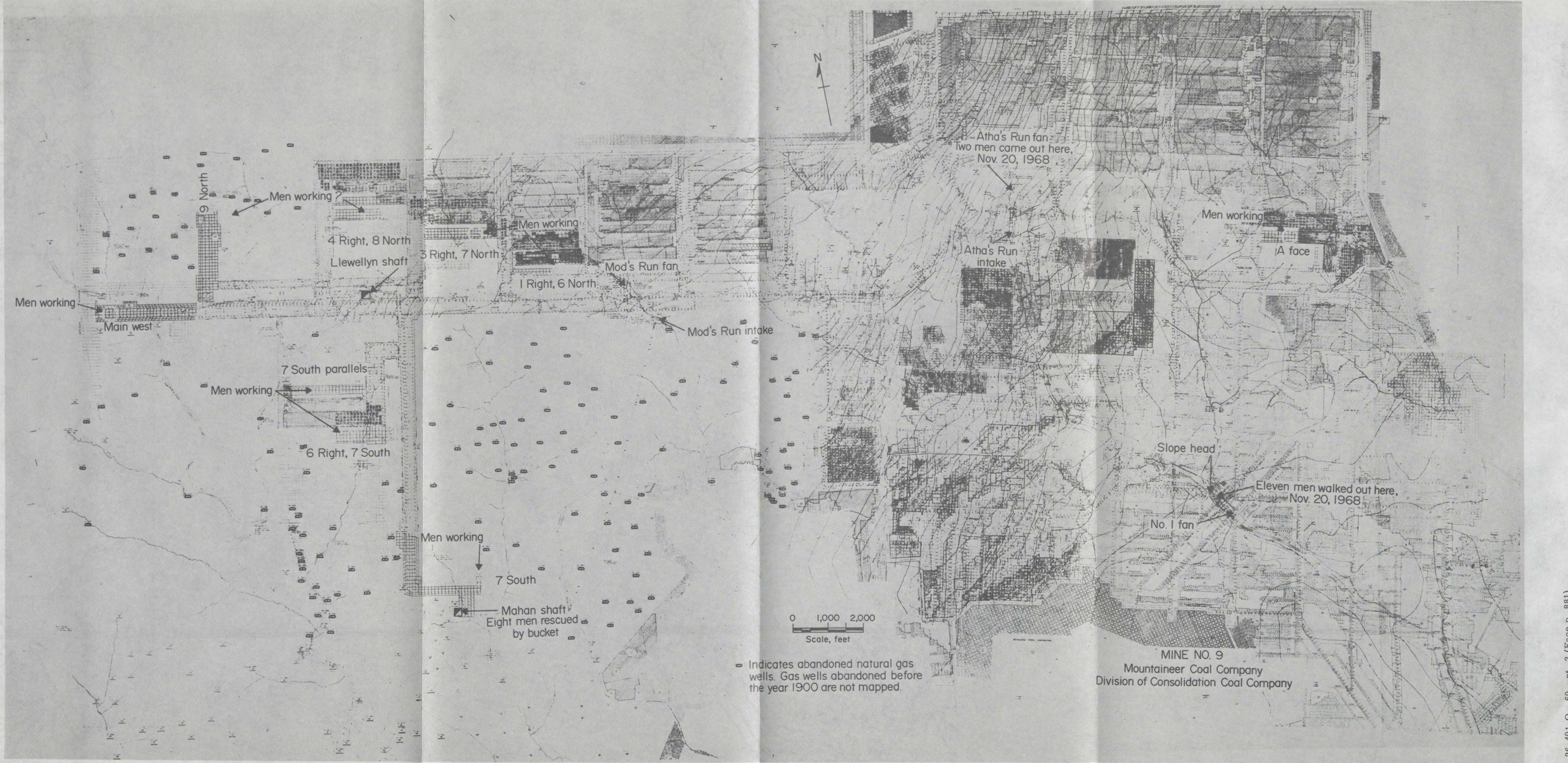
I give you this information to indicate why we are desperately concerned with the legislation on coal mine safety which this committee now has under consideration. I have been in my present position as president of the association since January 1957. Prior to this I was secretary and assistant secretary of this and the Operators' Association of Williamson, W. Va., field from 1946 to 1957. I have some experience as a mine worker and I was reared in a mining camp. I have been around the coal mines all of my life and I am the son of a miner who spent over 50 years of his life working at various mining jobs, including that of mine superintendent.

I also served for 3 years as secretary of the Pond Creek-Tug River Mining Institute, an organization of mine supervisors, whose purpose was to improve mine safety. I tell you this to indicate that my interest in mine health and safety matters is not a recent or casual whim of mine or of the organization I represent.

The Harlan County Coal Operators' Association organized in 1916 established a safety department in 1928 and employed a full-time safety director. This department has been active and effective since then and we are proud of its record in the field of safety and our accident prevention program. Our present safety director, who is here to testify, will give you more details of this work.

My purpose today is to point out that legislation proposed in S. 355, S. 467, S. 1094, S. 1178, and S. 1300 contains provisions that will seriously affect the whole economy of many coal-producing counties of Kentucky without materially improving the health and safety standards of the mining industry. It is most unfortunate that legislation of this kind only arises as a result of a major disaster when the emotions of those concerned control the issues rather than considering the best methods of preventing future accidents.

The Mannington disaster, the primary cause of much public concern and outcry, certainly should not be used as a pattern upon which legis-



N
Atha's Run fan
Two men came out here, Nov. 20, 1968
Men working ?
9 North
Men working
4 Right, 8 North
3 Right, 7 North
Llewellyn shaft
Mod's Run fan
1 Right, 6 North
Atha's Run intake
Men working
A face
Men working
Main west
Mod's Run intake
7 South parallels
Men working
6 Right, 7 South
Slope head
Eleven men walked out here, Nov. 20, 1968
No. 1 fan
Men working
7 South
Mahan shaft
Eight men rescued by bucket
0
1,000
2,000
Scale, feet

▭ Indicates abandoned natural gas wells. Gas wells abandoned before the year 1900 are not mapped.

MINE NO. 9
Mountaineer Coal Company
Division of Consolidation Coal Company

26-491 O - 69 - pt. 2 (Face p. 881)

lation may be passed to control all other mines whether gassy or nongassy. We believe that there is good reason for designating a mine nongassy, since no purpose is served by calling a mine gassy when, in fact, it is not.

Does this solve the problem of Mannington? I think not.

In my opinion and that of many others, it was a serious mistake to allow a mine to be developed in an area saturated with gas from producing gas wells. I have seen the map of this mine and have here a copy which was reproduced in the Mine Workers' Journal of December 1, 1968.

There are numerous abandoned gas wells shown and the caption states that gas wells abandoned before 1900 are not mapped. It was further reported that there were 13 active gas wells driven through the seam of coal being mined by this company. Any one of these wells could have caused the initial explosion that demolished this mine and killed 78 men.

Rather than force an unrealistic classification on all the nongassy mines, why not prevent further disasters by closer supervision of those mines classified gassy and prohibit the opening of a mine in or near an active gas field?

In order to comply with this one change in the law, the mines of Harlan County would be forced to spend over $10 million for permissible equipment. As an example, the cost of equipping one section of a mine will amount to over $260,000. The cost of a cutting machine is now about $80,000, a 14 BU loader is around $54,000, a shuttle car is $39,000, a coal drill is $24,000, and a roof drill about the same.

A section equipped with one cutting machine, one loader, two shuttle cars, one coal drill and one rock drill will produce between 200 and 300 tons of coal per shift. From six to eight men are necessary to operate this equipment. Under the proposed regulations all nonpermissible equipment would have to be scrapped or reworked to make it permissible.

In any case, the net result of this expensive change-over would not increase production by 1 ton of coal per day or have any beneficial effect in a nongassy mine. Of course, our mines cannot afford to spend this money without increasing production and we will be out of business.

About 5 percent of all mines in Kentucky and only 1 percent of the mines in Harlan County are classed as gassy mines. This means that all the mines are showing less than 0.25 of 1 percent of methane at the face.

Under the proposed law these mines could have 1 percent methane before action would be taken to reduce the concentration of gas. How does this improve the situation?

The statement has been made that 24 nongassy mines had gas ignitions and exploded. I say that if these mines had gas explosions, they had a greater concentration of gas than allowable and should have been classed as gassy. On the other hand, let's look at the record of mines classified gassy using permissible equipment. How many of them blew up even though they were supposed to be complying with the law in every respect?

Senator WILLIAMS. Will you pause there, Mr. McDowell?

Mr. McDOWELL. Yes.

Senator WILLIAMS. There is a vote on in the Senate. I have to go over and vote. We will recess and I will be back as soon as I can. It should not take long.

(Whereupon, a recess was taken.)

Senator WILLIAMS. Mr. McDowell, are you ready to resume?

Mr. McDOWELL. Regarding mandatory health standards for controlling dust in underground mines, we agree that some control is needed. However, there is a greater need for research and study of this problem in order to establish all the facts pertaining to it rather than setting an arbitrary limit of 4.5 milligrams of dust per cubic meter of air, which may or may not be the proper limit.

We do know that one cigarette contains over 35 milligrams of tar and nicotine which we presume would be in the form of respirable dust if it is inhaled as smoke. Are we then expected to keep mine air purer than a room in which a cigarette has been smoked? Medical witnesses have testified that they are not sure that cigarette smoking is harmful to health. Others say it is and yet not a law has been passed to prevent the sale or use of cigarettes.

A lung specialist from Great Britain visited all of the United Mine Workers' hospitals in 1958 to instruct these doctors in the diagnosis of lung diseases, including pneumoconiosis. I attended the meeting held in Harlan and heard him say that breathing coal dust would not cause coal miners' pneumoconiosis unless there was another substance present.

Dr. William H. Anderson, of Louisville, was present at this meeting and since has made a detailed study of coal miner's pneumoconiosis. He has testified in case after case that coal dust by itself would not cause miners' pneumoconiosis.

Coal dust per se may or may not be harmful to the health of miners, but it could be other factors such as the amount of sulphur in the dust, or the silica content or some other substance. We are told that anthracite coal dust is more abrasive than bituminous and it may be for this reason that a larger number of miners are affected by dust in Pennsylvania than in other States.

We believe that the dust problem should be attacked from the standpoint of preventing dust by requiring the manufacturers of mine machinery to build dust-suppressing attachments on all mine equipment rather than establishing a level of dust concentration. We have had a great deal of success in preventing dust by using water sprays on coal-cutting equipment. The use of dust collectors and respirators should be required where necessary and many other means can be developed through research if funds were available.

We realize that safety problems multiply in geometric ratio to the amount of coal produced in a section of a mine. The faster the coal is removed from the face, the greater will be the amount of dust produced. Also, the amount of methane liberated will be increased proportionately.

As the face advances at a faster pace, so will the need for better roof support be increased. All of the other requirements for safe mining should be speeded up, including better supervision and constant inspection for gas, roof, rib, and face conditions. Whereas, mines producing less than 2,000 tons per day seldom require the same amount of attention or create the great number of hazardous conditions as the more mechanized mines do. Thus, regulations to prevent these hazards in larger mines should be different than those in smaller mines since the conditions are different. What will increase safety in one may have the opposite effect in the other.

We do not believe that the Secretary of the Interior should be allowed to promulgate new regulations or change those written into the law. We think that regulations should be spelled out in the law so all will know where they stand and can decide if it is worthwhile to continue mining or go into some other business.

One change in the regulations could make the difference between profit and loss. We believe that hearings and judicial review should be simple and inexpensive and held as near as possible to the location of the mine so that a sufficient number of witnesses can be called when needed.

We can see no good reason for including surface mining in legislation governing underground safety and health. The two types of mining are entirely different requiring different machinery, different skills, and different methods of operation. We certainly think it unwise to leave this whole question of safety in these mines to a future decision of the Secretary of the Interior. In our opinion, the matter is now very well covered by State laws under the regulations of the Department of Strip Mining and Reclamation.

Regarding section 113(2) of S. 1300 dealing with penalties, we do not believe that the Secretary of the Interior should have the right to impose civil penalties on the operator. He is then in the position of the judge, jury, and executioner, as well as being a legislator in adopting future regulations.

We agree that penalties should be provided for willful violation of regulations and criminal neglect of safety standards, but to be effective they should be applied with equal force to the person or persons responsible, whether it be an employee, a supervisor, or an operator.

Finally, we believe that the Federal Government should make available sufficient funds to conduct studies of all mining conditions and to do research in connection with health and safety of the mining industry. We have been trying for several years to get a vocational program started in our local school to train young men in the operation of mine machinery and in the repair and maintenance of this equipment.

Only recently we have been promised such training. Yet, at the same time hundreds of our people have been trained for work where no local jobs exist. We could use a program such as this to teach not only the operation of equipment, but for a safety program as well.

We now have openings for 200 miners and none are available. We are considered to be in a depressed area and jobs of all kinds are going begging. Our safety director conducts classes for training mine foremen and he teaches safety to all miners interested in these courses. However, these men will not attend classes unless they receive pay, which would be at overtime rates according to the Wage and Hour Laws. Federal funds for safety education are available to other industries, but not the mining industry.

I think we can safely say that less is spent by the State and Federal Government on mine health and safety and more is spent on regulating the industry than in any comparable business. I trust that this situation can be reversed in the future.

I hope that we can join together, all parties involved, and do something constructive for mine safety rather than pass some punitive regulations that may prove more harmful than good for those who labor in the mines of our Nation.

Thank you for this opportunity to testify on behalf of the members of our association and the small mines of Kentucky.

Senator WILLIAMS. Thank you very much, Mr. McDowell.

Perhaps we had better go on to Mr. Bailey and see if any questions develop while both of you are present. Senator Randolph might have some questions and I might also.

Mr. Bailey.

STATEMENT OF RUFUS B. BAILEY, SAFETY DIRECTOR, HARLAN COUNTY COAL OPERATORS' ASSOCIATION, HARLAN, KY.

Mr. BAILEY. Mr. Chairman, I am Rufus B. Bailey, safety director of the Harlan County Coal Operators' Association, Harlan, Ky. I have held this position since December 15, 1957. This association was formed in 1916, is made up of 23 coal mines that produced approximately 3 million tons of coal in 1968. There were two fatal accidents in the mines of the association in 1968. Both of these accidents resulted from roof falls. Now—these roof falls were within 25 feet of the face arrears, I would like to say that.

Prior to my employment with the Coal Operators' Association I spent 10 years as mine inspector for the Department of Mines and Minerals of the State of Kentucky. At present I am serving on the Board of Directors of the Harlan Mining Institute, the Kentucky Mining Intsitute, and the National Mine Rescue Association, Post No. 2. Since 1963 I have served as a member of the National Mine Rescue and First Aid Rules Committee. My appointment was by the Director of the Bureau of Mines.

My mining career began in 1926, when as a boy I worked to finance my high school and college education. I have worked in various mines as a coal loader, motorman, rock driller, machine man, loading machine operator, and at other jobs. After graduation from college in 1933, I was a school teacher and coach for four terms and worked in the mines during the summer months.

Senator WILLIAMS. What did you coach, Mr. Bailey?

Mr. BAILEY. I coached football and basketball.

Senator WILLIAMS. Were you a football player and basketball player, too?

Mr. BAILEY. When I was in college.

Senator WILLIAMS. Yes, sir.

Mr. BAILEY. Yes, sir; I made four letters in football, three in basketball, and three in baseball.

Senator WILLIAMS. As a no-letter man I don't mind saying that is a great achievement.

Mr. BAILEY. I had a football scholarship and baseball scholarship. As a basketball player, I was more or less on the wrecking crew, on the third string. I went to college at Union College, Barbourville, Ky. That is a Methodist school.

Senator WILLIAMS. Well, you developed no bad habits there.

Mr. BAILEY. Well, some. On the side, that is.

Now the reason I decided to make mining a full-time occupation, after teaching school I found out that there was no money to be made as a schoolteacher. So I decided to make mining a full-time job. After earning my mine foreman's and inspector's certificates, I became foreman, safety director, superintendent, and mine inspector.

During my mining career I have successfully fought 219 mine fires and worked in 10 coal mine explosions. I have rescued or helped rescue 61 men who were trapped in mine fires, explosions, mine inundations, or behind large roof falls.

I would like to say when I wrote this, the first time I wrote this—about the fact of 219 mine fires, I wrote 218. Last week I fought another successfully, which made it 219.

My duties have called for me to teach mine foreman and inspector's classes since 1942 in five counties in Kentucky and in Virginia. Approximately 2,500 men have become certified officials as the result of these courses. I have trained mine rescue teams and first aid teams since 1941, both in Kentucky and Virginia. Two of my teams have become State and National champions upon repeated occasions.

By the way, I would like to make this statement, if I may. Mr. Van Meter, who is the next witness to testify behind me, took rescue training under me. He was one of my national championship team men.

Senator WILLIAMS. He is a football player, too.

Mr. BAILEY. Yes, sir; he is large enough.

Having spent most of my life dealing with the problems of mine safety, the Harlan County Coal Operators' Association felt that I should represent them as well as other operators in southeast Kentucky and southwest Virginia.

I am grateful for this opportunity to testify before this committee on a subject that I have considered most important for many years, the health and safety of all those who work in the mines.

The safety department of the association was formed in 1928 and has been very active since. We cooperate with the Bureau representatives and our State inspectors to the fullest. Yes, we are for safety which we have demonstrated by act and deed over many years.

As you well know, we are too often guided by our emotions. We were so guided after the West Frankfort explosion in which 111 people were involved. We are in the same frame of mind now. We, you, and I, are letting the clamor of people who know very little or nothing about coal mining, and our emotions lead us on to do things that are or may be detrimental to the livelihood of many of our people and to the industry.

Now, speaking of coal mines, I would like to make this statement which is not in my prepared remarks. There are three types of coal mines. You have the drift, that is the coal mine that goes directly back in.

Senator WILLIAMS. Drift?

Mr. BAILEY. Yes, sir; that is the drift mine. You have the slope mine, which goes down at an angle. Now this type of mine will probably go down in some instances as much as a hundred feet below the surface or below grade; that is, below the watercourse of the valley or whatever it might be.

Then you have the shaft mines. We have some shaft mines that go down as much as 1,200 feet below grade. The point in bringing this out is this: In your drift mine the pressure from the atmospheric pressure as well as the vertical roof above is not as great as it is when you go down in a slope mine or on down deeper in a shaft mine.

Now gas accumulates in the shaft mines, the mines that are straight down and deeper, far more than it does in a drift mine or in a slope mine.

Now that is the one point I wanted to bring out while talking about coal mines and while talking about explosions in coal mines.

Now, we are opposed to the classification of all mines as "gassy mines." Records will show that there are several hundred mines in the United States or 85 percent of all the mines are classed as "nongassy." Many of these have been operating for years and have excellent safety records.

In many hundreds of these mines no gas has ever been found—I might add there, even to the remotest percent—either by safety lamp, an ignition, or by air analyses.

Our present laws, both State and Fderal, state "that if gas is found by a flame safety lamp, by ignition; or if the percentage of methane gas found by analysis of an air sample taken in the mine is 0.25 percent or more, the mine will be classed as a gassy mine."

Let me state further that there are many coal seams in eastern Kentucky in which no gas has ever been found. Now that is either by ignition, by flame safety lamp, or by air analysis, not even in the smallest percentage. The records of the Bureau of Mines will verify this statement.

Now I would like to make a statement right here. In the area of the State in the southeastern part of the State of Kentucky and, as well, in most of the eastern part of Kentucky, we have 12 workable seams of coal. There is the high splint seam, the one near the top of the mountain; low split, Smith is next, then our Wallins, then our Creech which is No. 6, then our Mason, the Upper Mason and the Lower Mason, which is 2A and 2B.

In those seams of coal, gas has never been found either by ignition or by flame safety lamp or by analysis of air. Now the Bureau of Mines inspectors take air samples in these mines, in these various seams of coal, each time they inspect the mines. At no time has any percentage ever shown on any analysis of these different seams of coal in our area.

Now these many hundreds of nongassy mines throughout the United States are to be called gassy by just passing a law. In other words, if a law is passed, it will call these mines gassy. They will all be called gassy, even though gas has never been found in them.

Senator RANDOLPH. Mr. Bailey, are you speaking of the Kentucky mining operations?

Mr. BAILEY. Yes, sir; the mines in my area and the mines I am familiar with.

Senator RANDOLPH. What other States or areas would be similar?

Mr. BAILEY. I couldn't answer that except I can say this. Over in southwest Virginia where I have spent some time in the mines over there, it is pretty much the same thing in the seams that are above drainage and the seams that are parallel to the ones that I named. However, those same seams of coal in Virginia will have a different name than what they are over in our locality.

Senator RANDOLPH. Mr. Bailey, would you estimate for the members of the subcommittee the approximate number of miners who are employed, who are in the mines that you call "nongassy"?

Mr. BAILEY. No, sir; I couldn't do that, because I wouldn't have any idea as to how many there are.

Senator RANDOLPH. I think you should bring that to the subcommittee. Not at this moment, but I think it should be made a matter of record here. I am not critical of your statement, but I think it needs augmentation in this particular.

Mr. BAILEY. I can get that and get it back to you.

Senator WILLIAMS. That will be all right.

Mr. BAILEY. All right, sir; I can do that.

Senator WILLIAMS. We will appreciate it when you do get it.

Senator RANDOLPH. Is that information available through sources that we could contact?

Mr. BAILEY. I think you could contact the Bureau of Mines and they could give you that information almost immediately.

Senator WILLIAMS. I would think that would be the logical place.

Mr. BAILEY. That is what I think. In fact, I think they could give you the number of each employed in the nongassy mines in all the United States as far as that goes.

Mr. BAILEY. Backing up to the beginning of that paragraph, these many hundreds of nongassy mines throughout the United States are to be called gassy by just passing a law. It is not that simple. This change will cause these mines to face great financial loss in changing from nongassy to gassy. New permissible equipment must be bought and maintained. All the other requirements must be complied with as required by law. That is as required by law for a gassy mine.

This will force many of the mines to close. First, because the operators cannot meet the increase in cost. Second, he will not be able to get the proper equipment for many months or maybe years. Third, for many of them the margin of profit is too small to meet the increased cost.

Again, I will say that I am definitely for safety and I am doing everything that will promote safety in our mines, but I cannot see where anything is to be gained by this reclassification of our mines. I do say that if gas is found as prescribed by law, the mine should be "gassy."

I am opposed to the Secretary of the Interior having the authority to promulgate the health and safety standards of the coal mines. It is very doubtful that any person has the knowledge, regardless of the help that he can command to aid him in the writing of these rules or regulations, to make a rule or law that would be applicable to all mines.

In order to be able to do this, one must be familiar with all the characteristics of all the different coal seams in every coal-producing area in the Nation.

If your Secretary of the Department of the Interior is granted this right, the people working in the mine and the officials should be granted the right to be heard as to what they think and the right of appeal. The Secretary, if asked, should hear and listen to these people upon request. Laws governing any industry should not be made by any one person regardless of his position in Government, but by the Congress of the United States, not by me or the Secretary.

I do wish to say that if our Secretary of the Interior or the Director of the Bureau of Mines were men of wide experience in coal mines, I would welcome their advice and recommendations. To know the inside of a coal mine and what rules or regulations are needed for the safe workings, you must have been inside the mine. You cannot legislate for, or learn the conditions of a mine from an office desk. And you cannot legislate safety.

It must be taught in such a way that each man in the mine has the desire to be a safe worker.

Next, the civil penalty paragraphs in the related bills vary as to the fine or fines that should be for a flagrant or willful violation of the law. S. 1300 and H.R. 1047 have only penalties for the officials or the operator of the mine with none applying to the workman, while H.R. 4047 and H.R. 6504 bills and S. 355 and S. 1094 bills provide a penalty covering everyone connected with the mines or employed at the mines or a penalty for the operator and the workman with the former being the greater.

A mine is as safe as the people that work in the mine. No law should be passed that sets a penalty for one group of people while other people are exempted from the penalty even though they may violate the law endangering themselves and others. From my own experience I can testify that over 95 percent of the safety violations are committed by workmen and not by the operator in our mines. However, should an official or an employee knowingly violate any law that will endanger the health and safety of the people in the mine, he should be penalized.

In these related bills, especially S. 1300, it is stated that a line brattice or a line curtain should be installed in the face region of every working face in the mine. Our present-day mining systems are based on speed with which coal is moved from the face to be transported to the surface.

I state that if there is need for a line brattice, it should be used. However, if there is no gas or smoke in the face regions, a line brattice should not be required. It is very dangerous for haulage crews because they must pass through the brattice and we have had many injuries in our mines due to this. For example, what would happen to the auto drivers if curtains were hung across the street at various locations?

Now I would like to make a statement here concerning these line brattices. I am a firm believer in the line brattice. I call them a line curtain. That is a curtain that is extended from the last breakthrough to the face, which gives a fast flow of air going around the face. This removes the gas and the dust from the face areas, gas, smoke, and dust.

Now under our present-day system of mining, our coal is moved from the face or from the face areas by shuttle cars or by rubber-tired buggy by fast haulage. These operators of this equipment must pass through these line brattices or line curtains on the way from the face to the dumping point and back. In other words, they must pass through them at least two times to make one trip, to haul one trip of coal from the face.

As far as we can determine, there is no basis for setting a limit of 4.5 milligrams of allowable float dust in the mine atmosphere. We are aware of the clamor of many people who have never been in a coal mine to have something done about this problem. Long before the "black lung" issue was brought up, many of our mines had installed water on their continuous miners and were using a wetting agent such as calcium chloride and others to allay dust on their haulage roads, to improve vision and prevent a possible dust explosion.

Now I would like to state here that in our areas I know of no continuous mine machine that is being operated without water.

I do not believe that coal dust is entirely responsible for all the respiratory diseases that occur in coal miners. I can say from my own experience that smoking cigarettes is one of the greatest contributors to lung disease. I was reared in a coal mining town. My father was a cutting machine operator in the mines from 1913 until his retirement in 1953. He lived to be 80 years of age and was never troubled with "black lung" or any respiratory illness. He never smoked a cigarette in his life, which may account for his good health and longevity.

On the other hand, I suffered from a severe case of emphysema and bronchitis and was physically unable to work for many months. Prior to my illness I smoked about two packages of cigarettes per day. At this time my doctor told me if I didn't quit smoking, I would never get well. I quit and my health improved so that now I can do the work of any man my age.

Another paragraph in S. 1300 states that the laws that govern underground mines will be applied to surface mines. These are entirely two different types of mines. The rules and laws that govern underground mines are not applicable to surface mines except in rare instances. In fact, the laws that are applicable to highway construction or any earth-moving job should govern surface mines.

As you know, we have State laws that govern surface mining which, in my opinion are very effective. To duplicate these efforts would add nothing to safety and would cause confusion between these agencies.

Gentlemen, I want to thank you for the privilege of appearing before you. I have stated to you my opinions as an experienced coal mining man. I am in our mines regularly with our Federal and State inspectors. Now that is regular, each week.

Our present laws are good if carried out. We have a good safety record in our area. I say this has been accomplished by the fine cooperation between our inspectors, our operators and workmen and all concerned. By inspection, I mean both Federal and State inspectors. I say again that we are for good safety laws and the enforcement of them.

I will appreciate your consideration of my statement and hope that these comments will be of some help to the committee in arriving at a sound basis for future legislation on mine safety. Thank you.

Senator WILLIAMS. Thank you very much, Mr. Bailey.

Now when you are speaking of the line brattice, what you described is what appears in your mines? This is not common to all mines?

Mr. BAILEY. Yes, sir; all mines.

Senator WILLIAMS. Mr. Mittelman has the benefit of coming from a coal background. He has been in one coal mine and he just drew a picture. He drew a picture for me how it works in a mine in Pennsylvania.

Do you and Mr. Bailey want to exchange views on that?

Mr. BAILEY. All right, go ahead.

Mr. MITTELMAN. Let me try to describe what we saw in our visit to two mines in Pennsylvania several weeks ago.

Mr. BAILEY. Yes, sir.

Mr. MITTELMAN. It appeared that as you approached the working face off to the side there was a curtain that went down the side of the shaft, leading from the area of the working face out to the return shaft, the return airways where the return flow of air went out. There was no curtain at all through which the shuttle car had to pass. The shuttle car went back, dumped the coal in the railroad cars which were probably a hundred yards or so from the face of the mine.

It was perfectly clear, this was at both mines we visited, that none of those cars had to go through the line brattice or curtain, at least that we could see. They appeared to be along the side of the shaft and then go out to the return airway.

It did not interfere at all with the operation of the continuous mining equipment or the shuttle cars.

Mr. BAILEY. Now that might be true, say, in one working place where the possibility that the shuttle car would not have to pass through this line curtain. But, say, if your dumping point was to the left, and you were hauling coal from the working faces up here, in the first place you would not have to go through the line curtains or through the curtains across the breakthrough, but on the other places back here, you would have to.

Mr. MITTELMAN. Perhaps we just saw a particular example where they didn't have to. In the example we did see, they did not have to go through the line brattice. There was direct access from the area where the continuous miner was working to where the railroad tracks were.

Mr. BAILEY. I would like to draw you a sketch as to what I mean on that and just show it to you.

Mr. MITTELMAN. I think it might be helpful.

Senator WILLIAMS. Fine.

Mr. BAILEY. Will it be all right?

Mr. MITTELMAN. Yes.

Senator WILLIAMS. Mr. Bailey, you start out with a presumption of being right. Now we will see what Mr. Mittelman comes up with.

(Discussion off the record.)

Senator WILLIAMS. I don't have any questions. I just want to thank you again for your cooperation. Did you gentlemen come up today?

Mr. BAILEY. We came up yesterday.

Senator WILLIAMS. Mr. Mittelman has a question. He is qualified to ask questions as a one-day expert, which is one day more than I am. I acknowledge that.

Mr. MITTELMAN. Thank you, Mr. Chairman.

Could you explain a little more fully the difference between a gassy and nongassy mine?

Mr. BAILEY. A gassy mine, as stated by both the Federal laws and the State laws, is any mine in which gas has been found by ignition, or has been found on a flame safety lamp, or has been found by air analysis.

If the Federal law stated that if 0.25 percent is found in air analysis, then it is a gassy mine. And the Federal law also has, in addition to that, that if a nongassy mine should cut through or, as we say, hole through a gassy mine, then it is declared a gassy mine regardless of whether gas was ever found in that mine or not.

If it holes through or cuts through in another mine, then it is a gassy mine.

Mr. MITTELMAN. What is the consequence under existing Federal or State law of a mine being classified as gassy as contrasted to nongassy? What difference does it make in terms of what the operator of the mine has to do?

Mr. BAILEY. That requires the operator, if he is operating a nongassy, then all of his equipment may be a nonpermissible type of equipment.

Mr. MITTELMAN. Could you explain the difference between permissible and nonpermissible types of equipment?

Mr. BAILEY. Yes, sir. Nonpermissible type of equipment is not safe to use in a gassy atmosphere due to the fact that the flame or any arc or spark that may occur in the equipment would ignite gas if gas was in the atmosphere.

Mr. MITTELMAN. Will you give us some specific examples of the type of equipment used in a nongassy mine, but what would not be permissible in a gassy mine.

Mr. BAILEY. Would you state that again please?

Mr. MITTELMAN. Could you give us some example of the type of equipment which can be used in a nongassy mine, but would not be permissible in a gassy mine?

Mr. BAILEY. The equipment that is used in a nongassy mine, the joints of the equipment do not have to be a small separation of .004″ or less. The joints may be open.

Now in permissible equipment, all metal joints must be 1 inch or more of metal, all joints must be metal to metal, no gaskets, rubber, asbestos, or otherwise may be used in any particular joint in metal for permissible equipment.

The bolts must be set in a certain way where the cables go into permissible equipment. It must be so constructed that any flame or arc or spark occurring inside this equipment will not ignite gas in the surrounding atmosphere.

Mr. MITTELMAN. We have had previous testimony to the effect that coal dust is almost as explosive as methane gas. Is it correct to say that there is danger that a spark from equipment used in the mine could set off a coal dust explosion as easily as it could a methane explosion?

Mr. BAILEY. I would say as to that, that is possibly so, if you have the right mixture and the right temperature. In other words, you do not have a coal dust explosion just by pitching up dust in the air and sticking the torch at it. It does not explode that way.

Mr. MITTELMAN. Let me give you an example. We had testimony here the other day from the operator of a locomotive. This locomotive as it was passing over a certain part of the railroad track gave off a spark and there was coal dust that had accumulated on the track. It happened to be in the open air.

He described what happened as a very bad explosion which, had it happened inside the mine, would have had a very serious consequence. This was a fire and explosion that had nothing to do with methane gas. It was pure coal dust. Is this a danger in a nongassy mine that has to be guarded against?

Mr. **Bailey.** Now you can have an explosion if you have coal dust alone, you see. It takes approximately 1190° heat to 1200° heat to ignite coal dust if suspended in air. But you must have as much as one-twelfth of an ounce or as much as will lay on a quarter in a cubic foot of air.

You have at least—now you can ignite and set that off, but in order to create and cause an explosion, you must have at least 160 cubic feet of air with that amount of dust in it to give you force enough to be called an explosion.

Let me add something else to that last statement of yours. In a normal well-kept mine you are not likely to have coal dust over the rails. If you do have coal dust up over the rails where it is brought into suspension, you are in violation of the law. Those rails should be clean and that area of the mine should be rock dusted.

Mr. **Mittelman.** My questions are directed to either of you two gentlemen. Have you any opinion on where the prime responsibility for mine inspection should be placed as between the Federal Bureau of Mines or the State mine inspection agencies? Is there anything in previous experience that you have had with a State mining agency and the Bureau of Mines which leads you to some conclusion as to who can most effectively administer mine safety?

Mr. **Bailey.** Well, I believe both with our State and Federal inspectors daily.

Now understand I said "daily." I think that either one of them is just as effective in maintaining the good safe mines. Our Federal is just as effective as our State, either one or the other. We deal with them on this basis, that any danger in a coal mine should be removed.

Our Federal inspectors in our area and our State inspectors will tell you that I make the statement to them if we find a danger in a mine, let us have it removed then and there. If not, we withdraw the men. I would rather stop a mine than get one man killed.

Mr. **Mittelman.** Do you have any opinion as to whether the purpose of mine safety would better be served if the inspectors came from the State mine agencies or the Federal Bureau of Mines?

Do you think that it will have consequence one way or another if we place more responsibility for mine safety in the Federal Government than in the States?

Mr. **Bailey.** Well, you know I am from the South. We are south of the Mason-Dixon line. However, I think that one agency should be—I think the laws of one agency should be abided by as well as the laws of the other agency. I don't think that either one should have power over the other one or I do not think that one should—I do not think that the Federal law should supercede the State law.

Mr. **McDowell.** I think there may be some danger that in having an overpowering Federal legislation, you may cause the State to relax its guard and not do as effective a job as it has been doing in recent years. I feel that the State department of mines would do a more effective job if they were more or less considered the key safety instrument rather than being subjected probably to Federal legislation.

Mr. **Mittelman.** I have just two more questions.

When Senator Javits introduced S. 1300, he put some material that had been compiled by the Department of the Interior concerning the problem of the gassy as opposed to nongassy mines in the Congressional Record.

This was material appended to the transmittal letter from the Secretary of the Interior to the President of the Senate and the Speaker of the House of Representatives. Have you had a chance to look at the material which deals with the gassy and nongassy problem? I wonder if you could let us have your comments in a letter or memorandum concerning the Department's views in support of their proposal to eliminate the distinction between gassy and nongassy mines?

The burden of their argument, as I understand it, is that numerous explosions have in fact occurred in mines which were classified as nongassy and any number of mines that have been classified as nongassy over a period of years have, in fact, been found to be gassy after a period of time, in some cases as long as 15 years.

The views they present, I think, can be summed up by the statement that all mines are potentially gassy. That is the presentation they have made. We certainly would appreciate having your comments on the Department's views on this question.

Mr. McDowell. You want written comment?

Mr. Mittelman. Yes. If you will do that.

(The information referred to follows:)

HARLAN COUNTY COAL OPERATOR' ASSOCIATION,
Harlan, Ky., April 1, 1969.

HON. HARRISON A. WILLIAMS, JR.,
Chairman, Senate Subcommittee on Labor,
New Senate Office Building, Washington, D.C.

DEAR SENATOR: Please let me again express our appreciation for allowing Mr. McDowell and me to appear before your committee to give testimony concerning proposed legislation on coal mine safety and health.

During my testimony I was asked to clarify the difference between gassy and non gassy mines. The following statement is intended to answer this question and should be included in my remarks, which according to the record would begin on line 23, page 874.

A gassy mine is one in which a gas ignition has occurred or gas has been detected on a flame safety lamp or where gas has been found by analysis in amounts greater than .25 of 1%.

A non-gassy mine is one in which there has been no record of gas ignition or gas has not been detected on a flame safety lamp or where gas has not been found in quantity greater than .25 of 1% by analysis of an airsample taken one foot from the face, rib and roof.

The statement that there has been fifty-two ignition or gas explosions in nongassy coal mines killing twenty-seven people and injuring fifty-four is misleading. When these statistics are taken in their proper perspective we find that these explosions occurred in areas known to be gassy; two at Robbins, Tennessee, and the other at Herrin, Illinois. There can be no doubt but what these mines were gassy since you must have at least a five per cent concentration of methane gas to cause an explosion. However, these explosions represent only a small fraction of the hundreds of explosions that occurred in gassy mines during this period of time. It is also to be noted that only fifteen per cent of the nation's mines are classified gassy and eighty-five per cent non-gassy.

As reported in a U.S. Bureau of Mines publication, "Historical Summary of Coal Mine Explosion in the United States, 1810–1958", in the period from 1951 through 1954, there were eight major mines explosions that kill 184 men. All of these mines were gassy. During the same period there were ninety-one minor explosions in which twenty-two men were killed and 161 injured. All of these explosions were due to gas except eight which were caused by dust explosions in which one man was killed and three injured. The dust explosion that caused the fatal accident occurred outside the mine and was caused by a blow torch igniting dust in a coal bin. The other dust explosion was caused by open shots or gas ignition.

No major explosions occurred in 1955 and 1956. However, twenty-one minor explosions occurred in 1955 and all but one were caused by gas. No one was killed or injured by this dust explosion which may have been ignited by gas.

In 1956, forty-one minor explosions occurred and all but two were gas explosions. One dust explosion was caused by a dynamite shot on an overhanging rib and the other, which killed three men, was caused by a blown out shot at the face. It is apparent from these statistics that gas explosions have been the major cause of mine explosions and again we note that only fifteen per cent of the mines are involved. The vast majority (eighty-five per cent) are classified non-gassy and do not experience gas explosions. It is a known fact that an explosion will not occur in a mine unless the concentration of methane gas is between five and fifteen per cent. The limit of .25 of 1% of gas allowable in a non-gassy mine makes it impossible to have a gas explosion. Therefore, when a gas explosion occurs it is because the mine is gassy.

The incident of mine explosions from coal dust has been practically eliminated in recent years due to the use of rock dust, which when applied to coal dust renders it inert and incombustible. Present mining laws require that all loose coal dust be removed from the mine and rock dust be applied within forty feet of all active working faces, on all haulage ways and other areas where needed.

It is my opinion the elimination of the distinction between gassy and non-gassy mines would create the greatest danger possible since under the provision of this legislation a mine though classified gassy would be allowed to have a concentration of one per cent of gas at the face. This amount of gas is far greater than that now allowed in non-gassy mines. How then would this improve the situation?

I am convinced that gassy mines will continue to explode even if all mines are called gassy. It is perfectly clear that gassy mines, such as the Mannington mine, account for a vast majority of all major mine explosions. Not only is this true but these mines have a record of repeated gas explosions. In my opinion all gassy mines should be closely supervised and inspected hourly for gas accumulation.

And further, I would recommend that no one be allowed to develop a mine in a seam of coal that was penetrated by even one gas well or an oil well. The Mannington mine was operating in a known gas field and if it is reopened I predict that it will experience another gas explosion.

Legislation to reclassify non-gassy mines is not only misleading and will not prevent future gas explosions but it actually covers up the real cause of major disasters. Such legislation does not attack the problem of a gassy mine but may lead the unwary to think it does; thus, allowing gas explosions to continue to take its toll of those who work in gassy mines.

The fact that a nonpermissible piece of equipment is being used in a non-gassy mine does not present any hazard since a spark or arc would not in itself ignite coal dust if there were coal dust or create a fire hazard. The only time an arc or spark can create a hazard is when it is in the presence of an accumulation of gas in excess of five per cent. Therefore, there is no sound reason for requiring an operator to replace his present nonpermissible mining equipment with permissible equipment to guard against a danger which is not present.

Another question which was asked by Senator Randolph concerned the number of mine workers employed in gassy mines as compared to the number working in non-gassy mines. I believe that the U.S. Bureau of Mines has this figure; however, in Kentucky only five per cent of the mines are classified gassy, which would indicate that about one thousand of the twenty thousand miners employed in Kentucky are working in gassy mines of this state. Applying the same reasoning, in the United States about fifteen per cent of the mines are classified gassy with an employment of over one hundred thousand, or about fifteen thousand are working in gassy mines.

Should the mines of Harlan County be classified gassy, it will cost about ten million dollars to re-equip these mines with permissible equipment (U.S. Bureau of Mines estimate).

This would cause an economic collapse, not only in Harlan County, but in all coal-producing counties throughout the United States. In eastern Kentucky seventeen counties would lose their principal source of income. Thousands of people would be thrown out of work and complete chaos would result from this unnecessary change in the law.

Most of our accidents in the small and middle sized mines are caused by roof falls, haulage accidents and miscellaneous accidents. We need to concentrate on trying to eliminate these accidents in order to improve our safety record.

If we are forced to abide by strict regulations meant for gassy mines it will require much of our time, effort and money for this useless effort since we do not have these problems in non-gassy mines.

Based on my personal knowledge in Kentucky, I would estimate that at least eighty-five per cent of mines employees would be affected by eliminating the non-gassy classification. I estimate that at least one-third of the mines in eastern Kentucky would be closed down by this one change in the law and perhaps eighty per cent of the mines in Harlan County would suffer the same fate.

Thank you again for any consideration you can give to us regarding this matter, I am,

Yours very truly,

Rufus J. Bailey, *Safety Director.*

We either extinguished it or sealed the mine and I think that I can truthfully say we only sealed two out of all that group.

Mr. Mittelman. My question really is directed at the problem of whether or not a nongassy mine is as potentially dangerous as gassy mine in terms of the danger from explosions and fires I wondered if you could make a statement as to that.

Mr. Bailey. Let me make this statement. If a mine has an explosion from gas, that mine is a gassy mine when it explodes regardless of whether it is classified as nongassy or gassy. An explosion would not happen in a nongassy mine.

If there is gas in that mine, it is a gassy mine. Someone has failed to discover this gas and to declare the mine gassy as it should have been if there is a gas explosion inside a coal mine. Do you agree with that?

Mr. Mittelman. It seems obvious.

Mr. Bailey. It would have to be a gassy mine, because if it had an explosion, you had to have at least 5 percent methane gas, 5 to 15 percent.

Senator Williams. A minute ago you said you were on the rescue team where there were 10 explosions. You said five were gassy mines and five were nongassy. They were classified that way?

Mr. Bailey. That's right.

Senator Williams. But, in fact, there wouldn't have been explosions if there had not been some gas even in the other five which were classified as nongassy; is that right?

Mr. Bailey. No, sir; I didn't say that.

Senator Williams. I know you didn't.

Mr. Bailey. Some of the explosions in the other mines were from dust, not from gas.

Mr. Mittelman. No further questions.

Senator Williams. Just one final question as far as I am concerned.

Mr. McDowell you were talking about the dust and a great deal of the testimony dealt with that. One of the questions is on establishing better protection for the workers in the coal dust area, in terms of health; who in your judgment would be most logically assigned the medical aspect here? The Surgeon General or the Department of the Interior?

Mr. McDowell. I believe we should call on the Surgeon General, because I think his Department is better equipped to do some research that is badly needed. I think that there has been a lot of talk about this particular problem without too much fact involved.

I have been around mines all my life. I know that the type of disease that we are talking about can be caused by many other factors. Principally I am talking about smoking cigarettes.

Now a miner has a habit before he goes in a mine smoking all he can smoke. Then he goes in and works all day. The first thing he does when he comes out of the mine is start smoking. In other words, he is concentrating his smoking before and after his work.

Mr. MITTELMAN. Finally, Mr. Bailey, you were in 219 mine fires and 10 explosions.

Mr. BAILEY. Yes, sir.

Mr. MITTELMAN. Can you tell us how many of those fires and explosions occurred in nongassy mines as opposed to gassy mines? Do you have any figures on that?

Mr. BAILEY. Yes, sir. The first one that I was in, Black Mountain Coal Corp., Mine No. 30, May 22, 1928. That was the night that I graduated from high school. I was on a mine rescue team at Kilday, Ky. I left as soon as I got my diploma, I went to this mine to help recover the mine. That was a nongassy mine. That was a dust explosion. Eight men were killed, seven by force of the explosion.

The chief electrician, a gentleman by the name of Frank Chow, whose son was in the mine, entered the mine at the portal. The fan was blowing the after-damp of the explosion, the carbon monoxide gases were coming back out. He ran into the mine to see about his son.

His son was a repairman working in the electrical repair shop about 1,200 feet underground. He was going to see about his son. He was a big man, weighed about 260. He was strong. We tried to hold him. He broke loose from us. He went in. My brother who was on the rescue team ran to get him when he fell.

My brother fell and so did he. We pulled Frank Chow and my brother out and we gave them artificial respiration. We revived my brother, but we did not revive this chief electrician who died as a result, making eight men in the explosion.

That was a dust explosion in a nongassy mine created by open shots, adobe shots as it is known in coal mining terms.

The next explosion that I was in——

Mr. MITTELMAN. Mr. Bailey, I don't want to interrupt you. I don't think we will have time to go through all 10 explosions. Can you summarize them for us?

Senator WILLIAMS. I don't know what the rules of court are, but when a witness gets a question asked, I think he gets a chance to answer.

Mr. MITTELMAN. I am only trying to save the subcommittee time.

Senator WILLIAMS. You tell us what you think is important in response to the question.

Mr. BAILEY. Let me tell you. Five of the mines were nongassy and five were classified as gassy. Do you want any further statements on it now?

Senator RANDOLPH. What was this figure of 219?

Mr. BAILEY. You are talking about the mine fires?

Mr. MITTELMAN. I asked for both. I believe my question covered both the mine fires and the explosions.

Mr. Bailey. On the explosions there were five gassy and five nongassy. In the mine fires I wouldn't know, because wherever there was a mine fire, I could go back to my records which I have at home, dating back to 1941, and could probably give you that information wherever there was a mine fire regardless of whether it was gassy or nongassy.

We try to keep him from smoking inside the mine—they may do it sometimes, but we try to keep them from doing it. So he actually is presenting a greater health hazard, I think, to himself by concentrating the smoking before and after his work.

If he would smoke all day long, his celia that keeps the dust out of his lungs might have an opportunity to prevent some of the dust, and so forth, from staying inside the lung. This is just a layman's opinion, of course, but I do think the Surgeon General should have that responsibility and should do a better job in investigating the causes of the diseases.

Senator Williams. Thank you. Mr. Bailey, do you want to comment?

Mr. Bailey. No, sir.

Senator Williams. Thank you, gentleman.

Mr. Van Meter, you are next on the list.

STATEMENT OF HORACE C. VAN METER, SUPERINTENDENT AND GENERAL MANAGER, JEWEL SMOKELESS COAL CORP., GRUNDY, VA.

Mr. Van Meter. Mr. Chairman and members of the subcommittee, my name is Horace Van Meter, and I am general manager of mines of Jewel Smokeless Coal Co. of Grundy, Va.

I might mention here, it is not in my report, that I am a graduate mining engineer of VPI. I am a registered professional engineer in the State of Kentucky. I have had 12 years of mining experience, all in an engineering and supervisory capacity. I have been employed by Island Creek Coal Co. as director of engineering, general mine superintendent; International Harvester Co., as mining engineer; United States Steel Corp. in an engineering capacity; and Jewel Ridge Coal Corp. in an engineering capacity.

I am presently associated with Jewel Smokeless Coal Co. which is a small coal operator.

As a small coal operator I am pleased to have the opportunity to appear and give testimony on behalf of the National Independent Coal Operator's Association, an association of which my company has been a member for many years.

The National Independent Coal Operator's Association represents some 4,000 small coal mine operators in a number of coal-producing States, the bulk of our membership being located in the States of Kentucky, Virginia, and West Virginia. The vast majority of the members of this association operate underground mines known as drift mines. There are only a few slope mines and no shaft mines operated by members of this association, and none of our members are engaged in strip mining. Our members employ on the average eight mine employees, although there are some that employ several times this number.

We represent in the neighborhood of 35,000 employees in the coal industry. We are here today because the mine safety legislation being considered by the subcommittee is of vital concern to the small coal operators. If the Congress adopts new legislation which might be unwisely or oppressively applied to the small miner, it will, in effect, put us out of business.

If anyone has the notion that because we are small mine operators we are less interested in mine safety, or that we are willing to tolerate unsafe and hazardous conditions, let me quickly dispel any such idea. The exact contrary is true.

We have an even more important stake in the prevention of mine accidents because the cost of mining accidents, while damaging to the large producer, can mean economic disaster for the small producer. We are also vitally interested in the human welfare aspect of mine safety because in many cases members of our association employ friends, neighbors, and members of their families in their mine operations.

In not a few cases the mine operator himself spends at least part of this time supervising operations underground. As a consequence we are as much, and more, interested in the subject of mine safety as anyone in this room or anyone who has or will appear before this subcommittee.

Senator **Williams**. Let me ask you one thing there, Mr. Van Meter. We use the descriptive phrase, "coal operator." In some cases is the coal operator the coal mine owner?

Mr. **Van Meter**. Yes, sir.

Senator **Williams**. Not necessarily.

Mr. **Van Meter**. Yes, sir.

The coal operator in this description is referring to the owners themselves which in the biggest percentage of our cases are the operators and the owners combined.

My own particular company, of course, has 29 what we consider operators mining coal for us, either small operators that we lease them the coal, they mine it, we pay them a price for bringing the coal to our preparation plant.

My own company mines in excess of a million tons a year but the small operators, some of them, as little as 35,000 to 40,000 tons.

Senator **Randolph**. Mr. Van Meter, at the time of the consideration of the extension of the coal mine safety law to mines employing 15 workers or under in 1965 and 1966, were you opposed to that legislation?

Mr. **Van Meter**. Senator, not in all part at that time; no, sir.

Senator **Randolph**. Now that we have that provision for the smaller mines, has it worked a hardship on you?

Mr. **Van Meter**. No particular hardship, Senator, but as brought out later in my testimony the thing we opposed at the time was the fact that this was just a step toward bringing it under strictly Federal control.

At the time in question it was opposed, one of the thoughts put forth was, there won't be very much control put on it because these are all nongassy mines. As a result there will be very little Federal control exercised on these small operators.

Now we are hearing let us put them all under gassy classification. Had we known it for a fact, yes, we would have opposed it more stringently, more so than we did at that time.

Senator RANDOLPH. Thank you, Mr. Van Meter. I know you want to be, and you are, a factual and forthright witness before the subcommittee.

I have said over and over again, Mr. Chairman, that all viewpoints here, as we go into this very complex subject, are important.

Senator WILLIAMS. Now "coal operators" as a descriptive phrase can include owners of a mine or a lessor?

Mr. VAN METER. Yes, sir.

Senator WILLIAMS. Or how about just manager of a mine, would he be a coal operator?

Mr. VAN METER. He would in that sense, sir. When we speak of representing 4,000 coal operators we are speaking either of owners of these mines or lessors. The manager of a mine is considered just that, a mine foreman or manager.

Senator WILLIAMS. OK.

Mr. VAN METER. Notwithstanding this, we have cause for concern that the present clamor for coal mine legislation may well result in the adoption of unrealistic and inappropriate requirements which will have little effect upon the real causes of mine disaster, but will result in needless and unjustifiable burdens on the smaller companies.

For example, most of the bills now under consideration show a preoccupation with the problem of methane gas explosions, which is a negligible problem in the type of drift mining operation conducted by the vast majority of small mine operators.

I might interject here 1 minute and answer a question Mr. Mittelman asked the previous witness.

The explosion when it is a methane gas ranges from 5 to 15 percent. Coal dust explosions, of course, can occur, but these percentages must be greater than that of methane.

When the old Bureau of Mines made classifications at an earlier date they considered coal dust a very small minute cause of explosion. Had they not they would have considered it in previous legislation.

In regard to the question Mr. Mittelman asked concerning mine explosion on the outside, I doubt this. It could have caused a mine fire but on the outside of the mine in the atmosphere there was no coal dust explosion. I am sure of this, regardless of how the gentleman may have described it it was not an explosion.

Mine fire, coal dust fire, sure; but not an explosion. The percentage of coal dust would have been so small or diluted it could not have caused a coal dust explosion. The percentage of coal dust must be greater than methane to cause an explosion.

Mr. MITTELMAN. We had very specific testimony concerning the explosive character of coal dust from several witnesses who have described it as every bit as lethal as methane. As I understand the rock dusting standards in effect under present law are directed at minimizing the explosive potential of coal dust. The problem that we face in this legislation is that the rock dust standards are only directed at the explosion problem, not at the pneumoconiosis problem.

Essentially what I am interested in bringing out is whether a spark from a piece of nonpermissible electrical equipment could as easily start a coal dust explosion as it might a methane gas explosion.

Mr. VAN METER. The answer is, no, sir, I don't think it could as easily because the percentage of coal dust again would not be—it takes 5 to 15 percent methane to be explosive, whereas the concentration of coal dust would have to be much greater than that.

I don't know the exact percentage to propagate explosion. All coal dust explosions as far as I am concerned, and we have had research in this by the Bureau, have been propagated by methane or mishandling of explosives.

This is another question that comes in. What causes an explosion in a nongassy mine? I would like to ask the question that he asked earlier. I don't have the exact percentages but we have been working on some results of the Bureau statistics.

Since the year 1941 there has been a total of 1,126 mine fatalities due to mine fires and explosions, 77 percent of these were gassy mines, classified as gassy, with the other percentage being nongassy.

But in most of these cases this resulted through some negligence on the part of the individual or mishandling of explosives. What brought this percentage up, the well-known Centralia Mine in 1946, I believe, 111 killed in West Frankfort, Ill. This was due to smoking in the mines.

One of the things that the classification of gassy has now, it will allow you to smoke in the mines if the State law will permit it.

We will go on record as saying that smoking should be prohibited in all mines regardless of classification but there is a difference in coal mines and we want to keep this gassy and nongassy classification.

To go on with my testimony, to impose on drift mine operators the obligation to comply with costly procedures relating to prevention of methane explosions would be of no practical value and the added cost of such procedures could well destroy many of these small business entities which provide employment opportunities and other major economic benefits to the coal-producing areas.

On the other hand, the greatest single cause of mine fatalities; namely roof falls, is only lightly touched upon in the various proposals for safety legislation.

In short, we feel there exists at present a bandwagon psychology under which everyone is demanding coal mine safety and health regulations, but with very little understanding of the types of regulations and standards that would be of real value in improving mine safety and health conditions.

More importantly, there seems to be a tendency to lump all types of mines together and apply an across-the-board set of standards and regulations without regard to the wide differences which exist. To do this would vastly and unnecessarily increase the costs of inspection by Federal agencies, would impose additional and unwarranted cost burdens on the small companies, and would accomplish little or nothing in terms of improving mine safety in small mines.

Gassy and nongassy classification of mines should be maintained: One of the major features of the bills before this subcommittee is that they would apply the same safety standards to both gassy and nongassy mines thus eliminating a distinction which has been long recognized and is presently contained in the Federal Coal Mine Safety Act.

The gassy-nongassy classification was initially written into the law for very sound reasons and those sound reasons continue to exist. Gas accumulation problems are most prevalent in the deep shaft mines, and because of this it makes good sense to require frequent inspection with gas detection equipment, effective ventilation to remove pockets of gas and prevent accumulation of gas, and use of specially designed machinery and equipment to minimize the danger of gas ignition by electrical sparks or similar causes.

In the draft mine, where gas accumulation is negligible, it would be completely unnecessary and completely unreasonable to say that the mine operator must observe the same safety precautions and must lay out the same expenditures for specially designed equipment as in the case of the large mine operator who operates the deep shaft gassy mines.

It will be remembered that in connection with the 1966 amendments to the Federal Coal Mine Safety Act, which for the first time brought small mines within its coverage, one of the arguments most strongly advanced in support of extending coverage to title I mines was that the great majority of these mines were in the nongassy category and hence would not be affected by those safety standards which were applicable only to gassy mines.

To now eliminate the distinction between gassy and nongassy mines would be in effect a reversal of the logic which then persuaded Congress to bring small mines within the coverage of the act.

I might mention also here that in the event that legislation is brought forth it will in effect put many small operators out of business. This you can be assured of. I might mention the fact that the economic loss, not only to the State agencies, to the Federal Government, but also to the private individual landowners will be catastrophic in these small areas.

Some of the small operators completely support the economic structure of their communities. If they were out of business these communities would suffer greatly and would then be coming back to ask the Federal Government for more funds to support these people.

I would like to consider the fact that if these operators are out of business as they might well be, we may have a much bigger problem on our hands than the one that faces us today.

Mr. MITTELMAN. Under present law nonpermissible equipment can be used in a nongassy mine only if it was actually in use before a certain day. There is actually a grandfather clause.

Mr. VAN METER. Yes, there is.

Mr. MITTELMAN. So new equipment brought into a nongassy mine must be permissible?

Mr. VAN METER. No, sir. If a mine is declared nongassy, nonpermissible equipment can be brought in the mine. But the grandfather clause states if it becomes gassy after the equipment is brought into the mines, then this equipment can be kept in the mines until such time as it becomes inoperative.

But any new equipment brought into mines will then be permissible. I might mention here what is permissible and nonpermissible.

Permissible equipment, of course, is what is commonly referred to as sealed or closed. Nonpermissible is open or unsealed machinery whereas permissible is closed or sealed machinery.

As Mr. Bailey stated, in the event of a spark or fire the piece of equipment would contain it in one area, it would not come into the mine atmosphere. This is a basic difference between nonpermissible and permissible. The cost of this piece of equipment can run anywhere from a thousand to $5,000 difference between permissible and nonpermissible.

Mr. BLACKWELL. When a piece of equipment that is within the grandfather clause wears out and breaks down can you replace it with another nonpermissible piece?

Mr. VAN METER. Not if it is in a gassy mine; no, sir.

Mr. BLACKWELL. If it is in a gassy mine you have to go to permissible?

Mr. VAN METER. Yes, sir.

Mr. BLACKWELL. But if it is in nongassy then the grandfather protection follows on through?

Mr. VAN METER. Actually the grandfather clause only applies to gassy mines. If it is nongassy there is no grandfather clause. You use equipment in the mine that you can use to get the coal out.

Mr. MITTELMAN. Do you favor the elimination of the grandfather clause in gassy mines?

Mr. VAN METER. No, sir; we are in favor of retaining it.

Mr. MITTELMAN. You would favor allowing continuation of the use of nonpermissible equipment in a gassy mine under the grandfather clause; is that correct?

Mr. VAN METER. Yes.

Mr. MITTELMAN. Could you elaborate on why you favor that?

Mr. VAN METER. In the retention of this equipment, of course, the small miners, the only people who would be using this are the small operators, the small mines. This equipment, nonpermissible, I wouldn't say in all cases is not used in a shaft operation but the chances of nonpermissible equipment being used in a slope or drift or shaft operation is almost nonexistent.

Again, gassy mines can be declared if it contains twenty-five hundredths of 1 percent methane. Yet the explosive limits of methane are 5 to 15 percent.

So, with this 0.25 percent limit being there, they are called gassy. These operators are then required to make periodic inspections, periodic gases tests, more so than any other time.

Any time the gas approaches explosive limits the mine will be shut down.

Under the grandfather clause I think it is 1 percent. Even under the grandfather clause if the return air contains as much as 1 percent then this nonpermissible equipment is not used.

What we have now is a gassy mine declared at 0.25 percent. If it reaches 1 percent, then automatically nonpermissible equipment is no longer allowed. If the explosive limit is 5 percent you still have that leverage of 4 percent. So in that respect we would favor retention of the grandfather clause.

In other words, the 0.25 percent methane is as good as any for declaring the mine gassy but you are far away from the possibility of a mine fire or explosion. This is just a precautionary measure to start making sure that you are safe and being cautious.

In other words, at 0.25 there they say there is a possibility you might receive 5 percent at a later date. This does not mean it is dangerous.

Mandatory safety standards should be written into the law: Most of the bills now under consideration, including the administration's bill (S. 1300), would delegate to the Secretary of Interior the authority to promulgate mandatory health and safety standards for the coal-mine industry which would supersede the interim standards proposed.

We strongly urge that whatever standards are to be applied be firmly enacted into law by the Congress rather than through rule-making procedures by the Secretary of the Interior.

By having the legislative and enforcement functions combined within one agency, we believe the possibilities for arbitrary and, indeed, capricious and harassing action become limitless. It would, for example, allow the Secretary to regulate and control aspects of mining not necessarily related to safety or health, and thus permit legislation through administrative fiat.

It is no answer to say that the small producer has adequate protection through the channels of adminstrative review. Perhaps the large operator can easily afford the cost of such laborious remedies, but for most small operators such extended legal appeals are not within their financial reach.

Furthermore, we believe that by making the standards a matter of statute rather than agency regulation it would reduce the effect of any undue pressures which other interested groups in the coal industry would attempt to exert upon the Bureau of Mines.

It would, in short, relieve Government officials from the conflicting pressures from sources such as the giant operators and big labor.

Provisions for State cooperative inspection plans should be retained in the law: The present law recognizes and respects the role of the individual States in enacting and enforcing mine safety legislation, and provides for cooperative inspections between State and Federal agencies.

We feel it is vitally important that the authority of the States in this field be preserved and maintained. Better safety results have been achieved where these cooperative arrangements have been in effect. Section 104 of the administration's bill provides for the continuation of this Federal-State arrangement, but we note that other bills under consideration by the committee propose its elimination.

The area of mine inspection is one which, by its very nature, can be more effectively performed at the State level. It is also clear that States are aware of and are increasingly fulfilling their responsibility in this area.

For example, in the State of Virginia each of the State inspectors averages about 275 inspections a year, whereas the average Federal inspector inspects only about 42 mines a year. In Virginia, under the cooperative plan which was adopted in 1966, the safety record in coal mining has been dramatically improved, with a 57-percent decrease in the number of fatalities occurring over the past 6 years.

I will take just a moment to answer another one of Mr. Mittelman's earlier questions

I think the question was: Would we be in favor of retention of the State plan or would we rather have Federal Bureau, do we think it is better to let the Bureau have all the authority.

We feel it is better to have the State plan preserved. We think the result is more efficiency, less costly and more detailed inspection service if the States are allowed this privilege.

In any case, the State inspectors in our area, in most areas, are local men, familiar with the local scene, familiar with the local conditions and the people. Whereas in the majority of cases the Federal inspectors are not and therefore they are not as familiar with the problems that might come up in these seams.

For instance, in one county in West Virginia, Kanauha County has 17 coal seams all with different conditions. Only those people who work with the local people, only the people who grew up there and know these seams can effectively and systematically and efficiently inspect these mines on a day-to-day basis and give us the type of safety enactment that we need.

We are for retention of the Federal statutes as they are but giving the State the opportunity to regulate their own mining procedures with the Bureau's approval.

Mr. MITTELMAN. Does Kentucky have a safety code applicable to mines?

Mr. VAN METER. Kentucky has an excellent bureau of mines and minerals applicable to that but they are not under the State plan as such. There are only eight States at this time under the State plan. Virginia is one of these.

Mr. MITTELMAN. Virginia has an operable plan?

Mr. VAN METER. Yes; the State plan condoned by the Bureau of Mines of the Interior Department.

Mr. MITTELMAN. Do you know whether or not under the Kentucky and Virginia code standards are written in the law? Can the director of mine safety of the State change the standard by regulations?

Mr. VAN METER. No, he cannot. These are enacted by the legislature of that State. In fact, Virginia has just finished revising all its mine laws. I might add it strengthened them in many areas, making them more stringent. This just occurred this past year.

If Congress were to eliminate the provision under which cooperative State plans are made and carried out it would, we fear, tend to discourage and ultimately destroy any effort on the part of the States to maintain effective enforcement programs.

Federal preemption of inspection programs, and creation of a large army of Federal inspectors, is not going to improve mine safety or reduce accidents, and Congress would be engaging in a futile exercise by following this course.

As has so often been demonstrated, in the past, huge Federal bureaucracies not only do not solve the problems they are supposed to deal with but by their very existence create other and different problems more acute than the original problem.

Penalties: Some of the bills now under consideration would impose fines and penalties on the mine operator for any violation of the safety standards irrespective of the nature of the violation and irrespective of whether it could have been foreseen or prevented.

Many situations can develop in a coal mine where a temporary noncompliance with safety standards could occur through no fault or negligence on the part of the operator or his men.

If, when the situation is discovered, prompt remedial action is taken there should be no penalties imposed, and penalties should be reserved for the circumstance where proper remedial action is not taken within a reasonable time after the unsafe condition is discovered or called to the attention of the operator.

In regard to the question of imposing fines on individual workers for violation of safety procedures we feel that the mere threat of such a fine provides a strong inducement to the employee to more closely observe all safety requirements.

As we have pointed out, the vast majority of mine accidents are caused by individual carelessness, and anything that will reduce or minimize such carelessness will go a long way toward improving mine safety.

The need for more information to establish a meaningful dust standard: We concur with the view expressed by other witnesses that there is a need for establishing a legal respirable dust standard for coal mines. We are, however, concerned that the dust counts (3.0 to 4.5 milligrams per cubic centimeter of air) which have been proposed appear to have been selected in a rather hasty and arbitrary manner without any substantial supporting evidence to justify these figures.

There is little doubt that concentration of respirable dust over an extended period of time represents a health hazard, but the level at which it causes adverse health effects is subject to dispute. This is due in large part, we believe, to the lack of sufficient published medical data on the subject.

We suggest, therefore, that a more cautious approach be adopted for establishing a permissible level of dust count with the emphasis upon research in ultimately determining a safe level and developing a suitable technology for the control of respirable dust in coal mines.

In the interim, the adoption of a temporary standard of 4.5 milligrams appears both adequate and sufficiently realistic under the present state of technology, and until more precise data can be obtained.

Education must be emphasized: Many, if not most, of the major coal mine disasters in recent years have been due, not to the lack of safety legislation, but rather to human error. The same is true with respect to the principal cause of mine fatalities and injuries—roof and rib falls.

Legislation alone will not eliminate human error. But proper education and training can cause drastic reductions. Automobile accidents are a relevant parallel to our situation. In spite of our continuous efforts to legislate safety on the highways, we continue to experience mounting fatalities—because of driver carelessness. Mine safety is foremost a personal responsibility. It is not limited to operators or to inspectors. It extends to every individual in the mine.

In approaching this subject, Congress should recognize that 85 to 90 percent of mine accidents are not the result of laxness or indifference on the part of the mine operator, but are the fault of the individual employee who has failed to observe ordinary safety precautions intended for his own protection.

You need not expect, therefore, that you will get at the root of mine safety or that you will prevent any future accidents by the simple device of passing legislation. The problem will continue as long as coal is mined.

A point to remember, moreover, is that the overall accident total in coal mining is less than that of many other industries. In the construction industry, for example, a much greater number of fatal accidents occur each year as a result of excavation cave-ins.

These don't get the national headlines, however, as do the much less frequent coal mine accident, and the mind of the general public is conditioned to a much stronger reaction whenever a mine accident occurs.

This is not a valid basis, we feel, for piling regulations on the small coal operator without some reasonable relationship to existing conditions in the small mines.

Mr. Chairman, I thank you for this privilege of appearing before you and wish to say again that we are for coal mine safety in all respects and our association will go to the limit in protecting our mines and our employees.

We thank you for this privilege.

Senator WILLIAMS. Thank you very much, Mr. Van Meter. As far as inspections are concerned in the mines, I gather it is your opinion that the closer to home the inspectors are the better it is from where you sit?

Mr. VAN METER. Yes, sir.

Senator WILLIAMS. From whatever quarter the inspectors are gathered, whether it is Federal or State, when it comes to standards or permissible coal dust, for example, we are going to have to set standards that apply to the various States, coal-producing States.

Therefore, I am sure you will agree that this should be standardized for all the States and, therefore, would have to be a Federal finding of the standard; is that right?

Mr. VAN METER. Yes, sir. I might mention here, Mr. Chairman, that it was brought out in my testimony that actually mine safety and mine health are two different aspects of mining completely and should be separated.

I don't think we should talk of mine health and mine safety in the same breath.

We talk about mine safety being regulated by the State. Mine health is another subject to be considered. Of course, it is certainly part of the overall picture. In answer to your earlier question I would like to comment here that I think we would go on record as saying that the Surgeon General should have the authority to promulgate, if that be the word used earlier, the medical aspects of this, not the enforcement, of course.

That could be retained within the Department of the Interior. I do think the Department of the Interior could go a long ways toward creating two different agencies, one for mine safety and one for mine health.

I was with International Harvester for 5½ years. This company is very safety conscious, very health conscious. Six years ago we had an industrial hygienist down to run several dust counts and studies. Of course, the equipment being used at that time is very obsolete now. At that time it was very new, it was complicated equipment.

We did find that the industrial hygienist spent several years in this work. He could not overnight teach our inspectors the proper technique and proper use of this equipment. The mere hat or title of "Mine Inspector" doesn't make anybody more qualified to be a coal dust inspector than the fact—I think you heard the statement that membership in a musician's club does not make a fellow a musician. The title of "Mine Inspector" does not make a fellow a good mine inspector. It is the personal qualifications that make him a good inspector. By the same token these fellows may not be qualified dust inspectors.

Senator **Williams**. You did express very vividly the potential economic hardship, that if the burden of change is heavy there might be instances where a coal mine could not stand the expense and would have to close and go out of business.

We are told that coal production is on the increase. We know that is a fact. We are told that there is a projection that it will increase from what it is now. Would that suggest that if worse came to worse from your standpoint and you could not stand the expense of updating facilities to meet higher standards of safety and health, would the larger organizations move in to acquire your properties, do you think?

Mr. **Van Meter**. Probably not. This is one point I did not bring out. Most of the coal mine operators are small operators, operate in areas that are small in size. They may be only 10 or 15 acres. These are out on points, under cliffs, in very remote areas or in areas that the large operator could not afford to spend the money, the capital to do this.

For instance, our operators will go in a mine and spend 5 or 6 years possibly. A large operator would not be able to spend 6 weeks. Our operators many of them produce only 50 tons a day, maybe a hundred tons a day. Whereas a large coal mine operator if he does not produce 5,000 tons a day he is in bad shape. He has to produce this stuff. I know, because I was general superintendent of a coal mine that produced 7,500 tons a day.

We moved 3,000 feet in a matter of 4 weeks. I have operators that won't go 3,000 feet in 3 years. So they can actually operate into an area that would otherwise not be developed. That is what I am saying, it would be lost to the landowners themselves.

A little area out here that a big operator would not look at, if we could not mine it, the small operator, it would probably sit there for years and years. The landowner would not get money from it. He would not be able to lease the property.

Senator **Williams**. There are in operation economic programs from the Federal Government that move into areas where for one reason or another there is an economic hardship on an industry. Take shipbuilding, for example.

We have a program of Federal support for shipbuilding within this country. We have support for airlines or we used to. I recall a time when there was a tax incentive for industrial expansion called the 7-percent credit. We still have that. This is a benefit to industry. Have they ever suggested to small coal operators any economic backstopping if there is or if there was or if there should be an economic hardship?

In another area, the small business loan, for example, at a reduced rate?

Mr. **Van Meter**. I am not aware of it, Senator. There could possibly be some area there. I am glad you brought that up. In our particular industry as opposed to shipbuilding and some of the others, in the event that we go out of business, there are several other industries that are waiting in the wings so to speak, oil, gas, nuclear power. They will be glad to step in and take over our business. Whereas in shipbuilding I don't know if anybody could step in and take over their business or not.

Senator Williams. My first question was, Are you in a position if something should happen adverse to you where the big fellows would move in and take over your operation, buy you up. You said "No."

Mr. Van Meter. They would take over the market, yes.

Senator Williams. I see, the market. But not the mine?

Mr. Van Meter. In some instances they probably would. Some of our small operators have sufficient acreage and sufficient equipment and so forth they would buy them out.

It must be considered also here, we didn't bring it out, that most of our small operators are operating in seams very low in height. My own company operates in coal 24, 26 inches.

As a matter of fact a large company in our area is getting ready to relinquish a lease they have to 8,000 acres that we are going to pick up. The reason they are relinquishing it, the coal is too low, it is unmineable under their present conditions. It is unmineable for this large company.

In other words, the speed at which they must mine, the cost of their labor which is no more than ours actually, the cost of their equipment, the cost of their capitalization and so forth will not economically allow them to mine this thin coal but I can do it and I am doing it now.

Senator Williams. Are you with me, Mr. Van Meter?

STATMENT OF LOUIS HUNTER, EXECUTIVE SECRETARY, NATIONAL INDEPENDENT COAL OPERATORS ORGANIZATION

Mr. Hunter. Louis Hunter, executive secretary of the National Independent Coal Operators Organization.

There has been some small business association loans in small amounts to coal operators but they have been very few. But they have to be paid back. I might add there has never been any subsidy from the Federal Government to the coal industry outside of research.

As far as subsidy there has been none whatsoever in the coal industry.

Mr. Van Meter. We are not going on record as asking for subsidies. We would rather not have them but we would like to be able to operate under our own steam and with our own people.

Senator Williams. The Department of the Interior has not approached you within the area of their reference to increase coal production in any way?

Mr. Van Meter. No, sir; not in my particular instance.

Mr. Hunter. Could I add one thing that the Bureau of Mines has stated, one of their representatives? He made this in a talk in a meeting with us. The Bureau of Mines representative made it in a talk to us that if all mines were classified gassy—he said he did some research on this—that between 85 and 90 percent would automatically be out of business right now.

You can see what that would do to the Appalachian area. That is his statement.

Mr. Van Meter. Talking about permissible and nonpermissible equipment, even if the economics were available to these operators to provide permissible equipment the law in some of these instances requires 1 year's compliance.

It is a physically impossibility.

Mr. Mittelman. That is taken care of in the bill.

Mr. Van Meter. One year, is it not?

Mr. Mittelman. No.

Mr. Blackwell. You were asked the number of employees associated with the mine operation.

Mr. Van Meter. That is about 32,000.

Mr. Blackwell. Those are scattered in what States?

Mr. Van Meter. The bulk being in Kentucky, Virginia, and West Virginia, but we do represent companies as far west as Iowa, Tennesee, Oklahoma, and Alabama.

Mr. Blackwell. The bulk would be in Kentucky, Tennessee, western West Virginia, and southwest Virginia?

Mr. Van Meter. Yes, sir.

Mr. Blackwell. That would be about 22,000 of the 32,000 just roughly?

Mr. Hunter. Actually it would be about 32,000 but indirectly this would affect over 100,000 or 150,000 people. We have a number of small industries depending on these mining businesses. We have small mine manufacturing. In the town where he lives at Grundy we have six manufacturers, I could name them, of small mine equipment.

Each one of the six employs 10 to 15 men. They build these small loading machines that you can use in 26- to 27-inch coal. They make a small roof bolting machine. We have six manufacturers right in Grundy, a small town of 1,900 to 2,000.

Mr. Blackwell. Do you have local relatively small industry users of the coal that your mines are producing?

Mr. Hunter. No. I am talking about the manufacture of the equipment. Most of the coal goes to either public utilities——

Mr. Blackwell. That is shipped out.

Mr. Van Meter. We do have a certain amount of domestic market, a very small amount. There is coal used for domestic purposes. Mr. Bailey and Mr. McDowell's association probably sell more coal for domestic use than we do.

Mr. Blackwell. What is your marketing situation? Do you negotiate a long-term contract with the utilities?

Mr. Van Meter. A small operator cannot do this.

Mr. Blackwell. So, you are getting the price that the market offers at the time your coal hits the market.

Mr. Hunter. There is usually a middleman. The small operator cannot negotiate with the public utilities. I might add this fact to it, that the small operator, it costs him more to buy. He cannot buy in volume. You know if you can buy in volume you can buy a little cheaper. He is handicapped more ways than one. He is handicapped in his selling ability, he is handicapped in his purchasing.

Mr. **Blackwell.** Is there a differential in the price of the coal laid down at the utility between a large mine like Consolidation and one of your mines?

Mr. **Hunter.** Yes, sir; by far. You have the unit train which enters into it. A lot of times he will have a freight advantage of $1.80 a ton or $1.20 a ton.

Mr. **Blackwell.** The price that the user pays him regardless of the transportation.

Mr. **Van Meter.** Again, if I might interject here, my last job before coming with Jewel Smokeless Coal Co. was with a large operator. All the coal was shipped by unit train 10,000 tons at a time. Shipping this way we got in the neighborhood of $1.80 a ton freight differential. My operators could not produce 10,000 tons, some of them in 6 months, much less in 2 days.

We were producing 7,500 tons a day. There is a vast differential. The large operator many times because of this can underbid us to the point that the price that he is getting out of his coal is less than he once had but again in order to compete with him we have to bring our price down.

We can't. We are getting in the area of utilities. Much of the coal in our county that I am associated with is used for byproduct coal, steelmaking and such. They definitely get 50 cents to $1 more per ton than most of our operators.

This I know for a fact because we are in the process of negotiating a new contract. One of the neighbors getting the same coal from the same seam, 50 miles away, is getting 50 cents more for his coal than we are. He is a large company.

Mr. **Mittelman.** For the record, the section of the bill to which I referred in section 306(1), in S. 1300, it provides that:

> (1) One year after the operative date of this section—
>
> (1) all electric face equipment used in a coal mine shall be permissible and shall be maintained in a permissible condition, except that the Secretary may permit, under such conditions as he may prescribe, nonpermissible or open-type electric face equipment in use in such mine on the operative date of this title, to continue in use for such period as he deems appropriate after taking into consideration the availability of replacement equipment.

Mr. **Van Meter.** That would be fine certainly if the Secretary will assert his authority. Again if he will do it. We don't want to give him that power to begin with to regulate anything by regulation alone. Put it in the law. This is the reason we are opposing this gassy and nongassy classification.

What is to say he has to do this. You say he has the power to do so.

Mr. **Mittelman.** He would have the power under the bill.

Mr. **Van Meter.** If I could have the assurance of the committee that the Secretary will do this, then it is not as big a problem as it was one time. Again I don't think we can depend on it.

In other words, is it an across-the-board thing? Is it each individual mine. Again there is some undue pressure, sometimes that the Bureau in many instances has some pressures exerted on them that I possibly could not cope with. There are some people who would be tickled to death to see us out of business.

Senator WILLIAMS. Do you have an economic advantage on wages?

Mr. VAN METER. No, sir. Well, let me say this again; yes. Some of our operators do have this advantage. In my particular company we do not.

Senator WILLIAMS. Is yours organized?

Mr. VAN METER. No, sir, we are not organized. Our wages are comparable to organized labor. There is this advantage of course, yes.

Mr. HUNTER. We have some small operators who are mechanized that make $40 to $45 in an 8-hour shift a day, each man. I can back this up. This is not hearsay.

Mr. VAN METER. I have some employees who are averaging $1,500 a month. This is not the rule. This is the exception rather than the rule but the possibility exists.

Senator WILLIAMS. Are these men on piece-rate?

Mr. VAN METER. My men are on a production bonus.

Senator WILLIAMS. They get an hourly rate?

Mr. VAN METER. Plus production bonus.

Senator WILLIAMS. Is it an hourly or daily rate?

Mr. VAN METER. It is an hourly rate.

Mr. HUNTER. Could I add one thing, Mr. Chairman?

I gave to Mr. Blackwell a bill we are hoping will be introduced which spells the law out in detail. Just like he read a statement a minute ago. Is that negotiating with each individual? Is that across the board or what it is? Actually it is not spelled out in detail.

We are hoping that this bill may be introduced that spells things out in detail for safety sake. No two men see alike. I might inspect a mine one way, another man might inspect it another way. That has been a difficulty.

In other words, try to spell it out a little more in detail.

Mr. MITTELMAN. The problem is that the last time any adjustment was made in coal mine Federal Standards was 16 years ago. It is very difficult to get any particular law passed through Congress.

Certainly it is not feasible for anyone to expect Congress every year or every 2 years, whenever the standard should be adjusted, to move through this cumbersome process which really must be gone through every time legislation is suggested with all the attendant delays and considerations that enter into it, which is why all of the bills submitted, with the exception of one of the bills suggested by the United Mine Workers, provide that the Secretary has the power to promulgate these standards.

This flexibility is required because it is too hard to get a law through Congress every time you want to make an adjustment of the standards.

Mr. VAN METER. Of course, all the legislation is supposed to be for the safety and health of the employee and to promote and keep the coal industry alive. There is no one in the coal industry, whether it be the labor, operator, or what-have-you, who is for the Secretary to have this power to promulgate and regulate.

Therefore, are we to have any part in our own industry or not? That is what it boils down to. No one in the Bureau of Mines or State agencies for that matter as we pointed out can set the standards as effectively as the operator or the coal industry themselves.

They know their mines much better than anyone else. It is a fact that the mine safety has been bad in the past. It is becoming very much better. The State of Virginia is one of the best examples we have. It has decreased its fatalities by 57 percent in the last 2 years. So we are making great strides along this line.

Mr. HUNTER. I might insert this.

To leave this nongassy classification is an incentive because that man will work much safer and he will have more precautions for fear he might be classified gassy.

In other words, he will have a safer mine and records will back us up on that. You can check with the Bureau. The smaller mine is by far the safer mine than the larger one because he has something to work for.

You understand what I am talking about? As long as you are nongassy you don't have all these heavier penalties. If you keep that mine nongassy you are going to have a safer mine.

Mr. VAN METER. It is true. The mere fact that there are two different classifications is an inducement to the small operator to stay nongassy.

I would like to answer Mr. Mittelman's previous question. The Bureau of Mines states that all mines are potentially gassy. I think this is true when it gets down to classification of gassy. There are potentially gassy mines. But we don't agree with all the reports put forth by the Bureau.

I doubt very seriously that they can provide statistics that will prove this point.

Mr. MITTELMAN. I have asked Mr. Bailey and Mr. McDowell to submit written comments on the material submitted by the Department of the Interior. I also urge you if you wish also to submit any written comments that you care to make on the material submitted by the Department.

Senator WILLIAMS. I don't believe we have anything further, gentlemen. You have been very helpful.

Mr. VAN METER. We appreciate it very much.

(The following information concerning mine fatalities was supplied for the record:)

5,243 MINES—1966

Number of men	Number of mines	Fatality rates/ million man-hours
1 to 4	1,764	2.31
5 to 9	1,798	2.09
10 to 19	917	1.73
20 to 49	133	1.79
50 to 99		.97
100 to 249		1.09
250+		.57
National average		1.14

5,243 UNDERGROUND BIT. COAL MINES

	Fatalities	Fatality rate
1966 fatalities:		
85 captive mines	21	.50
20 largest companies, 163 mines	41	.60
4,995 mines	135	2.16
Total	197	1.14
1967 fatalities:		
85 captive	26	—62
20 large companies (163 mines)	62	—89
4,997 remainder	89	−1.37
Total	177	1.01

(The following bill, S. 2118, was subsequently introduced by Senator Randolph and ordered to be printed:)

91st CONGRESS
1st Session

S. 2118

IN THE SENATE OF THE UNITED STATES

May 12, 1969

Mr. Randolph introduced the following bill; which was read twice and referred to the Committee on Labor and Public Welfare

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A BILL

To improve the health and safety conditions of persons working in the coal mining industry of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Federal Coal Mine Health and Safety Act of 1969".

FINDINGS

Sec. 2. Congress declares that—

(a) the first priority and concern of all in the coal mining industry must be the health and safety of its most precious resource—the miner;

(b) the occupationally caused death or injury of a miner causes grief and suffering, and is a serious impediment to the future growth of this industry;

(c) there is an urgent need to provide more effective means and measures for improving the working conditions and practices in the Nation's coal mines in order to prevent death and serious physical harm, and in order to control the causes of occupational diseases originating in such mines;

(d) the existence of unsafe and unhealthful conditions and practices in such mines cannot be tolerated;

(e) the operators of such mines, with the assistance of the miners, have the primary responsibility to prevent the existence of such conditions and practices in such mines;

(f) the disruption of production and the loss of income to operators and miners as a result of a coal mine accident or occupationally caused disease unduly impedes and burdens commerce; and

(g) it is the purpose of this Act to provide for the establishment of mandatory health and safety standards and to require that the operators and the miners comply with such standards in carrying out their responsibilities.

MINES SUBJECT TO ACT

SEC. 3. Each coal mine, the products of which enter commerce, or the operations of which affect commerce, shall be subject to this Act, and each operator of such mine and every person working in such mine shall comply with the provisions of this Act and the applicable regulations of the Secretary promulgated under this Act.

DEFINITIONS

SEC. 4. For the purpose of this Act, the term—

(a) "Secretary" means the Secretary of the Interior or his delegate;

(b) "Director" means the Director of the United States Bureau of Mines;

(c) "commerce" means trade, traffic, commerce, transportation, or communication among the several States, or any place outside thereof, or within the District of Columbia or a possession of the United States, or between points in the same State but through a point outside thereof;

(d) "State" includes a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, and Guam;

(e) "operator" means a person operating a coal mine;

(f) "agent" means any person charged with responsibility for the operations of all or part of a coal mine;

(g) "person" means any individual, partnership, association, corporation, firm, subsidiary of a corporation, or other organization;

(h) "miner" means any individual working in a coal mine and includes the agent of the operator;

(i) "coal mine" means an area of land and all structures, facilities, machinery, tools, equipment, shafts, slopes, tunnels, excavations, and other property, real or personal, placed upon, under, or above the surface of such land by any person, used or to be used in, or resulting from, the work of extracting in such area bituminous coal, lignite, or anthracite from its natural deposits in the earth by any means or method, and the work of preparing the coal so extracted, and includes custom coal preparation facilities;

(j) "work of preparing the coal" means the breaking, crushing, sizing, cleaning, washing, drying, mixing, storing, and loading of bituminous coal, lignite, or anthracite, and such other work of preparing such coal as is usually done by the operator of the coal mine;

(k) "imminent danger" means the violating of a mandatory safety standard established by this Act which could reasonably be expected to cause death or serious physical harm before such condition or practice can be abated;

(l) "accident" includes a mine explosion, mine ignition, mine fire, or mine inundation, or lost-time injury to, or death of, any person;

(m) "inspection" means the period beginning when an authorized representative of the Secretary first enters a coal mine and ending when he leaves the coal mine during or after the coal-producing shift in which he entered; and

(n) "Board" means the Federal Coal Mine Health and Safety Board of Review established by this Act.

TITLE I—GENERAL HEALTH AND SAFETY STANDARDS; NEW OR REVISED STANDARDS; REVIEW

Sec. 101. (a) The Secretary shall, in accordance with the procedures set forth in this section, administer mandatory health and safety standards for the protection of life and the prevention of injuries and occupational diseases in a coal mine.

(b) The mandatory health and safety standards established in titles II and III of this Act shall be the health and safety standards applicable to the coal mining industry of the United States. With the exception of the limited circumstances described in subsection (c) of this section, these standards are intended as permanent health and safety standards.

(c) In the event of technological changes in the industry or the availability of new data from research, the Secretary may develop and promulgate new or revised mandatory health and safety standards (including the methods and procedures to attain compliance with standards) to provide for the protection of life and the prevention of injuries and occupational diseases in or around the mines, subject to the notice, hearing, and review procedures specified in subsections (e)–(j) of this section.

(d) In the development of such new or revised health and safety standards, the Secretary shall consult with other interested Federal agencies, representatives of States, and appropriate advisory committees established by this Act. In addition to the attainment of the highest degree of health and safety protection for the miner, other considerations shall be the latest available scientific data in the field, the technical and economic feasibility of the standards and experience gained under this and other health and safety statutes.

(e) In the development of new or revised mandatory health standards, the Secretary shall evaluate criteria developed and furnished to him by the Secretary of Health, Education, and Welfare on the basis of research, demonstrations, experiments, and such other information as may be appropriate, and the Secretary also shall consult for these purposes with appropriate representatives of the operators and miners, other interested persons, the States, advisory committees, and, where appropriate, foreign countries.

(f) Whenever the Secretary intends to promulgate such new or revised mandatory health or safety standards he shall publish such proposed standards in the Federal Register and shall afford interested persons a period of not less than thirty days after publication to submit written data or comments. In the event no objections and request for hearings thereon are filed, the proposed new or revised health or safety standards shall become mandatory after the expiration of the period for objections, with any changes or modifications made pursuant to the written data or comments received. Such new or revised mandatory health and safety standards shall be published in the Federal Register.

(g) Proposed mandatory safety standards for surface coal mines shall be developed and published by the Secretary not later than twelve months after the enactment of this Act, subject to the notice, hearing, and review procedures specified in subsections (e)-(k) of this section.

(h) On or before the last days of any period fixed for the submission of written data or comments under subsection (f) of this section, any interested person may file with the Secretary written objections to a proposed new or revised standard, stating the grounds therefor and requesting a public hearing by the Board on such objections. As soon as practicable, after the period for filing such objections has expired, the Secretary shall publish in the Federal Register a notice specifying the proposed standards to which objections have been filed and a hearing requested, and shall refer such standards and objections to the Board for review in accordance with subsection (i) of this section.

(i) Promptly after any matter is referred to the Board by the Secretary under subsection (h) of this section, the Board shall issue notice of and hold a public hearing for the purpose of receiving relevant evidence. Within sixty days after completion of the hearing, the Board shall issue a report to the Secretary setting forth findings of fact on such objections and appropriate recommendations thereon and shall make such report and recommendations public. Upon receipt of such report and recommendations, the Secretary may, upon consideration of the Board's findings of fact and recommendations, promulgate the mandatory standards with such modifications, or take other action, as he deems appropriate. In any instance in which the Secretary does not adopt the Board's recommendations, he shall publish his reasons therefor.

(j) Any mandatory standard promulgated under this section shall be effective upon publication in the Federal Register unless the Secretary specifies a later date.

ADVISORY COMMITTEES

SEC. 102. (a) The Secretary shall appoint one or more advisory committees to advise him in carrying out the provisions of this Act. The Secretary shall designate the chairman of each such committee, each of which shall have equal numbers of representatives of coal mine operators and coal mine employees.

(b) Advisory committee members, other than employees of Federal, State, or local governments, while performing committee business, shall be entitled to receive compensation at rates fixed by the Secretary but not exceeding $100 per day, including traveltime. While so serving away from their homes or regular places of business, members may be paid travel expenses and per diem in lieu of subsistence at rates authorized by section 5703 of title 5, United States Code, for persons intermittently employed.

(c) Such advisory committees shall meet at regular intervals.

INSPECTIONS AND INVESTIGATIONS

SEC. 103. (a) Authorized representatives of the Secretary shall make frequent inspections and investigations in coal mines each year for the purpose of (1) obtaining, utilizing, and disseminating information relating to health and safety conditions, the causes of accidents, and the causes of diseases and physical impairments originating in such mines, (2) developing new or revised health and safety standards, (3) determining whether an imminent danger exists in a coal mine, and (4) determining whether or not there is compliance with the mandatory health and safety standards provided for in this Act, or with any order issued under this Act and (5) determining whether a mine is gassy under section 105 of this Act. In carrying out the requirements of clauses (3) and (4) of this subsection in each underground coal mine, such representatives shall make inspections of the entire mine at least three times a year.

(b) For the purpose of making any inspection or investigation under this Act, the Secretary or any authorized representative of the Secretary shall have a right of entry to, upon, or through any coal mine.

(c) For the purpose of carrying out his responsibilities under this Act, including the enforcement thereof, the Secretary may, by agreement, utilize with or without reimbursement the services, personnel, and facilities of any Federal or State agency.

(d) For the purpose of making any investigation of any accident or other occurrence relating to health or safety in a coal mine, the Secretary may, after notice, hold public hearings, and may sign and issue subpenas for the attendance and testimony of witnesses and the production of relevant papers, books, and documents, and administer oaths. Witnesses summoned shall be paid the same fees and mileage that are paid witnesses in the courts of the United States. In case of contumacy or refusal to obey a subpena served upon any person under this section, the district court of the United States for any district in which such person is found or resides or transacts business, upon application by the United States and after notice to such person, shall have jurisdiction to issue an order requiring such person to appear and give testimony before the Secretary or to appear and produce documents before the Secretary or both, and any failure to obey such order of the court may be punished by such court as a contempt thereof.

(e) In the event of any accident occurring in a coal mine, the operator shall notify the Secretary thereof and shall take appropriate measures to prevent, to the greatest extent possible, the destruction of any evidence which would assist in investigating the cause or causes thereof.

(f) In the event of any accident occurring in a coal mine, an authorized representative of the Secretary, when present, may issue such orders as he deems appropriate to insure the safety of any person in the coal mine, and the operator of such mine shall obtain the approval of such representative, in consultation with appropriate State representatives, of any plan to recover any person in the mine or to recover the mine or to return affected areas of the mine to normal.

STATE PLANS

SEC. 104. (a) In order to promote sound and effective coordination in Federal and State activities within the field covered by this Act, the Secretary shall cooperate with the official coal mine inspection or safety agencies of the several States.

(b) Any State desiring to cooperate in making inspections required under this title may submit, through its official coal mine inspection or safety agency, a State plan for carrying out the purposes of this section. Such State plan shall—

(1) designate such State coal mine inspection or safety agency as the sole agency responsible for administering the plan throughout the State and contain satisfactory evidence that such agency will have the authority to carry out the plan;

(2) give assurances that such agency has or will employ an adequate and competent staff of inspectors qualified under the laws of such State to make mine inspections within such State, and that no advance notice of an inspection will be provided operators;

(3) give assurances that, upon request of the Secretary or upon request of an operator under section 105 (h) (1) of this title, such agency will promptly assign

inspectors employed by it to participate in inspections to be made in such State under this title; and

(4) provide that the agency will make such reports to the Secretary, in such form and containing such information as the Secretary may from time to time require.

(c) The Secretary shall approve any State plan or any modification thereof which complies with the provisions of subsection (b) of this section. He shall not finally disapprove any State plan or modification thereof without first affording the State agency reasonable notice and opportunity for hearing.

(d) Whenever the Secretary, after reasonable notice and opportunity for hearing to the State agency, finds that in the administration of an approved State plan there is—

(1) a failure to comply substantially with any provision of the State plan; or

(2) a failure to afford reasonable cooperation in administering the provisions of this title,

the Secretary shall notify such State agency of his withdrawal of approval of such plan and, upon receipt of such notice, such plan shall cease to be in effect.

(c) No inspection of a mine shall be made by an authorized representative of the Secretary under this title in any State in which a State plan is in effect unless a

State inspector participates in such inspection in accordance with such plan, except where, in the Secretary's judgment, an inspection is urgently needed to determine whether an imminent danger exists in such mine, and participation by a State inspector would unreasonably delay such inspection, or where, following due notice, a State inspector is not provided in due time to participate in an inspection, or where a spot inspection is deemed essential by a representative of the Secretary.

(f) Any State inspector assigned in accordance with a State plan, and any independent inspector appointed under section 105(h)(3) of this title, shall be entitled to admission to any mine for the purpose of making any inspection authorized under this title.

FINDINGS AND ORDERS

SEC. 105. (a) If, upon any inspection of a coal mine, an authorized representative of the Secretary finds that an imminent danger exists, such representative shall determine the area throughout which such danger exists, and thereupon shall, unless voluntary corrective action is then in progress which will immediately remove the imminent danger, issue an order requiring the operator of the mine or his agent to cause immediately all persons, except those referred to in subsection (c) of this section, to be withdrawn from, and to be prohibited from entering, such area until an authorized representative of the Secretary determines that such imminent danger no longer exists.

An authorized representative of the Secretary shall remain at the site of the area found to be affected by an imminent danger while the work of abating such imminence is in progress and until such imminence is totally abated.

(b) If, upon any inspection of a coal mine, an authorized representative of the Secretary finds that there has been a violation of any mandatory health or safety standard promulgated under this Act, but the violation has not created an imminent danger, he shall find what would be a reasonable period of time within which the violation should be totally abated and thereupon issue an order fixing a reasonable time for the abatement of the violation. If, upon the expiration of the period of time as originally fixed or subsequently extended there is a belief that an imminent danger exists, and if an authorized representative of the Secretary finds that the violation has not been totally abated, and if he also finds that the period of time should not be further extended, he shall find the extent of the area affected by the violation and shall promptly issue an order requiring the operator of such mine or his agent to cause immediately all persons, except those referred to in subsection (c) of this section, to be withdrawn from, and to be prohibited from entering, such area until an authorized representative of the Secretary determines that the violation has been abated, or that the imminent danger no longer exists. An authorized representative of the Secretary shall remain at the site of the area found to be affected by an imminent danger while the work of abating such imminence is in progress and until such imminence is totally abated.

(c) The following persons shall not be required to be withdrawn from, or prohibited from entering, any area of the coal mine subject to an order issued under this section:

(1) Any person whose presence in such area is necessary, in the judgment of the operator, to eliminate the condition described in the order;

(2) Any public official whose official duties require him to enter such area; and

(3) Any consultant or any representative of the employees of such mine who is, in the judgment of the operator, qualified to make coal mine examinations or who is accompanied by such a person and whose presence in such area is necessary for the investigation of the conditions described in the order.

(d) If an authorized representative of the Secretary, upon making an inspection of a mine, finds that methane has been ignited in such mine or finds methane by use of a permissible flame safety lamp or by an air analysis in an amount of 0.10 per centum or more in any open workings of such mine when tested at a point not less than twelve inches from the roof, face, or rib, he shall issue a warning that an order requiring the operator of such mine to comply with the provisions of this Act pertaining to gassy mines will be issued if and when 0.20 per centum or more of methane is found in such mine in any open working by use of a permissible flame safety lamp or by an air analysis when the test is at a point not less than twelve inches from the roof, face, or rib.

(e) Orders issued pursuant to this section shall contain a detailed description of the conditions or practices which cause and constitute an imminent danger, or a violation of any mandatory health or safety standard promulgated under this Act, and where appropriate, a description of the area of the coal mine from which persons must be withdrawn and prohibited from entering.

(f) Each warning and/or order issued under this section shall be given promptly to the operator of the coal mine or his agent by an authorized representative of the Secretary issuing such order, and all such orders shall be in writing and shall be signed by such representative.

(g) Except as provided in subsection (h) of this section, an order issued pursuant to this section may be modified or terminated by an authorized representative of the Secretary.

(h) (1) If an order is made pursuant to subsection (a) of this section, and a State inspector did not participate in the inspection on which such order is based, the duly authorized representative of the Secretary who issued the order shall notify the State mine inspection or safety agency immediately, but not later than twenty-four hours after the issuance of such order, that such order has been issued. Following such order the operator of the mine may immediately request the State mine inspection or safety agency to assign a State inspector to inspect the mine. Assuming that the State agency will promptly assign a State inspector to inspect the mine affected by such order, the State inspector will be expected to file an inspection report with the Secretary and the State agency. The order of the duly authorized representative of the Secretary shall remain in effect, but shall immediately be subject to review as provided in this title.

(2) No order shall be made pursuant to subsection (b) or (c) of this section with respect to a mine in a State in which a State plan approved under section 104 (c) of this title is in effect unless a State inspector participated in the inspection on which such order is based and concurs in such order, or an independent inspector appointed under paragraph (3) of this subsection concurs in such order, or partici-

pation of the State inspector in the inspection was not required under section 104 (e) of this title. If the State inspector does not concur in such order, the operator of the mine, the duly authorized representative of the Secretary who proposes to make such order, or the State inspector may apply, within twenty-four hours after the completion of the inspection under paragraph (3) of this subsection. Within five days after the date of his appointment, the independent inspector shall inspect the mine. The representative of the Secretary and the State inspector shall be given the opportunity to accompany the independent inspector during such inspection. If, after such inspection is completed, either the independent inspector or the State inspector concurs in the order, it shall be issued.

(3) Within five days after the date of receipt of an application under paragraph (2) of this subsection, the chief judge of the United States district court for the district in which the mine involved is located (or, in his absence, the clerk of such court) shall appoint a graduate engineer with experience in the coal mining industry to serve as an independent inspector under this subsection. Each independent inspector so appointed shall be compensated at the rate of $50 for each day of actual service (including each day he is traveling on official business) and shall, notwithstand-

ing the Travel Expense Act of 1949, be fully reimbursed for traveling, subsistence, and related expenses.

(4) An order made pursuant to subsection (a) or (b) of this section with respect to a mine in a State in which a State plan approved under section 104 (c) of this title is in effect shall not be subject to review under section 106 of this title, but shall be subject to review under section 108 of this title.

REVIEW BY THE SECRETARY

SEC. 106. (a) Except as provided in section 105 (h) (4) of this title, an operator notified of an order issued pursuant to section 105 of this title or subsection (e) of section 202 of title II may apply to the Secretary for review of the order within thirty days of receipt thereof. The operator shall send a copy of such application to the representative, if any, of persons working in the affected mine. Upon receipt of such application, the Secretary shall cause such investigation to be made as he deems appropriate. Such investigation shall provide an opportunity for a hearing, at the request of the applicant or a representative of persons working in such mine, to enable the applicant and the representatives of persons working in such mine to present information relating to the issuance and continuance of such order.

(b) Upon receiving the report of such investigation, the

Secretary shall make findings of fact, and (1) in the case of an order issued under subsection (a) of section 105 of this title, he shall find whether or not the imminent danger as set out in the order existed at the time of issuance of the order and whether or not the imminent danger existed at the time of the investigation, and (2) in the case of an order issued under subsection (b) of section 105 of this title, he shall find whether or not there was a violation of any mandatory health or safety standard promulgated under this Act as described in the order, whether or not such violation had been abated at the time of such investigation, and whether the failure to abate the violation had caused an imminent danger, and upon making such findings he shall issue a written decision vacating, affirming, modifying, or terminating the order complained of and incorporate his findings therein.

(c) In view of the urgent need for prompt decision of matters submitted to the Secretary under this section, all actions which the Secretary takes under this section shall be taken as promptly as practicable, consistent with the adequate consideration of the issues involved. In the case of withdrawal orders, action by the Secretary on applications by operators shall be taken no later than five days after the filing of such application.

(d) Pending completion of the investigation required by this section, the applicant may file with the Secretary a written request that the Secretary grant temporary relief from any order issued under section 105 of this title, together with a detailed statement giving reasons for requesting the granting of such relief. The Secretary may issue a decision granting such relief, under such conditions as he may prescribe, only after a hearing in which all parties are given an opportunity to be heard.

FEDERAL COAL MINE HEALTH AND SAFETY BOARD OF REVIEW

SEC. 107. (a) The Federal Coal Mine Health and Safety Board of Review is hereby established. For the purpose of carrying out its functions under sections 108 and 113 of this Act, the regular Board shall be composed of five members who shall be appointed by the President, by and with the consent of the Senate.

(b) For the sole purpose of carrying out the review functions set forth in section 101 of this Act, and matters related thereto, and only for a period of one year from date of appointment, there shall be included on the Board three additional members appointed by the President, by and with the consent of the Senate, at least one of whom shall have a public health background and the others each shall have a background, either by reason of previous training, education, or experience, in coal mining technology. All such additional members shall not have had any interest in, nor connection with, the coal mining industry for at least one year prior to their appointment.

(c) The terms of office of regular members of the Board shall be five years, except that (1) the members of the Federal Coal Mine Safety Board of Review established under the Federal Coal Mine Safety Act, as amended, who are in office on the effective date of this Act, shall be members of the Board established by this Act and their terms shall expire on the dates originally fixed for their expiration, and (2) a vacancy caused by the death, resignation, or removal of a member prior to the expiration of the term for which he was appointed shall be filled only for the remainder of such unexpired term. A member of the Board may be removed by the President for inefficiency, neglect of duty, or malfeasance in office.

(d) Each member of the Board shall be entitled to receive compensation at a rate specified at the time of actual service for grade GS–18 in section 5332 of title 5, United States Code, including traveltime, and shall be allowed travel expenses, including a per diem allowance in accordance with section 5703 (b) of title 5, United States Code, when engaged in the performance of services for the Board.

(e) The Board, at all times, shall consist of one person who, by reason of previous training and experience, may reasonably be said to represent the viewpoint of operators employing fourteen or fewer employees; one person who, by reason of previous training and experience, may reasonably be said to represent the viewpoint of operators employing fifteen or more employees; one person who, by reason of previous training and experience, may reasonably be said to represent the viewpoint of miners in mines employing fourteen or fewer employees; one person who, by reason of previous training and experience, may reasonably be said to represent the viewpoint of miners in mines employing fifteen or more employees; and one person, who shall be Chairman of the Board, who shall be a graduate engineer with experience in the coal mining industry or shall have at least five years' experience as a practical mining engineer in the coal mining industry, and, within one year of his appointment as a member of the Board, shall not have had a pecuniary interest in and shall not have been regularly employed or engaged in, the mining of coal, and shall not have regularly represented either coal mine operators or miners, nor shall he have been an officer or employee of the Department of the Interior.

(f) The principal office of the Board shall be in the District of Columbia. Whenever the Board deems that the convenience of the public or of the parties may be promoted, or delay or expense may be minimized, it may hold hearings or conduct other proceedings at any other place. At the request of an operator of a mine, the Board may hold hearings or conduct other proceedings on an application filed under section 108 of this title at the county seat of the county in which the mine is located or at any place mutually agreed to by the Chairman of the Board and the operator of the mine involved in the appeal or proceeding. The Board shall have an official seal which shall be judicially noticed and which shall be preserved in the custody of the Secretary of the Board.

(g) The Board shall, without regard to the civil service laws, appoint and prescribe the duties of a Secretary of the Board and such legal counsel as it deems necessary. Subject to the civil service laws, the Board shall appoint such other employees as it deems necessary in exercising its powers and duties. The compensation of all employees appointed by the Board shall be fixed in accordance with chapter 53, of title 5, United States Code.

(h) For the purpose of carrying out its functions under sections 108 and 113 of this title, three regular members of the Board shall constitute a quorum, and official action can be taken only on the affirmative vote of at least three members, except that in any official action involving mines in which no more than fourteen individuals are regularly employed underground, the participation of the small mine operators' representative and small mine workers' representative shall be required, and in any official action involving mines in which more than fourteen individuals are regularly employed underground the participation of the large mine operators' representative and large mine workers' representative shall be required; but a special panel composed of one or more members, upon order of the Board, shall conduct any hearing provided for in section 101 or 108 or 113 of this title and submit the transcript of such hearing to the entire Board for its action thereon. Such transcript shall be made available to the parties prior to any final action of the Board. An opportunity to appear before the Board shall be afforded the parties prior to any final action and the Board may afford the parties an opportunity to submit additional evidence as may be required for a full and true disclosure of the facts.

(i) Every official act of the Board shall be entered of record, and its hearings and records thereof shall be open to the public. The Board shall not make or cause to be made any inspection of a coal mine for the purpose of determining any pending application.

(j) The Board is authorized to make such rules as are necessary for the orderly transaction of its proceedings, which shall provide for adequate notice of hearings to all parties. The existing rules of the Federal Coal Mine Safety Board of

Review shall constitute the rules of the Board until superseded or modified by the Board.

(k) Any member of the Board may sign and issue subpenas for the attendance and testimony of witnesses and the production of relevant papers, books, and documents, and administer oaths. Witnesses summoned before the Board shall be paid the same fees and mileage that are paid witnesses in the courts of the United States.

(l) The Board may order testimony to be taken by deposition in any proceeding pending before it at any stage of such proceeding. Reasonable notice must first be given in writing by the party or his attorney of record, which notice shall state the name of the witness and the time and place of the taking of his deposition. Any person may be compelled to appear and depose, and to produce books, papers, or documents, in the same manner as witnesses may be compelled to appear and testify and produce like documentary evidence before the Board, as provided in subsection (k) of this section. Witnesses whose depositions are taken under this subsection, and the persons taking such depositions, shall be entitled to the same fees as are paid for like services in the courts of the United States.

(m) In the case of contumacy by, or refusal to obey a subpena served upon, any person under this subsection, the

Federal district court for any district in which such person is found or resides or transacts business, upon application by the United States, and after notice to such person and hearing, shall have jurisdiction to issue an order requiring such person to appear and give testimony before the Board or to appear and produce documents before the Board, or both; and any failure to obey such order of the court may be punished by such court as a contempt thereof.

REVIEW BY BOARD

SEC. 108. (a) Within thirty days after receipt of an order made pursuant to subsection (a), (b), or (d) of section 105 or subsection (e) of section 202 of this Act, an operator may apply to the Board for annulment or revision under section 106 of this title. Within thirty days after the receipt of a decision made by the Secretary pursuant to section 106 of this title, an operator may apply to the Board for a review of the decision.

(b) The operator shall be designated as the applicant in such proceeding, and the application filed by him shall recite the order or decision complained of and other facts sufficient to advise the Board and the Secretary of the nature of the proceeding. The Secretary shall be the respondent in such proceeding, and the applicant shall send a copy of such application by registered or certified mail to the respondent and to the representative, if any, of the persons working in the affected mine. Immediately upon the filing of such an application, the Board shall fix the time for a prompt hearing thereof. The Board shall permit any interested person to intervene in such proceedings.

(c) (1) If the application is made to the Board directly from an order issued under section 105 of this title or section 202 (e) of title II, the Board shall not be bound by any previous finding of fact by any representative of the Secretary, the burden of proof shall be upon the respondent, and evidence relating to the making of the order complained of and other pertinent matters may be offered by the parties to the proceeding.

(2) If the application is made to the Board from a decision issued under section 106 of this title, the record and the decision of the Secretary shall be received in evidence and the findings of the Secretary included in the decision shall constitute a prima facie case for the issuance of the decision complained of and the burden of rebutting such prima facie case shall be upon the applicant, but either party may adduce additional evidence.

(d) Upon conclusion of the hearing, the Board shall find, with respect to the order or decision, whether or not the imminent danger or a violation of a mandatory health or safety standard existed at the time of issuance of such order and whether or not such danger or such violation existed at the time of filing the application, and shall issue a written decision incorporating such finding therein and affirming, vacating, modifying, or terminating the order or decision issued under section 105 or 106 of this title.

(e) The Board shall have jurisdiction to review new or revised health or safety standards promulgated by the Secretary in the manner provided for in subsections (h) through (j) of section 101 of this title.

(f) Each decision made by the Board shall show the date on which it is made, and shall bear the signatures of the members of the Board who concur therein. Upon issuance of a decision under this section, the Board shall cause a true copy thereof to be sent by registered or certified mail to all parties and their attorneys of record. The Board shall cause each decision to be entered on its official record, together with any written opinion prepared by any members in support of, or dissenting from, any such decision.

(g) Pending the hearing required by this section for review of an order or decision issued under section 105 or 106, or 202 of this Act, or review of a new or revised standard promulgated under section 101 of this title, the applicant before the Board may file with the Board a written request that the Board grant temporary relief from the order or decision, or new or revised standards, together with a detailed statement giving reasons for granting such relief.

The Board may issue a decision granting such relief, under such conditions as it may prescribe, only after a hearing in which all parties are given an opportunity to be heard.

(h) In view of the urgent need for prompt decision on matters submitted to the Board under this section, all actions which the Board takes under this section shall be taken as promptly as practicable, consistent with adequate consideration of the issue involved.

JUDICIAL REVIEW

SEC. 109. (a) Any decision issued by the Board under section 108 of this title shall be subject to judicial review by the United States court of appeals for the circuit in which the affected mine is located, upon the filing in such court within thirty days from the date of such decision of a petition by the Secretary or by the operator aggrieved by the decision praying that the action of the Board be modified or set aside in whole or in part. A copy of the petition shall forthwith be sent by registered or certified mail to the other party and to the Board, and thereupon the Board shall certify and file in such court the record upon which the decision complained of was issued, as provided in section 2112, title 28, United States Code.

(b) The court shall hear such appeal on the record made before the Board. The findings of the Board, if supported by a preponderance of the evidence, shall be conclusive. The court may affirm, vacate, or modify any decision or may remand the proceedings to the Board for such further action as it directs.

(c) Upon such conditions as may be required and to the extent necessary to prevent irreparable injury, the court may, after due notice to, and hearing of, the parties to the appeal, issue all necessary and appropriate process and grant such other relief as may be appropriate pending final determination of the appeal.

(d) The judgment of the court shall be subject only to review by the Supreme Court of the United States upon certiorari or certification as provided in section 1254 of title 28, United States Code.

(e) The commencement of a proceeding under this section shall not, unless specifically ordered by the court, operate as a stay of the Board's decision.

POSTING OF NOTICES AND ORDERS

SEC. 110. (a) At each coal mine there shall be maintained an office with a conspicuous sign designating it as the office of the mine and a bulletin board at such office or at some conspicuous place near an entrance of the mine, in such manner that notices required by law or regulation to be posted on the mine bulletin board may be posted thereon, be easily visible to all persons desiring to read them, and be protected against damage by weather and against unauthorized removal. A copy of any notice or order required by this title to be given to an operator shall be delivered to the office of the affected mine, and a copy shall be immediately posted on the bulletin board of such mine by the operator or his agent.

(b) The Secretary shall cause a copy of any notice or order required by this title to be given to an operator to be mailed immediately to a duly designated representative of persons working in the affected mine, and to the public official or agency of the State charged with administering State laws, if any, relating to health or safety in such mine.

(c) In order to insure prompt compliance with any notice or order issued under section 105 of this title, or section 202 (e) of title II, the authorized representative of the Secretary may deliver such notice or order to an agent of the operator and such agent shall immediately take appropriate measures to insure compliance with such notice or order.

RECORDS

SEC. 111. Every operator of a coal mine and his agent shall establish and maintain such records, including records of any accident occurring in the mine, make such reports, and provide such information as the Secretary may reasonably require from time to time to enable him to perform his functions under this Act, and shall upon request of any person authorized by the Secretary, permit such person at reasonable times to have access to and copy such records, and the Secretary may compile, analyze, and publish, either in summary or detailed form, the information obtained. All information, reports, findings, notices, orders, or decisions issued under this Act may be published from time to time and released to any interested person and shall be made available for public inspection.

INJUNCTIONS

SEC. 112. The Secretary may request the Attorney General to institute a civil action for relief, including a permanent or temporary injunction, restraining order, or any other appropriate order, in the district court of the United States for the district in which a coal mine is located or in which the operator of such mine has his principal office, whenever such operator or his agent (a) violates or fails or refuses to comply with any order issued under section 105 of this title or under section 202 (e) of title II or decision issued under this title, or (b) interferes with, hinders, or delays the Secretary or his authorized representative in carrying out the provisions of this Act, or (c) refuses to admit such representative to the mine, or (d) refuses to permit the inspection of the mine, or to investigate an accident, injury, or occupational disease occurring in, or connected with, such mine, or (e) refuses to furnish any information or report requested by the

Secretary, or (f) refuses to permit access to, and copying of, records. Each court shall have jurisdiction to provide such relief as may be appropriate.

PENALTIES

Whoever knowingly violates or fails or refuses to comply with any order issued under section 105 of this title or any final decision issued under this title shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than six months, or by both, except that if the conviction is for a violation committed after the first conviction of such person, punishment shall be by a fine of not more than $20,000 or by imprisonment for not more than one year, or both.

TITLE II—MANDATORY HEALTH STANDARDS FOR CONTROLLING DUST AT UNDERGROUND MINES

SCOPE OF COVERAGE

SEC. 201. The provisions of this title shall be the mandatory health standards applicable to all underground mines to become effective after the effective date of section 202 (b) of this title, subject to the authority of the Secretary provided in section 101 of title I of this Act to promulgate new or revised standards in accordance with the procedures therein specified.

DUST STANDARD AND RESPIRATORS

SEC. 202. (a) Within sixty days after the effective date of this Act the Secretary shall appoint and set a conference of a Coal Mine Dust Advisory Committee consisting of equal numbers of representatives of the coal mine operators, of the employees, and of the Bureau of Mines to advise him on sampling and measurement methods appropriate to carry out the purposes of subsection (b) of this section. Thereafter, the Secretary may prescribe by regulation in accordance with the notice, hearing, and review of procedures specified in section 101 of title I of this Act, the equivalent methods for sampling and measurement by which compliance with dust standards will be determined.

(b) Except as provided in subsection (c) of this section, effective ninety days after the publication of the prescribed sampling methods by the Secretary—

(1) Each operator shall, at intervals prescribed by the Secretary or his authorized representative, cause the mine atmosphere to be sampled by a qualified person to determine if any miner is exposed to hazardous atmospheric concentrations of respirable dust. Samples shall be taken by a device approved by the Secretary and in accordance with the methods and at locations prescribed by him, pursuant to subsection (a).

(2) Each operator shall take all practical measures to control the concentrations of respirable dust in the mine atmosphere in any active working place so as to maintain miner exposure at or below four and one-half milligrams of dust per cubic meter of air averaged over no less than one working shift if measured with an MRE instrument or at or below an equivalent amount of dust if measured with another device approved by the Secretary.

(3) Respirators or other personal protection devices approved by the Secretary shall be worn for protection against exposures to concentrations of dust in excess of four and one-half milligrams of dust per cubic meter of air averaged over no less than one working shift if measured with an MRE instrument or in excess of an equivalent amount of dust if measured with another device approved by the Secretary. Each underground mine shall maintain a supply of approved respirators or like devices adequate to deal with miner exposure to respirable dust in the mine atmosphere in excess of the limit prescribed in this subsection, but such miner's exposure shall nevertheless be of short-term duration.

(4) As used in this section, the term "MRE instrument" means the gravimetric dust sampler with four-channel horizontal clutriator developed by Min-

ing Research Establishment of the National Coal Board, London, England.

(c) In the event an operator willfully refuses to take practical corrective or protective measure to conform to the standard or respirator provisions set in subsection (b) above, an authorized respresentative of the Secretary may issue an order causing all persons, except those referred to in subsection (c) of section 104 of this Act, to be withdrawn from and be prohibited from entering such area until an authorized representative of the Secretary determines that appropriate corrective or protective measures have been taken or commenced. Such orders shall be reviewable as provided for in sections 106, 108, and 109 of title I of this Act.

(d) Whenever the Secretary or his representative determines, upon application of an operator of an underground coal mine, that the application of the dust standard prescribed in subsection (b)(2) of this section, within the time prescribed, is not feasible from the standpoint of existing engineering technology applicable to said mine, he may suspend, under such conditions as he may prescribe, the application of such standard for an additional period, but not for more than six months without a hearing within ninety days after the suspension of the dust standard has been ordered for such mine.

(e) The Secretary, after taking into consideration available technology, may, in accordance with the hearing notice and review procedures specified in section 101 of this Act, prescribe the date upon which the miner exposure to respirable dust at each active working place in all underground coal mines shall not exceed three milligrams of dust per cubic meter of air averaged over no less than one working shift if measured with an MRE instrument, or an equivalent amount of dust if measured by another device approved by the Secretary.

MEDICAL EXAMINATION

SEC. 203. (a) The operator of an underground coal mine shall cooperate with the Secretary in making arrangements for each miner working in an underground coal mine to be given, at least once every two years, beginning six months after the operative date of this title, a chest roentgenogram by a licensed radiologist or competent X-ray technician. The films shall be read, interpreted, and classified by an American Board of Radiology certified radiologist in a manner to be prescribed by the Secretary of Health, Education, and Welfare and the results of each reading and interpretation on each such person shall be submitted to the Secretary of Health, Education, and Welfare, and at the request of the miner, to his physician, and to the Secretary of the Interior.

(b) Any miner who, in the judgment of the United

States Public Health Service, based upon such reading, shows substantial evidence of the development of pneumoconiosis shall be reassigned to a lesser exposure by the operator for such period or periods as may be necessary to prevent further development of such disease. The miner may be placed to work in an area of the mine containing more than such two milligrams, or equivalent, provided the miner wears a respirator approved by the Secretary.

DUST FROM DRILLING; FUMES

SEC. 204. The dust resulting from drilling rock shall be controlled by the use of permissible dust collectors or by foam or by water or by water with a wetting agent. Persons exposed to inhalation hazards from gas, dusts, fumes, or mist, shall wear permissible respiratory equipment.

TITLE III—MANDATORY SAFETY STANDARDS FOR UNDERGROUND COAL MINES

COVERAGE AND DUTY TO COMPLY

SEC. 301. (a) The provisions of this title shall be the mandatory safety standards applicable to underground coal mines. Any orders issued in the enforcement of the standards set forth in this title shall be subject to review as provided in sections 106, 108, and 109 of this Act.

(b) Every operator of a mine, and every person who is on the premises of a mine for any reason whatsoever, shall comply with the provisions of this title except those provisions which impose no duty, obligation, or responsibility upon such operator or such person.

GENERAL STANDARDS

SEC. 302. (a) A permissible or United States Bureau of Mines approved type of self-rescue device shall be made available to each person underground. Each underground employee shall be trained in the use of such device.

(b) Telephone service or equivalent two-way communication facilities shall be provided between the surface and each landing of main shafts and slopes and between the surface and each working section that is more than one thousand feet from the main portal.

(c) Smoking shall be prohibited underground. No person shall carry smoking materials, matches, or lighters underground. The operator of a coal mine shall institute a program, approved by the Secretary, at each mine to insure that any person entering the underground portion of the mine does not carry smoking materials, matches, or lighters. And the operator of a coal mine shall, at frequent intervals, cause each miner, at the portal, to demonstrate conclusively that such smoking or lighting devices are not taken underground. Smoking shall be prohibited in or around oil houses, explosives magazines, or other surface areas where such practice may cause a fire or explosion.

(d) All accidents shall be investigated by the operator or his agent to determine the cause and the means of preventing a recurrence. Records of such accidents and investigations shall be kept and the information shall be made available to the Director or his authorized representative and the State.

(e) Arrangements shall be made in advance for obtaining emergency medical assistance and transportation for injured persons. Emergency communications shall be provided to the nearest point of assistance. Selected agents of the operator shall be trained in first aid and first aid training shall be made available to all miners. Each mine shall have an adequate supply of first aid equipment located on the surface, at the bottom of shafts and slopes, and at other strategic locations near the working faces.

(f) Every operator of a coal mine shall cooperate in a program, approved by the Director, for training and retraining of qualified and certified persons needed to carry out functions prescribed in this title.

(g) Every operator of a coal mine shall cooperate in the indoctrination of new miners in safety rules and safe work practices.

ROOF SUPPORT

SEC. 303. The roof and ribs of all active underground roadways, travelways, and working places shall be supported or otherwise controlled adequately to protect persons against falls of the roof or ribs. A roof-control plan and revisions thereof suitable to the roof conditions and mining system of each mine, and approved by the Secretary, shall be adopted and set out in printed form within a reasonable period to be established after the operative date of this title by the Secretary by regulation. The plan shall show the type and spacing of supports approved by the Secretary. No person shall proceed beyond the last permanent support unless adequate temporary support is provided or unless such temporary support is not required under the approved roof-control plan. A copy of the plan shall be furnished the Secretary or his authorized representative upon request.

VENTILATION

SEC. 304. (a) (1) All mines shall be ventilated by means of main fans installed as follows:

(A) on the surface;

(B) in fireproof housing;

(C) offset not less than fifteen feet from the nearest side of the mine opening: *Provided, however,* That this does not apply to present fans that are offset any distance from the mine opening if they otherwise comply with this subsection and were installed prior to the effective date of this title;

(D) equipped with fireproof air ducts and ample means of pressure relief; and

(E) in lieu of requirements for the location of the fan and the pressure-relief facilities, the fan may be directly in front of, or over, the mine opening: *Provided, however,* That the opening is not in direct line with possible forces coming out of the mine if an explosion occurs: *And provided further,* That there is another opening having a weak wall stopping or explosion doors that would be in direct line with the forces coming out of the mine if an explosion occurs, such opening to be not less than fifteen feet nor more than one hundred feet from the fan opening.

(2) Main-mine fans shall be installed to permit the reversal of air flow and, unless the fan is attended constantly, shall be provided with an automatic device to give alarm when the fan slows down or stops This device shall be placed so that it will be seen or heard by a responsible person.

(3) At gassy mines, main fans shall be on separate power circuits, independent of any mine circuit.

(4) The area surrounding main-fan installations shall be kept free of combustible material for at least one hundred feet in all directions, where physical conditions permit.

(5) The fan shall be inspected daily and a record kept

of the inspection, which shall be open for reading by interested persons.

(6) Main fans shall be operated continuously, except when the mine is shut down with all men out of the mine. In such event, after the fan has been started and has been operated for a minimum of two hours, the mine shall be examined for gas and other hazards and made safe before men, other than the examiners, are permitted in the mine.

(7) Where electric power is available, main-mine fans shall not be powered by means of internal-combustion engines. Where electricity is not available, internal-combustion engines may be used. Internal-combustion engines may also be used for "standby" power to drive fans. Where internal-combustion engines are used, as provided, they shall not be set in the current of air caused by the fan operation, and the exhaust discharge shall be located so as to preclude the possibility of exhaust gases entering the mine. Such engines shall be in a fireproof structure.

(8) Main fans at gassy mines shall be provided with pressure-recording gages.

(b) All active underground working places shall be ventilated by a current of air containing not less than 19.5 volume per centum of oxygen, not more than 0.5 volume per centum of carbon dioxide, and no harmful quantities of other noxious or poisonous gases; and the volume and velocity of the current of air shall be sufficient to dilute, so as to render harmless, and to carry away, flammable or harmful gases and smoke and fumes. In bituminous coal and lignite mines, the minimum quantity of air reaching the last open crosscut in any pair or set of developing entries and the last open crosscut in any pair or set of rooms shall be six thousand cubic feet a minute, and the minimum quantity of air reaching the intake end of a pillar line shall be six thousand cubic feet a minute. In anthracite mines, the minimum quantity of air reaching the face of each working place shall be two hundred cubic feet a minute for each man working in the place. In robbing areas of anthracite mines, where the air currents cannot be controlled and measurements of the air cannot be obtained, the air shall have perceptible movement.

(c) (1) Substantially constructed line brattice or other suitable devices shall be used from the last open crosscut of an entry or room when necessary to provide adequate ventilation for the workmen and to remove gases and explosives fumes. When damaged by falls or otherwise, they shall be repaired promptly.

(2) The space between the line brattice and the rib shall be large enough to permit the flow of a sufficient volume of

air to keep the working face clear of flammable and noxious gases.

(3) Brattice cloth used underground shall be of flame-resistant material.

(d) Within three hours immediately preceding the beginning of a coal-producing shift, and before any workmen in such shift enter the underground areas of the mine, certified persons designated by the operator of the mine shall examine a definite underground area of the mine. Each such examiner shall examine every active underground working place in that area and shall make tests in each such working place for accumulations of methane and for oxygen deficiency with a permissible flame safety lamp or other means approved by the Secretary; examine seals and doors to determine whether they are functioning properly; examine and test the roof, face, and rib conditions in the active underground working places and on active roadways and travelways; examine active roadways, travelways, and all belt conveyors on which coal is carried, approaches to abandoned workings, and accessible falls in active sections for hazards; examine by means of an anemometer or other device approved by the Secretary to determine whether the air in each split is traveling in its proper course and in normal volume; and examine for such other hazards as an authorized representative of the Secretary may from time to time require. Such mine examiner shall place his initials and the date at or near the face of each working place he examines. If such mine examiner finds a condition which constitutes a violation of a mandatory standard or any condition which is hazardous to persons who may enter or be in such area, he shall indicate such hazardous place by posting a "DANGER" sign conspicuously at all points which persons entering such hazardous place would be required to pass, and shall notify the operator of the mine. No person, other than an authorized representative of the Secretary or State mine inspectors or persons authorized by the mine operator to enter such place for the purpose of eliminating the dangerous condition therein, shall enter such place while such sign is so posted. Upon completing his examination, such mine examiner shall report the results of his examination to a person, designated by the mine operator to receive such reports at a designated station on the surface of the mine or underground, before other persons enter the underground areas of such mine to work in such coal-producing shift. Each such mine examiner shall also record the results of his examination with ink or indelible pencil in a book kept for such purpose at a place on the surface of the mine designated by the mine operator. No person (other than a certified person designated under this subsection) shall enter any underground area, except during a coal-producing shift, unless an examination of such area as prescribed in this subsection has been made within eight hours immediately preceding his entrance into such area.

(e) At least once during each coal-producing shift, or more often if necessary for safety, the active underground working places shall be examined for hazardous conditions by certified persons designated by the mine operator to do so. Such examination shall include tests with a permissible flame safety lamp for methane and oxygen deficiency. Belt conveyors on which coal is carried shall be examined for hazardous conditions by qualified persons once each operating day.

(f) Examinations for hazardous conditions, including tests for methane, with a permissible flame safety lamp, a permissible methane detector, or by chemical analysis, shall be made at least once each week, by the mine foreman or other properly certified person designated by him in the return of each split of air where it enters the main return, on pillar falls, at seals, in the main return, at least one entry of each intake and return airway in its entirety, idle workings, and insofar as conditions permit, abandoned workings. Such weekly examinations need not be made during any week in which the mine is idle for the entire week, except with respect to the week immediately prior to reopening of a mine which has been closed or idle for a period in excess of one week. The person making such examinations and tests shall place his initials and the date at the places examined, and if hazardous conditions are found, such conditions shall be reported promptly. A record of these examinations and tests shall be kept at the mine.

(g) At least once each week, a certified or qualified person shall measure the volume of air entering the main intakes and leaving the main returns, the volume passing through the last open crosscut in each active entry, the volume being delivered to the intake end of each pillar line, and the volume at the intake and return of each split of air. A record of such measurements shall be kept in a book on the surface, and the record shall be open for inspection by interested persons.

(h) (1) Examinations for methane shall be made—

(A) before electrically powered or equipped face equipment is taken in by the open breakthrough nearest the face;

(B) before applying power to such machinery at or near the face;

(C) at regular intervals, not to exceed twenty minutes, while such machinery is in operation; and

(D) at such other times as may be necessary, or as designated by the mine operator or duly authorized representative of the Director, to avoid gas accumulations under the operating conditions of a particular mine or portion thereof.

Such examinations shall be made in the particular working place in which such equipment is to be operated or into which it is to be moved. Where such equipment is initially away from the face at the start of a shift such examination shall also be made at the initial location of the equipment before power is applied. The examination shall be conducted by a qualified person using a permissible flame safety lamp.

(2) If the air at an underground face working, when tested at a point not less than twelve inches from the roof, face, or rib, contains more than 1.0 volume per centum of methane, as determined by a permissible methane detector, a permissible flame safety lamp, air analysis, or other recognized means of accurately detecting such gas, changes or adjustments shall be made at once in the ventilation in such mine so that such air shall not contain more than 1.0 volume per centum of methane. While such ventilation improvement is underway and until it has been achieved, power to face equipment located in such place shall be cut off, no other work shall be permitted in such place, and due precautions will be carried out under the direction of the mine foreman

or assistant mine foreman so as not to endanger other work places.

(i) If a split of air returning from active underground working places in a mine contains more than 1.5 volume per centum of methane, as determined by a permissible flame safety lamp, a permissible methane detector, air analysis, or other recognized means of accurately detecting such gas, changes or adjustments shall be made at once in the ventilation in such mine so that such returning air shall not contain more than 1.0 volume per centum of methane.

(j) If a split of air returning from active underground working places contains 1.0 volume per centum of methane, as determined by a permissible flame safety lamp, a permissible methane detector, air analysis or other recognized means of accurately detecting such gas, all persons shall be withdrawn from the portion of the mine endangered thereby, and all electric power shall be cut off from such portion of the mine, until the air in such split is less than 1.0 volume per centum of methane. In virgin territory, in mines ventilated by exhaust fans, if the quantity of air in a split ventilating the working in such territory equals or exceeds twice the minimum volume of air prescribed in subsection (b) of this section and if only permissible electric equipment is used in such workings and the air in the split returning from such workings does not pass over trolley or other bare electric power wires, and if a certified person designated by the mine operator is continually testing the methane content of the air in such split during mining operations in such workings, it shall be necessary to withdraw all persons and cut off all electric power from the portion of the mine endangered by methane only when the air returning from such workings contains more than 2.0 volume per centum, as determined by a permissible flame safety lamp, permissible methane detector, air analysis or other recognized means of accurately detecting such gas.

(k) Air which has passed by an opening of any unsealed, abandoned area shall not be used to ventilate any active face area in the mine if such air contains 0.20 volume per centum or more of methane. Examinations of such air shall be made during the preshift examination required by subsection (d) of this section. In making such tests, a qualified person designated by the operator of the mine shall use means approved by the Secretary for detecting methane. For the purposes of this subsection, an area within a panel shall not be deemed to be abandoned until such panel is abandoned.

(l) Air that has passed through an abandoned panel or area which is inaccessible for inspection shall not be used to ventilate any active face workings in such mine. No air which has been used to ventilate an area from which the pillars have been removed shall be used to ventilate any active face workings in such mine, except that such air may be used to ventilate enough advancing working places or rooms immediately adjacent to the line of retreat to maintain an orderly sequence of pillar recovery on a set of entries.

(m) Where there are methane emission rates and inability during machine operation to safely conduct tests with a permissible methane detector, a permissible flame safety lamp, air analysis or other recognized means of accurately detecting such gas to justify such action, the Director may require the use of an approved fieldworthy methane monitor on a continuous mining machine, or a cutting machine or on a long wall face. Where methane monitors are being used on electrical face machinery and in other cases where the operator of the mine has voluntarily installed such methane monitor on such equipment, the monitor alarm shall be set for actuation at not more than 1.0 percent methane, and the power cutoff at the machine at no more than 2.0 percent methane.

(n) Idle and abandoned areas shall be inspected for methane and for oxygen deficiency and other dangerous conditions by a certified person as soon as possible, but not more than four hours before other employees are permitted to enter or work in such area. However, persons, such as pumpmen, who are required regularly to enter such areas in the performance of their duties, and who are qualified in the use of a permissible flame safety lamp, and are so equipped, are authorized to and shall make such inspections for themselves.

(o) Immediately before an intentional roof fall is made, pillar workings shall be examined by a person designated by the operator who is qualified in the use of a permissible flame safety lamp. If in such examination methane can be detected with a permissible flame safety lamp, such roof fall shall not be made until such methane is removed.

(p) Within twelve months after the operative date of this title, and thereafter, all workings which are abandoned shall be sealed or ventilated. If such workings are sealed, the sealing shall be done in a substantial manner with incombustible material. One or more of the seals of every sealed area shall be fitted with a pipe and cap or valve to permit the sampling of gases and the measuring of hydrostatic pressure behind such seals. If such workings are ventilated, this shall be done by bleeder entries or bleeder systems or by some other equally effective means. For the purposes of this subsection, workings within a panel shall not be deemed to be abandoned until such panel is abandoned.

(q) (1) Each mechanized mining section developed after the effective date of this Act shall be ventilated with a separate split of intake air directed by overcasts, undercasts or the equivalent. In situations wherein this provision cannot be complied with promptly because substantial and major changes in the mine ventilating system are required, reasonable time shall be granted to effectuate compliance.

(2) Crosscuts shall be made between entries and between rooms at intervals in accordance with applicable State laws: *Provided, however,* That in no case shall the distance between crosscuts exceed one hundred and five feet, except as the Director, or the Board on appeal from a ruling of the Director, approves a greater distance which maintains adequate ventilation and provides greater protection against hazards arising under particular mining conditions in a particular mine.

(r) Immediately before firing each shot or group of multiple shots, and after blasting is completed, examinations for methane shall be made with a permissible flame safety lamp by a person qualified in the use of such lamp. If methane is so detected the ventilation shall be improved in accordance with subsection (h) of this section.

(s) When the main fan fails or stops at a gassy mine, immediate action shall be taken to cut off the power in the mine and withdraw the men from the face regions of the mine. Each operator shall adopt a written plan and procedure that would accomplish the foregoing in such timely manner that electrical sources of ignition are removed before there is any likelihood of gas accumulation in the face areas. If ventilation is restored within thirty minutes, the face regions and other places where methane is likely to accumulate shall be reexamined by a certified person, and, if found free of explosive gas, the mine foreman may order power restored and work resumed. If ventilation is not restored within thirty minutes or if, before thirty minutes have elapsed, it becomes clearly evident that ventilation cannot be restored within said thirty minute period, the mine foreman shall order all underground employees out of the mine.

(t) When the main fan stops at a mine classified as nongassy, immediate action shall be taken to cut off the power in the mine and withdraw the men from the face regions of the mine. Each operator shall adopt a written plan and procedure that would accomplish the foregoing in such timely manner that electrical sources of ignition are removed before there is any likelihood of gas accumulation in the face areas. If ventilation is restored within sixty minutes, the face regions and other places where methane is likely to accumulate shall be reexamined by a certified person, and if found free of explosive gas, the mine foreman may order power restored and work resumed. If ventilation is not restored within sixty minutes or if, before sixty minutes have elapsed, it becomes clearly evident that ventilation cannot be restored within sixty-minute period, the mine foreman shall order all underground employees out of the mine.

(u) In mines employing a multiple-fan system, the operator shall adopt a plan of mine deenergizing and employees withdrawal which shall be appropriate under the peculiar circumstances of each mine in the event of a single fan stoppage and which shall afford to employees protection equal to the protection afforded employees under subparagraph (s) if the mine is gassy, and of subparagraph (t) if the mine is nongassy.

(v) A copy of the plan required in (s), (t), and (u), above, shall be posted at the mine and a copy shall be filed with the duly authorized representative of the Bureau and the State. The concurrence of each such authorized representative will be deemed to have been given except as he submits written exceptions to the operator within fifteen days of receipt of such copy.

(w) Where warranted by the rate of methane emission, the duly authorized representative of the Director, by written action, may reduce the time limit of thirty minutes specified in paragraph (s) above to not less than fifteen minutes.

(x) Changes in ventilation which materially affect the main air current or any split thereof and which may affect the safety of persons in the coal mine shall be made only when the mine is idle. Only those persons engaged in making such changes shall be permitted in the mine during the change. Power shall be removed from the areas affected by the change before work starts to make the change and shall not be restored until the effect of the change has been ascertained and the affected areas are determined to be safe by a certified person.

(y) The mine foreman shall read and countersign promptly the daily reports of the preshift examiner and assistant mine foreman, and he shall read and countersign promptly the weekly report covering the examinations for hazardous conditions. Where such reports disclose hazardous conditions, the mine foreman shall take prompt action to have such conditions corrected. The mine superintendent or assistant superintendent of the mine shall also read and countersign the daily and weekly reports of such persons.

(z) Each day, the mine foreman and each assistant mine foreman shall enter plainly and sign with ink or indelible pencil in a book provided for that purpose a report of the condition of the mine or portion thereof under his supervision, which report shall state clearly the location and nature of any hazardous condition observed by them or reported to them during the date and what action, if any, was taken to remedy such condition.

COMBUSTIBLE MATERIALS AND ROCK DUSTING

SEC. 305. (a) Coal dust, including float coal dust deposited on rock-dusted surfaces, loose coal, and other combustible materials, shall not be permitted to accumulate in dangerous quantities in active underground workings of a mine or on electrical equipment therein.

(b) Where underground mining operations create and/or raise an excessive amount of dust into the air, water, or water with a wetting agent added to it, or other effective method shall be used to reduce such dust to safe limits.

(c) All underground mines, except as provided in subsection (d) of this section and except those mines or areas of mines in which the dust is too wet or too high in incombustible content to propagate an explosion, shall be rock dusted within forty feet of all faces, and, if open crosscuts near such faces are less than forty feet therefrom, such crosscuts shall be rock dusted.

(d) In mines partially rock dusted or in mines that are required to start rock dusting, haulageways and parallel entries connected thereto by open crosscuts shall be rock dusted.

(e) In all underground mines, back entries shall be rock dusted for at least one thousand feet outby the junction with the first active entry. Inby this junction, the rooms, entries, and crosscuts shall be rock dusted.

(f) Where rock dust is required to be applied, it shall be distributed upon the top, floor, and sides of all open places and maintained in such quantity that the incombustible content of the combined coal dust, rock dust, and absorbed water shall be not less than 65 per centum. Where methane is present in any ventilating current, the 65 per centum of incombustible content of such combined water and dusts shall be increased 1 per centum for each 0.1 per centum of methane.

(g) Subsections (b) through (f) of this section shall not apply to underground anthracite mines subject to this Act.

ELECTRICAL EQUIPMENT—GENERALLY

SEC. 306. (a) The location and the electrical rating of all stationary electrical apparatus in connection with the mine electrical system, including permanent cables, switchgear, rectifying substations, transformers, permanent pumps, and trolley wires and trolley feeders, and settings of all direct-current circuit breakers protecting underground trolley circuits, shall be shown on a mine map. Any changes made in a location, electrical rating, or setting shall be shown on the map when the change is made. Such maps shall be fully corrected as often as may be necessary to keep them current.

(b) All power circuits and electrical equipment shall be deenergized before work is done on such circuits and equipment, except when necessary for trouble shooting or testing.

A person may repair energized trolley wires if he wears insulated shoes and suitable gloves. No work shall be performed on high-voltage circuits or equipment except by or under the direct supervision of a competent person. Disconnecting devices shall be locked out or suitably tagged by the persons who are to do the work. Locks shall be removed only by authorized persons.

(c) Electrical equipment shall be frequently examined by a competent person to assure safe operating conditions. When a potentially dangerous condition is found on electrical equipment, such equipment shall be removed from service until such condition is corrected.

(d) All electrical conductors shall be sufficient in size and have adequate current-carrying capacity and be of such construction that the rise in temperature resulting from normal operation will not damage the insulating materials.

(e) All connections or splices in conductors shall be mechanically and electrically efficient and suitable connectors shall be used. All connections or splices in insulated wire shall be reinsulated at least to the same degrees as the remainder of the wire.

(f) Cables shall enter metal frames of motors, splice boxes and electrical compartments only through proper fittings. When insulated wires, other than cables, pass through metal frames the holes shall be substantially bushed with insulated bushings.

(g) All power wires (except trailing cables, specially designed cables conducting high-voltage power to underground rectifying equipment or transformers, or bare or insulated ground and return wires) shall be supported on well-installed insulators and shall not contact combustible material, roof, or ribs.

(h) Except for trolley wires and their feeders, power wires and cables installed in haulage sloped shall be insulated adequately and suitably protected against mechanical injury. Power wires shall be insulated adequately or suitably guarded where they pass through doors and stoppings, and where they cross other power wires and cables.

(i) Automatic circuit-breaking devices or fuses of the correct type and capacity shall be installed so as to protect all electric equipment and circuits against short circuit and overloads, except on locomotives. Three-phase motors shall be protected against overload and single phase operation. For this purpose adequate protection is considered to be overload devices installed in two of the three phases.

(j) In all main power circuits disconnecting switches shall be installed underground within five hundred feet of the bottoms of shafts and boreholes through which main power circuits enter the underground portion of the mine and at all other places where main power circuits enter the underground portion of the mine.

(k) All electric equipment shall be provided with switches or other controls that are safely designed, constructed, and installed.

(l) One year after the operative date of this section—

(1) all electric face equipment used in a gassy coal mine shall be permissible and shall be maintained in a permissible condition, except that the Secretary may permit, under such conditions as he may prescribe, nonpermissible or open-type electric face equipment in use in such mine on the operative date of this title to continue in use for such period as he deems appropriate after taking into consideration the availability of replacement equipment: *Provided, however*, That explosion-tested cable-reel locomotives and shuttle cars, purchased before permissible cable-reel locomotives and shuttle cars became available, may be used in a gassy mine on condition that they are maintained in explosion-proof condition.

(2) In a gassy mine, only permissible junction or distribution boxes shall be used for making multiple-power connections inby the last open crosscut or in any other place where dangerous quantities of methane may

be present or may enter the air current, except that the Secretary may permit, under such conditions as he may prescribe, nonpermissible junction or distribution boxes in use, on the operative date of this title, inby the last open crosscut or in any other place where dangerous quantities of methane may be present or may enter the air current, to continue in use for such period as he deems appropriate, after taking into consideration the availability of permissible junction or distribution boxes and the time required to install such boxes; and

(3) a copy of any permit granted under this subsection shall be mailed immediately to a duly designated representative of the employees of the mine to which it pertains, and to the public official or agency of the State charged with administering State laws relating to coal mine health and safety in such mine.

(m) Any coal mine which, prior to the operative date of this title, was classed gassy and was required to use permissible electric face equipment and to maintain such equipment in a permissible condition shall continue to use such equipment and to maintain such equipment in such condition.

(n) All nonpermissible power-connection points outby the last open crosscut shall be in intake air.

TRAILING CABLES

SEC. 307. (a) Trailing cables used underground shall meet the requirements established by the Director for flame-resistant cables.

(b) Short-circuit protection for trailing cables shall be provided by an automatic circuit breaker or fuse of adequate current interrupting capacity in each ungrounded conductor. Disconnecting devices used to disconnect power from trailing cables shall be plainly marked and identified and such devices shall be equipped or designed in such a manner that it can be determined by visual observation that the power is disconnected.

(c) When two or more trailing cables junction to the same distribution center, means shall be provided to assure against the possibility of connecting a trailing cable to the wrong size breaker.

(d) No more than five temporary splices shall be made in any trailing cable. A temporary splice in a trailing cable within twenty-five feet of the terminal end of the cable attached to the machine (other than a splice attaching the cable to the machine) shall be eliminated. Temporary splices in trailing cables shall be made in a workmanlike manner and shall be mechanically strong and well insulated. Trailing cables or hand cables which have exposed wires or which have splices that heat or spark under load shall not be used.

Jacket repairs not involving conductors or conductor insulation are not considered to be temporary splices.

(e) When permanent splices in trailing cables are made, they shall be—

(1) mechanically strong with adequate electrical conductivity and flexibility;

(2) effectively insulated and sealed so as to exclude moisture; and

(3) vulcanized or otherwise treated with suitable materials to provide flame-resistant qualities and good bonding to the outer jacket.

(f) Trailing cables shall be clamped to machines in a manner to protect the cables from damage and to prevent strain on the electrical connections. Trailing cables shall be adequately protected to prevent damage by mobile machinery.

(g) Trailing cable and power cable connections to junction boxes shall not be made or broken under load.

GROUNDING

SEC. 308. (a) All metallic sheaths, armors, and conduits enclosing power conductors shall be electrically continuous throughout and shall be grounded. Metallic frames, casing, and other enclosures of electric equipment that can become "alive" through failure of insulation or by contact with energized parts shall be effectively grounded.

(b) The frames of all offtrack machines and the enclosures of related detached components shall be maintained at safe voltages by methods approved by an authorized representative of the Director.

(c) The frames of all underground high-voltage switchgear, transformers, and other high-voltage equipment shall be grounded to the high-voltage system ground.

(d) High-voltage circuits on the surface shall be deenergized and grounded before work is performed on them. Underground high-voltage circuits shall be deenergized and visibly disconnected before such work is performed on them.

(e) On idle days and idle shifts, power circuits underground shall be deenergized except to the extent that power is needed to maintain equipment to prevent water accumulation.

UNDERGROUND HIGH-VOLTAGE DISTRIBUTION

SEC. 309. (a) High-voltage circuits extending underground shall be protected by suitable circuit breakers of adequate interrupting capacity. Such breakers shall be controlled by relays protecting against overcurrent and ground fault.

(b) High-voltage circuits extending underground and supplying portable or mobile high-voltage equipment contain either a direct or derived neutral which shall be grounded through a suitable resistor at the source transformers, and a grounding circuit, originating at the grounded side of the grounding resistor, shall extend along with the power conductors and serve as a grounding conductor for the frames of all high-voltage equipment supplied power from that circuit. Underground high-voltage circuits may be extended underground to feed stationary electrical equipment if either metallic, armored, or installed in grounded rigid metallic conduit, or buried one foot below combustible material throughout their length. Within five hundred feet of the point where high-voltage circuits enter the underground portion of the mine, disconnecting devices shall be installed and so equipped or designed that it can be determined by visual observation that the power is disconnected.

(c) The grounding resistor, where required, shall be of such ohmic value to limit the voltage drop in the grounding circuit external to the resistor to not more than one hundred volts under ground fault conditions. The grounding resistor shall be rated for maximum fault current continuously and insulated from ground by a voltage equal to the phase-to-phase voltage of the system.

(d) High-voltage systems installed underground in mines developed after the operative date of this title shall include an approved ground check circuit to monitor continuously the grounding circuit to assure continuity and the approved ground check circuit shall cause the circuit breaker to open when either the ground or pilot check wire is broken. "Approved", as used in this subsection means approved by an authorized representative of the Secretary.

(e) Underground high-voltage cables purchased after the effective date of this title for supplying portable or mobile high-voltage equipment shall contain metallic shields around each power conductor. One or more ground conductors shall be provided having a total cross-sectional area of not less than one-half the power conductor. There shall also be provided an insulated conductor not smaller than number 10 (AWG) for the ground continuity check circuit. High-voltage cables, either constructed with metallic armor, installed in grounded metallic conduit, or buried throughout their length, and which feed stationary electrical equipment from underground systems as described in subsection (b) above, need not meet this requirement.

(f) If couplers are used they shall be of the three-phase type with a full metallic shell, and shall be adequate for the voltage and current expected. All exposed metal on the couplers shall be grounded to the ground conductor in the cable. The coupler shall be constructed so that the ground continuity conductor shall be broken first and the ground conductors shall be broken last when the coupler is being uncoupled.

(g) Single-phase loads such as transformer primaries shall be connected phase to phase.

(h) Each ungrounded, exposed power conductor that leads underground shall be equipped with lightning arresters of approved type within one hundred feet of the point where the circuit enters the mine. Lightning arresters shall be connected to a low-resistance grounding medium on the surface which shall be separated from the system safety equipment ground beds by a distance of not less than twenty-five feet.

(i) All underground high-voltage transmission cables shall be installed only in regularly inspected airways or haulageways, and in a manner that affords protection from physical damage and to personnel.

(j) Disconnecting devices shall be installed at the beginning of branch lines in high-voltage circuits and equipped or designed in such a manner that it can be determined by visual observation that the circuit is deenergized when the switches are open. Properly designed cable couplers are visible disconnect devices.

(k) Circuit breakers and disconnecting switches underground shall be marked for identification.

(l) Terminations and splices of high-voltage cable shall be made in accordance with manufacturer's recommendations.

(m) Frames, supporting structures, and enclosures of portable underground substation or switching station apparatus shall be effectively grounded to the system ground.

(n) Except where other sources of power are not available and except where adequate safeguards are taken, power centers and portable transformers shall be deenergized before they are moved from one location to another. High-voltage cables, other than trailing cables, shall not be moved or handled while energized.

UNDERGROUND LOW-VOLTAGE AND MEDIUM-VOLTAGE CIRCUITS

SEC. 310. Low-voltage and medium-voltage power circuits serving three-phase alternating-current portable or mobile electric equipment shall include a neutral circuit, whether direct or derived, which shall be used as part of a grounding system that will maintain the frame of the equipment and the frames of all accessory equipment at ground potential. Three-phase alternating current electric equipment, including its controls and portable or trailing cable, shall be deenergized automatically upon the occurrence of an incipient ground fault. The ground-fault-tripping current shall be limited by a grounding resistor to that current necessary for dependable relaying. The maximum ground-fault-tripping current shall not exceed twenty-five amperes.

TROLLEY AND TROLLEY FEEDER WIRES

SEC. 311. (a) Trolley wires and trolley feeder wires shall be provided with cutout switches at intervals of not more than two thousand feet and near the beginning of all branch lines.

(b) Trolley wires and trolley feeder wires shall be provided with overcurrent protection at each conversion substation.

(c) Trolley and trolley feeder wires, high-voltage cables and transformers shall not be located beyond the last open crosscut and shall be kept at least one hundred and fifty feet from pillar workings.

FIRE PROTECTION

SEC. 312. (a) Any electrical face equipment purchased after the effective date of this title shall be permissible before it is introduced underground.

(b) Each coal mine shall be provided with—

(1) suitable firefighting equipment adequate for the size of the mine;

(2) adequate water available to the faces for firefighting purposes;

(3) suitable fire control systems on or available to machinery and equipment;

(4) suitable, approved fire resistant hydraulic

fluid or fire suppression device on unattended, stationary underground equipment situated away from the face; and

(5) deluge-type water or foam sprays, automatically actuated by rise in temperature, or other effective means of controlling fire installed at main and secondary belt-conveyor drives, such sprays to be supplied with sufficient quantity of water or foam to control fires.

The authorized representative of the Director will develop a schedule of implementation at each mine to permit reasonable time of effectuate changes required to achieve compliance under this subsection.

(c) Underground storage places for lubricating oil and grease in excess of two days' supply shall be of fireproof construction. Lubricating oil and grease kept in face regions or other underground working places in a mine shall be in portable, closed, metal containers.

(d) Underground transformer stations, battery-charging stations, substations, compressor stations, shops, and permanent pumps shall be housed in fireproof containers, structures, or areas. Equipment shall be considered as complying with the requirements of this subsection if it is so constructed or encased so as to be protected against fire hazard. Air currents used to ventilate structures or areas enclosing permanent electrical installations shall be coursed directly into the return.

(e) Welding, cutting, or soldering with arc or flame in other than a fireproof enclosure shall be done under the supervision of a certified person when such work is done in—

(1) the region between the face and a point twenty feet outby the last open crosscut in first mining;

(2) the region between the pillar line and a point one hundred and fifty feet outby; or

(3) the region between the face and gob in longwall mining.

Such person shall make a diligent search for fire during and after such operations and shall test immediately for methane with a permissible flame safety lamp before and during such operations at a minimum of hourly intervals. Welding, cutting, or soldering shall not be conducted in air that contains more than 1 volume per centum of methane. Rock dust or suitable fire extinguishers shall be immediately available during such welding, cutting, or soldering.

(f) Beginning one year after the operative date of this title, unless fire suppression devices meeting specifications prescribed by the Secretary are used on underground equipment, only fire-resistant hydraulic fluids approved by the Secretary shall be used in the hydraulic system of such equipment.

(g) Deluge-type water or foam sprays, automatically actuated by rise in temperature, or other effective means of controlling fire, shall be installed at main and secondary belt-conveyor drives. Such sprays shall be supplied with a sufficient quantity of water or foam to control fires.

(h) Underground belt conveyors shall be properly equipped with slippage and sequence switches to stop automatically the appropriate driving motor or motors in the event a belt is stopped or impeded by slipping on the driving pulley, by breakage, or by other causes.

(i) After every blasting operation performed on shift, an examination shall be made to determine whether fires have been started.

BLASTING AND EXPLOSIVES

SEC. 313. (a) Black blasting powder shall not be stored or used underground. Mudcaps (adobes) or other unconfined shots shall not be fired underground, except that in underground anthracite mines mudcaps or other open, unconfined shots may be fired, if restricted to battery starting when no methane or fire hazard is present, and if it is otherwise impracticable to start the battery, and in such anthracite mines, open, unconfined "shake" shots in working places and other places in pitching veins may be fired, when no methane or fire hazard is present, if the taking down of loose hanging coal by other means is too hazardous for men working in such places. Only permissible explosives or permissible breaking devices shall be used underground in a mine, and these shall be used in a permissible manner when blasting coal, except as otherwise provided in this section: *Provided*, That this shall not apply to shaft and slope-sinking operations in rock if all persons are removed therefrom when blasting is done: *And provided further*, That when the use of a permissible shot-firing unit is not feasible, the Director or the Board, upon appeal from a ruling by the Director, is empowered to waive such requirement. Only incombustible materials shall be used for stemming boreholes. This section shall not prohibit the use of compressed air blasting.

(b) Explosives or detonators carried anywhere underground by any person shall be in containers constructed of nonconductive material, maintained in good condition, and kept closed.

(c) Explosives or detonators may be transported (1) in special closed containers in cars moved by means of a locomotive, rope, or belt, or in shuttle cars, or (2) in equipment designed especially to transport such explosives or detonators.

(d) When supplies of explosives and detonators for use in one or more sections are stored underground, they shall be kept in section boxes or magazines of substantial construction with no metal exposed on the inside, located at least twenty-five feet from roadways and power wires, and in a reasonably dry, well rock-dusted location protected from falls of roof, except in pitching beds, where it is not possible to comply with the location requirement, such boxes shall be placed in niches cut into the solid coal or rock.

(e) Explosives and detonators stored near the working faces shall be kept in separate closed containers, which shall be located out of the line of blast and not less than fifty feet from the face and fifteen feet from any pipeline, powerline, rail, or conveyor; except that if kept in niches in the rib, the distance from any pipeline, powerline, rail, or conveyor shall be at least five feet. Such explosives and detonators, when stored, shall be separated by a distance of at least five feet.

(f) Explosives and detonators shall be kept in separate containers until immediately before use at the working faces.

HOISTING, HAULAGE AND MANTRIPS

SEC. 314. (a) Every hoist used to transport persons at an underground coal mine shall be equipped with overspeed, overwind, and automatic stop controls. Every hoist used to transport persons shall be equipped with brakes capable of stopping the fully loaded platform, cage, or other device used for transporting persons, and with hoisting cable adequately strong to sustain the fully loaded platform, cage, or other device for transporting persons, and have a proper margin of safety. Cages, platforms, or other devices which are used to transport persons in vertical shafts shall be equipped with safety catches that act quickly and effectively in an emergency, and the safety catches shall be tested at least once every two months. Hoisting equipment, including automatic elevators, that is used to transport persons shall be examined daily. Where persons are regularly transported into or out of a coal mine by hoists, a qualified hoisting engineer shall be available for ready response to signals while any person is underground, except that no such engineer shall be required for automatically operated cages, platforms, or elevators.

(b) The following safeguard, adequate to minimize hazards with respect to transportation of men and materials, shall be provided:

(1) The roadbed, rails, joints, switches, frogs, and other elements of the track of all haulage roads shall be constructed, installed, and maintained in a manner consistent with speed and type of haulage operations being conducted to insure safe operation.

(2) All track switches, except room and entry-development switches, shall be provided with properly installed throws and, where necessary, equipped with guardrails. Room and entry-development switches shall be provided with properly installed latches and bridle bars.

(3) At least twenty-four inches of clearance shall be

provided at switch throws for a distance of not less than ten feet on each side of such throws.

(4) Rails shall be secured at all joints by means of plates or weld.

(5) On haulage roads where trolley lines are used, the clearance for traveling shall be on the side opposite the trolley lines, except where such lines are six and one-half feet or more above the rail.

(6) Breakthroughs adjacent to the clearance side of rail haulage roads which are designated travelways shall be maintained in a safe condition for use as shelter holes. Where such breakthroughs are separated by distances of more than one hundred and five feet, the authorized representative of the Secretary may require intermediate shelter holes of adequate dimensions to be made and maintained. Shelter holes of adequate dimensions shall be provided at manually operated doors and at switch throws, except where more than six feet clearance is maintained and at room switches.

(7) Where it is necessary for men to cross conveyors regularly, suitable crossing facilities shall be provided.

(8) Locomotives, mine cars, shuttle cars, supply cars, conveyors, and all other haulage equipment shall be maintained in a safe operating condition.

(9) An approved reflector or trip light shall be used on the last car of a trip of mine cars being moved under-

ground, except on cars being shifted to and from loading machines, or cars being handled at loading heads during gathering operations, or on trips pulled by animals.

(10) Pushing of cars on main haulage roads shall be prohibited, except where necessary to push cars from sidetracks located near the working section to the producing entries and rooms, where necessary to clear switches and sidetracks, and on the approach to cages, slopes, and surface inclines.

(11) Backpoling shall be prohibited except at places where the trolley pole cannot be reversed or when going up extremely steep grades, and then only at very slow speed.

(12) No person shall get on or off moving locomotives or cars being moved by locomotives: *Provided, however*, That the brakeman may get on or off the rear end of a slowly moving trip or the rear stirrup of a slowly moving locomotive to throw a switch, aline a derail, or to open or close a door.

(13) All trips and locomotives shall come to a complete stop before cars are coupled or uncoupled by hand unless a coupling hook is used.

(14) Material being transported shall be so loaded and protected that there is no danger to the motorman or brakeman from sliding of equipment and material.

(15) Where block signals are used, not more than one locomotive, except pushers, shall operate in any signal block at the same time, unless by special authority.

(16) Mantrips operated by means of locomotives shall be pulled and at safe speeds consistent with the condition of roads and type of equipment used, and shall be so controlled that they can be stopped within the limits of visibility.

(17) Each mantrip shall be under the charge of a certified official or other competent person designated by a certified official, and it shall be operated independently of any loaded trip of coal or other material.

(18) Mantrip passengers shall not ride under unguarded trolley wire unless suitably covered man-cars are used.

(19) Men shall not board or leave moving mantrip cars; they shall remain seated while in moving cars, and shall proceed in an orderly manner to and from mantrips.

(20) When belts are used for transporting men, an exmination shall be made by a qualified person prior to such use who shall check to see that the area of such belts upon which men are riding shall be free of loose coal or rock, and a minimum clearance of eighteen inches shall be maintained between the belt and the roof or crossbars, projecting equipment, cap pieces, overhead cables, wiring, and other objects; but where the height of the coalbed permits, the clearance shall be not less than twenty-four inches. Control switches

shall be provided at all places where men board or leave belts regularly.

(21) The belt speed shall not exceed three hundred feet a minute while men are loading, unloading, and being transported: *Provided, however,* That when belts are used to transport men, they shall be provided with continuous trip cords alongside to permit their being stopped by men on the belt in the event of an emergency.

(22) The space between men riding on a belt line shall be not less than five feet.

(23) Adequate clearance and proper illumination shall be provided where men board or leave conveyor belts.

(24) Drop bottom cars used for transporting men on mantrips shall be provided with adequate devices to prevent accidental opening of the car bottoms.

(c) Hoists shall have rated capacities consistent with the loads handled and the recommended safety factors of the ropes used. An accurate and reliable indicator of the position of the cage, platform, skip, bucket, or cars, in the shaft shall be provided.

(d) There shall be at least two effective, approved methods of signaling between each of the shaft stations and the hoist room, one of which shall be a telephone or speaking tube.

MAPS

SEC. 315. (a) The operator of an active working underground coal mine shall have, in a location chosen to minimize the danger of destruction by fire or other hazard, an accurate and up-to-date map of such mine drawn on a standard scale. Such map shall show the openings or excavations, shafts, slopes, entries, airways, active workings, all worked out and abandoned areas (excluding those areas which have been worked out or abandoned before the operative date of this subsection which cannot be entered safely and on which no information is available), contour elevations, elevations at the bottom of the coal along the haulage entries in each set of main and panel entries at horizontal intervals not exceeding two hundred feet, dip of the coalbed, escapeways, adjacent mine working within one thousand feet, mines above or below, water pools above, and oil and gas wells in such mine. Such map shall be made or certified by a registered engineer or a registered surveyor of the State in which the mine is located. Such map shall be kept up to date by temporary notations, and such map shall be revised and supplemented semiannually on the basis of a survey made or certified by such engineer or surveyor.

(b) The coal mine map and any revision and supplement thereof shall be available for inspection by the Director or his authorized representative, by coal mine inspectors of the State in which the mine is located, by employees working in the mine or their authorized representatives, and by operators of adjacent coal mines. The operator shall furnish to the Secretary or his authorized representative, upon request, one or more copies of such map and any revision and supplement thereof. Any such map or revision or supplement thereof shall be confidential and its contents shall not be divulged to any person other than those mentioned in this subsection without the consent of the operator of the mine covered by such map, except that such map or revision or supplement thereof may be used by the Director to carry out any provision of this Act and in any proceeding, investigation, or hearing conducted pursuant to this Act.

(c) Whenever an operator permanently closes such mine, or temporarily closes such mine for a period of more than ninety days, he shall promptly notify the duly authorized representative of the Director of such closure. Within sixty days of the permanent closure of the mine, or, when the mine is temporarily closed, upon the expiration of a period of ninety days from the date of closure, the operator shall file with the duly authorized representative of the Director a copy of the mine map revised and supplemented to the date of the closure. Such copy of the mine map shall be certified as true and correct by a registered surveyor or registered engineer of the State in which the mine is located and shall be available for public inspection.

ESCAPEWAYS

SEC. 316. (a) Except as provided in subsections (b) and (c), at least two separate and distinct travelable passageways to be designated as escapeways, at least one of which is ventilated with intake air, shall be provided from each mine working section to the surface or to a point where adequate escape facilities are provided to the surface. They shall be maintained in safe condition and properly marked. Mine openings shall be adequately protected to prevent the entrance into the underground portion of the mine of surface fires, fumes, smoke, and floodwater.

(b) Not more than twenty persons shall be allowed at any one time in any mine until a connection has been made between the two mine openings, and such work shall be prosecuted with reasonable diligence.

(c) When only one main opening is available, owing to final mining of pillars, not more than twenty persons shall be allowed in such mine at any one time: *Provided, however*, That the distance between the mine openings and workings shall not exceed five hundred feet.

MISCELLANEOUS

SEC. 317. (a) The operator of each operating mine shall file a report with the duly authorized representative of the

Secretary setting forth the name of the mine, the name of the operator, the location of the mine, and the postal address of the mine office on the following occasions:

(1) within thirty days after the effective date of this title;

(2) before opening a new or abandoned mine, abandoning a mine, discontinuing operation of a mine for a period exceeding two months, initially cutting into any section of an abandoned mine, making a new opening into an operating mine, or abandoning or closing an opening into an operating mine; and

(3) within thirty days of any change in the name of the mine or in the identity of the operator of a mine.

(b) Each operator of a coal mine shall comply with State laws and regulations in establishing and maintaining barriers around oil and gas wells penetrating coalbeds or underground workings of underground coal mines.

(c) Whenever any working place approaches within fifty feet of abandoned workings in the mine as shown by surveys made and certified by a competent engineer or surveyor, or within two hundred feet of any other abandoned workings of the mine which cannot be inspected and which may contain dangerous accumulations of water or gas, or within two hundred feet of any working of an adjacent mine, or a borehole or boreholes shall be dried to a distance of at least twenty feet in advance of the face of such working place and shall be continually maintained to a distance of at least ten feet in advance of the advancing solid face. When there is more than one borehole, they shall be drilled sufficiently close to each other to insure that the advancing face will not accidentally hole through into abandoned working or adjacent mines. Boreholes shall also be drilled not more than eight feet apart in the rib of such working place to a distance of at least twenty feet and at an angle of forty-five degrees. Such rib holes shall be drilled in one or both ribs of such working place as may be necessary for adequate protection of persons working in such place. When the particular mining system and/or machinery being used render the foregoing impractical, the duly authorized representative of the Director may approve alternate means which afford equal or greater protection. Request for such alternate means shall be made by the operator and approvals by the duly authorized representative of the Director shall be in writing.

(d) Persons underground shall use only permissible electric lamps for portable illumination.

(e) After the operative date of this section, all structures erected on the surface within one hundred feet of any mine opening shall be of reasonably fireproof construction. Unless existing structures located within one hundred feet of any mine opening are of such construction, firedoors shall be erected at effective points in mine openings to prevent smoke or fire from surface sources endangering men working underground. These doors shall be tested at least monthly to insure effective operation. A record of such tests shall be kept and shall be available for inspection by interested persons.

(f) Adequate measures shall be taken to prevent methane and coal dust from accumulating in excessive concentrations in or on surface coal-handling facilities. Where coal is dumped at or near air-intake openings, provisions shall be made to prevent the dust from entering the mine in such quantities as to create a dangerous condition.

(g) Adequate measures shall be taken at coal storage bins, recovery tunnels, and coal storage piles to safeguard persons working there from hazaards due to fire, ventilation deficiency, dust inhalation and falling.

(h) Good housekeeping shall be practiced in and around mine buildings and yards. Such practices include cleanliness, orderly storage of materials, and the removal of known sources of injury, such as stumbling hazards, protruding nails, broken glass, and falling and rolling materials. Lights shall be provided as needed in or on surface structures. Paths and walks outside of structures which are required to be used by workmen in the performance of their work shall be kept free from unnecessary obstructions and shall be suitably illuminated when required to be used at night.

DEFINITIONS

SEC. 318. For the purpose of this title and title II of this Act, the term—

(a) "certified person" means a person certified by the State in which the coal mine is located to perform duties prescribed by such titles, except that, in a State where no program of certification is provided, such certification shall be by the Director;

(b) "qualified person" means an individual deemed qualified by the Secretary to make tests or measurements, as appropriate, and deemed to be qualified by the State in which the coal mine is located to make tests or measurements required in the performance of his assigned duties in a coal mine, except that, in a State where no program of qualification is provided, such qualification shall be by the Director.

(c) "permissible" as applied to—

(1) equipment used in the operation of a coal mine, means equipment to which an approval plate, label, or other device is attached as authorized by the Director and which meets specifications which are prescribed by the Director for the construction and maintenance of such equipment and are designed to

assure that such equipment will not cause a mine explosion or a mine fire;

(2) explosives or blasting devices in such mines, means explosives or blasting devices which meet specifications which are prescribed by the Director; and

(3) the manner of use of equipment or explosives and blasting devices, means the manner of use prescribed by the Director.

(d) "rock dust" means pulverized limestone, dolomite, gypsum, anhydrite, shale, talc, adobe, or other inert material, preferably light colored, (1) 100 per centum of which will pass through a sieve having two hundred meshes per linear inch; (2) the particles of which, when wetted and dried, will not cohere to form a cake which will not be dispersed into separate particles by a light blast of air; and (3) which does not contain more than 5 per centum of combustible matter or more than a total of 5 per centum of free and combined silica (SiO_2);

(e) "coal mine" includes areas of adjoining mines connected underground;

(f) "anthracite" means coals with a volatile ratio equal to twelve or less; and

(g) "high-voltage" means more than six hundred and fifty volts.

TITLE IV—ADMINISTRATION

RESEARCH

SEC. 401. The Secretary, in coordination with advisory committees established under section 101 of this Act, and the Secretary of Health, Education, and Welfare, shall conduct such studies, research, experiments, and demonstrations as may be appropriate—

(a) to improve working conditions and practices, prevent accidents, and control the causes of occupational diseases originating in the coal mining industry;

(b) after an accident, to recover persons in a coal mine and to recover the mine;

(c) to develop new or improved means and methods of communication from the surface to the underground portion of the mine;

(d) to develop new or improved means and methods of reducing concentrations of respirable dust in the mine, and methods for measuring such respirable dust; and

(e) for such other purposes as he deems necessary to carry out the purposes of this Act.

TRAINING AND EDUCATION

SEC. 402. The Secretary shall expand programs for the education and training of coal mine operators, agents thereof, and miners in—

(a) the recognition, avoidance, and prevention of accidents or unsafe or unhealthful working conditions in coal mines; and

(b) in the use of flame safety lamps, permissible methane detectors, and other means approved by the Secretary for accurately detecting gases.

AUTHORIZED APPROPRIATIONS

SEC. 403. There is hereby authorized to be appropriated for the fiscal year ending June 30, 1970, and each of the succeeding fiscal years for carrying out the provisions of sections 401 and 402 of this Act the sum of $5,000,000.

ASSISTANCE TO STATES

SEC. 404. (a) The Secretary, in coordination with the Secretary of Labor and the Secretary of Health, Education, and Welfare, is authorized to make grants to any State in which coal mining takes place—

(1) to conduct research and planning studies and to carry out plans designed to improve State workmen's compensation and occupational disease laws and pro-

grams, as they relate to compensation for pneumoconiosis and injuries in coal mine employment; and

(2) to assist the States in planning and implementing other programs for the advancement of health and safety in coal mines.

(b) Grants under this section shall not extend beyond a period of five years following the effective date of this Act.

(c) Federal grants under this section shall be made to States which have a plan or plans approved by the Secretary.

(d) The Secretary is authorized to approve any plan which—

(1) provides that reports will be made to the Secretary, in such form and containing such information as may reasonably be necessary to enable him to review the effectiveness of the program or programs involved, and that records will be kept and afford such access thereto as he finds necessary or appropriate to assure the correctness and verification of such reports;

(2) provides such fiscal control and fund accounting procedures as may be necessary to assure proper disbursement and accounting for Federal funds paid to the State;

(3) contains assurances that the State will not in any way diminish existing State programs or benefits

with respect to pneumoconiosis and related conditions; and

(4) meets any additional conditions which the Secretary may prescribe by rule in furtherance of the provisions of this section.

(e) The Secretary shall not finally disapprove any State plan, or modification thereof, without affording the State reasonable notice and opportunity for a hearing.

(f) The amount granted any State for a fiscal year under this section may not exceed 80 per centum of the amount expended by such State in such year for carrying out such programs, studies, and research, and no one State may be granted an amount in a fiscal year which exceeds 15 per centum of the amount appropriated for grants to all States for that year.

(g) There is hereby authorized to be appropriated for the fiscal year ending June 30, 1970, and each of the succeeding fiscal years, the sum of $1,000,000 to carry out the provisions of this section.

RELATED CONTRACTS AND GRANTS

SEC. 405. In carrying out the provisions of sections 401 and 402, the Secretary may enter into contracts with, and make grants to, public and private agencies and organizations and individuals.

INSPECTORS; QUALIFICATIONS; TRAINING

SEC. 406. The Secretary may, subject to the civil service laws, appoint such employees as he deems requisite for the administration of this Act and prescribe their duties. Persons appointed as authorized representatives of the Secretary shall be qualified by at least five years' practical experience in the mining of coal or by at least five years' experience as a practical mining engineer: *Provided*, That two years' credit toward the five-year experience qualification be recognized for persons who have graduated from a recognized engineering school and by education. Such persons shall be adequately trained by the Secretary. In detailing coal mine inspectors to inspection of individual mines, due consideration shall be given to their previous practical experience in the work of mining coal in the State, district, or region where such inspections are to be made. The Secretary shall seek to develop programs with educational institutions and operators designed to enable persons to qualify for positions in the administration of this Act. In selecting persons and training and retraining persons to carry out the provision of this Act, the Secretary shall work with appropriate educational institutions and operators in developing adequate programs for the training of persons, particularly inspectors. Where appropriate, the Secretary shall cooperate with such institutions in carrying out the provisions of this section by providing financial and technical assistance to such institutions.

EFFECT ON STATE AND FEDERAL LAWS

SEC. 406. (a) No State law in effect upon the effective date of this Act or which may become effective thereafter shall be superseded by any provision of this Act or order issued or standard promulgated thereunder, except insofar as such State law is in conflict with this Act or with any order issued or standard promulgated pursuant to this Act.

(b) The provisions of any State law or regulation in effect upon the effective date of this Act, or which may become effective thereafter, which provide for more stringent health and safety standards applicable to coal mines, than do the provisions of this Act or any order issued or standard promulgated thereunder shall not thereby be construed or held to be in conflict with this Act. The provisions of any State law or regulation in effect upon the effective date of this Act, or which may become effective thereafter, which provide for health and safety standards applicable to coal mines for which no provision is contained in this Act or any order issued or standard promulgated thereunder, shall not be held to be in conflict with this Act.

(c) Nothing in this Act shall be construed or be held to supersede or in any manner affect the workmen's compensation laws of any State, or to enlarge or diminish or affect in any other manner the common law or statutory rights, duties, or liabilities of employers and employees under State laws in respect of injuries, occupational or other diseases, or death of employees arising out of, or in the course of employment.

ADMINISTRATIVE PROCEDURES

SEC. 408. The provisions of sections 551–559 and sections 701–706 of title 5 of the United States Code, shall not apply to the making of any order or decision pursuant to this Act, or to any proceeding for the review thereof.

REGULATIONS

SEC. 409. The Secretary is authorized to issue such administrative regulations, consistent with the provisions of this Act, as he deems appropriate to carry out any provision of this Act.

OPERATIVE DATE AND REPEAL

SEC. 410. The provisions of titles I through III of this Act shall become operative one hundred and twenty days after enactment. The provisions of the Federal Coal Mine Safety Act, as amended, are repealed on the operative date of those titles, exept that such provisions shall continue to apply to any order, notice, or finding issued under that Act prior to such operative date and to any proceedings related to such order, notice, or finding. All other provisions of this Act shall be effective on the date of enactment of this Act.

SEPARABILITY

SEC. 411. If any provision of this Act, or the application of such provision to any person or circumstance, shall be held invalid, the remainder of this Act, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.

REPORTS AND STUDIES

SEC. 412. (a) Within one hundred and twenty days following the convening of each session of Congress, the Secretary shall submit through the President to the Congress an annual report upon the subject matter of this Act, the progress concerning the achievement of its purposes, the needs and requirements in the field of coal mine health and safety, and any other relevant information, including any recommendations he deems appropriate.

(b) The Secretary shall conduct a special study to determine the sufficiency of the present safety requirements of the Federal Coal Mine Health and Safety Act and shall make a report to the Congress on the result of such study, together with his recommendations, within one year of the enactment of this Act. In making this study the Secretary shall appoint and consult with one or more advisory committees as provided by section 102 of this Act. The special study shall include but not be limited to the following areas of inquiry:

(1) Recommended safety and health standards for surface mining.

(2) Ventilation of pillared areas by bleeder systems or other means.

(3) Survival means and communications for persons underground in disaster situations.

(4) Design specifications for new equipment to minimize potential of fire.

(5) Based upon safety research through scientific studies centers at the Bureau of Mines facility at Bruceton, Pennsylvania, determine—

(A) whether significant changes in mine dust sizes have occurred which might justify change in present standards for rock dusting;

(B) whether the same standards should be applied to float dust control when trickle dusting or other means are employed to inert float coal dust while it is airborne and being deposited;

(C) what are appropriate wetting agents for use with water where water is used to abate coal dust on active roadways to face areas; and

(D) the issue of water in abating coal dust.

(Whereupon, at 5:05 p.m. the subcommittee adjourned subject to the call of the Chair.)

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