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PROCEEDINGS AND DEBATES OF THE 90th CONGRESS, SECOND SESSION

HOUSE OF REPRESENTATIVES—*Monday, June 10, 1968*

The House met at 12 o'clock noon.

The Chaplain, Rev. Edward G. Latch, D.D. offered the following prayer:

Blessed be God, the God of all comfort, who comforts us in all our affliction.—2 Corinthians 1: 3, 4.

O God, from whom we come and unto whom our spirits return, Thou hast been our dwelling place in all generations. Thou art our refuge and strength, a very present help in trouble.

Grant us Thy blessing in this hour as we remember our colleague in Congress who has gone home to be with Thee. We still stand stunned by the suddenness of it all and our hearts give way to sorrow. Yet in grief Thou art with us. Make us conscious of Thy presence and may we and our Nation find our security and our strength in Thee.

We pray for the family of our beloved Senator, for his wife and children, for his mother and father, for his sisters and brother. Comfort their hearts with thine indwelling spirit and give them the faith that sees beyond the earthly shadows the larger life in Thy living presence.

For our people we lift our spirits in prayer this sad hour. Together may we work to rid our world of war, may we toil at the task of ridding our Nation of crime, and may we labor to rid our hearts of ill will.

We pray for a nation united in purpose and principle, devoted to Thee and to Thy will for us, and dedicated to the good of all people and to Thy way among men of good will.

In the Master's name we pray. Amen.

THE JOURNAL

The Journal of the proceedings of Thursday, June 6, 1968, was read and approved.

COMMUNICATION FROM THE CLERK OF THE HOUSE

The SPEAKER laid before the House the following communication from the Clerk of the House of Representatives:

OFFICE OF THE CLERK,
U.S. HOUSE OF REPRESENTATIVES,
Washington, D.C., June 7, 1968.

The Honorable the SPEAKER,
House of Representatives.

DEAR SIR: Pursuant to authority granted on June 6, 1968, the Clerk received from the Secretary of the Senate today, the following messages:

That the Senate passed the bill H.R. 16911, entitled "An act to provide for U.S. participation in the facility based on special drawing rights in the International Monetary Fund, and for other purposes."; and

That the Senate, pursuant to Senate Concurrent Resolution 73, 90th Congress, appointed Mr. MANSFIELD, Mr. DIRKSEN, and Mr. JORDAN of North Carolina to the Joint Committee on Arrangements for the inauguration of the President-elect and the Vice President-elect on January 20, 1969.

Respectfully yours,
W. PAT JENNINGS,
Clerk.

ANNOUNCEMENT BY THE SPEAKER

The SPEAKER. The Chair desires to announce that pursuant to the authority granted him on Thursday, June 6, 1968, he did on June 7, 1968, sign the following enrolled bills of the House:

H.R. 5037. A act to assist State and local governments in reducing the incidence of crime, to increase the effectiveness, fairness, and coordination of law enforcement and criminal justice systems at all levels of government, and for other purposes; and

H.R. 16911. An act to provide for U.S. participation in the facility based on special drawing rights in the International Monetary Fund, and for other purposes.

REVENUE AND EXPENDITURE CONTROL ACT OF 1968—CONFERENCE REPORT

Mr. MIDDS submitted a conference report and statement on the bill (H.R. 15414) to continue the existing excise tax rates on communication services and on automobiles, and to apply more generally the provisions relating to payments of estimated tax by corporations.

Mr. Speaker, I ask unanimous consent that an explanation of the bill as agreed to in conference be printed in the RECORD immediately following the statement of the managers on the part of the House.

The SPEAKER. Is there objection to the request of the gentleman from Arkansas?

Mr. GROSS. Mr. Speaker, reserving the right to object, this is the conference report on the tax bill which is now tentatively scheduled to come up on June 19; is that correct?

Mr. MILLS. Mr. Speaker, will the gentleman yield?

Mr. GROSS. Yes; of course.

Mr. MILLS. I am not advised as to the exact date next week that it will come to the floor. That is a matter for the majority leader and others to determine. I do hope to go to the Committee on Rules on Tuesday, June 18, to request a rule that will make the conference report debatable for 4 hours rather than 1 hour, but I do not know that it will come on the 19th or the 20th.

Mr. GROSS. That is the question I would have asked the gentleman; that is, if he is going to seek a rule for more than 1 hour of debate. The gentleman says he will seek a rule for 4 hours of debate?

Mr. MILLS. Yes. And, if the gentleman will yield further, it is also my intention to ask that the 4 hours be equally divided between the ranking Republican member of the committee, the gentleman from Wisconsin [Mr. BYRNES], and myself.

The SPEAKER. Is there objection to the request of the gentleman from Arkansas?

There was no objection.

OMNIBUS CRIME BILL

Mr. POOL. Mr. Speaker, I ask unanimous consent to address the House for 1 minute, to revise and extend my remarks, and to include extraneous matter.

The SPEAKER. Is there objection to the request of the gentleman from Texas?

There was no objection.

Mr. POOL. Mr. Speaker, the omnibus crime bill as passed by the Senate Judiciary Committee, but not the Senate, included provisions which would preclude the Supreme Court and other Federal courts having jurisdiction to review, revise, vacate, modify, or disturb in any way a ruling in any trial court in any State in any criminal prosecution admitting in evidence as voluntary, a confession of an accused if the ruling had been affirmed or otherwise upheld by the higher court of the State involved. Also, it would curtail in the same manner the Supreme Court's or other Federal court's jurisdiction on the reviewability or admissibility of eye witness testimony where the State court had made a final ruling. Also, the original bill passed by the Senate Judiciary Committee took from the Federal courts the power to revise, vacate, or modify the highest State court decision in respect to questions of law or fact which were determined by that court and which had been brought to the Federal court through habeas corpus action. The Senate bill left this provision out.

The bill I am introducing today would amend the present statutes to include the provisions as originally passed by the Senate Judiciary Committee which were left out of the bill as passed by the Senate and the House.

I feel that Congress has the right to

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act on this under the provisions of article 3, section 2, paragraph 2, of the Constitution which provide for the Congress to set the appellate jurisdiction of the Federal courts.

Law enforcement officials in our country are today hamstrung by Supreme Court decisions which deny them powers necessary for the protection of our citizenry. For this reason I believe it imperative that the Congress limit the appellate jurisdiction of the Supreme Court as the authors of our Constitution expected us to do long before this.

TAX INCREASE AND SPENDING CUT

Mr. GROSS. Mr. Speaker, I ask unanimous consent to address the House for 1 minute, to revise and extend my remarks, and to include extraneous matter.

The SPEAKER. Is there objection to the request of the gentleman from Iowa?

There was no objection.

Mr. GROSS. Mr. Speaker, early in May, President Johnson stood before the television cameras, shook his fists and denounced as blackmailers and phonies those Members of Congress who insisted on more than a $4 billion spending cut as part of the so-called tax package.

Later in May, he again appeared before the television cameras but that time there was no fist shaking and no castigation of Members of Congress. The President reckoned as how there could be a $6 billion cut after all.

It would be interesting to know what caused him to change his mind in less than 30 days. But of importance now is when the President and the Democrat leadership in Congress propose to provide a bill of particulars as to where and when the $6 billion reduction in spending is to be made.

A vote on the tax package has now been put over until June 19. This Member has no intention of buying a pig in a poke. He has no intention of voting for a tax increase without specific assurance of a minimum $6 billion cut in spending and where those reductions are to be made.

TO REMOVE CERTAIN LIMITATIONS ON OCEAN CRUISES—CONFERENCE REPORT

Mr. GARMATZ submitted a conference report and statement on the bill (H.R. 12639) to remove certain limitations on ocean cruises.

SEA LEVEL CANAL BETWEEN ATLANTIC AND PACIFIC OCEANS—CONFERENCE REPORT

Mr. GARMATZ submitted a conference report and statement on the bill (H.R. 15190) to amend sections 3 and 4 of the act approved September 22, 1964 (78 Stat. 990), providing for an investigation and study to determine a site for the construction of a sea level canal connecting the Atlantic and Pacific Oceans.

PERMISSION FOR COMMITTEE ON WAYS AND MEANS TO FILE REPORT ON H.R. 17325, TO AMEND THE INTERNAL REVENUE CODE OF 1954

Mr. MILLS. Mr. Speaker, I ask unanimous consent that the Committee on Ways and Means may have until midnight tonight to file a report on the bill (H.R. 17325) to amend the Internal Revenue Code of 1954 with respect to advertising in a convention program of a national political convention.

The SPEAKER. Is there objection to the request of the gentleman from Arkansas?

There was no objection.

CALL OF THE HOUSE

Mr. ARENDS. Mr. Speaker, I make the point of order that a quorum is not present.

The SPEAKER. Evidently a quorum is not present.

Mr. ALBERT. Mr. Speaker, I move a call of the House.

A call of the House was ordered.

The Clerk called the roll, and the following Members failed to answer to their names:

[Roll No. 172]

Abernethy	Frelinghuysen	O'Hara, Ill.
Andrews, Ala.	Galifianakis	O'Hara, Mich.
Annunzio	Gallagher	O'Neal, Ga.
Ashley	Gardner	O'Neill, Mass.
Ayres	Gettys	Pelly
Bell	Giaimo	Pepper
Biester	Gibbons	Pike
Bingham	Gilbert	Podell
Blanton	Green, Oreg.	Price, Texas
Bolton	Gubser	Pryor
Bow	Gurney	Quillen
Brasco	Hagan	Resnick
Bush	Halpern	Rhodes, Pa.
Button	Hansen, Idaho	Rivers
Cabell	Hardy	Ronan
Carter	Harrison	Rooney, N.Y.
Clausen, Don H.	Hawkins	Rooney, Pa.
Cleveland	Hébert	Rostenkowski
Conyers	Herlong	Roudebush
Corbett	Holland	St Germain
Corman	Hungate	Satterfield
Cowger	Jarman	Scheuer
Curtis	Jonas	Sisk
Daddario	Jones, N.C.	Snyder
Dawson	Karsten	Stanton
Dent	Kelly	Stephens
Derwinski	Kluczynski	Taft
Diggs	Kupferman	Teague, Tex.
Dingell	Kyros	Thompson, Ga.
Donohue	Landrum	Thompson, N.J.
Dorn	Long, La.	Thomson, Wis.
Dow	McMillan	Tuck
Downing	Mayne	Vander Jagt
Dulski	Moorhead	Whitten
Evins, Tenn.	Morris, N. Mex.	Winn
Farbstein	Moss	Wyman
Fino	Murphy, Ill.	Zwach
Flynt	Murphy, N.Y.	
	Nix	

The SPEAKER. On this rollcall 321 Members have answered to their names, a quorum.

By unanimous consent, further proceedings under the call were dispensed with.

PROVIDING FOR CONSIDERATION OF H.R. 3400, AIRCRAFT NOISE ABATEMENT

Mr. MADDEN. Mr. Speaker, by direction of the Committee on Rules, I call up House Resolution 1203 and ask for its immediate consideration.

The Clerk read the resolution, as follows:

H. RES. 1203

Resolved, That upon the adoption of this resolution it shall be in order to move that the House resolve itself into the Committee of the Whole House on the State of the Union for the consideration of the bill (H.R. 3400) to amend the Federal Aviation Act of 1958 to authorize aircraft noise abatement regulation, and for other purposes. After general debate, which shall be confined to the bill and shall continue not to exceed one hour, to be equally divided and controlled by the chairman and ranking minority member of the Committee on Interstate and Foreign Commerce, the bill shall be read for amendment under the five-minute rule. It shall be in order to consider the amendment in the nature of a substitute recommended by the Committee on Interstate and Foreign Commerce now printed in the bill, and such substitute shall be considered under the five-minute rule as an original bill for the purpose of amendment. At the conclusion of such consideration, the Committee shall rise and report the bill to the House with such amendments as may have been adopted, and any Member may demand a separate vote in the House on any amendment adopted in the Committee of the Whole to the bill or committee amendment in the nature of a substitute. The previous question shall be considered as ordered on the bill and amendments thereto to final passage without intervening motion except one motion to recommit with or without instructions.

The SPEAKER. The gentleman from Indiana [Mr. MADDEN] is recognized for 1 hour.

Mr. MADDEN. Mr. Speaker, House Resolution 1203 provides an open rule with 1 hour of general debate for consideration of H.R. 3400 to authorize aircraft noise abatement regulations, and for other purposes. The resolution also provides that it shall be in order to consider the committee substitute as an original bill for the purpose of the amendment.

H.R. 3400 defines the role of the Federal Government as to control and abatement of aircraft noise and sonic boom. Its specific purpose is to afford present and future relief and protection to the public from unnecessary aircraft noise and sonic boom.

The purpose of the bill is to be achieved through implementation of provisions which amend the Federal Aviation Act of 1958.

Mr. Speaker, I urge the adoption of House Resolution 1203 in order that H.R. 3400 may be considered.

Mr. LATTA. Mr. Speaker, I yield myself such time as I may consume.

Mr. Speaker, I agree wholeheartedly with the statement which has just been made by my colleague, the gentleman from Indiana [Mr. MADDEN].

However, Mr. Speaker, I hasten to point out that this bill, even though it is entitled "Aircraft Noise Abatement," seems to me to be on a collision course with the need for safety of aircraft in the United States.

However, Mr. Speaker, I am pleased to state that the committee has gone into this matter and has pointed out this need before the issuance by the FAA of any rules and regulations by the Administrator of that agency with reference to the need for public safety and will take into consideration and recognize all of the technical and practical aspects of the proposal.

Mr. Speaker, as I said earlier, it seems to me that these two are on a collision course because in this jet age when you start slowing down a heavy airplane propelled by jet propulsion you certainly run into the question of safety.

Mr. Speaker, I know that there are several problems which exist at the National Airport with reference to the takeoff of aircraft going across the river just because of the question of noise abatement.

In interrogating the gentleman from West Virginia [Mr. STAGGERS], he assured me that this will be taken into consideration. However, I do not believe from the standpoint of aircraft safety, we cannot stress this fact too much. Therefore, I hope when this matter comes under investigation they will go into it thoroughly and that they will not sacrifice aircraft safety for the sake of noise abatement. If we cannot have both, let us have aircraft safety instead of noise abatement.

The purpose of the bill is to strengthen the Federal program of aircraft noise abatement and sonic boom control by authorizing the Federal Aviation Administration to prescribe standards for noise measurement and to enforce any necessary rules and regulations pertaining to control of aircraft noise.

The bill requires the Administrator of the Federal Aviation Administration, after consultation with the Secretary of Transportation to prescribe standards for the measurement of noise and sonic boom caused by aircraft. He is also required to prescribe such rules and regulations as are necessary to provide control of such problems. Such standards shall apply to, and enforcement shall be against all certificate holders; these include aircraft manufacturers, commercial airlines, and professional pilots.

Before issuing any standards, rules or regulations, the Administrator is required to take into consideration relevant technical data, the needs of public safety and the economic reasonableness and technical practicability of the proposal.

After any standard, rule, or regulation is promulgated all affected certificate holders may appeal the decision of the Administrator to the National Transportation Safety Board within 60 days of the promulgation. The Board may amend, modify, reverse, or confirm the ruling of the Administrator.

No additional cost is anticipated in fiscal 1968 if the bill is enacted. A few additional engineers will be needed in future years. The estimated cost for 1969 is $27,700; for 1970 the figure is $55,400.

All interested agencies support the legislation. There are no minority views.

Mr. GUDE. Mr. Speaker, will the gentleman yield?

Mr. LATTA. I yield to the gentleman from Maryland.

Mr. GUDE. I thank the gentleman for yielding, and I could not agree with him more that we must consider air safety. Those of us in the Washington area, particularly those residing in Montgomery County near the banks of the Potomac River are well aware of the mounting pressure of increased air traffic to and from National Airport. One of the more troublesome aspects of this pressure, aside from the air traffic congestion, has been the matter of jet noise which has grown with the increased volume of traffic. While the prime concern is and must continue to be the safe operation of the aircraft and the airport facilities, there is a considerable public interest in the total conditions related to this jet traffic development, including jet noise.

By the FAA's requirement to establish noise standards as a basis for aircraft noise abatement regulations under H.R. 3400, we can look to an increased effort by government and industry to reduce the aircraft noise problem. However, with due credit to advanced technology, no amount of success in reduced jet noise should deter the continued efforts to reduce the existing and potential air traffic congestion at National Airport and to bring the Washington air traffic to Dulles Airport, a modern air facility constructed specifically for the Washington jet traffic.

Mr. Speaker, I strongly support this legislation. At the same time I would hope the the airlines will cooperate in working toward the goal of reduced traffic at National Airport, and proper use of Dulles.

Mr. GROSS. Mr. Speaker, will the gentleman yield?

Mr. LATTA. I yield to the gentleman from Iowa.

Mr. GROSS. Does the gentleman from Ohio know whether this bill has had the approval of the residents of that so-called city that has been located just recently on the banks of the Potomac near the Lincoln Memorial? They have been complaining about aircraft noise.

Does the gentleman know what the residents of that new municipality think about this bill?

Mr. LATTA. To which city does the gentleman refer?

Mr. GROSS. In Washington, D.C.

Mr. LATTA. I am afraid I cannot answer the question. However, I feel it is important.

Mr. GROSS. I thank the gentleman.

Mr. LATTA. Mr. Speaker, I yield 5 minutes to the gentleman from New York [Mr. WYDLER].

Mr. WYDLER. I thank the gentleman for yielding.

My colleagues, I rise in support of this rule and in support of the bill with which the rule concerns itself.

I have been in Congress for 6 years and during the period of those 6 years I have been fighting for some effective legislation which would help our Nation's people in meeting this problem of jet aircraft noise. I am the original sponsor of the legislation which is the basis of the bill before the House.

The first thing that I believe we have to get very clear in mind when talking about jet aircraft noise is what you are talking about to the extent and degree of the problem. We are not talking here about just hearing some aircraft flying overhead that give us a little bit of trouble, we are talking about a thundering noise that is so loud that you cannot converse, or listen to your TV set, or live a normal life in its presence. And that is the problem which is inflicted on thousands upon thousands of American citizens everywhere, so that airlines may fly for a profit and make money subsidized in many cases by the American taxpayers.

I believe these people are perfectly well justified in asking that the Federal authorities do something about this problem, and to see what they can do to control it and give the people some protection.

When I first came to Washington I became a member of the Committee on Science and Astronautics, and found out that besides the Nation's space program, that NASA had under its jurisdiction aircraft research, and part of this aircraft research was the problem of jet aircraft noise abatement. It was a very weak program at the time.

It was a program directed almost exclusively to research, and they had been researching the question of jet aircraft noise for about 15 years, and repeating the results of that research over and over again which, summed up, could be simply stated as the fact that: You can do something about it if you are willing to spend money to do it.

This seemed to be all they could do insofar as research was concerned, and the question was: Would we ever get on toward trying to do something with the research?

I asked NASA to develop a program of development to use the research, and they did that. They allocated sufficient funds to do it, and in a very short time they have come up with the result which we knew they would come up with, which is that the problem of jet aircraft noise is indeed soluble, and can be solved if the effort is made on it, and if the funds are given toward the solution to the problem.

This was not a startling result, but it was one that was clearly forthcoming once it became clear to the airlines of the Nation that it was to their own economic self-interest to solve this problem. They are going to come under increasing restraints in operations unless they do in fact solve it. And it is for their economic benefit to solve this problem, along with everyone else in the world. But all of this development and all of this expenditure of effort and all of this research will go for naught unless we have a device, a device to put it into operation. And that device is this bill.

This will give the Federal Government the means and the power to take the research and development and put it into effect so that the airlines will adopt it, and the people who suffer from the problem will be helped.

Therefore, Mr. Speaker, I consider the legislation very important, and I hope that it will find very, very broad support in the House of Representatives.

Because, although this problem only affects a few people at the present time compared to the entire national population, the question of the sonic boom, which is the same problem in a different scientific context, is going to affect all of our people in the years ahead. And that means even if they are living in the middle of Iowa, or in the middle of Ohio, or on a farm, or in the city, they will all go through the terrible experience of these sonic blows that are caused by the airlines.

Mr. Speaker, I received today a tele-

gram in support of this legislation from Mr. Austin J. Tobin, the executive director of the Port of New York Authority which operates the Kennedy Airport and the LaGuardia Airport in New York. It has the responsibility for running these airports, and it wholeheartedly endorses this legislation.

I have not heard anything from the airlines, but I believe they should wake up and endorse this legislation wholeheartedly. In the New York area the airlines desperately need a new airport, and they cannot get a location because no community wants an airport in their neighborhood because the airplane is a poor neighbor, a bad neighbor, and it is a neighbor that distracts you and annoys you, and it is for the airlines' self-interest to recognize that fact, and get this legislation passed and do something about this problem, and they will benefit accordingly.

So, as I say, I rise in support of the rule and the legislation and I hope my colleagues will find it wise to do as well.

The SPEAKER. The time of the gentleman has expired.

Mr. LATTA. Mr. Speaker, I have no further requests for time.

Mr. MADDEN. Mr. Speaker, I move the previous question on the resolution.

The previous question was ordered.

The resolution was agreed to.

A motion to reconsider was laid on the table.

PROVIDING FOR CONSIDERATION OF S. 974, LAND CONVEYANCE, GLENDALE, ARIZ.

Mr. MADDEN. Mr. Speaker, by direction of the Committee on Rules, I call up House Resolution 1191 and ask for its immediate consideration.

The Clerk read the resolution as follows:

H. RES. 1191

Resolved, That upon the adoption of this resolution it shall be in order to move that the House resolve itself into the Committee of the Whole House on the State of the Union for the consideration of the bill (S. 974) to authorize the Secretary of Agriculture to convey certain lands to the city of Glendale, Arizona. After general debate, which shall be confined to the bill and shall continue not to exceed one hour, to be equally divided and controlled by the chairman and ranking minority member of the Committee on Agriculture, the bill shall be read for amendment under the five-minute rule. At the conclusion of the consideration of the bill for amendment, the Committee shall rise and report the bill to the House with such amendments as may have been adopted, and the previous question shall be considered as ordered on the bill and amendments thereto to final passage without intervening motion except one motion to recommit.

The SPEAKER. The gentleman from Indiana [Mr. MADDEN] is recognized for 1 hour.

Mr. MADDEN. Mr. Speaker, I yield 30 minutes to the gentleman from Ohio [Mr. LATTA] and pending which I yield myself such time as I may require.

Mr. Speaker, House Resolution 1191 provides an open rule with 1 hour of general debate for consideration of S. 974 to authorize the Secretary of Agriculture to convey certain lands to the city of Glendale, Ariz.

The purpose of S. 974 is to direct the Secretary of Agriculture to convey to the city of Glendale, Ariz., approximately 20 acres of land which now constitutes the Southwest Poultry Experiment Station.

The conveyance would be made only after the Secretary has determined that the lands are no longer needed by the Department and he has made such disposition of the improvements as he deems in the best interest of the United States. Title to this land would revert to the United States if not used for public park or recreational purposes in the future. The conveyance would also be conditioned upon a determination by the GSA that there is no further need of the property by any Federal agency. The consideration for the conveyance would be set by the Secretary at a price not less than $35,000. The land originally cost the Federal Government $4,500.

Mr. Speaker, I urge the adoption of House Resolution 1191 in order that S. 974 may be considered.

The SPEAKER. The Chair recognizes the gentleman from Ohio [Mr. LATTA].

Mr. LATTA. Mr. Speaker, I agree with the statement made by my friend and colleague, the gentleman from Indiana, and hasten to point out that this matter was up under suspension before the House and received a vote of 202 to 138, but did not receive a two-thirds vote.

The purpose of the bill is to direct the Secretary of Agriculture to convey to the city of Glendale, Ariz., a parcel of federally owned land approximating 20 acres.

The parcel is now the site of the Southwest Poultry Experiment Station, whose function, the Department has stated, has been completed; the land is no longer needed by the Department.

Under the terms of the conveyance, title to the land would revert to the United States at any time in the future when the land was not used for public park or recreational purposes.

No fixed price is set by the bill, but it may not be less than $35,000. Approximately one-half the parcel was originally obtained by the Government through gifts of local citizens. The other one-half was purchased for $4,500. Current valuation of the land is somewhere between $140,000 and $200,000.

The Department of Agriculture supports the bill. There are no minority views.

Mr. Speaker, I have no further requests for time.

Mr. MADDEN. Mr. Speaker, I move the previous question on the resolution.

The previous question was ordered.

The resolution was agreed to.

A motion to reconsider was laid on the table.

AIRCRAFT NOISE ABATEMENT

Mr. STAGGERS. Mr. Speaker, I move that the House resolve itself into the Committee of the Whole House on the State of the Union for the consideration of the bill (H.R. 3400) to amend the Federal Aviation Act of 1958 to authorize aircraft noise abatement regulation, and for other purposes.

The motion was agreed to.

IN THE COMMITTEE OF THE WHOLE

Accordingly the House resolved itself into the Committee of the Whole House on the State of the Union for the consideration of the bill H.R. 3400, with Mr. CHARLES H. WILSON in the chair.

The Clerk read the title of the bill.

By unanimous consent, the first reading of the bill was dispensed with.

The CHAIRMAN. Under the rule, the gentleman from West Virginia [Mr. STAGGERS] will be recognized for 30 minutes, and the gentleman from Illinois [Mr. SPRINGER] will be recognized for 30 minutes.

The Chair recognizes the gentleman from West Virginia [Mr. STAGGERS].

Mr. STAGGERS. Mr. Chairman, first, I would like to compliment the subcommittee which handled this bill. I think they gave it a very good hearing and certainly consideration in marking it up. I especially want to compliment Mr. FRIEDEL, the chairman of that committee, who has gone over the work. I think they have been very thorough and have brought to the full committee a good bill, which we have considered and have brought to the House.

Mr. Chairman, this is a simple but important amendment to the Federal Aviation Act. The Federal Aviation Administration presently has a program to reduce aircraft noise. However, it does not have specific authority to set standards, rules, and regulations with respect to aircraft noise and sonic boom. H.R. 3400 will provide this. Through this legislation the Federal Aviation Administration will be charged with the responsibility of actively carrying forward a noise-reduction effort. The specific purpose of the bill is to afford present and future relief and protection to the public from unnecessary aircraft noise and sonic boom. In effecting this program the Administrator will have to consult with the Secretary of Transportation and with Federal, State, and interstate agencies. He must also give consideration as to whether any proposed standard, rule, or regulation is consistent with the highest degree of safety.

Interested parties will have all of the usual administrative procedural rights and existing rights of judicial review. As you will see from page 7 of the report, the present FAA noise-abatement program amounts to a cost of $305,600 a year. The projects for the next 2 fiscal years contemplate only three new employees, an increase to $344,700 and $372,000, respectively. This bill was reported unanimously both by the subcommittee and the full committee.

I believe that it is a good bill and that it better defines the role of the Federal Aviation Administration in seeking remedies for the increasing problems of aircraft noise and sonic boom. I recommend its passage.

Mr. SPRINGER. Mr. Chairman, the subject of aircraft noise abatement has been before our committee in one form or another for a long time. It has been most difficult to separate the wheat from the chaff because of the conflicting in-

terests which necessarily exist. The traveling public wants frequent, convenient, and safe air service. Residents do not like to be shaken up periodically by screaming aircraft moving overhead at lower and lower altitudes.

Another conflict which further complicates the matter stems from the diverse opinions about the relationships between noise abatement procedures and safety of air operations. Many hearings have been held which could only be said to prove that airplanes, if they fly, make noise.

At last the committee comes to the House with a measure which it feels is worthwhile and will contribute to the eventual abatement of aircraft noise. This bill grants to the Administrator of the Federal Aviation Administration the authority to prescribe standards for the measurement of aircraft noise and sonic boom and make rules and regulations providing for its control and abatement.

This statement of the purpose is deceptively simple. The control of aircraft noise will result from different actions by several elements within the aircraft industry and the communities concerned. The Administrator will be able to set a noise standard to which a new aircraft must be built. Obviously this will depend upon the technology available and the speed with which research provides answers. He will also have authority to require aircraft already in operation to be modified if and when this appears to be a practical thing to do, taking into account the amount such modification will reduce noise levels and also the consequent disruptions to service and the cost to the airlines.

It should be noted that efforts of this kind are already underway, and this legislation does not contemplate any large expansion of manpower in the Federal Aviation Administration. There are 16 people currently engaged in noise abatement activities, and it is anticipated that this number will be increased to 20.

While the committee is of the opinion that the spelling out of this authority for FAA may make it easier to accomplish noise abatement, it does not want the Members of the House or the public to think that the conferring of this authority will bring about any fast or dramatic change in the present situation. We do hope that by passing this legislation the Federal Aviation Administration will be in a better position to make use of scientific advances and new rules and procedures as they become available.

Because there has been a running argument between the FAA and some airline pilots concerning procedures now used at some airports to lessen noise, I think it should be stated here, as the committee has in the report, that it is the intent of Congress to place the first and foremost emphasis on safety. Noise abatement is desirable, safety is essential. It is in the interests of safety that the committee saw fit to place this authority with the Federal Aviation Administration. That Agency is organized for and dedicated entirely to safety in air transportation, and we feel confident that any steps taken bearing on aircraft noise abatement will be with full consideration of the safety aspects.

One matter which has caused some discussion is the broad scope of the regulations which may eventually be promulgated concerning noise abatement. The bill applies to all certificates, and that means new aircraft, operating aircraft, airlines, and airmen. All have a significant role in noise abatement, and each must be made to carry out his part of the scheme. Therefore each must also be subject to any sanctions applicable to violations.

I recommend this bill to the House.

Mr. GROSS. Mr. Chairman, will the gentleman yield?

Mr. SPRINGER. I yield to the gentleman from Iowa.

Mr. GROSS. Mr. Chairman, is it proposed to create some kind of advisory board or commission within the Transportation Department or FAA with respect to this legislation?

Mr. SPRINGER. Not that I know of. May I ask the chairman if he understands that to be so?

Mr. STAGGERS. I would say there will not be any such commission created. The FAA staffing will be the same as now with the exception of three additional employees.

Mr. GROSS. I am glad to hear that. That will help hold down the expense with respect to this bill.

Mr. SPRINGER. As far as I can determine, there will be only three additional employees.

Mr. KYL. Mr. Chairman, will the gentleman yield?

Mr. SPRINGER. I yield to the gentleman from Iowa.

Mr. KYL. Mr. Chairman, the situation in Washington is rather typical of the problem areas in the country. Would this be, in and of itself, an alteration in any circumstances as far as the present use of Washington National Airport is concerned?

Mr. SPRINGER. Insofar as I can observe at this time—and I say this in good faith to the gentleman from Iowa—I do not see that there could be any change.

Mr. KYL. Mr. Chairman, if the gentleman will yield further, looking into the future, how will passage of this bill affect this specific situation in the future?

Mr. SPRINGER. I do not believe it could change it, except insofar as the national standards and rules and regulations would help to abate noise. But this would be applicable to every airport. I am trying to be as honest with the gentleman as possible.

It may be that in the future there may be flights transferred to Dulles. This is a matter for the FAA Administrator to determine. But I would not think that the noise problem would be the primary reason for a transfer of any flights from National to Dulles.

Mr. KYL. If the gentleman will yield just a moment further, the reason for asking these questions is that the public sometimes is misled by actions of the Congress. If the public reads that the House has passed an aircraft noise abatement program of any kind there is apt to be an immediate assumption that we are going to change the present situation so far as the use of jet aircraft is concerned.

This bill in itself does not do that; is that correct?

Mr. SPRINGER. I say this is a step, in my opinion, in the right direction. We do now require the Administrator to act in this field. Formerly we did not require him to do anything. We say to him now, "Get busy and start working on this job and give us some standard rules and regulations to which air companies will have to abide." That is in essence what we are saying.

Mr. KYL. And the committee is saying at the same time that never should the considerations requiring noise abatement take precedence over air safety.

Mr. SPRINGER. The gentleman is correct.

Mr. KYL. I thank the gentleman.

Mr. SPRINGER. There is probably just one further thing which ought to be clear. This will not do away with the noise problem immediately. This report shows clearly it is going to be a slow and tedious task. But we have to start. We believe this bill is a beginning.

Mr. KYL. I thank the gentleman.

Mr. STAGGERS. Mr. Chairman, I yield such time as he may consume to the gentleman from Maryland [Mr. FRIEDEL] the chairman of the subcommittee.

Mr. FRIEDEL. Mr. Chairman, for many years we have been receiving urgent complaints concerning aircraft noise. From 1958, when the large jets were first introduced into commercial service, complaints have steadily increased both in numbers and in the demands for relief.

Airlines, aircraft manufacturers, pilots, airport operators, local State and Federal offices have all tried to solve this problem. There is no simple solution. Some would place major emphasis on restrictive land use with acres of clear zones adjacent to airports. Others believe that this is impractical and certainly it can be argued that it would be prohibitively costly in many major cities where thousands of citizens would have to give up their homes.

The bill before us today is a more direct approach. Under H.R. 3400, the Federal Aviation Administrator would have to prescribe standards for measurement of both aircraft noise and the sonic boom and he will issue rules and regulations as to each. These will be considered with respect to the certificates which he presently controls for safety purposes. We have made his responsibilities as to noise coextensive with his responsibilities as to safety because we do not want there to be any possibility of a downgrading of safety. As important as noise reduction is, it should not be achieved at the expense of safety and the bill provides that the Administrator's actions must be consistent with the highest degree of safety.

I do not expect this bill to bring an overnight solution. I do expect that all of the major interested parties will continue their efforts in cooperation with the Administrator to achieve a speedy and effective solution to the problem. The bill has ample procedural protections. The Administrator must give full consideration to research, development and testing, he must consult with other Government agencies and he must consider the economical reasonableness and technological practicality of any proposed standard rule or regulation. In ad-

dition, actions of the Administrator are appealable to the National Transportation Safety Board.

I believe this bill is an excellent forward step toward the much desired and much needed goal of noise reduction. It has the full support of the Committee on Interstate and Foreign Commerce and I urge all other Members to add their support.

Mr. SPRINGER. Mr. Chairman, I yield such time as he may consume to the gentleman from Tennessee [Mr. KUYKENDALL].

Mr. KUYKENDALL. Mr. Chairman, I rise in support of H.R. 3400, the aircraft noise abatement bill.

The problem of aircraft noise is one that is serious and ever present, particularly for those in the vicinity of our ever-growing metropolitan airports.

Even though the easing of this "noise crisis" is one of great importance in our legislative tasks, I think it important, however, that we first reiterate the fact that our primary responsibility in regulating the flying of aircraft is one of safety for the passengers and the crew as well as the possible casualties on the ground. The wording of this legislation and the report makes it abundantly clear that all aspects of safety will be foremost in our minds when launching upon the task of reducing the noise around our airports.

The Federal Aviation Administration, assisted by the Department of Transportation, is given the task both in the areas of research and application to encourage and guide, if necessary, the aircraft engine manufacturers and the airlines themselves in striving for the quietest possible aircraft engine in line with safety limitations.

I wish to commend the aircraft industry and the airlines for the remarkable progress that has already taken place in the reduction of engine noise, particularly on takeoffs. I wish to point out, however, that the progress toward noise elimination on the approach patterns of our airports is not nearly so great.

I foresee a long-range program of retrofitting of existing airplane engines, but within the limitations of economic feasibility.

Mr. Chairman, we have a long way to go both in the areas of aircraft safety and noise abatement, but I do believe this legislation, H.R. 3400, is a step in the right direction.

Mr. SPRINGER. Mr. Chairman, I yield such time as he may consume to the gentleman from Nebraska [Mr. CUNNINGHAM].

Mr. CUNNINGHAM. Mr. Chairman, I was a member of the Subcommittee on Transportation and Aeronautics that heard the testimony on this legislation. I strongly support it. This is a big problem, but this is a first step toward solving it. I do believe, however, that this is a necessary step, and I hope the Congress will see fit to give it its wholehearted approval. Maybe before too long we can see some progress and some solution to this very perplexing problem.

Mr. STAGGERS. Mr. Chairman, I yield 4 minutes to the gentleman from New York, the chairman of the Committee on the Judiciary [Mr. CELLER.]

Mr. CELLER. Mr. Chairman, low-flying jet planes have reached an acute level on a nationwide basis for many people in the areas surrounding large urban airports. I express particular concern about the problem of jet noise for the people in the New York City metropolitan area.

Mr. Chairman, I single out the periphery of Kennedy and LaGuardia Airports as particular trouble spots.

Under this bill the Secretary of the Department of Transportation would be empowered to set standards for acceptable levels of aircraft noise, and he could in a case where an air carrier violated the standards, refuse to grant a license, or lift a license already granted.

Mr. Chairman, a sonic boom recently shattered 200 windows at the Air Force Academy at Colorado Springs, Colo.

This incident adumbrates the grave dangers of sonic boom and points up the need for Congress to take this problem in hand and pay attention to the increased hazards of the jet age.

This bill provides for a thorough inquiry as to the need to have the FAA prescribe and amend standards of aircraft noise and sonic boom.

Mr. Chairman, it is interesting to note that the General Electric Co., for example, has launched an advertising campaign with reference to supersonic transports which will be powered by General Electric engines. The company states in its advertisement:

> America's supersonic transport will streak across the skies at 1,800 mph. That's half a mile a second—faster than a 30-30 bullet. This plane—longer than a football field—will cross the Atlantic in about 2 hours and 45 minutes. It will knock 4 hours off today's flying time to Europe, both coming and going, giving travelers an extra working day there. That's why people are waiting for it.

But, Mr. Chairman, the noise and the turbulence of the supersonic transport would be incalcuable. Some means must be devised to control and reduce such noise consistent with aviation progress and the question of noise abatement cost.

Finally, Mr. Chairman, this window-shattering experience at the Air Force Academy resulted, incidentally, in a dozen persons being seriously injured by shattered glass. The coming of this supersonic transport with its attendant sonic boom strikes terror and awe in our hearts. Something must be done, and this bill would offer some sort of relief in the sense that there would be an inquiry as to the exact situation and that inquiry would point up something in the nature of a remedy and would set forth an appropriate standard for the noise abatement question.

Mr. SPRINGER. Mr. Chairman, I yield such time as he may consume to the gentleman from Minnesota [Mr. NELSEN].

Mr. NELSEN. I thank the gentleman from Illinois for yielding to me at this time.

I wish to point out the fact that the chairman of the metropolitan airport commission in Minnesota sent a letter to me urging the passage of this bill. He feels that unless some national standard is adopted we would be courting the possibility that we would have a hodge-podge of regulations in the many States. This might be very difficult, if not impossible, to cope with and therefore he urged that the bill become law.

Further, this morning I received a second communication from him indicating the urgency that they felt this situation should be dealt with.

I thank the gentleman from Illinois for yielding to me.

Mr. STAGGERS. Mr. Chairman, I yield 4 minutes to the gentleman from New York [Mr. ROSENTHAL].

Mr. ROSENTHAL. Mr. Chairman, I rise in support of H.R. 3400. The aggrieved airport neighbors in my district are watching with great interest as we consider H.R. 3400, the most important noise abatement bill we have yet considered.

With LaGuardia Airport at one end of Queens County, and Kennedy International Airport at the other, my constituents are well practiced in the "realism" of aircraft noise. They have heard all of the arguments. They know all of the positions of airline representatives, of the engine manufacturers, of the airport operators, and of government people. But now they want action.

They understand, as does anyone who knows the technology of jet aircraft, that aircraft noise will not end. They know that progress can only come slowly but they insist that it must come. They see in this bill the Federal Government belatedly taking its responsibility for leadership in noise control and reduction. And they expect vigorous and decisive leadership from Washington when this bill is passed.

For the airport neighbors, aircraft noise is not simply another "urban problem" and certainly not merely an unpleasant distraction. The jet airplane has made life unbearable for many of them. Babies scream in the night, old people are made irritable and even ill, normal social life has become impossible, all because no one has taken the responsibility for saying "Stop—this is enough."

Today we have that opportunity. Today we can give responsibility to the Federal Aviation Administrator to apply and enforce rules to make aircraft quieter. He will, under this bill, break the ring of inactivity and timidity which has paralyzed government and industry.

Instead of more reasons why less can be done, we should expect a forceful display from FAA of what it can do, and of pressures it can now apply to manufacturers and, ultimately, to airline operators.

Residents of my district may not sleep better tonight because of quieter planes. But they can go to bed reassured that someone has finally taken the first step toward considering the forgotten people in aviation—those who suffer in their homes, on the streets of their communities, and in sleepless nights in their beds, from an industry which provides every consideration for its passengers but none for the helpless victims on the ground below.

Mr. STAGGERS. Mr. Chairman, I yield such time as he may consume to the gentleman from Texas, a member of the committee [Mr. PICKLE].

Mr. PICKLE. Mr. Chairman, I thank the gentleman for yielding.

Mr. Chairman, I support the aircraft noise abatement bill before us today, and as a member of the Subcommittee on Aeronautics and Transportation, which heard this bill, I am proud the full committee has approved the bill.

For millions of Americans, aircraft noise is more than just another slogan—such as air or water pollution—describing the path to a better society. It is a constant menace and nuisance. It is something that can cause effects as wide ranging as insomnia and depressed land values, as well as other emotional reactions yet to be fully charted.

The bill before us represents perhaps the first major legislative step the Federal Government has taken in tackling this problem. The Federal Aviation Administration has had an Office of Noise Abatement for some years, but they were acting without the benefit of strong and clear statutory backing. Their work, however, spelled out the problem quite vividly, and showed the need for new efforts. I am glad to see that progress on the bill is being carried out, and that the committee took such great pains in perfecting the legislation.

As the administration proposal was originally introduced, the Secretary of Transportation was merely given the discretionary authority to certify planes and engines for noise purposes. Very little was spelled out in the way of guidelines, and there were no real protections to either the airlines or the public.

The committee, in narrowing the governmental responsibility, revested the noise functions in the FAA, which is a part of the Department of Transportation. Perhaps more importantly, the committee made the authority mandatory, rather than discretionary, to assure that the job would be carried out quickly.

There are three major methods by which noise control can be effectuated. There can be new airframe and engine designs; there can be controlled land-use planning; or there can be new flight operating techniques. The approach taken by this legislation embodies only the first, and attacks the problem of aircraft noise at the source.

In connection with the noise standards to be promulgated, the Administrator is to consider all data available relating both to aircraft noise and sonic boom, he must consult with other governmental agencies, and he must consider the economic reasonableness and technological practicability of the standards. These standards are to be applied by the FAA in issuing certificates to qualifying aircraft, and broad and reasonable appeal rights are present to those denied certification. We have to relate noise abatement with safety and this must be realized by all citizens. It is not enough to simply obtain noise abatement; we must have abatement but still maintain safety standards.

Mr. Chairman, once again, I would like to give this measure my enthusiastic support. Both in the subcommittee and the full committee there was a lot of give and take on the bill. All sides were heard, their views considered, and result reached is a fair one.

I believe we should give this approach a chance to work, and hope that the House agrees.

Mr. SPRINGER. Mr. Chairman, I yield such time as he may consume to the gentleman from New York [Mr. REID].

Mr. REID of New York. Mr. Chairman, I thank the gentleman for yielding, and I rise in support of H.R. 3400, a bill requiring the administrator of the Federal Aviation Administration to prescribe and amend standards and rules for the measurement, control and abatement of aircraft noise and sonic boom.

I believe, Mr. Chairman, that this is a small but an important step forward. There is no question but what we must do significantly more to reduce aircraft noise, aircraft soot, and to provide some relief to many families who find it difficult either to sleep or to watch television or even to go out on their front porch and have a quiet conversation.

My district in Westchester County, N.Y., is very close to two of the largest and busiest airports in the Nation—LaGuardia and Kennedy—and the noise problem in certain communities on the approaches to these airports is very serious. While I have been instrumental in alleviating the difficulty to a certain degree by working out an alternate approach pattern with the Federal Aviation Administration, the problem is by no means solved.

In 1966 and again in 1967, I introduced legislation similar to the bill before us today, the principal change being that the original measures merely authorized the FAA to prescribe such rules while the present bill requires him to do so. Specifically, H.R. 3400, as amended, requires the FAA Administrator to prescribe and amend standards for the measurement of aircraft noise and sonic boom, and to prescribe and amend any necessary rules and regulations to provide for their control and abatement. The Administrator is directed to use the certification procedure as one means of applying these rules, regulations, and standards.

H.R. 3400 takes a step toward coming to grips with a problem that has long been discussed but infrequently acted upon. The responsibility for aircraft noise abatement must be borne by the carriers and the airport operators but the FAA and the Department of Transportation must see to it that they act on that responsibility. In addition, whatever we do, I believe it is equally vital that we do so fully consistent with aircraft safety.

Reduction of aircraft noise at its source, which is the intent of this legislation, cuts across the three possible solutions to the noise problem which seem most feasible: First new or modified engine and airframe designs to achieve a quieter aircraft; second, special flight operating techniques and procedures; and third land-use planning for airports consistent with low noise objectives.

Regrettably, quiet will not be achieved instantly, and in the case of New York, may be even further delayed if a fourth jetport is not built very soon, preferably to the west of the main north-south corridor. But every appropriate action must be taken by the Federal Government to work with aircraft designers, airport operators and municipal officials to provide such relief as is now possible, consistent with air safety.

Mr. STAGGERS. Mr. Chairman, I yield 4 minutes to the gentleman from Illinois [Mr. PUCINSKI].

Mr. PUCINSKI. Mr. Chairman, I am very pleased to rise in support of this legislation, and want to take this opportunity to thank the chairman, the gentleman from West Virginia [Mr. STAGGERS], for working this legislation through his committee and presenting it to the House today for final action. I hope the other body will not hesitate in approving this legislation so that this Nation can get on with the job of dealing with one of our newest problems, the horrible noise generated by jet aircraft in the vicinity of airports.

I am extremely proud to be a cosponsor of this legislation and I am happy that we have been able to arouse sufficient interest in the Congress of the United States to take affirmative action to deal with this problem.

This legislation gives the Secretary of Transportation authority to prescribe standards for measuring aircraft noise and sonic booms and to establish such rules and regulations as he may find necessary for the control and abatement of excessive jet noise and sonic booms.

This is landmark legislation.

It not only gives the Secretary the right to establish these tolerable standards, but it also gives him the right to refuse to certificate the future generation of aircraft unless they are so designed and powered by engines which will produce no more noise than the tolerable standards established by the Secretary.

Mr. Chairman, I want this House to understand the historic step that we are taking here today and I hope that this legislation will be overwhelmingly approved.

My own studies show that the lives of more than 20 million Americans living in the proximity of jet airports have been very seriously affected with the advent of our jet age.

There are more than 3 million people in the Chicago area alone who live in the immediate proximity of O'Hare Field which lies in the shadow of my district, and whose daily lives have been fantastically altered by the growing problem of jet noise.

O'Hare Field is the world's busiest airfield and handles more than 2,500 operations every 24 hours. When wind conditions require excessive use of the east-west runways at O'Hare Field, my constituents endure an unbearable noise level for hours at a time because of the arriving or departing jets. Frequently when wind conditions demand departure on the east-bound runways, thousands of my constituents are aroused from their sleep by jets taking off in the middle of the night.

There is no question that my own constituents and the rest of the 20 million

Americans who have been so adversely affected by jet noise are entitled to meaningful relief. I believe this legislation, if it is properly and sincerely administered by the Secretary of Transportation, can provide a great deal of help to the American people.

I think it is important to note that heretofore, certification of aircraft depended only on its air worthiness and safety standards. We are today introducing a *whole* new dimension which engineers and manufacturers of future aircraft will have to meet before they can have the aircraft certificated for operation within the United States. This new dimension is the problem of jet noise and sonic booms.

I have predicted here on the floor of this House time and again that unless we do something now about jet noise and sonic booms before they get out of hand the conquences will be disastrous to America. We need only look at the havoc and costly damage wreaked upon the Air Force Academy last week when a superjet caused a sonic boom over the Academy to get an example of things to come if we do not now address ourselves to the future problem of sonic booms when the supersonic transport becomes operational in the United States.

I have legislation pending which would limit supersonic aircraft operations over the continental United States at such speeds which will not produce sonic booms in excess of 1.5 pounds overpressure per square foot at ground level.

My own extensive studies show that while sonic booms of less than 1.5 pounds overpressure per square foot are troublesome, they do not produce either physical damage or psychological damage to human beings and animals in their wake.

But my studies clearly show that anything over 1.5 pounds overpressure per square foot does create serious problems both to human beings, animals, livestock, and physical properties. I hope the Secretary, under the powers being granted him in this bill, will institute a national policy forbidding flights of supersonic aircraft over our Nation at speeds which produce sonic booms in excess of 1.5 pounds overpressure per square foot.

More important, it is my hope the Secretary will announce his intentions now so that the designers and manufacturers of supersonic aircraft both in the United States and in other nations of the world, will be put on notice that if they fail to develop an air foil and powerplant which will produce no more than 1.5 pounds overpressure per square foot at supersonic speeds, they risk the prospect of not having their aircraft approved for supersonic operations within the continental United States.

Mr. Chairman, I consider this one of the most important environmental health bills to come before this Congress. The problem of jet noise has deeply and seriously had adverse effects on a vast segment of our population.

This is an international problem and I am pleased that the United States is leading the way by sponsoring the legislation here before us today.

Last year I had the privilege of sitting in on the First International Conference on Jet Noise, held in London, England. Twenty-six major nations of the world sent delegates to this very important conference. These delegates were the most knowledgeable scientists and engineers versed in the problems of aircraft operations and jet noise. One of the most encouraging aspects of this international conference was the number of representatives of aircraft manufacturers who attended the conference and actively participated in trying to find solutions to the problem of excessive jet noise and sonic booms.

It was out of this international conference that the bill which we are today considering emerged.

The most significant single recommendation made unanimously by all the nations participating was that each nation adopt rules and regulations which would permit the denial of certification to a jet aircraft which generates noise in excess of the established tolerable standards.

Mr. Chairman, I cannot impress too much on my colleagues the importance of this legislation. It reflects not only the best judgment of our own experts in this field, but it reflects also the judgment of the leading experts of the world.

I hope that we in this Chamber will adopt this legislation overwhelmingly and I hope the other nations of the world will move swiftly to adopt the same standards so that American aircraft operating within the United States and flying in and out of foreign airports as well as all foreign aircraft, will be on notice that the next generation of aircraft to come off the production lines must meet the minimum noise standards.

This legislation also enpowers the Secretary to order a retrofitting of existing jet aircraft if and when the powerplant manufacturers score a significant breakthrough in producing an engine that will substantially reduce noise at both takeoff and landing.

A tremendous effort is now being made by the big jet engine manufacturers in this country and abroad. It is my hope that they will be able to redesign the powerplant in a manner that will substantially reduce both the takeoff noise and also the afterburner whine which is so troublesome to entire communities when a jet aircraft is in its final landing approach.

Mr. Chairman, I have proposed that the airlines be given a total tax credit for every penny they spend on replacing existing powerplants with new powerplants which produce a substantial reduction in noise just as soon as such a powerplant is developed and becomes operational.

I want to give aircraft companies the widest incentive to replace their existing powerplants as quickly as possible once a more quiet engine is developed and it is for this reason that I propose the total tax credit approach so that the retrofitting programs would not cost the airlines anything but would bring substantial relief to our citizenry as quickly as possible.

Mr. Chairman, I am proud to have been a cosponsor of this bill before us and I am proud of the contribution that I personally made to the discussions in London at the international conference there. There are many of us in this Congress who have fought this problem of jet noise for a long time and we have tried time and again to impress upon our colleagues the unbearable hardships being suffered by our constituents who live in the proximity of major jet airfields.

The fact that we have this legislation before us today and will take final action on its passage is a great tribute to our perseverence. I do hope our colleagues will support us in this very important effort.

When I first began talking about excessive jet noise at O'Hare Field, I was a sort of lonely voice in the forest, because this problem did not affect many communities in America. With the advent of jets all over the country today, I may say that every major airfield is affected by jet noise.

As I said a moment ago, more than 20 million people in this country will benefit from this legislation and I urge its adoption.

Mr. STAGGERS. Mr. Chairman, I yield 3 minutes to the gentleman from New York [Mr. TENZER].

Mr. TENZER. Mr. Chairman, I rise in support of H.R. 3400, a bill to authorize aircraft noise abatement regulation.

Since I came to the Congress in January 1965, I was glad to join those called for effective Federal regulations and standards to reduce aircraft noise and bring relief to the millions of Americans who live in the shadow of the Nation's airports.

In the beginning I was told that I was "beating a dead horse"—that nothing could be done about jet noise—and that in any event, it was a local problem.

During the 89th Congress, I addressed my colleagues in the House on this subject more than 20 times. I sponsored a number of bills to accelerate research activities in reducing jet noise and providing administrative regulatory power to require the airlines to install quieter engines.

I am proud to be a cosponsor of this legislation which marks an important first step toward bringing some relief from aircraft noise.

This legislation authorizes the Administrator of the FAA to establish minimum aircraft noise standards. In consultation with the Secretary of Transportation, the Administrator may now set realistic standards and apply them in issuing or revoking flight certificates under the Federal Aviation Act.

Jet noise affects the daily lives of millions of Americans—it disrupts outdoor activities, it annoys children in the classrooms and those attending houses of worship, it affects the health of those exposed to the constant noise of aircraft, and it disrupts the sleep of those who live near the Nation's airports.

Jet noise has also resulted in hundreds of lawsuits against airport operators, airlines, and municipalities operating airports—lawsuits asking millions of dollars in damages resulting from jet noise.

By its very nature, jet noise is a national problem. The courts have struck down local ordinances prohibiting aircraft from flying below specified levels or from exceeding certain noise levels.

In August of 1965, I wrote to the Presi-

dent recommending the appointment of a Presidential Commission to study aircraft noise and recommend executive and legislative action to curb this problem. In February 1966, in his transportation message to the Congress, President Johnson recognized jet noise as a national problem and appointed a special White House task force to frame an action program to attack this problem.

As a result of the work of that task force and the comprehensive study of aircraft noise and the work of the Honorable HARLEY O. STAGGERS, the distinguished chairman of the House Committee on Interstate and Foreign Commerce and the Honorable SAMUEL N. FRIEDEL, chairman of the subcommittee which conducted the hearings and all the Members of their respective committees, the legislation before the House today was proposed.

There are many facets to the noise problem. We need:

First. Accelerated research to produce a quieter jet engine to reduce aircraft noise at its source.

Second. A revitalized program of airport planning to reduce noise over densely populated areas. We should study the possibility of diverting general aviation aircraft cargo, executive and noncommercial flights—to general aviation airfields.

Third. Programs to encourage local governments to develop improved land use planning techniques and to encourage local governments to acquire undeveloped land near airfields to be used for light industry or open space purposes.

Fourth. A study of existing airport conditions and procedures with recommendations for constructing new runways to alleviate noise.

H.R. 3400 is the first and most important step in combatting the noise problem. For some time now, I have been convinced that we already possess the technical skills to produce a quieter jet engine which would significantly reduce aircraft noise at the source.

NASA has been working on a research model for a quiet jet engine but until now, there has been no Federal authority to require the use of such a quieter engine if developed.

Under H.R. 3400 the Administrator of the FAA in consultation with the Secretary of Transportation can establish standards and require the reduction of noise where technically possible.

The legislation recognizes that air safety must be assigned a higher priority than noise abatement, but we can make substantial progress without sacrificing safety.

H.R. 3400 also recognizes that we will need Federal standards to control sonic boom. As one who has called for postponement of the development of the supersonic transport, I believe we must solve the sonic boom problem before we spend billions of dollars to place a supersonic aircraft in operation.

I have not been given the answer to my question "what would happen if a sonic boom struck a ship at sea?" I have not been satisfied that we should construct an SST to fly only over water.

H.R. 3400 will provide us with the safeguards we need if and when supersonic aircraft become operational, whether built domestically or abroad, if such aircraft does not meet the standards set.

Mr. Chairman, I urge my colleagues in the House to support H.R. 3400. Many more congressional districts in the United States will soon know the problem of jet noise. As smaller jets are produced, additional airfields will service jet aircraft. We have an obligation to act now to protect the public from this menace.

I include at this point a list of my prior statements on aircraft noise, together with views furnished to me by the Airport Operators Council on the importance of passing H.R. 3400:

January 6, 1965: Introduced H.R. 2086 to control aircraft noise and aircraft pollution.

May 6, 1965: Introduced H.R. 7981 to authorize jet noise research.

May 6, 1965: Introduced H.R. 7982 to regulate aircraft noise.

May 6, 1965: "Aircraft Noise Abatement," CONGRESSIONAL RECORD, volume 111, part 7, page 9701.

May 13, 1965: "Jet Noise—Opens the Floodgates of Litigation," daily RECORD, page A2377.

May 20, 1965: "More on Jet Noise: NASA Conference," daily RECORD, page A2533.

May 27, 1965: "More on Jet Noise—Part IV—NASA Research Program," daily RECORD, page A2718.

June 10, 1965: "More on Jet Noise—Part V—FAA Aircraft Noise Symposium," daily RECORD, page A3037.

July 8, 1965: "Jet Noise—Part VI—Hazard to the Nation's Health," daily RECORD, page A3630.

August 12, 1965: "More on Jet Noise—Part VII—Report on Noise Forum," CONGRESSIONAL RECORD, volume 111, part 15, page 20398.

August 30, 1965: "More on Jet Noise—Part VIII—Novel Test Over Long Island and Correspondence With the President," CONGRESSIONAL RECORD, volume 111, part 16, page 22277.

September 15, 1965: "The Latest on Jet Noise—Part IX," CONGRESSIONAL RECORD, volume 111, part 18, page 24020.

March 3, 1966: "President Recognizes Jet Noise Problem," CONGRESSIONAL RECORD, volume 112, part 1, pages 810–811.

March 21, 1966: "President Johnson Acts on Congressman Tenzer's Jet Noise Plea," CONGRESSIONAL RECORD, volume 112, part 5, pages 6420–6421.

May 3, 1966: "Debate on NASA Appropriation," CONGRESSIONAL RECORD, volume 112, part 8, pages 9679–9686.

July 12, 1966: "Jet Noise: A Plea for Bipartisan Support," CONGRESSIONAL RECORD, volume 112, part 12, page 15392.

August 8, 1966: "Jet Noise" (delay the Supersonic Transport), daily RECORD, page A4163.

August 24, 1966: "Debate on Department of Transportation," CONGRESSIONAL RECORD, volume 112, part 15, page 20396.

August 30, 1966: "Debate on Office of Noise Control," CONGRESSIONAL RECORD, volume 112, part 16, page 21241.

October 3, 1966: "Supersonic Transport," CONGRESSIONAL RECORD, volume 112, part 18, page 24853.

January 10, 1967: Introduced H.R. 1398 to regulate aircraft noise.

April 13, 1967: "Jet Noise: The Fight Has Just Begun," CONGRESSIONAL RECORD, volume 113, part 7, page 9116.

June 7, 1967: "President's Science Advisor Calls for Noise Abatement Legislation," CONGRESSIONAL RECORD, volume 113, part 11, page 14933.

July 11, 1967: "Executive Branch Must Act on Aircraft Noise Abatement," CONGRESSIONAL RECORD, volume 113, part 14, page 18261.

July 18, 1967: "Debate on Jet Noise and the Supersonic Transport," CONGRESSIONAL RECORD, volume 113, part 14, page 19265.

July 27, 1967: "Air Safety and Noise Abatement," CONGRESSIONAL RECORD, volume 113, part 15, pages 20575–20576.

August 18, 1967: "End Delay on Noise Abatement Legislation," CONGRESSIONAL RECORD, volume 113, part 17, page 22947.

The Airport Operators Council International, representing local public bodies which own and operate those U.S. civil airports which enplane over 85% of domestic scheduled airline passenger traffic, strongly supports prompt enactment of H.R. 3400 as amended.

Enactment of this bill, as reported to the full House by the Committee on Interstate and Foreign Commerce, is required in the public interest to make possible a tolerable environment for all U.S. citizens and to assure an orderly growth of aviation. Its specific purpose is to afford relief and protection to the public from unnecessary aircraft noise and sonic boom.

H.R. 3400 would require the Administrator of the Federal Aviation Administration to prescribe and amend standards, rules and regulations to control and abate aircraft noise and sonic boom and to apply such rules and regulations in air carrier and aircraft frame and engine manufacturers' certificates authorized by Title VI of the Federal Aviation Act of 1958. Such action is necessary for as long as there is no control over the source of the noise—the engine and the aircraft—there can be no resolution of the problem of the amount of noise an aircraft can create over populated areas. Only the Federal government can provide the incentive and authority to require reduction of aircraft noise by the development and promulgation of national noise standards, rules and regulations and their application to all aircraft through the certification process.

The only effective way to resolve the noise problem with *present aircraft* is to provide the Federal government with the authority (through enactment of H.R. 3400) to insure that *available* technology to reduce noise of *present* aircraft is uniformly required to be used by all airlines and airframe manufacturers. The aircraft manufacturers, FAA and NASA all state that significant reductions in noise are achievable *now* by sound insulation modifications to current jet engines.

The only effective way to insure that *future aircraft* are designed and built to be more compatible with our urban airport environments is to provide the Federal government with the authority (through enactment of H.R. 3400) to require that such aircraft be built in conformance with those noise levels which will be specified by the Federal government.

Passage of this bill is not intended to, nor will it, degradate flight safety in any way. The Administrator is required by H.R. 3400 to insure that any noise or sonic boom control or abatement rule or regulation ". . . is consistent with the highest degree of safety in air commerce or air transportation . . ."

While continuing to insure the utmost safety in air commerce, the U.S. Members of the Airport Operators Council International heartily support this legislation which will, for the first time, help insure a more tolerable environment for all U.S. citizens.

Mr. STAGGERS. Mr. Chairman, I wish to compliment the gentleman in the well for the work that he has done on this kind of legislation. I know that he has come to me many times, as have other Members of the Congress, to speak about this matter. The fact is there were 20

companion bills introduced, most of them identical with the bill now before the House.

Mr. TENZER had one that was somewhat different upon which he came before the committee to testify.

Mr. SPRINGER. Mr. Chairman, I yield such time as he may consume to the gentleman from Massachusetts [Mr. KEITH].

Mr. KEITH. Mr. Chairman, I rise in support of H.R. 3400, the aircraft noise abatement bill. Many of the music lovers in the Nation's Capital may fondly recall the almost pastoral atmosphere at the Watergate concerts two summers ago. At that time most of the airlines had been struck and therefore permitted one to enjoy a Beethoven symphony or a Sousa march with little or no interruption from the thunder of aircraft. It was even rumored that the conductors became so adept that they would synchronize their pauses or rests with the infrequently scheduled takeoffs and landings of airlines which were not struck.

Although H.R. 3400 is not specifically designed to bring back the peace and serenity of that brief interval 2 years ago or of the prejet age—I believe that it is an important first step at attacking the problem of aircraft noise and sonic booms. With the development of the SST, and with other advancements in aeronautical technology, the potential dangers will become even more critical. The future well-being of our citizens, and even our animals and buildings, is at stake.

H.R. 3400 provides a very constructive approach to developing standards and regulations for the control and abatement of aircraft noise. An especially desirable feature of the bill is the provision for consultation and coordination among the Federal, State, and local agencies involved in research, development, and regulation.

Significant measures have already been taken in my own State of Massachusetts at Boston's Logan International Airport. Thus the Massachusetts Port Authority and I share the belief that H.R. 3400 can be an effective complement to local programs.

Mr. SPRINGER. Mr. Chairman, I yield such time as he may consume to the gentleman from Minnesota [Mr. MACGREGOR].

Mr. MACGREGOR. Mr. Chairman, I thank the gentleman for yielding.

Mr. Chairman, I rise in support of this legislation to authorize aircraft noise abatement regulation.

Last July I introduced a bill similar to the one presently under consideration, and in November I testified before the House Committee on Interstate and Foreign Commerce in favor of legislation for the control and abatement of aircraft noise.

I support this legislation because of the very critical nature of the aircraft noise pollution problem in my own congressional district and in adjacent Minneapolis-St. Paul areas. We have in the Twin Cities Metropolitan population center one of the largest and busiest airports in the Nation. It is also one of the Nation's 15 noisiest airports.

It is clear to me, from the great volume of correspondence I have received on this problem and through firsthand observation, that Congress can no longer ignore the critical problems which noise pollution causes in metropolitan areas.

The Interstate and Foreign Commerce Committee report on H.R. 3400 lists as the three most promising ways of combating aircraft noise pollution:

First, new or modified engine and aircraft designs;

Second, special flight operating techniques and procedures; and

Third, planning for land use in areas adjacent to airports so that such land use will be most compatible with aircraft operations.

The third alternative is feasible only in cases where a completely new airport is to be built far from residential and business districts, or where the existing airport is currently located in a nonresidential, nonbusiness area. Such is not the case with the Minneapolis-St. Paul International Airport. It is located adjacent to a densely populated residential area and near business districts in Bloomington, Richfield, Edina, St. Louis Park, Minneapolis, and St. Paul. Only very limited results can be obtained from control of land use around the Minneapolis-St. Paul airport.

However, the work of the metropolitan airports commission of Minnesota is an outstanding example of what can be done to employ special flight operating techniques and procedures to lessen the effects of aircraft noise on adjacent areas. The commission has been considering these four antinoise measures: Rearrangement of airport guidelines used by pilots; a new section in the pilot procedure manual spelling out the required altitudes at various distances from the airport; a review by the FAA of departure routes; and the possibility of installing an instrument landing system allowing a pilot in his cockpit to determine how high his plane should be at various intervals during landing preparations.

The legislation currently before this House is aimed at combating aircraft noise pollution by striking directly at its source, the design and operation of the aircraft causing noise. Only the Federal Government can establish and enforce the regulations necessary to bring about the development and use of quieter engines and airframe designs.

In March of this year, I presented to the House Committee on Interstate and Foreign Commerce the statement of Mayor Stanley W. Olson of Richfield, Minn. As the first citizen of the city of Richfield, which borders the Minneapolis-St. Paul International Airport, Mayor Olson made the following request of the House:

> Please take a positive action now to stop the spread of blight and discomfort caused by a geometric increase in airport noise.
>
> I'm certain the 1.7 million citizens of the Twin Cities metropolitan area surrounding the airport and the 2.3 million more to arrive during the next 33 years will join with millions elsewhere in thanking you for favorably considering effective aircraft noise abatement.

We cannot now ignore that request. Mr. Chairman, while I urge adoption today of legislation to combat aircraft noise pollution, I hope that the Congress will take action this year on the proposal authored by Congressman FRANK BOW and by me to provide a plan for private financing in the development of the supersonic transport airplane. This aircraft promises to be the most flagrant violator of peace and quiet in aviation history through the apparently insoluble sonic boom problem. I cannot see how the Congress can claim to be acting in a reasonable and consistent manner when it with one hand advances legislation for aircraft noise abatement regulation and legislation increasing taxes and reducing Federal expenditures, and with the other hand doles out huge amounts of Federal money for development of the most noisome aircraft in history.

Mr. SPRINGER. Mr. Chairman, I yield such time as he may consume to the gentleman from Virginia [Mr. SCOTT].

Mr. SCOTT. Mr. Chairman, I thank the gentleman for yielding.

Mr. Chairman, I rise in support of the bill. I have a great number of constituents, below Alexandria in the Mount Vernon district, who write me from time to time with regard to the noise at National Airport. They are concerned about the noise of aircraft. In my opinion, this bill that will help relieve the situation as well as similar situations throughout the country.

Mr. Chairman, I urge adoption of the bill.

Mr. STAGGERS. Mr. Chairman, I yield to the gentleman from New York [Mr. ADDABBO] such time as he may consume.

Mr. ADDABBO. Mr. Chairman, I rise in support of H.R. 3400, legislation which is long overdue, and legislation which I have long advocated and was among the first to introduce.

For many, many years, even prior to the advent of the commercial jet airplane, those of us in the Congress who represent areas in which large airports are located have sought clarification of the responsibility for noise abatement and control but without success. Today we at long last have the opportunity to affirm Federal responsibility in this area and to empower the Administrator, in consultation with the Secretary of Transportation, to act.

The harassed citizens who live in the neighborhoods of these large airports have suffered for years and their complaints have been shifted from one agency to another, city, State, and Federal, never receiving any satisfactory answer. As jets came into service and commercial air traffic increased by leaps and bounds the situation continued to worsen in spite of efforts to work out landing and takeoff procedures to lessen the noise over residential communities. It is obvious that the only relief that we can expect is in the development of a quieter aircraft engine—this will come about when we can say to the aircraft manufacturers that a plane must meet established noise criteria before it will be certificated. The bill before us today requires the Federal Aviation Administrator to prescribe such criteria and to take this into consideration along with safety features in certificating the given plane.

Mr. Chairman, this has been one of the hardest fights in which I have engaged since I have been in Congress. It was in 1962 that the Committee on Interstate and Foreign Commerce was directed, through passage of a House resolution, to look thoroughly into this problem of aircraft noise and the area of responsibility for regulation. In its report, resulting from this study, the committee stated:

> Should the authority of the Federal Aviation Administrator to promulgate air traffic rules which seek to alleviate the impact of aircraft noise on persons and property on the ground be found by him to be inadequate, he should report this fact to the Congress and seek whatever additional authority is necessary to achieve that end.

Mr. Chairman, that was in February 1963. The situation today is worse than it was then—larger jets are in operation, stretchouts and SST are in the immediate future—we must act. The President in his 1966 transportation message said:

> It is clear that we must embark now on a concerted effort to alleviate the problems of aircraft noise.

Of course, I do not imply that nothing has been done in the interim, because I know that research into the problem has been underway for some years, and I have always supported such research and the funding for same. However, I do believe that this program has not been given the priority it deserves. The one essential incentive to find the answer, I believe, is the establishment of a maximum noise level which will be tolerated or approved in the certification of the aircraft, and this maximum must be low enough to make life livable for the people living in the communities near our Nation's airports.

Mr. Chairman, passage of this legislation is not going to end the noise problem, but it is an essential first step in this direction. We must insure that as our technology brings about improvements in the noise level of aircraft that these improvements will be incorporated in the planes that serve the flying public.

Mr. Chairman, a few years ago there were only a few of us who were experiencing the problems of jet aircraft noise, those of us who had the Nation's largest airports in our district—I am sure that all my colleagues know that John F. Kennedy International Airport is located in my congressional district—today more than 150 airports have jet service and it is expected that nearly 350 airports will have jet service by 1970. We can readily see that, in a very few years, any city or town with commercial air transportation will have jet transportation—this simply by reason of the rapid conversion to jet service by the airlines.

So, I say to my colleagues who may not have the problem today, you must join us in the passage of this legislation—it could well help you and your constitutents avoid many "headaches" in the future.

Mr. Chairman, as I have stated, the passage of this legislation is only the first step. There are many areas of this complex problem which require our attention, and I pledge my continuing efforts in the fight to bring to my constituents and to every American the right to enjoy the peace and tranquillity in his home to which he is entitled and to which he has every right to expect. We must insure that the clergy may give uninterrupted sermons in places of worship and that the teachers in the classrooms may give uninterrupted lessons to our children.

Mr. MINISH. Mr. Chairman, I rise in support of the aircraft noise and sonic boom control abatement bill. Aircraft noise is the neglected child among environmental problems in the United States. Perhaps the neglect is due to the relatively small number of individuals adversely affected by the problem at the present time. However, when consideration is given future prospects, one realizes we cannot repeat the disastrous course of action we undertook in allowing air and water pollution to continue unchecked for years and years. In my own area, at Newark Airport, the number of commercial flights arriving and leaving each day has increased by 64 percent over the last 10 years. Larger and more powerful planes are already on the drawing board. Hugh jetliners, now in the planning stage, such as Boeing's 747, and the supersonic transport, will be in regular service in the 1970's. The SST, as one example, will utilize three times as much thrust per passenger as subsonic aircraft and the noise nuisance increases in proportion to the increase in daily thrust at an airport location.

Mr. Chairman, experts testify that a very loud noise measuring 160 decibels will break a human being's ear drum. Already, jet engines and afterburners discharge up to 140 decibels of sound. A normal individual can experience temporary hearing damage when noise is at a level of 100 to 120 decibels, and frequent exposure to such noise will result in permanent damage to the sense of hearing. Moreover, anyone who has flown or even visited a large airport, ought to be aware of the obvious discomfort to people living in close proximity to such installations.

Effective initiative for eventually solving the problem of aircraft noise must come primarily from a source not compromised by economic interests which conflict with the welfare of the people. Under such criteria, both industry and local government are disqualified. There is only one source—the Federal Government.

Of course, the Federal Government already has assumed responsibility for many aspects of aircraft noise abatement including controls over air traffic and flight patterns. However, it is evident that these efforts, while commendable, have proved inadequate to solve the problem.

The bill before us today would authorize the Federal Aviation Administration, in addition to normal air worthiness tests, to certify aircraft on the basis of uniform noise control standards. I have no doubt that when aircraft manufacturers are compelled to cut noise levels, they will find a way to do so. Millions and millions of dollars are spent each year developing new, faster, and more luxurious planes. If only a portion of the industry's available pool of scientific talent and technical know-how were devoted to noise abatement, the problem would undoubtedly be alleviated in short order.

I urge passage of H.R. 3400 in order to make possible a more tolerable environment for all citizens.

Mr. CHARLES H. WILSON. Mr. Chairman, as a Member of Congress, who has pioneered in the introduction of various legislative remedies for the jet noise problem, I strongly support the passage today of H.R. 3400, which I cosponsored.

I represent an area, which encompasses the Los Angeles International Airport, that has been directly affected by air noise pollution. On March 19, 1968, I, along with representatives of the Inglewood Unified School District, testified before Chairman FREIDEL's Transportation and Aeronautics Subcommittee of the Interstate and Foreign Commerce Committee in favor of H.R. 3400. At that time we presented studies proving that the schoolchild of our community loses up to 50 percent of his class instruction time because of jet noise. To combat this specific problem, I have introduced H.R. 11073 amending the Federal Airport Act to provide Federal financial assistance for noise abatement with respect to schools located near public airports. The bill would allow local school districts to soundproof present classroom structures, and include soundproofing in new schoolbuildings. This proposal is just one of a series of steps I have taken to solve the jet noise problem. The substance of my other two bills, H.R. 13372 and H.R. 8309 is included in H.R. 3400. H.R. 3400 gives the Administrator of the Federal Aviation Administration, after consultation with the Secretary of Transportation, the authority to prescribe standards for the measurement of aircraft noise and sonic boooms and prescribe any rules and regulations necessary to provide for their control and abatement. H.R. 3400 also allows the Administrator to modify or suspend any certificate authorized by title VI of the Federal Aviation Act of 1958. I have also been a consistent supporter of both NASA and FAA authorizations that included funds to combat jet noise.

After this legislation is accepted by both Houses and signed by the President, I hope that the designated authorities will move very quickly to initiate the study and apply the necessary standards.

I feel that while much remains to be done in this vital area, we should not lose sight of the accomplishments of the local city officials, local boards of education, and airport administrators who are working toward a solution of the jet noise problem.

I hope we can all continue to work together, above partisanship and personal political gain, to solve this very serious problem threatening our metropolitan areas.

Mr. BROYHILL of Virginia. Mr. Chairman, I rise in support of H.R. 3400, to require aircraft noise abatement regulations, and I am particularly pleased that the committee, in its wisdom, strengthened the provisions so that such regulations would be required, not simply authorized. Action is long overdue in this field, Mr. Chairman, and I believe the urgent need for regulations de-

mands speedy action on the part of the Administrator of Federal Aviation just as soon as this measure becomes law.

As our colleagues know, Mr. Chairman, the 10th Congressional District, comprised of Arlington County, parts of Fairfax County and the city of Alexandria, is often referred to as the bedroom of the Nation's Capital. Unfortunately, it has become an increasingly noisy bedroom since the jets arrived at Washington National Airport in 1966.

The residents of my district, sandwiched between National and Dulles Airport, are vitally—and often quite vocally—concerned about the annoyance of excessive aircraft noise.

They have joined in large numbers an organization which advocates virtual abandonment of Washington National Airport and diverting all air traffic to Dulles, all because of the lack of adequate noise abatement regulation, and the apparent lack of penalty provisions for those pilots and carriers who violate existing regulations.

Never a day passes, Mr. Chairman, that I do not receive a few complaints from area residents which I faithfully refer to the Federal Aviation Administration, of violations of the FAA requirement that pilots remain on a river course for 10 miles beyond the Cabin John Bridge before turning off, and requiring southbound pilots to remain on course for 5 miles. These regulations, if strictly adhered to, would greatly relieve the residents of heavily populated areas both north and south of the noise of the planes turning over their homes.

Mr. Chairman, I believe the Civil Aeronautics Board, which has had underway for more than a year a study of the utilization of Washington National, Dulles, and Friendship, should have long ago reached the conclusion that an absolute top limit on the number of operations permitted at National should be imposed. I believe that the limit should have been 40 operations per hour in any given hour under instrument conditions and 60 operations per hour in fair weather.

Back in 1957, when the officials of the old Civil Aeronautics Authority came to us to emphasize the urgent need for a new airport at Dulles, they told us 40 operations per hour were "standard good operations" and that this could "perhaps" get up to 60, "if there were no difficulties, no delays, no communication problems and everything worked perfectly."

Today, 11 years later, after spending $110 million to build the most modern international airport in the world, we find that Washington National Airport is still handling twice as many operations as is Dulles International Airport.

The Civil Aeronautics Board, as I said before, Mr. Chairman, has been attempting to relieve the problem in the Washington metropolitan area through hearings on the use of the Washington National, Dulles International, and Friendship Airports. However, they found that their repeated attempts to reach a voluntary agreement among the air carriers, the civic parties, Government agencies and general aviation as to the solution to the problem was impossible. So they began preparing for a full-scale hearing in September of last year. Unfortunately the hearing has still not been held, because the Department of Transportation still has not "formulated its policies and procedural recommendations", whatever that means. Meanwhile, residents of Northern Virginia and parts of Washington and Maryland, whose peace and tranquillity is being disturbed in their homes by noisy jets, eagerly await the action of this House today.

Mr. Chairman, the airline industry can develop quieter jets, just as the automobile industry has developed quieter automobiles. Efforts to do so are underway, and this legislation will add impetus to industry to get on with the job.

Mr. Chairman, I urge passage of this legislation.

Mr. PATTEN. Mr. Chairman, I rise in support of H.R. 3400, a bill to authorize the Administrator of the FAA to establish minimum aircraft noise standards and sonic boom standards.

This legislation places the Congress on record as recognizing jet noise and sonic boom as national problems requiring Federal control. The residents of my congressional district and millions of others across the Nation living near airports will be protected by this authority to control the annoying problem of jet noise.

As we make progress in the field of aviation, as new airports are constructed, as smaller jet planes operate, as the supersonic transport is developed, the menace of noise and pollution of the atmosphere accelerates.

This bill, H.R. 3400, is a start in controlling these problems. Jet noise is a problem which cannot be satisfactorily met by the States or local governments. Only the Federal Government can regulate air traffic, placing air safety first and then making every effort to reduce noise.

I praise the chairman of the House Interstate and Foreign Commerce Committee and the other members of the committee for reporting this legislation and I urge my colleagues in the House to act favorably.

The people of New Jersey—those living near Newark Airport and those who may suddenly find themselves living near a new airfield must have protection. I am sure the situation is similar in the other States and H.R. 3400 is a step in the right direction.

Mr. FRASER. Mr. Chairman, I do not have to expound on the need for Federal regulation of aircraft noise. I know that my colleagues from cities with busy metropolitan airports are acutely aware of their constituents' cry for help. Our files are flooded with angry letters demanding that Congress move to silence the roar and whine of jet engines in living rooms, parks, and classrooms. Such an opportunity is now before us.

H.R. 3400 gives the FAA the same regulatory power over noise as it now has over safety. It provides for the suspension or revocation of the operator's certificate for failure to comply with noise standards. Federal regulation is clearly justified, for we simply cannot expect a profit-oriented airline to begin a potentially costly public-oriented program on its own initiative.

I realize that the din of jet aircraft cannot suddenly be ended with the passage of a law. But the time for a first step has long since arrived. Air travel is expected to triple in volume by 1975; the supersonic transport will leave in its wake a sonic boom 50 miles wide. On a coast-to-coast flight this crash could reach the ears of 20 million Americans. It is up to us to act now while the situation is still manageable.

I have here a telegram I received this morning from Mayor Arthur Naftalin, of Minneapolis, and Mayor Thomas R. Byrne, of St. Paul. It reads as follows:

MINNEAPOLIS, MINN.,
June 8.

DEAR CONGRESSMAN FRASER: The peace and welfare of the Metropolitan Minneapolis-St. Paul citizens requires passage of H.R. 3400, an aircraft noise control and abatement bill, as approved by the House Transportation and Aeronautics Committee. We urge your support in the passage of this bill when it comes up for consideration by the House of Representatives on June 10, 1968.

Sincerely yours,

ARTHUR NAFTALIN,
Mayor of Minneapolis.
THOMAS R. BYRNE,
Mayor of St. Paul.

Mr. Chairman, this is one of the most urgently needed bills before Congress. I urge its passage.

Mr. ZABLOCKI. Mr. Chairman, in its deliberations today on aircraft noise abatement legislation the House is coming to grips with one of the most pressing problems of our time. I commend Chairman STAGGERS and his Committee on Interstate and Foreign Commerce for their efforts in this matter and for bringing to the floor a meaningful and effective proposal.

My first aircraft noise abatement proposal was introduced on June 29, 1966. At that time I stated in a speech to the House that there is a dire need for Federal action in this area. It was that same conviction that prompted me to reintroduce an improved version of my proposal in the 90th Congress on January 23, 1967. That bill, H.R. 3344, is similar in many respects to the measure we are considering here today.

With the passage and ultimate enactment of this legislation this Congress will have served to preserve one of man's greatest possessions and needs—the privacy that comes from reasonable quiet.

Over the years many anguished letters have come to me from residents in the Fourth District of Wisconsin whose homes have been shaken, sleep interrupted and nerves drawn to the breaking point by the shattering roar of aircraft noise. This problem is especially acute, of course, in the vicinity of General Mitchell Field in Milwaukee.

The committee has aptly noted in its report on H.R. 3400, "at this stage of engine and aircraft development there are no easy nor ready solutions to the continuing and increasing problems" of aircraft noise and sonic boom. The fact that this bill provides the framework within which those solutions can be actively pursued, however, is encouraging.

Within this same context it is also heartening to note that aircraft and engine manufacturers are conducting their own noise research efforts. Efforts toward the development of quieter engines—without a downgrading of efficiency and

safety—must continue as a complement to this legislation. The indication that the industry will not only maintain but increase its contributions toward the common goal of noise abatement is commendable.

It is my urgent hope that the Administrator of the Federal Aviation Administration will pursue with the greatest diligence the challenge established for him and his agency in this bill. Deliberation, consultation, and research by the FAA will, of course, be needed before the full benefit of this proposal's intent and objectives are fulfilled. On behalf of the many concerned constituents who have written me on this matter, I express the hope that those objectives will be achieved soon.

Mr. FASCELL. Mr. Chairman, the growth of the air industry within the last few years has been nothing short of phenomenal. In less than a year, the number of U.S. airports served by jet airliners has increased from 110 to 150; and in the next 3 years, the total will be some 350 terminals. Noise from this jet aircraft already is plaguing thousands of people in airport neighborhoods despite years of effort by the aviation industry. This is the price of the remarkable progress which the jet engine has brought to air transportation, but it is too high a price.

People living near these airports are subjected to the most severe emotional and psychological strains to say nothing of the grave economic consequences which result from the loss of property value in such areas. As difficult as the situation now appears, with jumbo jets on the horizon, the prospects for the future are a lot worse.

For these reasons, I introduced H.R. 3400 in the first session of the 90th Congress. This bill would amend the Federal Aviation Act to require the Federal Aviation Administrator to prescribe standards of measurement, control, and abatement of aircraft noise and sonic boom. This country has long taken the lead in the rigid safety requirements imposed on the aircraft industry in the interest of passenger safety. Here is an opportunity for the United States to take the lead in another area—namely, the protection of the nonflying public.

I urge that my colleagues in the House of Representatives join with me today in the unanimous support of H.R. 3400, a measure to provide the Nation with a means for action in curbing the growing menace of aircraft noise.

Mrs. KELLY. I wish to rise in support of H.R. 3400, a bill to amend the Federal Aviation Act of 1958, to authorize aircraft noise abatement regulations and for other purposes.

I am sure that we as Members of Congress are especially aware of the fact that aviation has become an essential and widely approved part of our national transportation system. In fact increased aviation facilities have over the years allowed us to spend more time with our constituents while at the same time to be always available for our many legislative duties in the U.S. Capitol. However, aircraft noise and sonic boom have few if any champions. Both noise and sonic boom are unwanted and unpleasant. Therefore, I introduced H.R. 16977, a bill with provisions similiar to the one before us today but with certain committee amendments which I support.

H.R. 3400, as reported by the Committee on Interstate and Foreign Commerce, defines the role of the Federal Government as to control and abatement of aircraft noise and sonic boom. Its specific purpose is to afford present and future relief and protection to the public from unnecessary aircraft noise and sonic boom by authorizing the Secretary of Transportation to establish standards for the measurement of aircraft noise and sonic booms and to promulgate and enforce regulations for the control and abatement thereof.

As a Representative from a very large urban area I feel that enactment of this legislation is a necessity. It is important that aircraft and airport noise disturbances—especially where they exist close to populated areas, such as in my State of New York—be minimized as soon as possible. Mr. Chairman, the very least the Congress can do in this field is to apply the same safety standards to noise abatement and sonic boom control on the ground as we have for those traveling in aircraft.

Mr. Chairman, just recently at our Air Force Academy a number of our cadets were injured and property damage was sustained due to the sonic boom. Therefore, I believe we must take cognizance of this happening and pass this legislation which I believe will most definitely benefit and insure the safety of the general public. Today, I urge adoption by this House of H.R. 3400.

Mr. RODINO. Mr. Chairman, I am most gratified to have the opportunity to rise in support of this long overdue and most essential legislation to establish standards for the regulation of aircraft noise abatement.

The problem has been under study for almost 10 years, since hearings on aircraft noise were first held in September 1959 in New York by a subcommittee of the Interstate and Foreign Commerce Committee. Research has continued since then, but it is evident that technological advances and changes in aircraft and their operation make it imperative that we constantly review the situation.

Certainly aircraft and engine manufacturers have been seeking ways to curtail noise, for I understand that they presently support research in this area at a level of about $20 million a year. But with Federal regulation, combined with continuance of this private enterprise effort, we will be able to intensify and hopefully bring about sooner a feasible solution to this complex problem.

The basic objective of H.R. 3400 is to afford relief and protection to the public, now and in the future, from unnecessary noise from aircraft and from sonic boom. But it is not just the immediate annoyance and hardship they create which concern us. For with our increasing reliance on air transportation, it is obvious that new airports and the expansion of existing ones will be a continuing problem. It is therefore a matter of urgency to begin action at once.

As the Representative of the 10th Congressional District of New Jersey, I travel frequently by air between Washington and the Newark Airport, which is located within the confines of my district. So I am personally—and indeed most strongly—testify to the need for this measure. The lives of residents living near the airport are undoubtedly disturbed and disrupted. The adverse impact on their lives, the education of their children, and in fact their entire outlook on the world is impossible to calculate or assess.

I would like also to cite another factor which illustrates the need for enactment of H.R. 3400.

In New Jersey a new jetport has long been needed, but for a decade no agreement has been possible on a site. Establishment of noise abatement standards should help make it possible to develop a jetport proposal that would be both feasible and satisfactory to all viewpoints. In this connection, I would like to include in my remarks at this point the text of a telegram from Austin J. Tobin, executive director of the Port of New York Authority which has jurisdiction over the proposed new jetport, and an article from the Newark Sunday News commenting on the importance of this legislation.

The original site proposed for this new jetport, to serve the northern New Jersey-Metropolitan New York area, was in the great swamp area of Morris County, N.J. The incredible nature of this proposal, though probably little known outside of New Jersey, demonstrates the vital need for approval of H.R. 3400. For this great swamp area proposed as the site for a jetport is now a national wildlife refuge, and in fact, hearings have just been held on legislation sponsored by the entire New Jersey Congressional delegation which would authorize a portion of this refuge to be designated as a wilderness area.

New Jersey, the most urbanized State of the Union, desperately needs to save this priceless area of wilderness which, by some miracle, still exists in our highly industrialized and populous State.

Yet, on the other hand, because of the very fact of the importance of New Jersey in the Nation's industrial and commercial life, a new jetport is essential.

It is my hope that this measure will be of major assistance in resolving this difficult situation

Mr. Chairman, I most strongly urge approval of H.R. 3400. It will be a significant step in our effort to curb aircraft noise and in the longer range, but as yet little noted, campaign to diminish the environmental hazard of noise pollution which constitutes a growing menace to our health and safety.

In my judgment, Mr. Chairman, this legislation will represent a crucial step in our objective of improving our environment so this great Nation will be the healthy and pleasant area of our planet with which we were originally gifted.

The material mentioned above follows:

WASHINGTON, D.C.,
June 8, 1968.

Hon. PETER WALLACE RODINO, Jr.,
Washington, D.C.:

Aircraft noise and sonic boom control and abatement bill H.R. 3400 is now scheduled for consideration and vote by U.S. House of Representatives Monday June 10. In the public interest we urge your full support without any further changes in order to make possible tolerable environment for all citizens and to assure an orderly growth of aviation.

AUSTIN J. TOBIN,
Executive Director,
Port of New York Authority.

[From the Newark (N.J.) Sunday News, June 9, 1968]

JET NOISE LEGISLATION

(By Albert M. Skea)

WASHINGTON.—For the first time in aviation history, federal action is being sought to soft-pedal aircraft noise, including the clap of thunder known as the sonic boom.

Slated to come before the House of Representatives this week is an administration-backed bill which would direct the Federal Aviation Administration to establish aircraft noise limits and to set up methods for enforcing the standards.

The proposed legislation, while world-wide in its implications, is viewed as of particular interest to New Jersey for these reasons:

Establishment of strict noise abatement standards could make it "politically feasible" to locate a fourth jetport in North Jersey.

Newark Airport, which is being modernized at a cost of $250 million to serve 50 percent more passengers, would be able to continue operations as a "good neighbor"—with minimum annoyance to surrounding communities.

PORT AUTHORITY SUPPORT

The bill has been supported by the Port Authority, acting through the Airport Operators Council, International. The proposed legislation also has the backing of the Aviation Development Council, representing the major airlines serving the metropolitan area.

Federal policing of aircraft noise had been opposed by the Air Transport Association, which represents all U.S. airlines. In an interview yesterday, however, Stuart Tipton, president of ATA, said the association would now support the noise measure.

A key provision in the proposed legislation would be that its noise minimums would apply to aircraft presently in service, as well as to future aircraft. The airline industry generally has opposed setting other than future standards. The proposed bill, however, provides a safety-valve for airline financial concerns.

The bill stipulates that FAA enforcement of minimums, including the substitution of quieter engines on today's planes, should also consider whether the abatement prescription "is economically reasonable."

The airline industry has estimated it would cost between $3 and $4 million to re-equip each four-engined aircraft with advanced, less noisy powerplants. The airlines now operate about 1,000 jets.

ADDITIONAL COSTS

The Aerospace Industries Association further estimates it would cost between $600,000 and $800,000 per plane to provide noise dampening engine covers. (Aircraft noise stems both from the interaction of exhaust gases with the atmosphere and from the shrill revolutions of the internal turbines.)

As interpreted by Tipton, the House bill is a long range measure "introducing noise reduction into aircraft design." He said he was optimistic that the House, and later the Senate, would approve the bill.

Aircraft noise abatement rules have evolved around the world in response to local reactions. The Port Atuhority was in the forefront in seeking noise abatement, stipulating in 1952 that no aircraft could land at Newark, La Guardia and Kennedy airports without permission, based on noise level tests.

Other airports around the world took similar action, including bans on takeoffs aftercertain hours at night. The Port Authority, and other airport operators, maintain that quieter jet engines are technologically available. The challenge is to convince the airlines that the investment in new engines is necessary in their own and in the public interest.

SOLBERG SITE

Aircraft engine makers say little about quieter engines, apparently lest they offend their customers, the airlines.

Presumably, with federal noise abatement measures in effect, the Port Authority after a decade of searching, would be able to propose a jetport site that would be both politically and aeronautically feasible. Austin Tobin, PA executive director, has said he would accept the Hunterdon-Solberg area as a jetport site. The original choice had been the Great Swamp area of Morris County.

Support for the proposed regulation has been greatest from New York City community groups, particularly organizations in the vicinity of Kennedy International. New Jersey interest has been minimal, possibly reflecting satisfaction with, if not resignation to, Newark Airport operations.

Mr. TIERNAN. Mr. Chairman, I am pleased that the House has taken a meaningful first step in the effort to solve the deafening problem of aircraft noise and sonic boom by approving today H.R. 3400, the Aircraft Noise Abatement Act.

One of the most annoying aspects of our jet transportation age has been the increased volume of noise in population centers adjacent to our growing airports.

We live in an era of great technological advancement and change but with this progress has come the side effects of new discomforts and additional irritants.

I am hopeful that this legislation will help to bring about improvements in noise abatement methods and will eventually lead to an elimination of most of the discomfort and nuisance caused by our modern aircraft.

Mr. MILLER of Ohio. Mr. Chairman, the problem of aircraft noise is, as of today, not one of great concern to the people of my district. We do not have any of the large metropolitan type airports. We do, however, have a considerable amount of commercial air traffic passing over the district. We are obviously moving closer to the time when noise from some types of aircraft could conceivably present a problem. Commercial jets use the radio navigation facilities at Zanesville Municipal Airport on inbound flights to Port Columbus from many points in the east. This same situation is true in other parts of the district. This bill has as a main interest the measurement of aircraft noise and sonic boom. It also provides for present and future relief. Looking forward to the future, the SST aircraft now being designed could be a source of sonic boom. And that could then be of concern to citizens in any part of the Nation.

Further, the cost of the proposed legislation, adding three additional acoustical engineers, seems well within reason.

This legislation seems to me to be timely; and I wish to voice my support for H.R. 3400.

Mr. RYAN. Mr. Chairman, I support H.R. 3400 which would authorize the prescription and amendment of standards, rules, and regulations for measurement, control and abatement of aircraft noise and sonic boom.

Such legislation is long overdue, and those of us who have been pressing for noise-abatement legislation for many years greet such a bill with satisfaction. I hope that the vote will be unanimous for its passage.

However, I think it is important to note certain questions that I have as to whether or not this legislation will be effectively implemented and whether or not the seriousness of the problem is clear.

First, I commend the Committee on Interstate and Foreign Commerce for its presentation and for the improvement it has made in the administration proposal. The administration had proposed that the Secretary of Transportation be "empowered" to prescribe and amend standards and regulations. The committee version has stated that the Administrator of the Federal Aviation Administration "shall" prescribe and amend standards and regulations "in order to afford present and future relief and protection to the public from unnecessary aircraft noise and sonic boom," and has included guidelines for such action. This positive requirement is certainly a step forward in the hoped-for implementation of the aims of this legislation.

However, there is a problem here that cannot be overlooked. While the administration had proposed that the Secretary of Transportation have the responsibility for standards and regulations, the committee has assigned this responsibility to the Administrator of the FAA. The committee's reasoning in explanation of this change appears to be sound. In essence it is that since standards and regulations relating to noise problems include new engine developments and engine certification, operating flight procedures, and so forth, they may also relate to questions of air safety. Since the responsibility for safety standards rests with the Administrator of the FAA, the committee deems it appropriate for the two responsibilities to be vested in the same authority.

Yet, it may be that in vesting this responsibility in the Administrator of the FAA, the committee has placed the Administrator somewhat in a position of a conflict of interest. For example, the FAA is the body which is promoting the development of, and is responsible for certification of, the supersonic transport. The FAA has been working long and hard to see that this controversial development takes place and that the SST project is concluded with as much dispatch as possible. It has persevered in face of severe criticism from many quarters about the economic wisdom of this project and the still unanswered questions about technical feasibility. But the greatest critics—and potentially the most effective—of the SST program have been those concerned with sonic boom—who cite the SST proj-

ect as potentially if not likely intolerable to the Nation from the noise standpoint, even should it be otherwise successfully concluded. It may be that the burden upon the Administrator of FAA will be great indeed in making judgments that on the one hand should protect the public interest by restricting the growing hazard of noise pollution, and on the other hand permit the FAA to continue unimpeded prosecution of a very costly technical project—in which the government investment will be at least $5 billion—for which FAA has been the primary exponent and bears primary responsibility for success.

The committee report has cited the noise problem, generated by aircraft, as unwelcome noise—"unwanted and unpleasant." It states:

> The noise problem is basically a conflict between two groups or interests. On the one hand, there is a group who provide various air transportation services. On the other hand there is a group who live, work, and go to schools and churches in communities near airports.

I personally would have stated the problem as far more severe than that. Studies by doctors have shown that excessive noise levels are a serious hazard to physical and mental health—and aircraft noise as we know it today frequently reaches levels considered medically excessive. What is more, the amount of air traffic is increasing rapidly and the aircraft noise problem increases along with it. There are few cities, any more, of any appreciable size that do not have airports in or near their limits.

The noise problem in cities, of course, is not limited to aircraft sources. It is severe and is aggravated by many industrial processes, automobiles and other forms of transportation, workmen using machines, mechanical devices like air conditioners or television sets which exist in great profusion and close proximity, and so on.

But the greatest villain remains aircraft noise, and most cities would have to fall into the category of "a group who live, work, and go to schools and churches in communities near airports." Thus, aircraft noise is not simply a problem for an unfortunate few who happen to live near an airport, it is a serious urban problem and a severe strain on urban citizens.

If aircraft noise were the only problematical factor in the urban environment, it might possibly be tolerable as an isolated irritant to which one could hopefully become accustomed. But the various forms of irritation and environmental pollution in cities, from the air that must be breathed, through polluted rivers, overcrowded and inadequate housing and schools, excessive noise levels, transportation delays, unavailability and delays in essential services, and so forth, make it very difficult for urban residents to cope successfully with the conditions under which they must live and to meet their responsibilities with poise, dignity, and thoughtful ease. In combination with the other problems, a serious and physically irritating factor like excessive noise can become a serious hazard. Thus, nothing must be permitted to stand in the way of effective and rapid implementation of the expressed aims of this legislation.

I hope that the pending legislation will be enacted into law and that the Committee on Interstate and Foreign Commerce and the Congress at large will keep this legislation under careful review as it is administered, in order to make sure that neither conflict of interest, nor sincere but excessive concern with the financial responsibilities which lie with industry, nor excessive interest in further studies of technical problems and long leadtime technical solutions, will stand in the way of our primary purpose—to protect the public interest.

Mr. DELANEY. Mr. Chairman, legislation to authorize aircraft noise abatement regulations and certifications, as provided in H.R. 3400, is long overdue.

The fight against jet noise has been in evidence in this country since the introduction of the jet airplane by the military. The number of complaints was small at first, but the opposition by the public to aircraft noise has kept an almost even pace with the use of jet engine transports by the airline industry. In 1962 the airlines were flying 400 jet transports. As of January 1 of this year they were flying over 1,300 aircraft of this type. Since many of these aircraft fly several trips a day, the actual number of jets flying during every 24-hour period is considerably in excess of this figure. A good example of public reaction toward jet noise was demonstrated when jets began to fly into and out of Washington National Airport in April 1966. Before introduction of jets the airport had received an average of five complaints a month concerning aircraft noise, but within the first month of jet operation complaints soared to 1,100.

It seems that only those who have spent some time near major airports, such as Washington National, Kennedy International, or LaGuardia, in my own district, can really understand the physical discomfort that accompanies the repeated ear-splitting whine of jets. The residents near these major airports are greatly disturbed by this noise invasion which violently destroys the peace in their homes.

To make the noise problem worse, the demand for aviation is increasing at a faster rate than in past years. Between 1950 and 1967, the number of aircraft takeoffs and landings at the large hub airports more than tripled. The Federal Aviation Administration forecasts that aircraft takeoffs and landings at these airports are expected to increase from 20 million in 1965 to 75 million in 1980. In other words, within the next 12 years we can expect aircraft operations to almost quadruple from what they were just 3 years ago.

Further, the noise problem will be aggravated even more by the supersonic transport—SST—when it begins to fly in this country in the early 1970's. Along with engine noise, the SST will bring the sonic boom. While officials of the FAA have said that despite its hugeness the SST engines will be no louder than those engines in the jet transports today, I would hasten to point out that it is the jet engines of today which gave impetus to this legislation now being considered.

The sonic boom is a totally different type of noise which may be more unwelcome than that of the jet engine. Studies have shown that up to 25 percent of the people subjected to the sonic boom found it to be unbearable and could not learn to accept it as a continuous part of their everyday life. The seriousness of this problem is apparent when we realize that an estimated 100 million people will hear the boom each day when the SST reaches its peak growth and flies over land.

In my view, the most important part of H.R. 3400 is the provision for certification of aircraft for engine noise and for sonic boom. We are now at a point where noise abatement is second only to air safety, and certification is needed for noise and sonic boom as it is for air safety.

Certification of aircraft for noise, for instance, will give the Federal Aviation Administration the power to control noise at its source—the engine. Future aircraft engines would be designed with the lowest noise level consistent with the standards established. And, similarly, future supersonic transports would be designed for the lowest level of sonic boom.

This legislation allows the FAA to treat the problem rather than its symptoms. While certification will not solve every aspect of the aircraft noise and sonic boom problem, it will enable the Federal Government to have more control over the problem and provide alternative solutions from which to choose.

Our residents on the ground, Mr. Chairman, rightly demand in their homes a semblance of the lounging comfort which the airlines so widely advertise to be available to airline passengers flying over their homes.

H.R. 3400 will materially assist in arresting this noise invasion of our citizens homes, and I strongly urge its passage.

Mr. HALPERN. Mr. Chairman, there is no question in my mind but that H.R. 3400 is long overdue and vitally needed. Its objectives have been long-sought goals of many of us in the Congress, particularly those of us who represent areas that are plagued by the deafening, nerve-shattering, and often physically hazardous din of airplane noise. This has been one of my stanchest legislative objectives ever since I came to the House in 1959, when I introduced a series of bills aimed at this problem, including one to place the responsibility of airplane noise in the hands of the FAA. I am privileged to have sponsored legislation identical to H.R. 3400, which was introduced by the able and distinguished chairman of the Interstate and Foreign Commerce Committee.

The bill fills a legislative vacuum in airplane noise abatement by authorizing once and for all, the responsibility for setting standards to the Administrator of the FAA. This is what we have been fighting for all these years.

Acceptance of this measure, as is reflected in the House vote does not wholly resolve the problem. It is not a panacea. Far from it. It can only be as successful as its implementation.

In order for the Administrator to set effective standards for noise abatement, he must be able to command a full and

deep knowledge of the extent to which aircraft noise can be diminished.

A clear mandate to carry out all the research and development necessary to exploit to the fullest the capacities of our technology would assure that H.R. 3400 is implemented to the best advantage of our citizenry, and in the manner in which this Congress intended it to be carried out.

The lack of coordination between the research and the power to establish standards remains an unfortunate deficiency that is not resolved by this bill. It is obvious that a fuller study and more conclusive research in those areas where our knowledge is presently deficient must be carried out if this legislation is to fulfill its objectives.

Therefore, it should be apparent that this legislation is but a first, and most important step, and that further action is necessary to realize the ultimate aims of protecting the public from the anathema of plane noise.

I commend the Interstate and Foreign Commerce Committee and its able chairman, the distinguished gentleman from West Virginia [Mr. STAGGERS] for bringing forth a bill that at last sets the wheels in motion for effective aircraft noise abatement.

Mr. STAGGERS. Mr. Chairman, I have no further requests for time.

Mr. SPRINGER. Mr. Chairman, I have no further requests for time.

The CHAIRMAN. There being no further requests for time, pursuant to the rule the Clerk will read the amendment in the nature of a substitute recommended by the Committee and printed in the bill as an original bill for purposes of amendment.

The Clerk read as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That title VI of the Federal Aviation Act of 1958 (49 U.S.C. 1421–1430) is amended by adding at the end thereof the following new section:

"CONTROL AND ABATEMENT OF AIRCRAFT NOISE AND SONIC BOOM

"SEC. 611. (a) In order to afford present and future relief and protection to the public from unnecessary aircraft noise and sonic boom, the Administrator of the Federal Aviation Administration, after consultation with the Secretary of Transportation, shall prescribe and amend standards for the measurement of aircraft noise and sonic boom and shall prescribe and amend such rules and regulations as he may find necessary to provide for the control and abatement of aircraft noise and sonic boom, including the application of such standards, rules, and regulations in the issuance, amendment, modification, suspension, or revocation of any certificate authorized by this title.

"(b) In prescribing and amending standards, rules, and regulations under this section, the Administrator shall—

"(1) consider relevant available data relating to aircraft noise and sonic boom, including the results of research, development, testing, and evaluation activities conducted pursuant to this Act and the Department of Transportation Act;

"(2) consult with such Federal, State, and interstate agencies as he deems appropriate;

"(3) consider whether any proposed standard, rule, or regulation is consistent with the highest degree of safety in air commerce or air transportation in the public interest;

"(4) consider whether any proposed standard, rule, or regulation is economically reasonable, technologically practicable, and appropriate for the particular type of aircraft, aircraft engine, appliance, or certificate to which it will apply; and

"(5) consider the extent to which such standard, rule, or regulation will contribute to carrying out the purposes of this section.

"(c) In any action to amend, modify, suspend, or revoke a certificate in which violation of aircraft noise or sonic boom standards, rules, or regulations is at issue, the certificate holder shall have the same notice and appeal rights as are contained in section 609, and in any appeal to the National Transportation Safety Board, the Board may amend, modify, or reverse the order of the Administrator if it finds that control or abatement of aircraft noise or sonic boom and the public interest do not require the affirmation of such order, or that such order is not consistent with safety in air commerce or air transportation."

SEC. 2. That portion of the table of contents contained in the first section of the Federal Aviation Act of 1958 which appears under the center heading "TITLE VI—SAFETY REGULATION OF CIVIL AERONAUTICS" is amended by adding at the end thereof the following: "Sec. 611. Control and abatement of aircraft noise and sonic boom."

Mr. STAGGERS (during the reading). Mr. Chairman, I ask unanimous consent that the committee substitute amendment be considered as read, printed in the RECORD, and open to amendment at any point.

The CHAIRMAN. Is there objection to the request of the gentleman from West Virginia?

There was no objection.

Mr. WYDLER. Mr. Chairman, I move to strike the requisite number of words.

Mr. Chairman, I take this time only to put a little balance into this point that has been raised here over and over again today about the problem of airline safety.

That is obviously a very important consideration and it will be in the future for the people who are charged with enforcing this new provision, but I think unless we look at this a little bit rationally we tend to make the present resolution all but meaningless.

I fly in an aircraft every week. This week I am going to make two round trips from Washington to New York. I fly during the year constantly in aircraft. So I am obviously very much in favor of having good airline safety. But I think, unless we are very careful, we can use this whole argument as a defense for doing nothing in the entire area.

Practically anything that is done to an aircraft in its construction or in any way it is flown can be used as an argument that it increases the danger in risk to the passengers and, therefore, should not be done. For example, it would seem to me fairly obvious that adding weight onto an aircraft would reduce the safety factor. Yet the airlines seem to have no trouble in loading the planes with movie theaters and projection sets for the benefit of passengers, when the airlines think that will sell tickets for the airlines. Yet, we could make an argument that it compromises in some respect or other the safety of the passengers on the plane.

We can bring this argument almost to a ludicrous point unless we do realize that safety does have an important bearing, but it must be kept in balance in its application. We do fly planes for a number of purposes—to transport cargo or people—and we have to make sure they are built to protect the people inside the plane as well as the people on the ground who do not use the plane and have to suffer because of them.

For example, I find it impossible to understand how the airlines can get so high and mighty about the safety matters, when they are landing or taking off planes at 1-minute intervals at airports and filling the area with aircraft, losing track of them, and having near collisions all the time.

When it means they are going to make some profit from it, they do not seem to have any problem with the safety matter at all. When it comes to some place they may have to spend a little money, as to protecting the public from aircraft noise, they always scream and say, "Oh, do not compromise safety, not an iota. We might endanger some passengers in an airplane."

I just say that this Congress should take this argument somewhat with a grain of salt, when we see some of the activities of the airlines. We should make sure, when the agencies come to the writing of proper rules and regulations on protecting people on the ground, that they do not become overawed because of this safety argument.

I just point this out to my colleagues in the House, because I have heard this argument for many years and it has been used in the past as a "dodge" to avoid taking action which would cost money.

AMENDMENT OFFERED BY MR. WOLFF

Mr. WOLFF. Mr. Chairman, I offer an amendment.

The Clerk read as follows:

Amendment offered by Mr. WOLFF: On line 15, page 3, insert new subsection (b) and renumber the following subsections accordingly:

"(b) No overlights of the land areas of the United States shall be permitted any foreign or domestic commercial aircraft until the FAA administrator has been satisfied that the problem of sonic boom has been solved and its effects have been controlled."

Mr. WOLFF. First, Mr. Chairman, I should like to compliment the chairman of the full committee and the chairman of the subcommittee who proposed this legislation, which has been long overdue.

However, there seems to be in one area a very grievous problem; that is the fact that we have not, to my mind, prevented a recurrence of the situation which has developed with respect to jet noise. The public will be visited with the same type of experimentation and overflights as have occurred with jet noise, in the area of the sonic boom, but the effects will be multiplied and could even be disastrous.

In this connection I do not feel that the American public should be considered again a guinea pig, and therefore would request that all overflights of the United States and its land area be prohibited by supersonic commercial aircraft until such time as the problem of sonic boom has been solved.

Mr. PUCINSKI. Mr. Chairman, will the gentleman yield?

Mr. WOLFF. I yield to the gentleman from Illinois.

Mr. PUCINSKI. Does not the bill before us now move in that direction? It does give the Secretary the right to prescribe standards for measurement of sonic boom.

I introduced legislation earlier this year, H.R. 1110, which would prohibit flights by sonic aircraft over the continental United States at speeds generating sonic booms in excess of 1.5 pounds overpressure per square foot at ground level, because that appears to be the tolerable level. Anything over that does create excessive damage, both physically and psychologically.

I believe the bill before us does give the Secretary authority, and as a matter of fact, instructs him to address himself to determining tolerable standards and effects of sonic booms. I believe the Secretary would have the right to bar especially the French Concorde which is going to be creating booms well in excess of 2 pounds overpressure when it starts flying.

As I read this legislation, it means the Secretary will have the duty to place limitations on such flights.

Perhaps the sponsor of the bill would care to respond as to whether or not we are reading the legislation correctly.

Mr. WOLFF. Would the chairman like to answer that question?

The point I should like to establish is that perhaps the FAA administrator has the authority to do exact limits, however, my objective is to establish legislative history to instruct him to see to it that no overflights of supersonic aircraft are made until the attendant problem has been solved and the destructive quality of sonic boom has been removed.

Mr. STAGGERS. Mr. Chairman, I rise in opposition to the amendment. This amendment is at cross purposes to the bill, and I would say it should not be considered. This bill limits noise. We all want to do it, and this bill gives the authority to the Administrator to do just that. One way to stop all noise is to stop all flights. The gentleman knows we cannot do that. You and I know that.

The amendment was not considered before our committee. If the gentleman wants to propose this in the form of legislation that will be considered before our committee, we will be glad to have it. At that time we can have the experts testify on it and we will see what can be done and not just say here on the floor that this is what we want done and not know what the experts have to say about it. We had no one come up and testify on it.

As I said, this is at cross purposes with the bill.

Mr. WOLFF. Mr. Chairman, will the gentleman yield?

Mr. STAGGERS. I am glad to yield to the gentleman.

Mr. WOLFF. My amendment has nothing to do with the question of noise, Mr. Chairman. It has to do with the prevention of destruction by sonic boom. What is being attempted here is to permit the full use of aviation in this Nation not inconsistent with the public good.

Mr. STAGGERS. The gentleman does not want to tie the Administrator's hands to start off with; does he?

Mr. WOLFF. There is no attempt to do that here.

Mr. STAGGERS. Let us see what the Administrator is going to do and how he is going to do it.

Mr. Chairman, I oppose the amendment and say, as chairman of the committee, that in my opinion it is at cross purposes with the bill.

Mr. PUCINSKI. Mr. Chairman, I move to strike the last word.

Mr. Chairman, I would like to make some legislative history here so that there is no question of what we are doing.

I agree with the gentleman from New York [Mr. WOLFF] that we are heading into some very serious problems with sonic booms. We saw the effect of this at the Air Force Academy last week. An airplane flew over the academy at sonic speeds and the sonic boom did considerable damage to property. It injured some 15 people. I understand one of the colonels there had a piece of glass imbedded in his neck. I do not know his condition today, but it was reported to be very serious at the time. So there is no question but that sonic booms are something we have to deal with and we have to do this effectively before we invest $2 billion in a supersonic plane and then find out that we have invested all of this money in it and then have the people say, "Well, we now have to learn to live with sonic booms." I do not think we have to learn to live with them nor do I believe we have to accept sonic booms as the necessary product of progress.

As I read this legislation—and I am inclined to agree with the chairman—in section 611 it says, first, that the Secretary is empowered to prescribe and amend standards for the measurement of aircraft noise and sonic booms. Then it goes on to say—and this is for the legislative history which I would like to establish—this is a mandate to the Secretary—that after he has established the necessary means of measuring noise and sonic booms he will then carry out the second part of this section 611 language, which says: "and shall prescribe and amend such rules and regulations as he may find necessary to provide for the control and abatement of aircraft noise and sonic boom, including the application of such standards, rules, and regulations," and so forth. In other words, what we are doing here today is first giving the Secretary the tools with which to establish standards and to determine what is a tolerable noise level and a livable boom. Then we say after that that he is to prescribe rules and regulations to limit jet noise and sonic booms to tolerable levels. This does not say that he may, but it says that he shall prescribe rules and regulations to make sure that aircraft are so constructed and so operated that they will not exceed the maximum tolerable noise levels which studies have established.

That is the purpose of this bill, and that is why I am supporting it. I think this is the first meaningful step we have seen in this country toward dealing with a problem that affects 20 million Americans.

Mr. TENZER. Mr. Chairman, will the gentleman yield?

Mr. PUCINSKI. I yield to the gentleman from New York.

Mr. TENZER. I would like to rise to agree wholeheartedly with the gentleman from Illinois. This morning I talked with representatives of the FAA and I asked the question specifically—and I alluded to that in my statement on the floor—and I was told that the Administrator fully intended to establish these rules and regulations. Of course, I say to the committee and to other Members of Congress that it becomes our duty to watch and be sure to see that these rules and regulations are established and put into effect and to see that they are properly implemented and that if there should be other necessary amendments to the legislation, that they would be made.

Mr. PUCINSKI. This is just not another study commission. What we are doing here is amending the Aviation Act. We want to make certain that the Secretary of the Department of Transportation has a mandate to do something affirmative, something positive and meaningful about jet noise abatement and sonic boom. It is my opinion that within the structure of this legislation we will be able to do this.

Mr. WOLFF. Mr. Chairman, will the gentleman from Illinois yield to me for the purpose of propounding an inquiry to the chairman of the full committee?

Mr. PUCINSKI. I yield to the gentleman from New York.

Mr. WOLFF. Mr. Chairman, will the Concorde be able to fly in the United States and over the United States before the problem of sonic boom has been solved?

Mr. STAGGERS. The Administrator has to make that decision. That is the reason we are giving him this authority. The Congress of the United States is not going to make that decision, because there are too many complexities involved in order to do it. Therefore, we have to rely upon the Administrator.

Mr. PUCINSKI. Mr. Chairman, as I read this legislation under its provisions, if adopted, the Administrator is given the mandate and the duty to refuse to permit the Concorde to fly over the United States if it is going to generate pressures beyond tolerable limits for sonic booms. This is why I believe this legislation is very important and meaningful to all Americans and not just those who live around the large cities.

Mr. SPRINGER. Mr. Chairman, I rise in opposition to this amendment.

Mr. Chairman, I think we ought to have some background information in order that the gentleman from New York will understand it. We have held hearings on this matter several times. The Administrator does not have any idea of letting supersonic planes to which he refers fly over land. I do not anticipate flight will be allowed in the United States at this time for planes to fly at supersonic speeds over the continent of the United States. The result of that is that you would not get these civilian plane supersonic booms over land. I hope we are making this clear that when the supersonic transport comes into being, there is no thought of them flying at supersonic speeds over

land. In my opinion this represents good judgment and I do not believe that they would sit by; that is, the responsible authorities, and let the Administrator authorize them to do it.

Further, let me mention one question which might be confusing in the minds of some of the members of the Committee, and that is this incident which occurred at the Military Academy. May I say that the only airplanes on this continent which have the power to create a supersonic boom are the military aircraft and that there are no civilian aircraft flying anywhere on this continent which would create a supersonic boom. I want to be sure that that fact is clear. This now applies only to military aircraft. The damage which was sustained at the academy at Colorado Springs was done by military aircraft, over which our committee has no jurisdiction.

Mr. Chairman, what we have done here is to make sure that the Administrator has the power to delve thoroughly into this matter and, second, that he is required to come forth with rules and regulations and standards.

I might say to the gentleman from New York that our committee intends to continue to monitor this operation in order to see that the Administrator does act upon this legislation. We intend to have hearings next year and have him come before the committee and afford to us the opportunity to ask him just what has been done in this field. In other words, we do not want to just hand him this law and then do nothing about enforcement of the provisions thereof.

Mr. Chairman, I do want to disabuse any thought in the mind of the Members who are considering this legislation that the Administrator might allow a civilian aircraft capable of creating a supersonic boom to fly over a land area of the United States of America.

I hope I have clarified that issue. That is the reason I do not believe this amendment is either wise or necessary at all. The language of the amendment is very indefinite in talking about controls.

Mr. COLLIER. Mr. Chairman, I move to strike the requisite number of words.

Mr. Chairman, there is one aspect of this legislation which disturbs me, not so much for what is in the bill, but rather for what it does not say.

I would like to relate to the members of the Committee the situation that stirs up my concern. Just recently at O'Hare International Airport, which is in my congressional district, a new runway—undoubtedly necessary—was opened. At that time apparently the local school district, the local officials of the adjoining communities, and others in authority were apparently not aware of the fact that this runway had been on the drawing board, so to speak, for several years. It seems certainly shameful to me that the school district should have proceeded with the erection of a new school that will be opening its doors for the first time in September of this year. Both the takeoff and the landing path in this new runway is directly over this new school.

Mr. Chairman, I contend that someone should have the responsibility for coordinating this type of thing, it seems to me, and certainly with local school officials, so that we should not have planes taking off and landing directly over a school. Aside from the noise problem, there is also the built-in hazard to public safety.

Mr. PUCINSKI. Mr. Chairman, will the gentleman yield?

Mr. COLLIER. I yield to the gentleman from Illinois.

Mr. PUCINSKI. I thank the gentleman for yielding.

I believe the gentleman has brought up a very important point. And the strength of this legislation—and I wonder if the chairman will agree with me on this—the strength of this legislation is that it now firmly fixes the responsibility.

You know and I know that every time these citizens try to get relief from jet noise they get bounced around. The Federal people say that it is a local problem. and the local people say that it is a Federal problem. This legislation firmly and unequivocally fixes the responsibility in the hands of the Department of Transportation, so that people who now have a complaint on the very thing you are raising, that when you are raising it you will know where to go, where to take the complaint, and where to get action, and where you can seek some remedy. That is the strength in this bill.

Mr. COLLIER. But will it go so far as to place the responsibility for the proper notification of local authorities when the opening of a runway of this nature is proposed?

In other words, it is easy to say, as was said in the hearings which I arranged at the request of the school officials and the local officials out there in that district, that "my goodness gracious, this has been on the drawing boards for these many years."

But unless these people have access to those drawing boards, certainly it does not seem feasible to me that they would have proceeded with the construction of a new school had they been apprised at that time where this new runway was going to be opened. I took occasion to go out there and watch and listen to the planes landing and taking off, and could only ask myself "how in the world are they going to run classrooms in that school come next September unless something is done about such noise?"

Mr. PUCINSKI. If the gentleman will yield further, the gentleman is exactly correct, and this has been done, the airlines need additional runways. As the gentleman knows, at O'Hara Field they have four runways going at one time. And when they want additional runways they build additional runways, and the community does not know anything about it, nobody knows anything about it until it is too late for them to do anything about it, normally.

But under this legislation the Secretary of Transportation through the FAA now is held responsible and accountable, and that is the strength of the legislation.

Mr. COLLIER. They should be responsible to the community, and not be fearful of publicizing when a new runway is going to open for fear that the local community might touch off some protest that would hold up the opening.

I firmly believe that there is silence in this area for the very reason that, had officials publicly announced that this new runway would have been opened in direct line with the new school, that they could have properly anticipated protest—possibly even legal action from the community.

Mr. PUCINSKI. Mr. Chairman, will the gentleman yield?

Mr. COLLIER. I am happy to yield to the gentleman.

Mr. PUCINSKI. I might tell the gentleman that the people at O'Hare Field assured the people of that community that there would not be another runway. They told them that there would not be another runway and hearings were held and the people asked questions and the people were assured that there would not be another runway, and all of a sudden there she is.

Mr. HECHLER of West Virginia. Mr. Chairman, I move to strike out the last word.

Mr. Chairman, I support this legislation which I think is long overdue.

Mr. Chairman, I would like to take this time to commend the chairman of the full committee, my distinguished colleague from West Virginia [Mr. STAGGERS], for bringing this bill to the floor. I feel that this is an important piece of legislation which merits the unanimous support of my colleagues.

As chairman of the Subcommittee on Advanced Research and Technology of the Committee on Science and Astronautics, I have conducted hearings over the past few years which relate to the question of aircraft noise and its control. Our subcommittee, year after year, has recommended the authorization of funds beyond amounts requested in the President's budget for aircraft noise control, including advanced research on a quieter engine. For the fiscal year 1969, our subcommittee voted—and our position was sustained by the full committee and by vote of the entire House—an additional $1 million beyond the President's budget in the field of aeronautics, including aircraft noise control. The National Aeronautics and Space Administration is planning to spend about $15 million during fiscal year 1969 for aircraft noise control, and this amount may be increased as a result of the recommendation of our committee; the authorization bill is being taken up today in the other body, after which it presumably will go to conference.

I bring these facts to the attention of the Members in order to underline the importance of the pending legislation in the entire perspective of our efforts to deal with a problem of increasing concern in urban areas throughout the Nation. The rising decibels of noise from jet aircraft contributes still another strain on the nerves for urban residents.

I believe this a problem of noise pollution which deserves even more attention than it has received from the Federal Aviation Administration. One West Virginia example occurs to me immediately. The two largest cities in West Virginia, Charleston and Huntington, are located only 50 miles apart and are being joined

by an interstate highway. The proximity of these two cities, plus the fact they are fast growing toward each other, makes a regional airport midway between the cities along the interstate highway a logical development. Charleston and Huntington each now have inferior airports which will not be able to handle jet traffic, and will be too expensive to upgrade for the long future. In fact, upgrading the Charleston airport would make the citizens of that area vulnerable to jet noise immediately over the most populated areas of Kanawha County. This is an additional argument in support of further action by the FAA in encouraging the development of airports outside of heavily populated urban centers. I commend the FAA for steps already taken in this direction, which I believe serve to complement the action which is being taken through the passage of H.R. 3400.

The CHAIRMAN. The question is on the amendment offered by the gentleman from New York [Mr. WOLFF].

The amendment was rejected.

The CHAIRMAN. The question is on the committee amendment in the nature of a substitute.

The committee substitute amendment was agreed to.

The CHAIRMAN. Under the rule, the Committee rises.

Accordingly the Committee rose; and the Speaker having resumed the chair, Mr. CHARLES H. WILSON, Chairman of the Committee of the Whole House on the State of the Union, reported that that Committee, having had under consideration the bill (H.R. 3400), to amend the Federal Aviation Act of 1958 to authorize aircraft noise abatement regulation, and for other purposes, pursuant to House Resolution 1203, he reported the bill back to the House with an amendment adopted by the Committee of the Whole.

The SPEAKER. Under the rule, the previous question is ordered.

The question is on the amendment.

The amendment was agreed to.

The SPEAKER. The question is on the engrossment and third reading of the bill.

The bill was ordered to be engrossed and read a third time, and was read the third time.

The SPEAKER. The question is on the passage of the bill.

The question was taken, and the Speaker announced that the ayes appeared to have it.

Mr. TENZER. Mr. Speaker, I object to the vote on the ground that a quorum is not present and make the point of order that a quorum is not present.

The SPEAKER. Evidently a quorum is not present.

The Doorkeeper will close the doors, the Sergeant at Arms will notify absent Members, and the Clerk will call the roll.

The question was taken; and there were—yeas 312, nays 0, not voting 121, as follows:

[Roll No. 173]

YEAS—312

Abbitt	Albert	Andrews, N. Dak.
Adair	Anderson, Ill.	Arends
Adams	Anderson, Tenn.	Ashmore
Addabbo	Aspinall	Baring
Bates	Battin	Belcher
Bennett	Berry	Betts
Bevill	Blackburn	Blatnik
Boland	Bolling	Brademas
Bray	Brock	Brooks
Broomfield	Brotzman	Brown, Calif.
Brown, Mich.	Brown, Ohio	Broyhill, N.C.
Broyhill, Va.	Buchanan	Burke, Fla.
Burke, Mass.	Burleson	Burton, Calif.
Burton, Utah	Button	Byrne, Pa.
Byrnes, Wis.	Cahill	Casey
Cederberg	Celler	Chamberlain
Clancy	Clark	Clawson, Del
Cohelan	Collier	Conable
Cramer	Culver	Cunningham
Daniels	Davis, Wis.	de la Garza
Delaney	Dellenback	Denney
Devine	Dickinson	Dole
Dow	Dowdy	Downing
Duncan	Dwyer	Eckhardt
Edmondson	Edwards, Ala.	Edwards, Calif.
Edwards, La.	Eilberg	Erlenborn
Esch	Eshleman	Evans, Colo.
Everett	Fascell	Feighan
Findley	Fisher	Flood
Foley	Ford, Gerald R.	Ford, William D.
Fountain	Fraser	Friedel
Fulton, Pa.	Fulton, Tenn.	Fuqua
Galifianakis	Garmatz	Gathings
Gonzalez	Goodell	Goodling
Gray	Green, Pa.	Griffin
Griffiths	Gross	Grover
Gubser	Gude	Hagan
Haley	Hall	Halleck
Hamilton	Hammer-schmidt	Hanley
Hansen, Wash.	Harsha	Harvey
Hathaway	Hays	Hechler, W. Va.
Heckler, Mass.	Henderson	Hicks
Holifield	Horton	Hosmer
Howard	Hull	Hunt
Hutchinson	Ichord	Irwin
Jacobs	Jarman	Joelson
Johnson, Calif.	Johnson, Pa.	Jones, Mo.
Jones, N.C.	Karth	Kastenmeier
Kazen	Kee	Keith
King, Calif.	King, N.Y.	Kirwan
Kleppe	Kornegay	Kuykendall
Kyl	Laird	Langen
Latta	Leggett	Lennon
Lipscomb	Lloyd	Long, Md.
Lukens	McCarthy	McClory
McCloskey	McClure	McDade
McDonald, Mich.	McEwen	McFall
Macdonald, Mass.	MacGregor	Machen
Madden	Mahon	Mailliard
Marsh	Martin	Mathias, Calif.
Matsunaga	May	Meeds
Meskill	Miller, Calif.	Miller, Ohio
Mills	Minish	Mink
Minshall	Mize	Monagan
Montgomery	Moore	Morgan
Morse, Mass.	Morton	Mosher
Myers	Natcher	Nedzi
Nelsen	Nichols	O'Hara, Mich.
O'Konski	Olsen	Ottinger
Passman	Patman	Patten
Perkins	Pettis	Pickle
Pike	Pirnie	Poage
Poff	Pollock	Pool
Price, Ill.	Pryor	Pucinski
Purcell	Randall	Rarick
Rees	Reid, Ill.	Reid, N.Y.
Reifel	Reinecke	Reuss
Rhodes, Ariz.	Riegle	Roberts
Robison	Rodino	Rogers, Colo.
Rogers, Fla.	Rosenthal	Roth
Roush	Roybal	Rumsfeld
Ruppe	Ryan	Sandman
Saylor	Schadeberg	Scherle
Schneebeli	Schweiker	Schwengel
Scott	Selden	Shipley
Shriver	Sikes	Skubitz
Slack	Smith, Calif.	Smith, Iowa
Smith, N.Y.	Smith, Okla.	Springer
Stafford	Staggers	Steed
Steiger, Ariz.	Steiger, Wis.	Stephens
Stratton	Stubblefield	Stuckey
Sullivan	Talcott	Taylor
Teague, Calif.	Tenzer	Thompson, Ga.
Tiernan	Tunney	Udall
Ullman	Utt	Van Deerlin
Vanik	Vigorito	Waggonner
Waldie	Walker	Wampler
Watkins	Watson	Watts
Whalen	Whalley	White
Whitener	Widnall	Wiggins
Williams, Pa.	Willis	Wilson, Bob
Wilson, Charles H.	Wolff	Wyatt
Wydler	Wylie	Yates
Young	Zablocki	Zion

NAYS—0

NOT VOTING—121

Abernethy	Fallon	Murphy, Ill.
Andrews, Ala.	Farbstein	Murphy, N.Y.
Annunzio	Fino	Nix
Ashbrook	Flynt	O'Hara, Ill.
Ashley	Frelinghuysen	O'Neal, Ga.
Ayres	Gallagher	O'Neill, Mass.
Barrett	Gardner	Pelly
Bell	Gettys	Pepper
Biester	Giaimo	Philbin
Bingham	Gibbons	Podell
Blanton	Gilbert	Price, Tex.
Boggs	Green, Oreg.	Quie
Bolton	Gurney	Quillen
Bow	Halpern	Railsback
Brasco	Hanna	Resnick
Brinkley	Hansen, Idaho	Rhodes, Pa.
Bush	Hardy	Rivers
Cabell	Harrison	Ronan
Carey	Hawkins	Rooney, N.Y.
Carter	Hébert	Rooney, Pa.
Clausen, Don H.	Helstoski	Rostenkowski
Cleveland	Herlong	Roudebush
Colmer	Holland	St Germain
Conte	Hungate	St. Onge
Conyers	Jonas	Satterfield
Corbett	Jones, Ala.	Scheuer
Corman	Karsten	Sisk
Cowger	Kelly	Snyder
Curtis	Kluczynski	Stanton
Daddario	Kupferman	Taft
Davis, Ga.	Kyros	Teague, Tex.
Dawson	Landrum	Thompson, N.J.
Dent	Long, La.	Thomson, Wis.
Derwinski	McCulloch	Tuck
Diggs	McMillan	Vander Jagt
Dingell	Mathias, Md.	Whitten
Donohue	Mayne	Winn
Dorn	Michel	Wright
Dulski	Moorhead	Wyman
Evins, Tenn.	Morris, N. Mex.	Zwach
	Moss	

So the bill was passed.

The Clerk announced the following pairs:

Mr. Hungate with Mr. Ashbrook.
Mr. Dorn with Mr. Bush.
Mr. Gilbert with Mr. Carter.
Mr. Boggs with Mr. Frelinghuysen.
Mrs. Green of Oregon with Mr. Kupferman.
Mr. Annunzio with Mr. Railsback.
Mr. Satterfield with Mr. Cowger.
Mr. Corman with Mr. Don H. Clausen.
Mr. Hébert with Mr. Bell.
Mr. McMillan with Mr. Curtis.
Mr. Pepper with Mr. Biester.
Mr. Brasco with Mr. Fino.
Mr. Rooney of New York with Mr. Bow.
Mr. Teague of Texas with Mr. Derwinski.
Mr. Kluczynski with Mr. Michel.
Mr. Donohue with Mr. Conte.
Mr. Fallon with Mr. Corbett.
Mr. Herlong with Mr. Gardner.
Mr. Podell with Mr. Taft.
Mr. Rivers with Mr. Jonas.
Mr. O'Neill of Massachusetts with Mr. Ayres.
Mr. Murphy of New York with Mr. Halpern.
Mr. Landrum with Mr. Harrison.
Mr. Whitten with Mr. McCulloch.
Mrs. Kelly with Mrs. Bolton.
Mr. Gallagher with Mr. Gurney.
Mr. Dent with Mr. Hansen of Idaho.
Mr. Colmer with Mr. Snyder.
Mr. Barrett with Mr. Mathias of Maryland.
Mr. Tuck with Mr. Mayne.
Mr. Wright with Mr. Pelly.
Mr. Jones of Alabama with Mr. Price of Texas.
Mr. Long of Louisiana with Mr. Quillen.
Mr. St Germain with Mr. Quie.
Mr. Rostenkowski with Mr. Roudebush.
Mr. Hardy with Mr. Thomson of Wisconsin.
Mr. Abernethy with Mr. Winn.
Mr. Kyros with Mr. Wyman.
Mr. Diggs, Jr., with Mr. Resnick.
Mr. Gettys with Mr. Zwach.
Mr. Philbin with Mr. Vander Jagt.
Mr. Sisk with Mr. Stanton.
Mr. Andrews of Alabama with Mr. Cleveland.
Mr. Scheuer with Mr. Conyers.

Mr. Blanton with Mr. Morris of New Mexico.
Mr. Moss with Mr. Thompson of New Jersey.
Mr. Nix with Mr. Bingham.
Mr. Dulski with Mr. Gibbons.
Mr. Dawson with Mr. Helstoski.
Mr. O'Neal of Georgia with Mr. Ashley.
Mr. Brinkley with Mr. Moorhead.
Mr. Murphy of Illinois with Mr. Dingell.
Mr. Daddario with Mr. Rhodes of Pennsylvania.
Mr. Rooney of Pennsylvania with Mr. Flynt.
Mr. Evins of Tennessee with Mr. Cabell.
Mr. Carey with Mr. Giaimo.
Mr. Hanna with Mr. St. Onge.
Mr. Hawkins with Mr. Holland.
Mr. Davis of Georgia with Mr. O'Hara of Illinois.
Mr. Farbstein with Mr. Ronan.

The result of the vote was announced as above recorded.

The doors were opened.

The title was amended so as to read: "A bill to amend the Federal Aviation Act of 1958 to require aircraft noise abatement regulation, and for other purposes."

A motion to reconsider was laid on the table.

GENERAL LEAVE

Mr. STAGGERS. Mr. Speaker, I ask unanimous consent that all Members may have 5 legislative days within which to extend their remarks on the bill just passed.

The SPEAKER. Is there objection to the request of the gentleman from West Virginia?

There was no objection.

LAND CONVEYANCE, GLENDALE, ARIZ.

Mr. POAGE. Mr. Speaker, I move that the House resolve itself into the Committee of the Whole House on the State of the Union for the consideration of the bill (S. 974) to authorize the Secretary of Agriculture to convey certain lands to the city of Glendale, Ariz.

The SPEAKER. The question is on the motion offered by the gentleman from Texas.

The motion was agreed to.

IN THE COMMITTEE OF THE WHOLE

Accordingly the House resolved itself into the Committee of the Whole House on the State of the Union for the consideration of the bill S. 974, with Mr. FULTON of Tennessee in the chair.

The Clerk read the title of the bill.

By unanimous consent, the first reading of the bill was dispensed with.

The CHAIRMAN. Under the rule, the gentleman from Texas [Mr. POAGE] will be recognized for 30 minutes, and the gentleman from Oklahoma [Mr. BELCHER] will be recognized for 30 minutes.

The Chair now recognizes the gentleman from Texas [Mr. POAGE].

Mr. POAGE. Mr. Chairman, I yield myself 5 minutes.

Mr. Chairman, this is the kind of bill that oftentimes comes before this House.

Back in 1921 the people of Glendale, Ariz., conveyed 10 acres of land which was at that time out at the edge of the town, to the U.S. Government for the purpose of a poultry experiment station.

In 1933 the Government bought an additional 10 acres of land, for which it paid $4,500.

The purpose of the purchase has long since been fulfilled, and the Department of Agriculture has declared that it no longer needs this station.

The needs for research of this sort have passed in this area. The objectives have been accomplished. Only 4 percent of the chickens in the United States come from the five-State area served.

The facilities are outmoded. They are in need of costly replacement if they are to be used any longer.

The area is no longer agricultural, but urban.

Fifteen buildings were recommended for demolition in 1960. None of the buildings or laboratories are suitable for experimentation under controlled and enviromental conditions of modern scientific research.

The Department feels that it would be a great waste of public money and effort to continue this research station.

The land has, however, been pretty well surrounded by the city. It is now urban in character. This property is said to be worth as much as $140,000 and some estimates go up to $200,000 as to its value. We think these estimates are excessive.

The legislation proposes that the land should be reconveyed to the city of Glendale for use as a public park with a reservation that when it ceases to be used for such public purposes, it would revert to the United States of America.

The bill, as amended by the House committee, provides that the city of Glendale shall pay not less than $35,000 to the U.S. Government.

Now, remember, the Government has an investment of only $4,500 in the whole of the land. It is a pretty good profit to the United States in any event, and especially so when it is conveying it all for public purposes. The general practice is to convey for about $1 for public purposes. But in this case we are going to get $35,000 for something that the United States has no need whatever, and it is still to be kept in use for public purposes.

To the Committee on Agriculture this decision seems to be a sound deal and an equitable procedure, and in line with the practice which has been followed all over the United States. The Committee on Agriculture urges the passage of the bill.

Mr. JOELSON. Mr. Chairman, will the gentleman yield?

Mr. POAGE. I yield to the gentleman.

Mr. JOELSON. Mr. Chairman, do I understand the distinguished gentleman to say that the U.S. Government originally owned a great portion of this land and conveyed it?

Mr. POAGE. No; the city of Glendale, Ariz., gave the U.S. Government the original 10 acres without cost to the Government. Then some 8 or 9 years later the Government did buy an additional 10 acres and paid $4,500 for it.

Mr. JOELSON. And was that, so far as the gentleman knows, the market value at that time?

Mr. POAGE. At the time it was purchased, that was the market value. That was during the depression, incidentally.

Mr. JOELSON. But the original 10 acres or whatever it was, was an outright gift?

Mr. POAGE. That was an outright gift by the people of Glendale to the Government.

Mr. JOELSON. I see. I thank the gentleman.

Mr. GOODLING. Mr. Chairman, I think the chairman of the committee has covered the purposes of this bill very well.

I might add just a few things. Originally, as the gentleman said, this property was used for poultry research by the U.S. Department of Agriculture. Poultry is no longer an important segment of our economy in that particular area.

The buildings on this ground are old and antiquated and are no longer suited for research. The Department does not feel justified in expending a large sum of money to improve and modernize these buildings.

As the chairman said, originally the 10 acres of this land was a gift to the Federal Government from the people of Glendale, Ariz. That gift occurred in 1921. In 1933 the Federal Government acquired an additional 10 acres.

This ground is to be reported to the General Services Administration as excess property. It can only be transferred—and there was some question about this—it can only be transferred after it has been declared surplus property and when no other agency has a need for it.

I do not know whether the chairman has said this, but this ground may only be used for recreational or park purposes. If it is used for any other purpose, the ground immediately reverts to the Federal Government.

Originally the bill called for no payment for this transfer. Some of the members of the committee thought it was improper, and the bill does now call for some payment to the Federal Government.

I yield so much time as he may consume to the gentleman from Arizona [Mr. RHODES].

Mr. RHODES of Arizona. I thank the gentleman for yielding.

Mr. Chairman, I rise in support of the bill. It is a good bill. It is a fair and equitable bill.

Mr. Chairman, S. 974 should be adopted. It provides for the sale of 20 acres of land which was formerly occupied by the Southwest Poultry Experiment Station. This station has been closed.

The bill provides that no sale shall be made unless this land is declared surplus pursuant to the Federal Property and Administrative Services Act of 1949. In the event such a declaration is made, the city of Glendale, Ariz., will be allowed to buy this land for a price no less than $35,000. The sale to Glendale will be for park and recreational purposes only. In the event the use is changed, the land would revert to the United States.

Mr. Chairman, in my opinion this is a fair bill. The price of $35,000 is a fair price. It should be borne in mind that 10 acres of the 20 acres to be sold was originally given to the Federal Government without charge by the city of Glendale.

The other 10 acres was bought by the Federal Government for $4,500. Thus, on this transaction the Federal Government will show a net profit of $30,500. I submit that this is a much happier result than we usually expect from real estate transactions of the Federal Government.

Glendale is a rapidly growing city. It needs a park in the area in which this land is situated. As a matter of fact, if this land were to be disposed of in some other way, I think it would be fair to expect the city of Glendale to come to the Department of Housing and Urban Development for a grant to buy other lands in this area for park purposes. I am sure that all of the Members of the House will agree with me that the solution offered here, with its profit to the Federal Government, is better for the taxpayers of the United States than would be the alternative.

Mr. Chairman, I ask unanimous consent that the gentleman from Arizona [Mr. STEIGER] may extend his remarks at this point in the RECORD.

The CHAIRMAN. Is there objection to the request of the gentleman from Arizona?

There was no objection.

Mr. STEIGER of Arizona. Mr. Chairman, S. 974 is a bill which would authorize the Secretary of Agriculture to convey to the city of Glendale, Ariz., for public park purposes, approximately 20 acres of land which at present constitute the grounds of the Southwest Poultry Experiment Station.

This station has been closed by the Department of Agriculture and poultry research has been discontinued in this area for primarily, economical reasons.

The land is located within the city of Glendale. In 1921, prior to the establishment of the Southwest Poultry Station, the local citizens raised the money to pay for the station property. After it was purchased by these private subscriptions, it was donated to the Secretary of Agriculture for poultry research.

Later, in 1933, the Government acquired by eminent domain proceedings an addition to the grounds.

Since the Department of Agriculture no longer desires to use this property for its intended purpose, or any purpose, I would strongly urge that the property be returned to the city for public park purposes, particularly since one-half of it was donated by the citizens of the city. The mayor and the city council are anxious to develop the land.

The city badly needs park acreage. The size of the parcel is large enough and its geographical location makes it particularly valuable for these purposes.

S. 974 as amended by the Committee on Agriculture would provide for payment by the city of a sum, determined by the Secretary of no less than $35,000. There is also a reverter clause in the event the land is not used for public park or recreational purposes.

It seems patently proper that the Department of Agriculture, which is no longer able to use the land for the purposes originally donated, should return it to the citizens of the city.

I strongly urge the passage of this bill.

Mr. POAGE. Mr. Chairman, I yield as much time as he may consume to the gentleman from Arizona [Mr. UDALL].

Mr. UDALL. Mr. Chairman, the bill before us today is not the most important issue facing the Congress. It involves no expenditure of funds. It has no very far-reaching significance. But it is important to the people of Glendale, Ariz., and I believe it is clearly in the public interest to pass it.

As my colleagues know, this little bill has been brought to the floor on several previous occasions. Each time it has failed of passage. I think we all know that its defeats have resulted from controversy unrelated to its particular merits.

Mr. Chairman, I have received a letter from Senator CARL HAYDEN, the sponsor of S. 974, asking my assistance in passing this bill. Although Glendale is not in my district, I am personally familiar with the situation and strongly endorse this bill. I am pleased to join with Senator HAYDEN in asking that the bill be given consideration on its own merits today.

S. 974 has been reported favorably by the House Committee on Agriculture. It has received the customary careful scrutiny of that committee, and I know how careful that scrutiny is because I have appeared before that committee many times myself. As we see the bill today it has been amended by the committee to provide for a purchase price not to exceed $35,000, and I think we can agree that for a parcel which cost the Government $4,500 this is not an unreasonable figure, either for the Federal Government or for the city of Glendale.

The 20 acres in question, formerly used for the Southwest Poultry Experiment Station, is no longer needed by the Federal Government. It is needed by the city of Glendale for park and recreational development.

In view of all these considerations I hope my colleagues will give this bill their wholehearted endorsement and support today.

Mr. Chairman, you may know that I have circularized all of my colleagues in an effort to bring this matter to a conclusion. I have also circulated the letter I have received from Senator HAYDEN asking approval of this legislation. I should now like to read that letter into the RECORD, as follows:

U.S. SENATE,
COMMITTEE ON APPROPRIATIONS,
Washington, D.C., May 27, 1968.

Hon. MORRIS K. UDALL,
House of Representatives,
Washington, D.C.

DEAR MO: As you know, on February 5, the House failed to achieve a two-thirds majority vote on the motion to suspend the rules on S. 974, my bill to convey land to the City of Glendale, Arizona. This was the third time this bill failed of passage in the House.

I am sure you are aware of the unfortunate circumstances behind the House actions on this legislation—circumstances that have nothing whatsoever to do with the merits of the bill itself. The House leadership assisted in every way it could, and Chairman Poage took a personal interest in the bill during the floor consideration.

At this time, I feel that you can be of help and would appreciate your contacting your colleagues in the hope that you can convince them of the equities of the Glendale bill in order to have it brought up once more for passage before the 90th Congress adjourns.

With best regards, I remain

Yours very sincerely,

CARL HAYDEN.

Mr. POAGE. Mr. Chairman, I have no further requests for time.

Mr. GOODLING. Mr. Chairman, I have no further requests for time.

The CHAIRMAN. There being no further requests for time, the Clerk will read.

The Clerk read as follows:

S. 974

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, should such land become surplus property pursuant to the Federal Property and Administrative Services Act of 1949, as amended, the Secretary of Agriculture is authorized and directed to convey to the city of Glendale, Arizona, all right, title, and interest of the United States in and to those lands constituting the grounds of the Southwest Poultry Experiment Station, located in the city of Glendale, Arizona, which station has been scheduled for closing in the near future by the Department of Agriculture. The lands authorized to be conveyed by this Act, consisting of approximately twenty acres, the exact legal description of which shall be determined by the Secretary of Agriculture, shall be made only after a final determination has been made by the Secretary that such lands are no longer needed by the Department of Agriculture for poultry research purposes or for any other purpose. After such a determination has been made by the Secretary and before the conveyance of such lands is made, the Secretary shall make such disposition of improvements and facilities located on such lands as he deems to be in the best interest of the United States.

SEC. 2. The conveyance authorized by the first section of this Act shall provide that the lands so conveyed shall be used by the city of Glendale, Arizona, for public park or recreational purposes only, and if they shall ever cease to be used for such purposes the title to such lands shall revert to the United States which shall have the immediate right of reentry thereon. Such conveyance may be made subject to such other terms, conditions, and restrictions as the Secretary of Agriculture deems appropriate.

Mr. POAGE (during the reading). Mr. Chairman, I ask unanimous consent that further reading of the bill be dispensed with, and that it be considered as read, printed in the RECORD, and open to amendment at any point.

The CHAIRMAN. Is there objection to the request of the gentleman from Texas?

There was no objection.

COMMITTEE AMENDMENT

The CHAIRMAN. The Clerk will report the committee amendment.

The Clerk read as follows:

Page 1, line 6, after the word "Arizona," insert the words: "upon payment by said city of such amount as he deems appropriate, but in no event less than $35,000, giving due consideration to the public use thereof,".

The CHAIRMAN. The question is on the committee amendment.

The committee amendment was agreed to.

Mr. BENNETT. Mr. Chairman, I move to strike the last word.

The CHAIRMAN. The gentleman from Florida is recognized for 5 minutes.

Mr. BENNETT. Mr. Chairman, I take this time primarily by way of inquiry. I am chairman of the Real Estate Subcommittee of the House Armed Services Committee. When this bill came up before I had some question in my mind as to why this action was being taken because, so far as I know, it is perfectly permissible to have land revert to the Federal Government and be disposed of in the usual procedures whereby there are opportunities for local communities to come in and share under the legislation already enacted. So the purpose of my inquiry at this point is to ask, Why was not that procedure followed here? Why was not the land declared surplus so as to let the local community come in and make whatever public purpose bid it wanted to for that property?

Mr. RHODES of Arizona. Mr. Chairman, will the gentleman yield?

Mr. BENNETT. I yield to the gentleman from Arizona.

Mr. RHODES of Arizona. If the procedure my friend from Florida has outlined had been followed, the sale would have been at auction and anybody would have been eligible to bid on the piece of land, as the gentleman knows.

Mr. BENNETT. Yes; the gentleman knows that. As I understand, the law provides that a local community can come in, make certain suggestions, and be given opportunities above other people if the land is intended for a public purpose.

Mr. RHODES of Arizona. The gentleman is undoubtedly correct on the law. However, there were other matters that came into play, among them being a reluctance on the part of the General Services Administration to make the decision which would have been necessary to put this particular land into that category. They asked for congressional guidance on it. We see no reason why that guidance should not be given. The land is ideally suited for park purposes.

If the land were put up for auction, it would be impossible for the city to buy it for a limited purpose such as this for several reasons, one being the laws of the State of Arizona as to the type of payment which can be made for land under conditions such as this.

I hope my good friend from Florida will believe me when I tell him all avenues have been explored to get this land into the hands of the city of Glendale, which all of us believe is for the highest and best use.

Mr. BENNETT. Mr. Chairman, my reason is that in similar cases that have come before us, the land has been sold at its fair market value. We have had some cases like that. But this case is just to bypass the ordinary procedure of having it revert to GSA and having it be disposed of through that procedure. This is land which is worth obviously a great deal more than $35,000, and it is being made available to the city of Glendale at a price very much cheaper than other people in the United States have to pay for land like that which is sold by the Federal Government.

Mr. RHODES of Arizona. Mr. Chairman, may I differ with the gentleman as to the value of the land. As I say, ever since I have been in Congress this has been under discussion. The gentleman should bear in mind that 10 acres of this land was a gift from the city of Glendale to the Federal Government. There is a certain equity which the gentleman, I think, will not deny. We are talking about a purchase of 10 acres, not of 20 acres. This land otherwise would have to go to the highest and best use, and the highest and best use for this otherwise would be for residential purposes. The going value for residential purposes in that area is less than approximately $4,000 per acre. The price contained in this bill as a floor is a price which is in my opinion in excess of the value of the land for a limited purpose such as this, and which is about the price which would have to be paid if it were to be sold for residential purposes.

Mr. POAGE. Mr. Chairman, will the gentleman yield?

Mr. BENNETT. I yield to the gentleman from Texas.

Mr. POAGE. Mr. Chairman, I would like to point out that if the appraisal of $140,000, is divided by two, it is $70,000 for the land for which the U.S. Government paid $4,500 and the Government only bought one half of the land. We should also consider the fact that the appraisal is for a fee simple title, and we are not giving a fee simple title. There is no private owner on earth who would pay $70,000 for the right to use this for public park purposes, and there is no market even at $35,000, which is the price fixed in here as a minimum.

What we have done is that we simply assumed half the appraisal went to the land the Government bought, and that the other 10 acres is not worth more than half as much with this use limitation on it as would be a fee simple title. We get down then to $35,000 theoretically, but with no possible purchaser, because there would be no purchaser who would buy this land with those title limitations thereon—nobody except the city of Glendale which wants and needs this land for a public park.

The CHAIRMAN. The time of the gentleman from Florida has expired.

(By unanimous consent, Mr. BENNETT was allowed to proceed for 3 additional minutes.)

Mr. BENNETT. Mr. Chairman, the main reason why I stood on the floor today to speak is that, the last time this bill was up the press reported that there were some extraneous matters which caused some people to cast negative votes at that time. Certainly those matters had nothing to do with my vote. I intend to cast a negative vote today because of what I have today discussed and this was my reason for a negative vote before.

This is giving a special benefit to a local community which is not generally given to most local communities throughout the United States; because generally such land goes at the fair market value, if it has to pass through the GSA route, and the GSA route is set up in such a way as to permit the local communities to come in and make special pleas for public uses.

I would like to make straight for the RECORD that my stand with respect to my negative vote before and today is based on the fact that we are giving an advantage to this community which we do not allow to other communities generally. It might be said that there is an equity in the park purpose but that is covered by general law.

So I must say unless this bill is amended I would expect to vote against it again.

Mr. RHODES of Arizona. Mr. Chairman, I move to strike the requisite number of words.

I do not believe we should add too many more remarks about this. I should just like to say in rebuttal to the last remarks of my good friend from Florida that everything has been done which I believe properly should be done to make sure the Federal Government and the city of Glendale get a good deal on this particular matter.

I do not believe it is necessary to remind my colleagues in the Committee that the Federal Government has appropriated large sums of money for the purpose of acquiring land or allowing local communities to acquire land for park purposes. There are, in the budget for this year, appropriation requests for millions of dollars for this purpose.

Certainly, it is not too farfetched to make an analogy here. If indeed the argument of the gentleman from Florida has merit, if the city of Glendale is getting something here, then certainly it is not any more than any other city in the United States could get if a proper grant were asked for, through the Department of Housing and Urban Development, and allowed.

I will state again, that in my opinion, the appraisal for this land is completely overpriced. I am familiar with the land. I know exactly where it is. I know perfectly well if that land is worth $14,000 an acre there is an awful lot of other land around there that could be bought at that price. The price is just not that high for land in that area.

In my opinion this is a good bill. It has been worked over by all of us from Arizona. The esteemed senior Senator from Arizona is most interested in the bill. My colleagues from the second and third districts are for the bill. We feel it is absolutely necessary for this growing city to have a park in that area.

I suggest it would be utterly foolish for us to take this land, to sell it to the highest bidder, and to have the city of Glendale turn around next year and ask for a grant from HUD to buy 20 acres more of land in that area for a park. That is exactly what would happen.

Mr. POAGE. Mr. Chairman, I move to strike the last six words.

I feel that I should comment on the action of the Committee on Agriculture on this bill. I believe the implication was given that we did not give it fair and adequate consideration. I think that is contrary to the fact.

The Committee on Agriculture, like most other committees, I believe, recognizes that when a government acquires land, ofttimes there are certain equities involved. We have believed that when local communities paid for the cost of the land, that placed them in a quite differ-

ent position from the one occupied when the Government simply has gone in and purchased at the best price it could land in the community.

In this case, the circumstances of a gift apply to the first 10 acres involved. Consequently, there needed to be something more than a mere harsh application of general rules set down in the general law.

We felt that the other body was exactly correct in taking this into consideration.

Then, when there is a required special and public use for the land, as there is in this case, we felt that, too, properly required a special consideration or treatment of that land, and we took that into consideration.

Then when there is a question about the validity of an appraisal, as there clearly is in this case, we felt that this, also, justified special consideration. It does not mean appraisers are dishonest when they are out of line with what others think is a reasonable appraisal. Reasonable and honest men have differing opinions about value. Our committee felt that this appraisal sounded, on its face, to be an extremely high figure for land in a relatively small town.

Taking all those things into consideration, the committee felt the only way there could be an effective and equitable disposition of this matter was to have the Congress pass upon these matters rather than to submit it to the general procedure that it would go through if sold under auction by the General Services Administration.

Your committee felt that the other body had sent us a sound piece of legislation, but there was not any specific provision in the Senate bill as to exactly how much the Federal Government should get. We took what some called the "Morse formula," from the distinguished Senator from Oregon, and applied that. We came out with $35,000 as a minimum amount to be paid to the U.S. Government.

Now, remember this: The U.S. Government has an investment of $4,500 in this land. Only $4,500 in land. You are going to come out with a clear profit of $30,500. I submit this is a great deal better than the Government ordinarily comes out, either in special bills or in general legislation.

Mr. Chairman, I think this is a pretty good deal for the Federal Government. The Committee on Agriculture has given it pretty fair consideration. I think we tried to bring about an equitable solution for everybody involved, and I hope the House will support us on it.

The CHAIRMAN. Under the rule, the Committee rises.

Accordingly the Committee rose; and the Speaker, having resumed the chair, Mr. FULTON of Tennessee, Chairman of the Committee of the Whole House on the State of the Union, reported that that Committee, having had under consideration the bill (S. 974), to authorize the Secretary of Agriculture to convey certain lands to the city of Glendale, Ariz., pursuant to House Resolution 1191, he reported the bill back to the House with an amendment adopted by the Committee of the Whole.

The SPEAKER. Under the rule, the previous question is ordered.

The question is on the amendment.

The amendment was agreed to.

The SPEAKER. The question is on the third reading of the bill.

The bill was ordered to be read a third time, was read the third time, and passed.

A motion to reconsider was laid on the table.

GENERAL LEAVE TO EXTEND

Mr. POAGE. Mr. Speaker, I ask unanimous consent that all Members may have 5 legislative days in which to revise and extend their remarks on the bill just passed.

The SPEAKER. Is there objection to the request of the gentleman from Texas?

There was no objection.

GUN CONTROL LAW—COMMUNICATION FROM THE ATTORNEY GENERAL OF THE UNITED STATES

The SPEAKER laid before the House the following communication from the Attorney General of the United States, which was read and, together with the accompanying papers, referred to the Committee on the Judiciary:

OFFICE OF THE ATTORNEY GENERAL,
Washington, D.C., June 10, 1968.

The SPEAKER,
House of Representatives,
Washington, D.C.

DEAR MR. SPEAKER: Last week the President wrote to you stating his emphatic concern that Congress not stop with a "half-way measure," or enact a "water-down version" of a gun control law, but that it "give America the Gun Control Law it needs." The enclosed draft bill would carry out the President's request.

The proposed bill differs from Title IV of H.R. 5037, recently passed by this Congress, in two principal respects. First, it imposes restrictions on rifles and shotguns parallel to those that H.R. 5037 imposes on hand guns. These provisions prohibit mail-order purchases, sales to nonresidents, and sales to juveniles. Second, the proposed bill includes provisions to control the interstate shipment of ammunition and the sale of ammunition to juveniles, matters omitted altogether in H.R. 5037. Additionally, the draft embodies a few minor technical refinements.

By recognizing the Federal responsibility to control the indiscriminate flow of firearms and ammunition across State borders, this bill will give States and local communities the capacity and the incentive to enforce effectively their own gun control laws. Once enacted into law, it will ensure that strong local or State laws are not subverted by a deadly interstate traffic in firearms and ammunition.

The President has repeatedly urged Congress to put an end to "mail order murder," and to arrest the violence in our nation by tightening controls over firearms.

The need for immediate action can no longer be ignored. Each year 6,500 murders, 43,000 aggravated assaults, and 60,000 robberies are committed with firearms. Each day, 50 lives—more than one every half-hour—are destroyed by firearms. Since 1900, three-quarters of a million people have died in the United States by firearms, more than in all our wars. In 1967 alone, assaults with a gun rose 22%. One out of every 5 assaults is committed with a gun. Firearms are used in 58% of all robberies.

Nor is this solely a problem of hand guns. Thirty per cent of the homicides each year with firearms are by rifles or shotguns. Between 1960 and 1966, more than 95% of all law enforcement officers killed in the United States were slain with firearms, and one in four of these officers was slain by a rifle or a shotgun. A recent survey of police departments in some 40 cities over a five year period revealed that during the survey period more than 50,000 rifles and shotguns were confiscated from murderers, robbers, juvenile offenders, and others engaging in unlawful activities. Rifles and shotguns have become the chosen instruments of slaughter for snipers and assassins. Any truly effective firearms legislation simply must cover long guns as well as hand guns.

So also it is clear that controlling the distribution of ammunition is as important as regulating the sale of the firearms which use it. In previous firearms bills, including S. 1592 introduced in the last Congress, the President has urged inclusion of ammunition. With an estimated 50 million firearms now privately owned in the Nation, the control of the ammunition they fire is crucial to controlling the abuse of these weapons.

The people of this country have indicated overwhelmingly that they want immediate Federal controls over all kinds of firearms. We have debated the issue beyond reason. The increasing number of violent crimes committed with firearms and the tragic events of the last few months have made it abundantly clear that Congress must act now to help prevent further violence.

The proposed bill is substantially similar to a number of bills sent to the Congress by the President and considered by both chambers during the past two Congresses. These include S. 1592, H.R. 6628 and H.R. 6783 of the 89th Congress, and S. 1—Amendment 90 and H.R. 5384 of the 90th Congress.

The Senate Commerce Committee held two months of hearings on firearms control in 1963 and 1964. The Senate Juvenile Delinquency Subcommittee held hearings on firearms bills in 1963, and again in 1964, 1965, and 1967. The House Judiciary Committee has held hearings on this matter at length in 1965 and again in 1967.

In light of this extensive background, and at the request of the President, I urge the Congress to give immediate consideration to this extremely important legislation. There must be action now, before the Congress adjourns. While the time is short before adjournment, so also is the time short for the country to move to control the principal weapon of crime—the gun.

Sincerely,

RAMSEY CLARK,
Attorney General.

CONGRESSMAN McCARTHY ASSAILS NATIONAL RIFLE ASSOCIATION ARGUMENTS AGAINST STRICT GUN LAW

Mr. McCARTHY. Mr. Speaker, I ask unanimous consent to address the House for 1 minute, to revise and extend my remarks, and to include extraneous matter.

The SPEAKER. Is there objection to the request of the gentleman from New York?

There was no objection.

Mr. McCARTHY. Mr. Speaker, in the New York Times of Saturday, June 8, the president of the National Rifle Association, Harold W. Glassen, advanced a number of arguments against gun control legislation. I would like to take these one by one and answer them.

First, Mr. Glassen said:

The simple fact is there is no gun control law that the mind of man could conceive that would have had the slightest effect in

preventing any of the assassinations of our day.

This is false.

The original gun control bill introduced by the gentleman from New York [Mr. CELLER], and other Members including myself, would ban the interstate mail-order sales of rifles and shotguns as well as handguns. Lee Harvey Oswald clipped out a coupon from the National Rifle Association's official publications, the American Rifleman, mailed it to a mail-order gun house in Chicago and received through the mails the rifle that killed President John F. Kennedy. If the Celler bill had been law at the time Oswald acted, he would have been unable to obtain this weapon through the mails.

Second, Mr. Glassen disputed:

all this talk about the gun lobby is baloney * * * we have yet to spend 1 single dollar on lobbying; we have never hired a lobbyist.

Who is spreading baloney?

Does anyone in this Chamber really believe that the National Rifle Association is not one of the most powerful and effective lobbying organizations in the United States today? The NRA does not have to hire lobbyists in the technical sense. It has active members right in this Chamber. In the May 1967 issue of the American Rifleman, an ad soliciting new members stated that one of the purposes of the association was to speak with a strong voice on gun legislation. The dues requested from new members, the ad emphasized, would be used to support this effort. In addition, the NRA's legislative and public affairs division spent almost $454,000 in 1966. This total did not include $113,000 listed for "public relations" campaigning costs. Because the association is tax exempt, it generates tremendous capital for its antigun law efforts. Some 28 percent, or $1,356,000, of its 1966 income came from gun, ammunition, and sporting goods manufacturers advertisements in the American Rifleman. No tax was paid on this tremendous revenue because it is exempt from taxes as a "social welfare" organization.

Third. Mr. Glassen also declared:

There is no correlation whatever between the proliferation of firearms and crime . . . tight gun control laws wouldn't prevent or reduce homicides.

Let us take the case of Japan, with about half the population of the United States. In Japan in 1962, where they have a very strict gun law, there were only 37 firearms murders in 1962. By contrast, in the United States, there were 4,954 homicides by firearms that year.

Today guns are involved in more than 6,500 murders each year in the United States. This compares with 30 in England and 68 in West Germany. Both these countries have strict gun control laws.

Fourth. Mr. Glassen did say:

We agree with the Administration that firearms are not for everyone. We support legislation barring the sale of guns to juveniles, to delinquents, to drug addicts and convicts.

But this claim flies in the face of the fact of the NRA's consistent opposition to restrictions on the mail-order sales of firearms. Obviously, any juvenile, drug addict, or convict can—with very little difficulty—order any weapon he wants through the mails, just like Oswald did.

Fifth. Groping for another argument against strict firearms legislation, Mr. Glassen observed that such items as a dictating machine, a telephone, a picture frame could be used to kill a person.

The truth is that the average killer prefers a gun to any other weapon. Of the 33 Americans murdered each day last year, nearly two out of three were murdered with guns. More than 80 percent of the killers who used a gun had criminal records. As a matter of fact, they had an average of six arrests over a 10-year period prior to the murder. In 74 percent of the cases, the killer and the victim were either friends, relatives, or acquaintances; 84 percent of the murders stemmed directly from an argument or a lover's quarrel. The average person who committed murder in the United States last year had a gun handy when the rage to kill overtook him. It is clear that the mere availability of a lethal weapon increases the likelihood of a fatal crime of violence.

Sixth. Glassen asserted:

Let's not punish 40 million American sportsmen because of the fact that there are some kooks in America today.

Nobody is talking about punishing anybody. Perhaps the laws I advocate would inconvenience gun manufacturers and gunowners. But then we must also consider the "inconvenience" that the Nation's previous apathy has cost the families of John F. Kennedy, Martin Luther King, and Robert F. Kennedy.

BISHOP ROBERT E. TRACY OF BATON ROUGE

Mr. RARICK. Mr. Speaker, I ask unanimous consent to address the House for 1 minute, to revise and extend my remarks, and to include extraneous matter.

The SPEAKER. Is there objection to the request of the gentleman from Louisiana?

There was no objection.

Mr. RARICK. Mr. Speaker, there have been many statements expressing the sympathy of the American people regarding the tragic events of the past week, as well as prayerful exclamation that we reevaluate our individual commitments to rid our environment of the forces which induce violence.

Probably no one has expressed the public feeling better than the beloved and highly respected bishop of Baton Rouge—Bishop Robert E. Tracy.

I am honored to insert Bishop Tracy's statement on the death of Senator Robert F. Kennedy at this point in the RECORD:

STATEMENT OF BISHOP ROBERT E. TRACY, OF BATON ROUGE, ON THE DEATH OF SENATOR ROBERT F. KENNEDY

In this tragic hour, there comes to us a rush of thoughts—of horror, of inestimable loss, of sympathy for the bereaved, and of unspeakable national grief over the death of Senator Robert F. Kennedy.

And there are apprehensions too: about the sorrow that the Kennedy family must now face once more, in its long history of affliction; and about the impact on the nation of the recent slayings of so many high-minded leaders, cut down in their young manhood, just when they were giving to their country their greatest promise of sterling, vigorous service.

But there is consolation also: for even though we humans must all walk a daily tightrope between security and tragedy, our lives are still in the hands of God who, in the end, is able to bring good out of the most unfortunate accidents and the most devastating tragedies.

Hence, in this hour of bewilderment and grief, we turn to God in prayer, for we know that, without Him, not a sparrow falls from the skies nor a single lily adorns the fields.

Let us retire, now, into our hearts and pray. And then let us arise, as a nation, to carry on the work of justice and love and compassion which cries out so agonizingly for our attention.

May God be good to the gallant young leader who was Robert F. Kennedy!

And may we remember him in our common observances and in our private prayers.

But, above all, let us strive to understand and correct the injustices, the discrimination and the corroding immorality among us which induce this awful climate of violence and against which Robert Kennedy and John Kennedy, during their lives, so mightily contended.

A NEW TRADE BILL

Mr. WATSON. Mr. Speaker, I ask unanimous consent to address the House for 1 minute, to revise and extend my remarks, and to include pertinent material.

The SPEAKER. Is there objection to the request of the gentleman from South Carolina?

There was no objection.

Mr. WATSON. Mr. Speaker, despite strong congressional reaction to last summer's Kennedy round of trade agreements, the President's new trade message offers no consolation to domestic industries who are being crippled by foreign imports.

Since the United States decided to shift from bilateral to multilateral trade negotiations and agreements by joining the organization known as the General Agreement on Tariffs and Trade, literally hundreds of bills have been introduced to limit imports which undersell similar domestically produced commodities.

Invariably these protectionist bills are designed to control imports on single items. In fact, last year almost 200 bills were introduced in this body to restrict imports on textiles alone. Hundreds of other related trade bills were submitted to cut imports on everything from wristwatches to dairy products.

Mr. Speaker, although I have sponsored import quota legislation on various individual commodities, I have consistently urged that the entire spectrum of U.S. trade policy should be carefully examined by Congress in order to find an adequate solution to the import problem. In my judgment the best method to accomplish this would be through a comprehensive or omnibus trade bill that would regulate imports on a number of items.

Practically every major American industry is feeling the adverse effect of foreign imports. The implications of the import problem are very clear. They in-

clude the loss of jobs for American workers, an increase in the balance-of-payments deficit, and the dependence of our national defense upon the friendliness of foreign nations.

One method suggested by several of our colleagues is to establish import ceilings on various products. Under this plan, imports would increase or drop back on the basis of domestic consumption. This flexible approach would assure foreign nations of participating in the American market on a more equitable basis which at the same time it would protect domestic industries from heavy imports.

Of course, in a worldwide industry where overcapacity situations are often created, the foreign producer enjoys the right of dumping his incremental volume into the most generous and useful market available, the United States. We do have antidumping laws to restrict this practice, however nothing is being done to enforce them.

Mr. Speaker, our distinguished colleague, the gentleman from Florida [Mr. HERLONG], explained the various provisions of the import ceiling bill in remarks which appeared in the RECORD May 7. After carefully examining this bill and the laudable objective it seeks to attain, I am convinced that it offers one of the most realistic approaches to the problem of imports, since the beginning of the Kennedy round in 1962. Accordingly, it is indeed an honor for me to join my colleagues today in introducing this bill.

Unless Congress takes command to redefine U.S. trade policy with a view toward protecting domestic industries, I fear that there is going to be a substantial decrease in our industrial superiority among the nations of the world. I believe there is sufficient interest in Congress to resist the trend of exporting jobs, and for this reason I am hopeful that a bill of this type will gain approval during this session of Congress.

A STIRRING TRIBUTE

Mr. BOLAND. Mr. Speaker, I ask unanimous consent to address the House for 1 minute, to revise and extend my remarks, and to include extraneous matter.

The SPEAKER. Is there objection to the request of the gentleman from Massachusetts?

There was no objection.

Mr. BOLAND. Mr. Speaker, the stirring eulogy Senator EDWARD M. KENNEDY has given for his brother makes clear the qualities that have enabled the Kennedys to bear their public successes and private tragedies with equal grace. Among these family hallmarks are a profound love for one another, an equally profound loyalty, a sense of purpose in life, and a conviction that one must do his best in any task no matter how unfavorable the odds.

Senator KENNEDY's tribute to his slain brother is more than a statement of one man's love for another, more than a statement of solace for a grieving nation. It is an affirmation that the goals sought by Robert Francis Kennedy, and by John Fitzgerald Kennedy before him, have not died with these two remarkable men.

The text of Senator KENNEDY's eulogy:

Your Eminence, Your Eminences, Mr. President, on behalf of Mrs. Robert Kennedy, her children and the parents and sisters of Robert Kennedy, I want to express what we feel to those who mourn with us today in this Cathedral and around the world.

We loved him as a brother and father and as a son. From his parents, and from his older brothers and sisters—Joe and Kathleen, Jack—he received inspiration which he passed on to all of us. He gave us strength in time of trouble, wisdom in time of uncertainty, and sharing in time of happiness. He will always be by our side.

Love is not an easy feeling to put into words. Nor is loyalty or trust or joy. But he was all of these. He loved life completely and he lived it intensely.

WORDS ON FATHER RECALLED

A few years back, Robert Kennedy wrote some words about his own father which expresses the way we in his family feel about him. He said of what his father meant to him:

"What it really all adds up to is love—not love as it is described with such facility in popular magazines, but the kind of love that is affection and respect, order, encouragement, and support. Our awareness of this was an incalculable source of strength, because real love is something unselfish and involves sacrifice and giving we could not help but profit from it."

And he continued:

"Beneath it all, he has tried to engender a social conscience. There were wrongs which needed attention. There were people who were poor and who needed help. And we have a responsibility to them and to this country. Through no virtues and accomplishments of our own, we have been fortunate enough to be born in the United States under the most comfortable conditions. We, therefore, have a responsibility to others who are less well off."

APPEAL TO JUSTICE, COMPASSION

That is what Robert Kennedy was given. What he leaves to us is what he said, what he did and what he stood for. A speech he made to the young people of South Africa on their Day of Affirmation in 1966 sums it up the best, and I would read it now:

"There is discrimination in this world and slavery and slaughter and starvation. Governments repress their people; millions are trapped in poverty while the nation grows rich; and wealth is lavished on armaments everywhere.

"These are differing evils, but they are the common works of man. They reflect the imperfection of human justice, the inadequacy of human compassion, our lack of sensibility toward the sufferings of our fellows.

"But we can perhaps remember—even if only for a time—that those who live with us are our brothers, that they share with us the same short moment of life; that they seek—as we do—nothing but the chance to live out their lives in purpose and happiness, winning what satisfaction and fulfillment they can.

"Surely this bond of common faith, this bond of a common goal, can begin to teach us something. Surely we can learn, at least, to look at those around us as fellow men. And surely we can begin to work a little harder to bind up the wounds among us and to become in our own hearts brothers and countrymen once again.

OBSOLETE DOGMA AND CHANGE

"The answer is to rely on youth—not a time of life but a state of mind, a temper of the will, a quality of imagination, a predominance of courage over timidity, of the appetite for adventure over the love of ease. The cruelties and obstacles of this swiftly changing planet will not yield to the obsolete dogmas and outworn slogans. They cannot be moved by those who cling to a present that is already dying, who prefer the illusion of security to the excitement and danger that come with even the most peaceful progress. It is a revolutionary world we live in; and this generation, at home and around the world, has had thrust upon it a greater burden of responsibility than any generation that has ever lived.

"Some believe there is nothing one man or one woman can do against the enormous array of the world's ills. Yet many of the world's great movements, of thought and action, have flowed from the work of a single man. A young monk began the Protestant reformation, a young general extended an empire from Macedonia to the borders of the earth, and a young woman reclaimed the territory of France. It was a young Italian explorer who discovered the New World, and the thirty-two-year-old Thomas Jefferson who proclaimed that all men are created equal.

"These men moved the world, and so can we all. Few will have the greatness to bend history itself, but each of us can work to change a small portion of events, and in the total of all those acts will be written the history of this generation. It is from numberless diverse acts of courage and belief that human history is shaped. Each time a man stands up for an ideal, or acts to improve the lot of others, or strikes out against injustice, he sends forth a tiny ripple of hope, and crossing each other from a million different centers of energy and daring those ripples build a current that can sweep down the mightiest walls of oppression and resistance.

MORAL COURAGE CALLED RARE

"Few are willing to brave the disapproval of their fellows, the censure of their colleagues, the wrath of their society. Moral courage is a rarer commodity than bravery in battle or great intelligence. Yet it is the one essential, vital quality for those who seek to change a world that yields most painfully to change. And I believe that in this generation those with the courage to enter the moral conflict will find themselves with companions in every corner of the globe.

"For the fortunate among us, there is the temptation to follow the easy and familiar paths of personal ambition and financial success so grandly spread before those who enjoy the privilege of education. But that is not the road history has marked out for us. Like it or not, we live in times of danger and uncertainty. But they are also more open to the creative energy of men than any other time in history. All of us will ultimately be judged and as the years pass we will surely judge ourselves, on the effort we have contributed to building a new world society and the extent to which our ideals and goals have shaped that effort.

"Our future may lie beyond our vision, but is not completely beyond our control. It is the shaping impulse of America that neither fate nor nature nor the irresistible tides of history, but the work of our own hands, matched to reason and principle, that will determine our destiny. There is pride in that, even arrogance, but there is also experience and truth. In any event, it is the only way we can live."

A GOOD AND DECENT MAN

That is the way he lived. And that is what he leaves us. My brother need not be idealized, or enlarged in death beyond what he was in life, to be remembered simply as a good and decent man, who saw wrong and tried to right it, saw suffering and tried to heal it, saw war and tried to stop it.

Those of us who loved him and who take him to his rest today, pray that what he was to us and what he wished for others will some day come to pass for all the world.

As he said many times, in many parts of this Nation, to those he touched and who sought to touch him:

"Some men see things as they are and say why.
I dream things that never were and say why not."

IMPROVED AIRLINE SERVICE FOR THE QUAD-CITY AREA IN ILLINOIS AND IOWA

Mr. RAILSBACK. Mr. Speaker, I ask unanimous consent to address the House for 1 minute and to revise and extend my remarks.

The SPEAKER. Is there objection to the request of the gentleman from Illinois?

There was no objection.

Mr. RAILSBACK. Mr. Speaker, this week the Civil Aeronautics Board will conduct hearings to consider the matter of improved airline service for the quad-city area in Illinois and Iowa. This area is equivalent in population and commercial activity to a city of approximately a quarter of a million persons and includes the cities of Rock Island, Milan, Silvis, East Moline, and Moline, Ill., and Davenport, and Bettendorf, Iowa. All of the municipal governments and chambers of commerce in this area are seeking nonstop service between the Quad-City Airport and Washington, D.C., and New York City.

In addition to the unanimous action taken by all of the cities in the area, the Department of Defense has conducted a study on behalf of its agencies located in the quad-city area; namely, the U.S. Army Weapons Command, the Rock Island Arsenal, the Army Management Engineering Training Agency, the Production Equipment Agency, the USAMC Installation and Service Agency, and the Rock Island district of the Corps of Engineers. The research has found that there are more than 1,500 flights a year by members of the Department from this area to Washington. Furthermore, the study has shown that traveltime to Washington could be cut by 48 percent if nonstop service were instituted. This saving in time to Government personnel alone is worthy of serious consideration.

The proposal which the Board will consider is for single-plane service between the quad cities and Washington, and, also, New York with one stop in Peoria, Ill. While direct, nonstop service would be most desirable, this plan would certainly be an improvement over the current situation whereby a traveler must change planes in Chicago, frequently experiencing a layover, before continuing on to his destination.

The tremendous continuing growth of population and governmental and commercial importance in the quad-city area would be greatly assisted by improved airline service to and from Washington and New York. I share the hope of the communities of the area that our efforts will be successful for an early inauguration of direct air service between the Quad-City Airport and the cities of Washington and New York.

U.S. GROUP TO THE INTERPARLIAMENTARY UNION

The SPEAKER pro tempore (Mr. NEDZI). Under previous order of the House the gentleman from New York [Mr. PIRNIE] is recognized for 60 minutes.

Mr. PIRNIE. Mr. Speaker, I ask unanimous consent to revise and extend my remarks and to include extraneous matter.

The SPEAKER pro tempore. Is there objection to the request of the gentleman from New York?

There was no objection.

Mr. PIRNIE. Mr. Speaker, as president of the U.S. group to the Interparliamentary Union, it is my privilege at this time to report to the Congress on the spring planning conference of the world's oldest international organization of parliamentarians.

During the period April 15–21, representatives of parliamentary institutions from all over the world convened in the National Assembly in Dakar, Senegal, to discuss a variety of complex international issues. The range and importance of the topics covered by the 224 delegates from 55 nations were considerable.

There was a free exchange of ideas and information and I am confident that every delegate returned from our mission to Africa better equipped to more effectively discharge our legislative responsibilities as the result of participating in such a valuable and enlightening conference. I shall expand upon this theme in a moment, but first I wish to list the other members of our delegation:

Senator GORDON ALLOTT, of Colorado, member of the Interparliamentary Union Council; Representative EMILIO Q. DADDARIO, of Connecticut, member of the Interparliamentary Union Executive Committee and the Interparliamentary Union Council; Representative EDWARD J. DERWINSKI, of Illinois; Senator B. EVERETT JORDAN, of North Carolina; Senator A. S. MIKE MONRONEY, of Oklahoma; Representative JOHN B. ANDERSON, of Illinois; Representative JOHN JARMAN, of Oklahoma; Representative ROBERT MCCLORY, of Illinois; Representative JOHN S. MONAGAN, of Connecticut.

Our 10-member, bipartisan delegation constituted one of the smallest groups representing our country at such an international conference in recent years. Other nations dispatched more representatives than we did, but I am glad to observe that what we lacked in quantity, we compensated for in quality. The diverse background of experience each of our delegates possessed made for a balanced and effective team.

Before proceeding to the substantive portion of this report, I would like to comment briefly on two other aspects of our mission. Both are pertinent to this discussion and may prove of value to our other colleagues who, at some future date, may be privileged to represent the United States at similar international conferences.

It is the firm belief of those of us associated with the Interparliamentary Union that the success of any of our missions is directly related to the amount of advance planning that precedes the actual working sessions. A hastily called caucus en route or a predeparture strategy session is hardly sufficient to prepare adequately for an assignment of this nature.

Our group meets monthly throughout the year to prepare for the two annual IPU conferences. Continuity is maintained so that all the members can be current on developments within the organization and aware of the activities of member-nation delegations. State Department officials are frequently called in on a consultative basis as topical matters are reviewed. The research capability of the Library of Congress is employed to good advantage so we will have the necessary backup material to support our mission.

When we are at the conferences we strive constantly to have all of our efforts coordinated. Each morning delegation meetings are held to review the previous day's sessions and determine the course of action for the day to follow.

During the conference itself we realize the dividends from our earlier investment of time and energy. The effective cooperation evident within our group is, I feel, attributable to the diligence with which the members have applied themselves to the task prior to and during the conferences.

Also, I wish to stress the effectiveness of a delegation that presents a united front. When we are honored to travel abroad to represent our country at international meetings we should be mindful at all times that partisan attitudes should be left behind. In the eyes of the delegates from other nations, we are not viewed as a Republican from New York or a Democrat from Connecticut, but as Members of Congress of the United States. Therefore, it becomes essential that we act in concert as Americans, as spokesmen for the policies of our country. Dissension in our delegation could create the wrong impression among those not accustomed to our system of government and thereby weaken our hand when we are endeavoring to deal from strength. This we sought to avoid through our prior discussions and planning at home. Consequently, when our delegates spoke or engaged in debate, their words were taken as statements of U.S. position. The benefit of this approach is apparent when it is remembered that at any given time our delegates were scattered among several simultaneous sessions. Further, it conveyed to others the proper image, namely that despite occasional reports to the contrary, we are a people with a unity of purpose.

Since its formation in 1889, the IPU has provided its membership with a unique forum for legislator-to-legislator contacts. No other organization is similar in size, scope, and character since the majority of them, are composed of delegations that are functionaries of the executive branch. Ours is an organization of parliamentarians, of elected representatives of the people, of individual legislators who, like those of us in the U.S.

group, must pass judgment on measures that have international significance. Therefore, our participation in these conferences helps greatly to expand our thinking on subjects having worldwide impact. Armed with the information acquired at such sessions, we are more knowledgeable in areas of foreign policy and, better prepared to provide our constituents with the type of representation they desire and deserve.

The Honorable Andre de Blonay, Secretary General of the Interparliamentary Union, recently authored a magazine article in which he described the Union's objectives. Two key passages from his text are submitted as a prelude to an account of what transpired at the Dakar conference in order to acquaint my colleagues with the prime role of the IPU:

As an organization devoted to peace, its mission is to inform its members of the realities of international life, to ensure that, by personal contacts and a free exchange of views, they have a better understanding of each other's preoccupations and to promote, if possible, the growth of a conciliatory spirit, of a desire for reciprocal concessions, without which it would be impossible to solve the dangerous crises which have persisted and multiplied during recent years.

The Union's task is not so much to adopt a definite stand with regard to crises which divide two or more States as to undertake a long-term and continuing search for a system of co-operation and international security which would serve to prevent conflicts or, in case of need, to put an end to them by rapid and efficacious intervention. Indeed, it is in the realm of ideas and principles that the Union must display its activities.

Principle was the key phrase used repeatedly by our delegation at Dakar in its successful effort to prevent the Union's acceptance of a Communist bloc attempt to secure endorsement of its "universality of membership" proposal. Under the plan, which has been pending for several years, admission to IPU membership is sought for several divided states, including East Germany and North Korea.

The United States has steadfastly maintained that the nations in question do not have duly elected representative parliaments and, therefore, do not meet the criteria for IPU membership. Senator ALLOTT, the ranking U.S. delegate on the Parliamentary and Juridical Committee, before which this subject was reviewed, was particularly effective during committee debate. In a forceful address, which is appended to this report, he emphasized that there was "no universality about the meaning of universality." Among other things, he pointed out that the proponents of the universality concept were anxious to secure membership in the IPU for their proteges, but were not willing to accord the same privilege to other nonmember nations who are less receptive to the doctrine espoused by the Iron Curtain states.

The end result of the protracted debate on the subject was the approval of an Australian resolution—appended, as are all major resolutions passed at the conference—calling for the establishment by the executive committee of a working group "to examine the question of universality and other criteria for membership of the Union." The group will be designated at the Union's fall conference and will be instructed to submit its initial report at the spring session of 1969.

Our success in this holding action is deemed vital, not only as it affects the future of the Interparliamentary Union, but also as it relates to other international bodies. From experience we know that our conferences are frequently used by member-nations as test forums to obtain an international reaction to a proposal for which acceptance is sought on many fronts. For example, it is conceivable that the failure of the Communist bloc to achieve a breakthrough on this question at Dakar may portend the outcome of the next United Nations' debate on the admissibility of Red China to that organization.

The situation in the Middle East precipitated the most time-consuming and dramatic confrontations at the Dakar conference. I was named chairman of the Committee on Political Questions, International Security and Disarmament, and in this capacity presided over the lengthy and often stormy sessions at which this subject came under scrutiny.

While the animosity evident in the early stages of our deliberations prompted forecasts of a stalemate, with no definite action being taken, I am pleased to report that we were able to achieve a positive result. Patience and persistence were rewarded by the adoption of a resolution placing the Union on record in support of the U.N. Security Council resolution of November 22, 1967. Our delegation supported this resolution.

The impasse which was threatened as a result of the deep divisions evident during a heated Arab-Israel debate was avoided when I, as chairman, appointed a special drafting committee with instructions to develop a maningful resolution relative to the Middle East situation. Delegates from Sweden, the Netherlands, Yugoslavia, Senegal, and Nepal were named to the panel and were able to accomplish the desired result, namely an acceptable resolution, the provisions of which would not duplicate or complicate the activities of Ambassador Jarring's U.N. peacekeeping mission in the Middle East.

While we were able to muster near unanimous support for the drafting committee resolution, a resolution offered by Jordan, and amended by the Dutch, passed only by a narrow margin. Basically, this measure called for the establishment of a committee of inquiry to investigate the treatment of the people in occupied Jordan. Its implementation was left to the discretion of the Secretary General and the President. Our delegation was in opposition because, as was pointed out during debate, we do not believe the IPU should duplicate the activities of the United Nations, but, rather, should focus its attention on the original aim of our organization:

To promote personal contacts between members of all Parliaments and to unite them in common action to secure and maintain the full participation of their respective States in the firm establishment and development of democratic institutions and in the advancement of the work of international peace and cooperation.

The Committee on Political Questions, International Security and Disarmament also decided to recommend the inclusion on the agenda for discussion at the next conference the following item:

Concrete measures for ensuring, in particular at the Parliamentary Level, the Implementation of the United Nations Declaration on the Inadmissibility of Intervention in the Domestic Affairs of States and the Protection of their Independence and Sovereignty.

On the question of a Scandinavian proposal for the establishment of a peace research program, the committee agreed to follow the recommendations contained in the Secretary General's report. A working group, composed of an equal number of parliamentarians affiliated with the Union and of specialists from various countries will be appointed by the executive committee to study the project and submit its conclusions at a future session of the Interparliamentary Union Council.

While the action taken on the resolutions relating to the questions of universality and the Middle East highlighted the Dakar conference, I think it significant to note that a third major development occurred, the absence of debate on Vietnam.

The Czechoslovakian delegation withdrew its request that the subject be an agenda item and the anticipated highly critical Communist bloc comment on U.S. involvement in Southeast Asia did not materialize. This is the first time in recent years that we have been spared the propaganda barrage on Vietnam. It was apparent that the President's March 31 address had been accepted at face value as a demonstration of our good faith. Doubtless, the Paris talks are being followed closely by our IPU associates.

The IPU's Educational, Scientific and Cultural Committee examined several questions pertaining to the conservation of natural resources and decided to establish a special committee to explore the overall subject in depth. In this pursuit, it was recommended that the committee collaborate with the International Union for Conservation of Nature and Natural Resources (IUCN) an independent body that specializes in this important field of study.

I am pleased to report that Representative MCCLORY, of our delegation, was elected vice chairman of this major committee. This recognition of his outstanding contributions to the work of his group is well deserved.

The Committee on Non-Self-Governing Territories and Ethnic Questions devoted its working sessions to a review of the subject "Colonialism, Neo-Colonialism, and New Forms of Racial, Religious, Political, and Economic Discrimination," which it decided to further explore at the fall conference.

The Economic and Social Committee absorbed itself in the consideration of items that dealt with means of providing effective aid to developing countries. A determination was made to consolidate its discussion headings into one comprehensive designation:

Methods of providing aid to developing countries through stable prices for exported products, development of primary industries and effective financial assistance.

A resolution was approved for consideration at the forthcoming plenary session of the Union.

Mr. Speaker, appended to this report are the various resolutions endorsed by the respective committees and subsequently approved by the Interparliamentary Union Council.

Prior to concluding this report, I wish to commend the entire delegation for the conscientious manner in which each member handled official assignments and also for the spirit of cooperation that was evident throughout the entire mission.

Great credit is due Representative DADDARIO for his excellent work as a member of the executive committee. This body met for long and difficult sessions during which his objective leadership was most apparent. Also, he and Senator ALLOTT represented the United States in the extended meetings of the Council. We who were privileged to witness their conduct in these sessions have only praise for their effective participation.

A well-deserved tribute is due the Honorable Katharine St. George, our executive secretary. Her background of experience as past president of the U.S. group and an honorary member of the Interparliamentary Union made her a valuable colleague and enabled her to function efficiently in assisting the delegates throughout the entire mission.

In addition, I wish to cite the excellent support received from our efficient and effective staff under the leadership of Mr. Darrell St. Claire, our able administrative officer. Mr. William H. Gleysteen, of the Department of State, was a helpful consultant to the delegation, and our senior escort officer, Lt. Col. William Parker, USA, and Lt. Col. Richard Guertin, USA, performed their assignments skillfully.

Finally, on behalf of the entire delegation, I wish to express high commendation of our Ambassador to Senegal, L. Dean Brown, and the official family of our Embassy in Dakar. They were magnificent in support of our mission. The logistical arrangements were perfect, and throughout the entire period we noted the excellent cooperation and complete loyalty of a staff that, from the moment we alighted from the plane, became a part of the team. They demonstrated a devotion to duty that is deserving of the highest praise.

To all whose efforts combined to insure the success of our mission I, as chairman, am deeply grateful.

TEXT OF REMARKS MADE BY U.S. SENATOR GORDON ALLOTT BEFORE THE PARLIAMENTARY AND JUDICIARY SUBCOMMITTEE OF THE INTER-PARLIAMENTARY UNION, DAKAR, SENEGAL, APRIL 17, 1968

The United States regards this item as the most important question on our entire agenda. It seems obvious and plain to me that any attempt to play with or tamper with the fundamental character of the Inter-Parliamentary Union, to change statutes by statements of "intent" or "desirability" are weakening, debilitating in nature, and can only eventually lead to the weakening and perhaps the destruction of the Inter-Parliamentary Union.

Such loose statements will tend to weaken the spirit of the organization for every member can speak his mind fully and freely no matter what his party nor what the view of his government may be. An attempt to change the fundamental nature of the statutes as the pending Resolution does by placing a perverted interpretation on it is the wrong method and is one which every member of Parliament should avoid at all cost.

I want to make one thing clear, the United States supports fully the universality of Inter-Parliamentary membership for all states *which meets the standards and the criteria of the Inter-Parliamentary Statutes.*

The Statutes were designed and have been maintained to keep the unique and special character of the Inter-Parliamentary Union as distinguished from the United Nations and hundreds of other international organizations. Article 1 of the Statute says, *"to promote personal contacts between members of all Parliaments, constituted into National groups,* and to unite them in common action to secure and *maintain the full participation of their respective States in the firm establishment and development of Democratic institutions* and in the advancement of the work of international peace and cooperation, particularly by means of a universal organization of nations. With this object in view, the Inter-Parliamentary Union will also *study and seek solutions for all questions of an international character suitable for settlement by parliamentary action and shall make suggestions for the development of parliamentary institutions, with a view to improving the working of those institutions and increasing their prestige."*

To achieve these purposes the Statute logically sets out certain minimal criteria. Article 3 of the Statute says, and I quote, "The Inter-Parliamentary Union shall be composed of *National Groups constituted in Parliaments functioning as such* within the territory of which they *represent the population, in a State recognized as a subject of international law."* The Statute goes on to say how application for membership shall be handled.

As we view it, there are four criteria set up in Article 3:

(1) They must be national groups.

(2) They must be constituted in Parliaments functioning as such.

(3) They must be "within the territory of which they represent the population."

(4) In a state recognized as a subject of international law.

These qualifications are clear and sensible. They have carried this organization through more than three-quarters of a century.

There is only one way to change, and that is by changing the Statutes, not by fuzzy, unclear resolutions, defining "intent" and "desirability" but under Article 19 of the Statutes which provides, and I quote: "Proposals to alter the Statutes must be made formally in writing and sent to the Inter-Parliamentary Union Bureau at least three months before the meeting of a Conference . . ."

Let's take a short look at "universality." What do its proponents mean, and what do they not mean. There is no common understanding as is plain from the discussion here of what is meant by the proponents of universality. In fact, the only conclusion we can draw from the discussion is that there is no universality of opinion as to what constitutes universality, and this we get from the proponents of the various resolutions.

At this point I want to emphasize that if we are to adopt some interpretations of universality and to change the basic purpose and statute of the Inter-Parliamentary Union, the United States Delegation will be forced to take a long, hard look at its long-standing participation in the Inter-Parliamentary Union. We see no useful end in making the IPU a minor or secondary United Nations as some people have proposed this afternoon. We already have a United Nations. And I believe we of the American delegation would have a difficult time justifying our action in changing the nature of this organization as the advocates of some of our resolutions would have us do. We would have a difficult time in justifying our action to our fellow members of Congress. If we are only to develop a secondary or minor UN and abandon the special character of this unique organization, I am sure that our fellow members of Congress would show considerable reluctance in the support for us that they have in the past.

As I have said before, I want to make clear we support the principle of universality within the standards of the Statutes, but I hope all of us will remember that we live in a world of realities.

These realities include the facts that some states do not have Parliaments.

Others have Parliaments which do not reasonably represent their population.

Others are dramatically opposed to representative government.

And still others are not states "recognized as a subject of international law" under Article 3 of the Statutes.

Do certain proponents of unlimited "universality" favor admission of Portugal and South Africa? Do they favor letting Southern Rhodesia enter the Inter-Parliamentary Union? And if they favor, as some have said, the elimination of international requirements of the Statutes, how will they handle Rhodesia?

Do those who might favor the admission of Communist China really favor granting the same privilege to the Republic of China on Taiwan?

I do not wish to inject any unnecessary or unresolvable points into this debate but I must say that I strongly suspect that many—though not all—proponents of universality are prone to look upon it as a means to ease the entry of states which might not otherwise obtain the necessary majority of votes. But they also propose by their interpretation of "universality" to forever bar and keep other states from becoming members so that true universality is never obtained.

In closing I wish to stress most strongly that the objection of my delegation to the adoption of completely unqualified universality does not prejudge nor bind us, nor will it prejudge us or bind us, in any way we might vote on *any* individual applications which are brought before the Inter-Parliamentary Union in the proper manner.

Thank you, Mr. Chairman.

CONCRETE MEASURES FOR ENSURING, IN PARTICULAR AT THE PARLIAMENTARY LEVEL, THE IMPLEMENTATION OF THE UNITED NATIONS DECLARATION ON THE INADMISSIBILITY OF INTERVENTION IN THE DOMESTIC AFFAIRS OF STATES AND THE PROTECTION OF THEIR INDEPENDENCE AND SOVEREIGNTY

(Draft resolution adopted by the Committee on Political Questions, International Security, and Disarmament, and included by the Inter-Parliamentary Council in the Agenda of the Lima conference)

(Rapporteur: Mr. V. Novy (Czechoslovakia))

The 56th Inter-Parliamentary Conference,

Noting the great international significance of the Declaration adopted by the XXth Session of the United Nations General Assembly on the Inadmissibility of Intervention in the Domestic Affairs of States and the Protection of their Independence and Sovereignty,

Expressing serious concern that, despite the unanimous approval and adoption of the above-mentioned Declaration, some States continue armed intervention in the domestic affairs of other States in different parts of the world, as well as carry on other forms of direct or indirect interference with the sovereign independence of other countries and nations, resulting in increased in-

ternational tension and in threats to universal peace,

Giving full support to the resolution adopted by the XXIst Session of the United Nations General Assembly on the Implementation of the Declaration on the Inadmissibility of Intervention in the Domestic Affairs of States and the Protection of their Independence and Sovereignty,

Realizing the urgent need for adoption by Parliaments of concrete measures so as to achieve strict observance of the principles of the said Declaration,

Considers it its duty to call upon the Parliaments of all countries:

1. to contribute, in all their foreign-policy activities, towards the strict implementation of the principles of the Declaration of the XXth Session of the United Nations General Assembly on the Inadmissibility of Intervention in the Domestic Affairs of States and the Protection of their Independence and Sovereignty, as well as of the resolution on the implementation of this Declaration adopted by the XXIst Session of the United Nations General Assembly;

2. to secure the immediate termination and permanent avoidance of recourse to armed intervention or to the promotion or organization of subversion, terrorism or other indirect forms of intervention for the purpose of changing by violence the existing system in another State or interfering in civil strife in another State;

3. to oppose actively all actions directed towards interference in the domestic affairs of other States, particularly by open parliamentary discussions of such actions, by refusal to approve appropriations for carrying them out and by countering all other actions which might hamper the unconditional application of the humane principles of non-intervention and national independence in the practice of international relations.

METHODS OF PROVIDING AID TO DEVELOPING COUNTRIES THROUGH STABLE PRICES FOR EXPORTED PRODUCTS, DEVELOPMENT OF PRIMARY INDUSTRIES, AND EFFECTIVE FINANCIAL ASSISTANCE

(Draft resolution adopted by the Economic and Social Committee and included by the Inter-Parliamentary Council in the agenda of the Lima conference)

(Rapporteur Mr. J. Hall (Great Britain))

The 56th Inter-Parliamentary Conference,

Convinced that continued efforts are essential to accelerate economic and technological progress and to promote mutual undertanding among nations,

Recognizing that the economic growth of developing countries at a satisfactory pace is a question of fundamental importance not only for these countries but for the future of mankind,

Convinced that the "Principles governing international trade relations and trade policies conducive to development", adopted by the United Nations Conference on Trade and Development in 1964, create the basis for normalizing international trade and reflect a progressive conception of international economic relations,

Considering that the deterioration in terms of trade, that is to say in the relation between the prices of exported and imported goods, seriously impedes the economic progress of developing countries.

Supporting the intensive efforts of the developing countries to put an end to economic backwardness as quickly as possible and to build up a strong national economy,

Taking into account the need for encouraging the development of products of national importance, the expansion and diversification of all channels of international trade and, more particularly, the stabilization of equitable prices for basic exports of developing countries,

Appeals to the Parliaments of all countries to exert influence on their respective Governments:

1. to mobilize the efforts of their States for the speedy implementation of the decisions of the United Nations Conferences on Trade and Development contributing towards the expansion and normalization of international trade, on the basis of the principles of equality, respect for sovereignty non-interference in internal affairs of countries and mutual benefit;

2. to make every effort to ensure the practical realization of the decisions adopted by the United Nations Conference on Trade and Development held in New Delhi with regard to:

(a) the stabilization of prices of raw materials and basic products;

(b) the promotion of industrialization;

(c) the provision of financial aid without strings on an international, multilateral or bilateral basis to the developing countries;

(d) the provision of technical advice and assistance of all types;

(e) the reduction of restrictive trade barriers.

PARLIAMENT'S ROLE IN THE ELABORATION AND CONTROL OF NATIONAL SCIENCE POLICY

(Draft resolution adopted by the Educational, Scientific, and Cultural Committee and included by the Inter-Parliamentary Council in the agenda of the Lima conference)

(Rapporteur: Mr. R. McClory (United States of America))

The 56th Inter-Parliamentary Conference,

Considering science to include not only the basic study of natural laws but also the application of this knowledge for mankind's needs through development, technique and technology,

Noting the continually increasing importance of science in the life of all peoples and its essential role in economic development,

Recognizing the necessity for every State to set its own goals, to formulate and implement a science policy in harmony with its own national development, and to help itself towards the achievement of its goals,

Recognizing also the universal nature of science, the imperative necessity for international co-operation in the different branches of science and the mutual benefits to be derived from world-wide co-operation in all scientific fields,

Aware of efforts to promote national science policy planning by Unesco, the Advisory Committee of the Economic and Social Council of the United Nations on the Application of Science and Technology to Development, and other international organizations, and of the advantages of strengthening the relationship between the Inter-Parliamentary Union and Unesco in this area as well as in other fields of common interest,

Believing that it is the responsibility of Parliaments to help formulate and control national science policies and to ensure that scientific advances are applied for the development of the national economy and for social progress,

1. *Reaffirms* the resolution adopted by the 55th Inter-Parliamentary Conference on the Application of Science and Technology to Economic Development, drawing particular attention to the invitation to developing countries to establish organs and institutions for studying means of harnessing the national scientific and technological potential for the purpose of economic development;

2. *Requests* that Unesco continue its role, in co-operation with other international agencies, to assist nations with science policy planning;

3. *Expresses the hope* that the developed nations will search for new ways to share the benefits of their scientific knowledge and capabilities with the developing nations for the maximum benefit of all the peoples of the world;

4. *Urges* all Parliaments to ensure that national scientific activities are provided with the human, financial and material resources necessary for their full development and to establish the governmental bodies and institutions required for the elaboration and coordinated implementation of a national science policy, giving emphasis to education as well as to research and development;

5. *Recommends* that each Parliament take the initiative in defining the objectives of a national science policy designed to meet its national needs and the guiding principles for achieving those objectives;

6. *Recommends* further that all parliamentarians be made aware of their new responsibilities in the sphere of science and technology;

7. *Invites* consideration by legislative assemblies of the following procedures to ensure that their new responsibilities in the field of science are fulfilled:

(a) Establishment of standing parliamentary committees specially constituted for the examination of questions relating to science policy with the aim of helping to co-ordinate scientific activities and preventing duplication of effort without adversely affecting basic scientific research;

(b) Provision to parliamentarians of access to all sources of information and the assistance necessary for debating questions regarding science policy with a full knowledge of the facts;

(c) Creation of opportunities for exchanging ideas with qualified representatives of the scientific community drawn from industry, education and other, private circles, as well as from Government;

(d) Adoption of long-term and medium-range plans for scientific development, as well as functional budgets for scientific activities.

COLONIALISM, NEOCOLONIALISM AND NEW FORMS OF RACIAL, RELIGIOUS, POLITICAL, AND ECONOMIC DISCRIMINATION

(Draft resolution adopted by the Committee on Non-Self-Governing Territories and Ethnic Questions, and included by the Inter-Parliamentary Council in the agenda of the Lima conference)

(Rapporteur: Mr. P. de Montesquiou (France))

The 56th Inter-Parliamentary Conference,

Recalling its attachment to the basic principles contained in the Universal Declaration of Human Rights and guaranteed by Article 55 of the United Nations Charter and in the Declaration on the Granting of Independence to Colonial Countries and Peoples adopted by the United Nations General Assembly in Resolution 1514 (XV),

Aware that respect of fundamental rights and freedoms is an integral element of the dignity of human beings, the violation of which, by acts of racial, national or religious intolerance, is liable seriously to compromise international security,

Deeply concerned that, despite the recent liberation of many peoples from colonialist rule, there remains a great number of human beings in certain parts of the world who are still under its yoke,

Deeply concerned, furthermore, at the maintenance and practice of racial discrimination in certain States which constitute a denial of the right of peoples to self-determination, in particular by the policy of apartheid,

Convinced that the efforts to promote human rights throughout the world are not sufficient to eliminate all forms of intolerance,

Noting that the gap between the industrialized and the developing nations is widening and that this constitutes one of the most urgent problems of the age which seri-

ously hinders the establishment in the developing countries of effective freedoms based on the economic, social and cultural promotion of the individual,

1. *Condemns* violations of human rights and fundamental freedoms wherever they occur;

2. *Associates* itself with the work of numerous international organizations preoccupied with these problems, particularly the General Assembly, the Economic and Social Council and the Commission on Human Rights of the United Nations;

3. *Invites* delegates to take action in their respective Parliaments to ensure the adoption of legislative measures which would promote absolute respect for human rights and the elimination of all forms of discrimination based on race, sex and religion, as well as of all propaganda designed for this purpose;

4. *Urges* them to increase their efforts for the acceleration of the process of decolonization of the still dependent territories on all continents, in keeping with the United Nations resolutions;

5. *Appeals* to National Groups to exert their influence to urge their Governments to co-operate with the United Nations without delay by taking positive steps against violations of the territorial sovereignty of nations;

6. *Urgently requests* Governments

(a) to seek a solution for alleviating the economic difficulties of developing nations resulting from the trade and economic conditions maintained by neo-colonialist policies;

(b) to support the work of the 1964 Geneva Conference on Trade and Development, especially regarding the state of world market prices for raw materials, the intensification of technical aid and investments of a productive character;

(c) to support the granting of aid through the intermediary of international organizations.

SITUATION IN THE MIDDLE EAST—I

(Decision adopted by the Inter-Parliamentary Council at Dakar on April 20, 1968, by 89 votes in favour, none against, and 4 abstentions)

The Inter-Parliamentary Council,

Stressing the decisive importance of the United Nations in the efforts to reach a solution to the dangerous conflict in the Middle East,

Emphasizing the significance of the resolutions already passed by the Security Council and the General Assembly of the United Nations on the situation in the Middle East,

Expressing its support of all the views set forth in Security Council Resolution 242 of November 22, 1967, in particular that the establishment of a just and lasting peace in the Middle East "should include the application of both the following principles:

"(i) Withdrawal of Israeli armed forces from territories occupied in the recent conflict;

"(ii) Termination of all claims or states of belligerency and respect for and acknowledgement of the sovereignty, territorial integrity and political independence of every State in the area and their right to live in peace within secure and recognized boundaries free from threats or acts of force";

1. *Calls upon* the Security Council and all members of the UN to give every possible support to the Special Representative of the United Nations Secretary-General appointed on the basis of Security Council Resolution 242 (1967);

2. *Appeals* to the parties immediately concerned in the Middle East crisis to accept the said resolution, to be ready to implement it and to abstain from any action which might impede the efforts of the Special Representative to achieve a peaceful settlement.

SITUATION IN THE MIDDLE EAST—II

(Decision adopted by the Inter-Parliamentary Council at Dakar on April 20, 1968, by 50 votes in favour, 35 against, and 13 abstentions)

The Inter-Parliamentary Council,

Decides to establish and send as soon as possible a committee of enquiry to investigate for itself the actual conditions and treatment of the people in those parts of Jordanian territory at present occupied by Israel.

The Acting President of the Inter-Parliamentary Council, Mr. Abderrahman Abdennebi, and the Secretary General of the Union are instructed to implement the above Decision.

THE PRINCIPLE OF UNIVERSALITY IN THE LIGHT OF THE STATUTES OF THE UNION

(Decision adopted by the Inter-Parliamentary Council at Dakar on April 20, 1968, by 68 votes in favour, 16 against, and 3 abstentions)

The Inter-Parliamentary Council,

Recognizing the lack of agreement on the principles which should govern membership of, and the admission of new members to, the Union,

1. *Requests* the Executive Committee to appoint a working group to examine the question of universality and other criteria for membership of the Union;

2. *Directs* that the working group, in its composition, should include representatives of all major member Groups in terms of voting power, as well as representatives of member Groups smaller in terms of voting power, the latter to be selected with a view to ensuring equitable geographic distribution;

3. *Requests* the working group to draw extensively upon such expertise as already exists within the international community and international organizations on the legal and other issues which relate to the question of universality of membership;

4. *Instructs* the working group to make its first report to the meeting of the Executive Committee of the Union to be held in Vienna in April, 1969.

UNION PARTICIPATION IN THE ILO'S 50TH ANNIVERSARY

(Decision adopted unanimously by the Inter-Parliamentary Council at Dakar on April 21, 1968)

The Inter-Parliamentary Council,

Expressing its recognition of the unique efforts made by the International Labour Organisation since 1919 for the welfare of workers throughout the world,

Recognizing the benefits accruing from its continuing work in the field of labour and social policy over the past fifty years,

Desirous of associating the Union closely with the plans being made to mark the 50th Anniversary of the International Labour Organisation in 1969,

1. *Decides* to request the Union's Executive Committee to prepare a programme of activities within the Union which will give due recognition to the 50th Anniversary of ILO;

2. *Appeals* to the Parliaments of the world to provide an opportunity during the year 1969 for a debate on, or an assessment of, the International Labour Organisation's achievements throughout the fifty years of its history and of the participation of the respective Governments in its work;

3. *Instructs* the Secretary General to convey the text of this decision to all Parliaments and *requests* them to inform the Inter-Parliamentary Bureau at the appropriate time of the action taken.

Mr. PIRNIE. Mr. Speaker, I ask unanimous consent that the gentleman from Illinois [Mr. DERWINSKI] may extend his remarks at this point in the RECORD and include extraneous matter.

The SPEAKER pro tempore. Is there objection to the request of the gentleman from New York?

There was no objection.

Mr. DERWINSKI. Mr. Speaker, I am pleased to join the gentleman from New York [Mr. PIRNIE], the chairman of our congressional delegation to the Interparliamentary Union Spring Conference, in a report on the progress and developments at that meeting.

It was my responsibility to serve along with the distinguished gentleman from Oklahoma [Mr. JARMAN], on the Committee on Non-Self-Governing Territories and Ethnic Questions. Our committee meetings were rather uneventful and unlike some others, did not erupt into any intense debate.

The chairman of our committee, Mr. F. Mohiewdine, of the United Arab Republic, was reelected to serve in that capacity for the next year.

The agenda for committee debate and discussion at the forthcoming meeting in Lima, Peru, will be colonialism, neocolonialism, and new forms of racial, religious, political, and economic discrimination.

It is obvious, Mr. Speaker, that there is a great difference in defining what presently constitutes colonialism. Personally, it is my opinion that the only huge colonial power in the world today is the Soviet Union, which holds in bondage non-Russian people within the U.S.S.R., and exercises economic colonialism over the Communist regimes of Eastern Europe.

However, at present, Communist propaganda carries continuous repetition of charges of "Western" colonialism. We recognize that by and large the Western powers have very properly and peacefully granted independence to areas they once held as colonies. The Communists at our meetings made great use of their new charge of "neocolonialism." Incidentally, they use this same tactic at the U.N.

In addition, I served with the gentleman from Connecticut [Mr. DADDARIO] on the Political and Disarmament Committee. The chairman has reported on the subject matter under discussion in that group.

May I also mention the fact that we were able to obtain through briefings, conferences, and various opportunities for discussion, a timely review of the situation in much of Western Africa, especially in the nations that were former French colonies.

As a member of the Foreign Affairs Committee, I have found this assignment as a member of our IPU delegation valuable assistance to me in work on the Foreign Affairs Committee.

Mr. Speaker, in the time that was available to us between sessions and activities, I conducted an extensive inspection of the operations of the U.S. Information Service facilities in Dakar. Mr. James McGinley, public affairs officer, was extremely cooperative in giving me an indepth report on the operations of his unit. I believe that there can be substantial improvements made in USIS operations. Congress has neglected to prop-

erly oversee this agency. I believe it would be beneficial to its operations and to our taxpayers if we would more effectively scrutnize the procedures and long-term goals of the USIS.

In addition, Mr. Speaker, along with other members of our delegation, I visited Peace Corps operations and met with groups and individual Peace Corps men and local school officials with whom they were working. It is obvious that the Peace Corps faces a very unique challenge in Senegal, but that with the cooperation of the government and eventual receptiveness of the populous, the Peace Corps function in that country is promising.

Mr. MONAGAN. Mr. Speaker, will the gentleman yield?

Mr. PIRNIE. I yield to the gentleman from Connecticut [Mr. MONAGAN] a most valuable member of our delegation.

Mr. MONAGAN. Mr. Speaker, I am very happy to join with the gentleman from New York [Mr. PIRNIE] in this report on the activities of the U.S. delegation to the International Parliamentary Union meeting, which was held this spring in Dakar. I believe that it is appropriate that we should give an account of our stewardship, because we do represent the Congress, and at the same time the people of the United States of America.

I am proud, Mr. Speaker, of the record of our delegation, not only at this conference but also at many other conferences I have attended in past years. I agree with the statement of the gentleman from New York that we have contributed much to the prosecution of the foreign policy of the United States.

I congratulate the gentleman from New York on his leadership of the delegation. Once again, he has proved indefatigable. He has not only accomplished the difficult political discussion that the delegation had before it, seeing to it that Members did the tasks that were allotted to them and made the presentations that were required, but also in the demanding social contact of the position, which is in many ways, as all of us know, as important as the debate because of the friendly personal discussions which are made possible.

I am proud that our colleague the gentleman from Illinois [Mr. MCCLORY] served not only as rapporteur this time, as he has in the past, for the Committee on Education, Science, and Culture, but also that he was elected as the vice-chairman of this committee. This is appropriate recognition for him and for the United States of the work he has done. I hope it may be an indication, as it has been in the past, of future advances for the gentleman.

I agree with the appraisal of the gentleman from New York as to the work of the gentleman from Connecticut [Mr. DADDARIO]. I make special mention of him because he is a colleague of mine and a friend of mine from Connecticut. Once again he has handled a difficult task in the political committee, that developed upon us this year.

It is true that the problems we discuss are important problems.

From time to time questions are raised as to the participation of the United States in this conference. I cannot conceive how the organization itself could go on without the participation of the United States. I feel, and I know the Secretary of State and other officials in the State Department and in the executive branch believe, that our discussion of these problems, our meetings with parliamentarians from 50 to 80 countries throughout the world, strengthens our capacity to carry on our foreign policy effectively, and at the same time carries out the ideals of the organization itself, which is to spread support for our free society and the free system of parliamentary democracy.

I believe, too, it is a great education for us to learn the viewpoints of representatives of other nations, and to gain an insight into these other countries throughout the world. I firmly believe, and it is my experience, that it makes us better Members of the House of Representatives for having had this opportunity.

I am not going to discuss this in any detail, because the gentleman from New York has fully covered the specific activities of the Interparliamentary Union meeting and of the various committees, but I do want to commend him and my colleagues for the work that has been done and I wish to say that I look forward to this U.S. delegation giving increasingly vital service to the country in this role which it performs.

I thank the gentleman for yielding.

Mr. PIRNIE. I thank the gentleman for his contribution. I wish to make clear to my colleagues that this report does not cover all of the activities of our group. There were many informal conferences which were very important.

We did have an opportunity to observe in the field some of our agencies of government operating particularly in Senegal. I should like to commend the gentleman from Connecticut [Mr. MONAGAN], for the work he did in appraising and examining into the activities of those agencies. I know his personal interest, so intelligently displayed, did much to improve the morale of those representatives of our country engaged in that work. I am sure he will agree with me that it was one of the most rewarding aspects of the trip.

Mr. MONAGAN. I certainly agree. The agency the gentleman refers to is the Peace Corps, specifically. One of the young representatives had come from the State of Connecticut, and another had studied in the State of Connecticut.

I believe all of us were proud of the quality of these young men, of the dedicated way in which they went about their tasks, and particularly happy about the reaction of the people of Senegal themselves to these young men, because they lived among them and spoke their language. They felt that they were brothers in spite of any difference in race or nationality.

Mr. MCCLORY. Mr. Speaker, will the gentleman yield?

Mr. PIRNIE. I will be very happy to yield to the gentleman.

Mr. MCCLORY. I thank the gentleman from New York for yielding.

Mr. Speaker, I want to commend the gentleman for his leadership and for his splendid report to the House today and to the country. Also I want to express my appreciation for the contribution which has just been made by my colleague from Connecticut [Mr. MONAGAN]. I may say it was a proud privilege that I had to serve on this committee with my colleague from Connecticut. I want to say particularly that his contribution on behalf of the subject of cultural and educational exchange is extremely significant in the work of the Interparliamentary Union. It seems to me this characterizes the type of work which it is possible to accomplish in these interparliamentary exchanges which we are able to have in the work of the Interparliamentary Union. I would like to add that the diplomacy which is carried out by us as representatives in meeting with representatives of other parliamentary bodies is extremely important, it seems to me, both with regard to the short-range and immediate foreign policy of our Nation as well as the long-range benefits that can be accomplished through it. I think particularly of the work of my own committee with regard to considering subjects of illiteracy and literacy training which are only possible to accomplish through cooperation of the developed nations in assisting the underdeveloped or the developing nations. So, with regard to this subject of cultural and educational exchange, these exchanges which students and educators are able to have, provide opportunities for understanding and for long-range methods of achieving peace and tranquility in this world, it seems to me.

Mr. Speaker, I would also like to make reference to other subjects that are of concern. Of course, with regard to the subject of science policy, which is on the agenda at the Lima Conference in September, a draft resolution which was offered originally by our U.S. group and which has now been adopted not only by the committee but the Council of the Interparliamentary Union for general debate in Lima affords an opportunity for us to educate in a sense as well as to encourage the use of technological and scientific advances in order to enable these developing nations to advance.

Also, of course, as the gentleman has indicated, the subject of natural resources and their conservation is extremely important and requires international cooperation. It involves the parliaments of the world and their role as such and involves us individually as parliamentarians.

So, with regard to most of the subjects, which were considered at this recent meeting at Dakar, Senegal, I think we were fortunate that the negotiations looking toward peace in Vietnam were taking place, because there was less propaganda and less emphasis on that subject at this Conference. This enabled us to concentrate more on the essential purposes of the Interparliamentary Union to promote parliamentary government and promote a discussion of those things in which the parliaments of the world are individually involved.

So I want to express very definitely my wholehearted support of this activity and emphasize the significance of these exchanges which we in the Congress of the

United States have with the parliamentary representatives of other countries. I think we should recall in considering this, also, that most of the leadership in the world is elected from the parliamentary bodies.

I would like to say further that our contacts frequently are with the ministers who represent the executive, who represent the Government in our exchanges and that these benefits which they receive from our having an opportunity to communicate with them and the benefits which we receive from our communications are important, and are an extremely important part of our diplomacy.

I sometimes think this is the most important part because certainly we are not only speaking for ourselves when we communicate but we are speaking for the people who have elected us and whom we represent, and know in a sense it is our responsibility to the American people to bespeak the will and expressions that are made by our diplomatic regime.

It is impossible, of course, for us to relate, except very briefly here, the work we did. However, it is my opinion that we should, of course, recall, as the gentleman in the well has recalled, the preparatory work which went on in advance of our meeting and our conferences, the conferences that we had to hold in order to make preparation for our work, the careful attendance and attention to the work while in the conference country.

Certainly, very salutary results emanated from our active preparation for the meeting.

Mr. PIRNIE. I thank the distinguished gentleman for his remarks. The gentleman from Illinois [Mr. McCLORY] was one of the most effective members of our delegation.

I would like to comment just briefly on the cooperation with the other member nations in the development of the legislative process. As my colleague will recall, we experienced a very wonderful rapport with some of the delegations, particularly in those countries where they are just developing in the early stages their representative form of government. They were intrigued by the manner in which legislation is evolved here in our country. They were interested in our committee system and the fact that we conduct hearings, that we have the legislative proposals before us for full debate and amendment. Already we have noted several nations which as a result have made changes in their legislative process which will further develop over the years if we continue to exchange views in a helpful way. Certainly we can thereby strengthen the legislative process throughout the world by these exchanges and it is so very important to do so.

Mr. JARMAN. Mr. Speaker, will the gentleman yield?

Mr. PIRNIE. I shall be very happy to yield to the distinguished gentleman from Oklahoma [Mr. JARMAN], one of the very fine members of our delegation.

Mr. JARMAN. I thank the chairman for yielding to me at this time.

Mr. Speaker, it was a real privilege to attend the Dakar conference. It represented a rich and rewarding experience. It proved to be one of the most enlightening and worthwhile meetings in which I have had the opportunity to participate.

Mr. Speaker, I simply want to go on record today in support of everything which the chairman has said in his eloquent and complete report on the essential and important aspects of the meeting.

The personal contacts, Mr. Speaker, and the free exchange of views on political, economic, social, juridicial, and cultural problems of international significance gave us all a better understanding of the realities of international life. Only through this spirit of cooperation and understanding can we hope to solve the dangerous crises which confront this world today.

I would like to take this opportunity, Mr. Speaker, to express my sincere appreciation to the distingunished gentleman from New York [Mr. PIRNIE], our chairman, for his outstanding contributions to the conference as chairman of the U.S. delegation. I would be remiss, Mr. Speaker, if I did not also pay a justly deserved tribute to each member of our delegation for their able and effective representation of our Nation at this important international meeting.

Mr. PIRNIE. Mr. Speaker, I thank the gentleman, and I certainly concur in his observation that each and every member of the delegation was faithful to his assigned task, and it was a pleasure to have that complete cooperation.

May I also commend the gentleman for his serious participation in individual conversation with the members of other delegations. I am sure the gentleman agrees with me that this is one of the unique experiences available to us, and I am very sure he made full use of the opportunity and found it memorable in every way.

Mr. ANDERSON of Illinois. Mr. Speaker, will the gentleman yield?

Mr. PIRNIE. I am happy to yield to the distinguished gentleman from Illinois.

Mr. ANDERSON of Illinois. Mr. Speaker, I thank the gentleman for yielding.

It was my privilege and pleasure likewise to serve as a member of the U.S. delegation for this spring planning conference of the Interparliamentary Union.

First, Mr. Speaker, I would say, like the gentleman from Oklahoma [Mr. JARMAN] who just addressed the House, that my impressions were perhaps somewhat different from other members of the delegation because it was my first experience, and therefore they were in a sense unique impressions. But I certainly came away fortified with the feeling that it would simply be incomprehensible that the United States not be represented by a delegation at important meetings of this kind.

I believe there were something like 54 governments represented at the conference. I had the very definite feeling that whenever a member of the U.S. delegation spoke on a particular issue, whether it was in plenary session or in a committee, that other nations were listening very carefully, and watching and waiting for leadership on the part of of our delegation. I am happy to report that that leadership was not wanting. Very much of the credit for that fact, of course, must go to the distinguished gentleman now in the well, the gentleman from New York [Mr. PIRNIE] because of the great competence and great diligence with which he served the delegation as its chairman, and served our Government well, I believe, in the very many important capacities which are incumbent upon the chairman of a delegation.

It was my privilege to serve as a member of the parliamentary and political committee. Although the gentleman in the well has said that his report did not attempt to even begin to be definitive, he has touched on some of the matters that were discussed in that committee. So I shall not take a great deal of time this afternoon to repeat them save to express the opinion that on the question of universality, which was an important item on the agenda, the attempt which was made by certain countries to amend the statutes of the Interparliamentary Union in effect by resolution, I believe would not have been defeated had it not been for the very fine work that was done by the senior Senator from Colorado, Mr. ALLOTT, who served on that committee.

Again I believe that this brought out the importance of the United States having the kind of representation that it had in that conference.

Also, to second what has been said already so very well by the gentleman now in the well, and other members of the delegation, I learned of the extreme importance of the parliamentry contracts that one is able to make; the fact that one can, not only in formal plenary sessions and in committee meetings, but also on an informal, ad hoc basis, discuss the issues that threaten the peace of the world, that threaten, indeed, to divide countries in the world, that one can discuss them on this kind of basis and form the personal friendships that I believe in turn form the basis for a better understanding. I believe this is simply inevaluable insofar as the foreign policy of our country is concerned.

So again I would thank the gentleman in the well, the gentleman from New York [Mr. PIRNIE] for the leadership which he provided this conference. It has been a real privilege and a matter of pride to me in having been a member of the delegation.

Mr. PIRNIE. Mr. Speaker, I thank the gentleman from Illinois [Mr. ANDERSON] for his comments.

Mr. Speaker, I would like to say to the gentleman from Illinois [Mr. ANDERSON] and the gentleman from Oklahoma [Mr. JARMAN] that, although this was their first trip with a delegation of the Interparliamentary Union, it is the hope of all of our colleagues that it will not be the last, because they both carried to this conference a determination to faithfully represent this country, and that they did.

In conclusion, I would just like to observe that individuals having the responsibility to represent our Nation abroad find it sobering, particularly in these difficult times.

But if we can reflect integrity of purpose and understanding of others and a determination to achieve a relationship that will permit this world to develop; to expand all of the forces for good; and to control the forces for evil, then we believe there is within the concept of representative government the capacity to build an enduring foundation for meeting the real needs of the people. In an atmosphere of joint responsibility, people who have these tasks in their respective countries are meeting under these circumstances, in that type of friendly exchange that brings us closer to what they actually think.

There is no mirror—there is no press—there is just simply the meeting of men who perhaps share this sense of responsibility very deeply and who want to do the very best by their country and by the world.

I can say from the bottom of my heart that one of the most rewarding aspects of this great conference has been to see over the period of years the development of a closeness which has become genuine friendliness—the sparring is ended—the exchange is real, and the gestures of friendship are many.

So if we can do it on a small scale, perhaps we can set an example for something that can be achieved on a larger scale.

To each and everyone of my colleagues who shared in this mission, I want to express my deep appreciation for their faithfulness to what was the basic purpose of the mission. They put everything else aside. They worked long hours and seemed to enjoy it. They also took advantage of whatever little free time was allotted to them to see what other agencies of the U.S. Government were doing in their areas of responsibility abroad.

I think we gave encouragement and help to improve the morale of those people who in faraway places seem to be doing things which do not come to the notice of people—things which are dedicated efforts to the causes of humanity.

I remember some of the young men we saw out in the native villages, living in their little rooms with only a desk and a bed and chair, an oil lamp strung overhead. Their only entertainment was some good books. They were living there with the natives, needing so much—and being able to give so little—except something of themselves. Because they gave of themselves they were being accepted into that little community and were able to give the advice and the help to move them along paths that might protect their health—improve their minds—increase their capacity to meet the difficult conditions in this world.

The best thing was that despite differences in color and in background, they became brothers in the best sense of the word—brothers in service—brothers in purpose—and brothers in compassion.

When I saw such activity as that being carried out in the name of the U.S. Government—with no dollar sign attached—the gift, only of self, I was very proud. I remember one young man who was approaching the end of his tour, and he wanted to return and get married and pick up his life's work. But he thought maybe he ought to extend his tour because his job was not done and he was not sure if he left it that it would move as rapidly as he felt these people deserved to have it move.

When a man will put personal desires in the background and think of somebody other than himself, then he is achieving a greatness—and our Nation is the greater because of his representation.

We saw those things. We felt those things. We come back here in a way to report them and to support them. But in the sense that we went as representatives of this body and of this Nation, I feel the members of the delegation were faithful to their trust.

A SUMMING UP ON NOISE

The SPEAKER pro tempore (Mr. NEDZI). Under previous order of the House, the gentleman from New York [Mr. KUPFERMAN] is recognized for 60 minutes.

Mr. KUPFERMAN. Mr. Speaker, on April 21, 1966, in the 89th Congress—see the CONGRESSIONAL RECORD, volume 112, part 7, page 8850—I introduced H.R. 14602—H.R. 2819 in this Congress—to establish an Office of Noise Control in the Office of the Surgeon General of the United States.[1]

Because of the special nature of that problem, I introduced legislation in the 90th Congress, H.R. 2820, to authorize a program specifically for aircraft noise abatement.

My various speeches, statements, and analyses, and reproduction of leading articles on the problem of noise pollution can be found in the CONGRESSIONAL RECORD, volume 112, part 7, pages 8745–8768, 9470–9477; volume 112, part 8, page 9679; May 16, 1966, daily RECORD, page A2629; volume 112, part 9, pages 12191–12205; August 1, 1966, daily RECORD, page A4048; volume 112, part 14, pages 18233–18257; volume 112, part 15, page 20388; volume 112, part 20, pages 27803–27824; October 21, 1966, daily RECORD, page A5494.

In the 90th Congress, in addition to the statement on January 18, 1967, at pages 788–810 in connection with H.R. 2819 and H.R. 2820, further analyses can be found in Senator MAGNUSON'S statement on the Electric Vehicle Development Act at page 613 of the RECORD of January 17, 1967; pages 2582–2589 of the RECORD of February 6, 1967; page 7280 of the RECORD of March 20; page 8464 of the RECORD of April 5; page 10749 of the RECORD of April 25; pages 24844–24865 of the RECORD of August 31, 1967; pages 27008–27015 of the RECORD of September 27, 1967; pages 27235–27237 of the RECORD of September 28, 1967. Moreover, I included Secretary of Interior Udall's antinoise ode in the RECORD of May 14, 1968, at page 13290.

This week a national conference, in which I shall participate, on "Noise As a Public Health Hazard," will be held here in Washington sponsored by the American Speech and Hearing Association.

Next week "Atmospheric Noise Pollution and Measures for Its Control" will be the subject of a full week's symposium in continuing education in engineering at the University of California at Berkeley. I shall be on the panel.

The Berkeley program for the symposium follows:

FINAL ANNOUNCEMENT: ATMOSPHERIC NOISE POLLUTION AND MEASURES FOR ITS CONTROL—CONTINUING EDUCATION IN ENGINEERING, THE COLLEGE OF ENGINEERING, AND THE INSTITUTE OF TRANSPORTATION AND TRAFFIC ENGINEERING, UNIVERSITY OF CALIFORNIA, BERKELEY, MONDAY THROUGH FRIDAY, JUNE 17–21, 1968

This program will deal with engineering and other problems concerned with noise pollution of the atmosphere originating from such sources as transportation systems, heavy construction, industry, and commerce, Major problems are: the relation of noise measurements to the actual effects of noise on man and the community under various circumstances; defining standards for noise control in different situations; theoretical and technical aspects of structural and equipment design and construction to meet noise control standards; relating the benefits of noise control to its cost in terms of dollars and equipment performance; legal problems associated with noise abatement enforcement.

Faculty Member in Charge: Walter W. Soroka, Professor of Acoustical Sciences and Assistant Dean, College of Engineering, University of California, Berkeley.

Enrollment fee: $270.

Location: 390 Hearst Mining Building, University of California, Berkeley.

Enrollment: Advance enrollment is required. Enrollment may be made by individuals or companies. Upon receipt of a written request, a place in the program will be reserved for individuals requiring time to obtain authorization. No refunds will be granted after the opening of the program.

For further information write or telephone Continuing Education in Engineering, University of California, 2223 Fulton Street, Berkeley, California 94720; phone (415) 845–6000, ext. 4151.

Note: University regulations do not permit the tape recording of any portion of this program.

PROGRAM

(Coffee breaks scheduled each morning and afternoon.)

Monday, June 17

Registration at 8:00 a.m.

(Program lectures commence at 8:30 a.m. and end at 4:30 p.m. daily.)

AM—Introduction (Soroka): A brief survey of the noise pollution problem. Growth of the problem in various sectors of community life. Attitudes and approaches toward its control. Terminology.

Problems of setting specific criteria acceptable to communities, regulatory bodies, and industry. (Kryter.)

PM—Subjective and objective methods of measuring noise and "standards" for tolerable exposure with respect to damage to hearing; speech; communications; and annoyance. (Kryter.)

Hearing conservation, damage risk criteria, industrial safety regulations. (Glorig): Data showing relations of hearing loss to noise-exposure and their correlation with damage risk criteria will be discussed. These will be related to existing safety regulations.

Tuesday, June 18

AM—Severity and extent of audio pollution problems. (Beranek): A review of international studies directed toward assessment of effects of noise pollution on man and the growth of local, state, national, and international regulatory activities for its control.

[1] I have since been joined in the endeavor by my colleagues, CHARLES H. WILSON, of Los Angeles, Democrat of California, H.R. 8309, and DONALD R. FRASER, of Minneapolis, Democrat of Minnesota, H.R. 13846.

PM—Origins of noise of various automotive prime movers and vehicles. (Priede): The effects of operational and design parameters are to be considered. Substantial reductions of noise by design will be discussed.

Wednesday, June 19

AM—Highway designs and materials related to noise pollution. (Bourget): Rank ordering with respect to a reference design. Predictability of community acceptance.

PM—Technical and psychological aspects of noise pollution. (Salmon): Rapid transit systems will be discussed from the points of view of operator, customer, and community. The efficacy of specific noise control procedures will be considered.

Measurements and analysis of high speed rapid transit system noise and vibration. (Wilson): Predicted community noise levels for various types of systems. Procedures for controlling and reducing transit noise will be discussed.

Thursday, June 20

AM—Plans and efforts by the Federal Aviation Administration to alleviate aircraft noise. (Pauulin): Selected flight paths, promotion of compatible land use, research and development on the reduction of noise produced by aircraft and aircraft engines. The political and social factors will be presented, showing efforts to establish efficient and equitable solutions to aircraft noise problems.

PM—Two sources of aircraft noise: propulsion system noise and the sonic boom. (Large): The lectures will describe how aircraft noise is produced, what is known about noise suppression, and the influence of community noise requirements on aircraft design and operating characteristics.

Friday, June 21

AM—Community noise—what is it and how is it measured? (Donley): The changes in community noise in recent years, methods of measuring community noise, efforts to establish legal restrictions on noise. Statistical descriptions of noise in various areas.

Zoning laws and community planning for noise. (Donley): Typical zoning laws in the U.S. will be compared with measured noise levels in specific communities, and factors affecting enforcement of noise sections of zoning codes. Proposed zoning codes will be presented.

PM—Progress in community noise control. (Donley): Current progress in controlling noise at construction sites and general city noise will be indicated, new trends and procedures which may be adopted for reducing or controlling future noise pollution in cities will be discussed.

Legislative approach to noise pollution control. (Kupferman): How the public, business, and industry help or hinder; legislative efforts to provide suitable noise control legislation. A comparative study of foreign legislative approaches and an assessment of the relative success here and abroad.

FACULTY MEMBER IN CHARGE

Walter W. Soroka, Professor of Acoustical Sciences and Assistant Dean of Engineering for International Cooperative Programs, College of Engineering, University of California, Berkeley. Dr. Soroka received his Sc.D. degree at Massachusetts Institute of Technology where he taught mechanical engineering from 1930–37. Since 1934 he has made industrial and research studies of factory, construction, traffic, commercial, machinery, jet engine and architectural noise problems. In 1947 he returned to academic duties at the University of California, Berkeley, where he has been teaching and doing research in vibration and noise control. He is also in charge of the Acoustics Laboratory of the Mechanical Engineering Department.

INSTRUCTIONAL STAFF

Leo L. Beranek, President of Bolt, Beranek and Newman, Cambridge, Massachusetts. Dr. Beranek received his Sc.D. in physics from Harvard University where he was a professor, Director of Research for Sound Control, Director of the Electro-Acoustic Laboratory and the Systems Research Laboratory. As an associate professor of communications engineering at M.I.T. from 1947–58, he also served as Technical Director of the Acoustics Laboratory. Subsequently he has been Secretary and Project Research Director of the National Research Council; a consultant to the Port Authority of New York, Outboard Marine Corporation, Lincoln Center for Performing Arts; a Hawksley Lecturer at the Institute of Mechanical Engineers in London; and an officer for scientific research and development for the United States Army and Navy. His principal work has been in architectural acoustics, electromechanico-acoustical devices, telephony, principles of sound control in airplanes, acoustical measurements, and noise control.

Louis Bourget, Materials and Research Department, California Division of Highways, Sacramento. Mr. Bourget received special training in the laboratories of Bell Telephone, Philco, and Wright-Patterson Engineering. During World War II he served as chief inspector in Electronics at McClellan AFB near Sacramento, and later taught for Grant Technical College. In addition to his current responsibilities, since 1954 he has served as consultant to the California State Division of Architecture on noise problems in State buildings, the California Highway Patrol on problems of vehicular noise measurement and control, Los Angeles City Noise Abatement Committee, Aerojet-General Corporation, and the Sacramento County Board of Health in their hearing testing program for school children. He holds patents in the field of electro-acoustics and is the author of numerous publications.

Ray Donley, Principal Engineer and Manager of Special Projects, Goodfriend-Ostergaard Associates, Cedar Knolls, New Jersey. Mr. Donley received his undergraduate training in mechanical engineering at the University of Cincinnati and his graduate study at American University. From 1956–62 he served as Chief, Acoustical Research Branch and as Ordnance Engineer, Engineering Research Laboratory, U.S. Army Human Engineering Laboratories, Aberdeen Proving Ground, Maryland. He is the author of numerous technical publications and is a member of several professional societies, among them the National Research Council Committee on Hearing, Bio Acoustics, Bio Mechanics, and the New Jersey Section of the American Industrial Hygiene Association.

Aram Glorig, Director, The Callier Hearing and Speech Center, Dallas, Texas. Dr. Glorig received his undergraduate degree at Atlantic Union College and his degree in medicine from Loma Linda University. He has held teaching appointments in the fields of otology and audiology at several schools of medicine, among them Yale University, University of Southern California, Loma Linda University, University of California at Los Angeles, American Academy of Ophthalmology and Otolaryngology, and Southern Methodist University. During his professional career Dr. Glorig has also served as a consultant in otology and audiology to numerous federal, state, military, public health, medical and scientific organizations throughout the country.

Karl Kryter, Director, Sensory Sciences Research Center, Stanford Research Institute, Menlo Park, California. Dr. Kryter received his Ph. D. in psychology and physiology from the University of Rochester. He has held academic appointments at Washington University in St. Louis and at Harvard University, where he was a research and teaching fellow at the Psycho-Acoustic Laboratory and Systems Research Laboratory. His professional activities have included executive committee and advisory positions for national and international governmental agencies and professional societies. He is a member of numerous scientific societies as well as the author of publications generally concerned with audition, psychoacoustics, and speech communications.

Theodore R. Kupferman, Member of Congress of the United States, House of Representatives, Seventeenth District, New York. Congressman Kupferman received his LL.B. from Columbia Law School, is a member of the New York Bar, and was admitted to practice before the U.S. Supreme Court in 1948. He served as President and Chairman of the Board of the Federal Bar Association of the States of New York, New Jersey, and Connecticut during the years 1954–60. He was the editor of the Bulletin of the Section of International and Comparative Law of the American Bar Association, and later was Chairman of the Patent, Copyright, and Trademark Relations Committee of the A.B.A. His fields of specialization have been the legislative approach to noise pollution and the problems faced by the legislature in providing suitable noise control legislation, and he has authored three bills to effect control of noise pollution. He has also made comparative studies of foreign legislative approaches and why they appear to have been more successful than those in the United States.

John B. Large, Chief, Aircraft Noise Unit, SST Propulsion/Mechanical Staff, the Boeing Company, Seattle, Washington. Mr. Large is a graduate in engineering, London University and Purdue University. He joined The Boeing Company in 1958, and he is now responsible for all the acoustic research work associated with the Commercial Airplane Division, including the SST program. Mr. Large is co-inventor of a pliant wall for reducing the skin drag of flying vehicles and the reduction of noise transmission through structures. He has published articles on all aspects of the aircraft noise problem and is a member of a number of professional societies and committees for research, evaluation, and development concerned with air pollution problems.

Robert L. Paullin, Chief, Systems Analysis Staff, Office of Noise Abatement, Federal Aviation Administration, Washington, D.C. Mr. Paullin received his undergraduate training from the South Dakota School of Mines and Technology, and holds a M.S. in civil engineering from the University of California, Berkeley. Subsequent to his undergraduate work, he served as a jet fighter pilot with the USAF before joining the Douglas Aircraft Company, where he worked as a flight test and research engineer and as Chief, Flight Safety Engineer. In 1961 Mr. Paullin joined the staff of the Civil Aeronautics Board. At the F.A.A. he has been concerned with aircraft certification (design and manufacturing) and operation. In 1965 he was selected by the F.A.A. for a year of graduate study at the Institute of Transportation and Traffic Engineering, University of California, Berkeley.

T. Priede, Senior Lecturer and Head of the Industrial Noise, Vibration and General Environmental Engineering Group, Institute of Sound and Vibration Research, University of Southampton, England. Dr. Priede received his technical education at the University of Latvia, Riga, where he obtained the degree of Inz. Mech., and he later received his Ph.D. degree from the University of London. In 1945 he joined the Baltic University in Hamburg as instructor in charge of the establishment of a mechanical engineering laboratory. From 1948 he was employed as research engineer at the British Internal Combustion Engine Research Association on problems related to diesel engine noise. In 1953 he joined C.A.V. Ltd. as principal research officer. His published work on automotive engine and vehicle noise has received several outstanding awards.

Vincent Salmon, Senior Research Scientist, Sonics Department, Physics and Chemical Physics Laboratory, Stanford Research Institute, Menlo Park, California. Dr. Salmon

received his Ph.D. in theoretical physics from Massachusetts Institute of Technology. After ten years with Jensen Manufacturing Company of Chicago as physicist in charge of Research and Development, he came to Stanford Research Institute in 1949. His chief interests are noise control, underwater sound, nondestructive testing, and electroacoustics. He is a fellow of several professional societies and a member of the Research Society of America, which is affiliated with Sigma Xi. Dr. Salmon is a Registered Professional Engineer of California and Illinois. His publications and patents are chiefly in the fields of electroacoustics and noise control, and he has given several courses on noise control and electroacoustics.

George Paul Wilson, Wilson, Ihrig and Associates, Berkeley, California. Dr. Wilson received his academic training and took a Ph.D. degree in mechanical engineering at the University of California, Berkeley, where he conducted special studies in the acoustical engineering field. While with The Boeing Company, Seattle Division, Acoustics Research Group, he was involved in a wide range of research problems related to acoustical phenomena in jet and rocket aircraft; instrumentation design for calibration of acoustical transducers; and design of environmental test facilities. For six years he engaged in teaching and research engineering activities at the University of California, where he was concerned with architectual acoustics, statics, dynamics, and machine design, as well as the operation and development of the Acoustical Laboratory. Dr. Wilson has also spent many years as a consultant to federal, state, civic, and private agencies and organizations in the whole field of acoustical and vibration problems, including research on the dynamics of the human body as related to the measurement of blood flow rate.

Having attempted, as Senator WARREN G. MAGNUSON, senior Senator from the State of Washington and chairman of the Senate Commerce Committee, has indicated[2] "to alert the attention of the Congress to the problems of noise abatement and control," this then becomes a proper focal point to sum up on antinoise activity throughout the world since I last reported to my colleagues.

Also, as a Paul Revere once did in another area, we must be aroused to the dangers and evils of noise.[3]

First, we should be apprised of the report No. 1463 of May 23, 1968 in the 90th Congress, Second Session, by the House Committee on Interstate and Foreign Commerce to accompany H.R. 3400 to amend the Federal Aviation Act of 1958 to authorize aircraft noise abatement regulation. My bill H.R. 2820 is in a similar vein. This 23-page report on the bill states that it "defines the role of the Federal Government as to control and abatement of aircraft noise and sonic boom."

Of the many interesting articles on noise which I shall discuss, the recent one in Electronics World of March 1968 at page 58 is of great interest:

SILENCE POLLUTION

(By John Frye)

Mac, returning from lunch, stepped through the door of the service department only to have his ears assaulted by a blast of sound. Both a radio and a portable TV receiver were blaring away on the "intermittent bench" while Barney snapped his fingers and twisted his body in rhythm to the music of a *Tiajuana Brass* record revolving on the turntable of a portable hi-fi resting on the main service bench.

Mac walked over and turned down the volume controls of the radio and TV receiver and threw the bench switch that cut off power to the record player. The ensuing sudden silence was deafening.

"Hey! What did you do that for?" Barney demanded.

"So I could hear myself think," Mac retorted. "What are you trying to do, ruin your hearing?"

"Of course not. Those two jobbies on the intermittent bench both have complaints of intermittent loss of sound; so I was keeping an ear on them while I worked on this hi-fi player that is supposed to lose on of its stereo channels every now and then. Being a man who likes to combine pleasure and work, I was just shagging along with Herb Alpert while I listened. Anything wrong with that?"

"Quite a bit. In the first place, nine out of ten intermittent audio failures will show up more quickly at a low signal level than at a high one, especially if the fault lies in a coupling capacitor. Furthermore, I wasn't kidding about damaging your hearing. The October, 1967 issue of *Today's Health*, published by the AMA, carried an article by Drs. John A. Garrett and Charles P. Lebo, ear specialists at the University of California, reporting their findings on deliberately exposing their hearing to lengthy sessions of rock and roll music. After one three-hour session Dr. Garrett reported, 'I couldn't hear my watch tick for three hours afterwards.'

"Dr. Samuel Rosen, another ear specialist, calls noise 'a molestor.' He describes 'a chronic noise syndrome' this way: 'At an unexpected or unwanted noise, the pupils dilate, the skin pales, mucous membranes dry up, there are intestinal spasms, and the adrenals explode secretions. The biological organism, in a word, is disturbed.' Dr. Rosen says our loss of hearing in later years is most likely related to accumulated noise exposure in our urban environment rather than age. A 70-year-old Meban tribesman in the Sudan, where average environmental noise is less than the hum of a refrigerator, has the hearing acuity of a 20-year-old New Yorker.

"It has been established by a number of authorities in continuous noise environments that a sound level of 85 dB has a damage potential. Yet you are making 10 dB of sound just breathing, Matilda's quiet typewriter is producing 65 dB, and I am producing 60–70 dB talking. A New York subway train rounding a curve produces 104 dB of noise; a loud power lawn mower, 107 dB; a jet plane at takeoff, 150 dB.

"Before you crank up the volume next time, remember this warning from the American Academy of Ophthalmology & Otolaryngology in its *Guide for Conservation of Hearing in Noise:* 'Prolonged exposure to the noises encountered in many industrial environments can produce a permanent hearing loss. This hearing loss is not amenable to treatment. Once a noise-induced loss has been acquired, normal hearing cannot be restored.' "

"I will, I will!" Barney promised with a grin. "But tell me how you define 'noise.' "

"You've touched a nerve there," Mac admitted. "Sometimes it's hard to tell what *is* noise. Probably the best definition is that noise is unwanted sound. Another definition says noise is sound that does not convey information or produce pleasure. Any sound can, under certain conditions become noise. Take the case of an auto mechanic tuning up a motor in a garage where a radio service technician is repairing a radio. The sound of the jazzing motor will be noise to the radio man trying to listen to the sound from the speaker; yet it is not noise to the mechanic because it conveys information to him. At the same time the music from the radio is noise to the mechanic because it masks informative sounds of the engine's response to acceleration he needs to hear."

"Is anybody doing anything about noise abatment?"

"You bet. A year ago New York formed the Mayor's Task Force on Noise Abatement to: (1) identify noise sources, (2) find resources that can minimize noise, and (3) educate New Yorkers to the problem so they will support abatement measures. In Congress, Representative Theodore R. Kupferman of New York is a kind of Paul Revere trying to arouse his fellow Congressmen to the dangers and evils of noise. He has done so much research on the subject that he is recognized as a lay authority on noise. He placed a bill before the House Interstate Commerce Committee that woud create an office of noise control within the Office of the Surgeon General. Last June the Health, Education, and Welfare Department decided noise was one of the most unpleasant forms of pollution confronting Americans today and decided that by no later than 1973 it must have all data necessary to set human levels of tolerance for noise."

"That means we must have some way to measure noise accurately, I suppose," Barney observed.

"Right, but this is a lot more difficult than a person might think," Mac replied. "An excellent discussion of the problems involved is contained in several articles in the November, 1967 issue of the *Hewlett-Packard Journal*. As pointed out therein, if we are going to reduce noise, we must have instruments to measure loudness; but loudness is subjective. It is the way things sound to the human ear, and no instrument yet devised is a complete model of the human ear. In fact, we do not have a very good understanding of the complicated physiological and psychological mechanisms involved in the sensation of loudness. However, even though our knowledge of many unique properties of the human ear is only empirical, we are still able to make instruments that do a fair job of duplicating the loudness-sensing function of the ear."

"Are two different but equally loud sounds equally disturbing?"

"Not necessarily, and this has caused some scientists to try to define a better measure of noise-sound called 'annoyance.' But this is difficult to pin down because of the the large number of unknown psychological factors that contribute to the effects of a sound on an individual at a given time. These include such things as the listener's history, his present state of mind, what he is trying to do at the moment, etc. Mothers know they can easily tolerate the din produced by their children at one time and scarcely bear it at another. Kryter's 'perceived noise' concept, which arrives at annoyance measured in PNdB by a computing method, has found some acceptance, but until we know more about the psychological effects of sound, the only reasonable objective measure of the disturbing effect of a sound seems to be its loudness.

To get down to basics, sound at a particular point is a rapid variation in the pressure at that point around the steady-state atmospheric pressure value. It is measured in the same units as atmospheric pressure, but because of its alternating nature 'sound pressure' refers to its r.m.s. value. At a frequency of 1 kHz, sound with an r.m.s. value of 2×10^{-4} μbar, or about 2×10^{-10} atmosphere, is just below the level of audibility for good ears. (One μbar represents one dyne per square centimeter, about the sound pressure produced by a human speaker at a distance of one meter.) This means the sensitive ear responds to variations in atmospheric pressure of only a few parts in 10^{10}.

"But the ear can also accommodate sound pressures as high as 200 μbars without becoming overloaded. Because of this tremen-

[2] CONGRESSIONAL RECORD, vol. 113, pt. 1, p. 614.

[3] Silence Pollution by John Frye, Electronics World, March, 1968 at page 58. See *infra*.

dous dynamic range of the ear, a logarithmic scale is used for sound pressure. The reference value is the threshold of hearing level of 2×10^{-4} μbar, and *sound pressure level* is indicated in dB above this value. On this scale the ear has a dynamic range of about 120 dB—a range matched by only a few of the more sophisticated instruments.

"Because loudness is subjective, the primary instrument for measuring it must be a human observer. To determine how loud a sound is, we must have a significant number of people compare its apparent loudness with that of a standard sound, the accepted standard being a pure 1-kHz tone or narrow-band noise centered at 1 kHz. When a significant number of observers say the two sounds are equal to loudness, we define the *loudness level* of the measured sound as being equal to the sound pressure level of our standard sound. Loudness level is measured in *phons*. The level of any sound in phons is equal to the sound pressure level in dB of an equally loud standard sound. Thus a noise judged to be as loud as a 40-dB, 1-kHz tone has a loudness level $L=40$ phons.

"But the phon scale does not fit a subjective loudness scale. Doubling the loudness doesn't double the number of phons. In fact, for 40 phons or greater, the corresponding increment is 10 phons. Why loudness should be different from physical quantities like voltage, for which a factor of two corresponds to 6 dB, is not fully understood; but in an effort to obtain a quantity proportional to the intensity of the loudness sensation, a loudness scale was defined with a unit called a *sone*. One sone corresponds to a loudness level of 40 phons, and the numerical value equivalent for loudness levels of 40 phons or greater are given by the formula $S=2(L-40)/10$, in which S is in sones and L in phons.

"There remain many other difficulties in measuring noise. Broad-band sounds seem louder to human ears than pure tones or narrow-band noise having the same sound pressure level, and I'm sure you know loudness is a function of frequency. A 40-phon, 100-Hz tone has a sound pressure level of 50 dB, while a 40-phon, 1-kHz tone has a sound pressure level of only 40 dB. I'm sure you've seen the Fletcher-Munson equal loudness level curves published in 1933 showing the response of normal ears with varying frequency. These curves are made for pure tones and relate feeling to sound level. They show the average sound intensity needed to produce a given loudness level throughout the audio-frequency spectrum.

"Zwicker worked out a procedure in which the frequency range between 45 Hz and 14 kHz is divided into bands by pass-band filters and the level of each band measured. Then these are combined by computation to produce a total loudness level comparing closely to that of the human ear. *Hewlett-Packard's* new Model 8051A Loudness Analyzer is designed to measure loudness by the Zwicker method automatically. Sound is fed into the instrument from a microphone or tape recorder and the levels of all the outputs of the 20 pass-band filters are displayed simultaneously on a CRT, while the total loudness is shown on a meter. The displays can be frozen for several minutes for leisurely analysis, and the instrument also has X and Y recorder outputs. There's lots more dope on the theory back of this instrument and its performance and application in the *H-P Journal* that I recommended you read."

"Okay, but I was just thinking: we've had the Lost Generation and the Angry Generation; but now, what with air pollution, water pollution, radioactive pollution, and now silence pollution, do you suppose I belong to the Polluted Generation?"

President Johnson in his message to the Congress of March 8, 1968, "to renew a Nation" following up on the efforts of Theodore Roosevelt in conservation stated—in the CONGRESSIONAL RECORD of Monday, March 11, 1968, page 5897 to page 5900 as follows on "Noise Control":

NOISE CONTROL

What was once critically described as "the busy hum of traffic" has now turned into an unbearable din for many city dwellers.

The crescendo of noise—whether it comes from truck or jackhammer, siren or airplane—is more than an irritating nuisance. It intrudes on privacy, shatters serenity and can inflict pain.

We dare not be complacent about this ever-mounting volume of noise. In the years ahead, it can bring even more discomfort—and worse—to the lives of people.

I am directing all departments of Government to take account of noise factors in choosing the location and design of buildings, highways and other facilities whose construction is assisted by Federal funds.

I also urge the Congress to take prompt action on legislation to strengthen the authority of the Secretary of Transportation to deal with aircraft noise. We need greater capacity to deal with the rapidly growing noise problem created by our expanding air transportation system.

The New York Knickerbocker for Sunday, March 31, 1968, volume 1, No. 6, had a feature article by Wambly Bald, entitled "A Congressman Urges: Let's Stop the Noise Menace."

A CONGRESSMAN URGES: LET'S STOP THE NOISE MENACE

(By Wambly Bald)

New York's cacophony of noises may never have killed anyone, but—

It can nudge you toward a sick state of frazzled nerves, psychotic anxiety, high blood pressure, impaired hearing, destroyed efficiency, and even heart attacks.

It has made our town the most sleepless city in the world. And neither pills nor ear plugs are an effective antidote.

The damage multiplies, year after year, but nothing is ever done about it.

These charges are made annually by Congressman Theodore R. Kupferman (R.-N.Y.) whose angry concern has earned him the questionable rank of New York Noise Fighter No. 1.

"Around my home," says Rep. Kupferman, "way up on the 15th floor in 72nd Street, my wife Dorothee has to turn on the air conditioner to neutralize the noise.

"She calls this system her anti-missile, a missile against noise."

Kupferman has fired many missiles of his own—but none has found a target.

When he was City Councilman in 1965 he introduced two separate noise abatement bills. They proved cries in the wilderness. No action was taken.

NOISE COMMISSION NEEDED

As a Congressman, on April 21, 1966, he made his bid on the national level with a bill calling for the creation of an Office of Noise Control, under the Surgeon General. This would teach states and local government to control noise at its point of origin. Still no action.

Kupferman has not given up.

"I'm ready to try with a third bill—and a fourth and a fifth, until Congress and the whole nation gets the message," he insists. "We must have an Office of Noise Control for mental as well as physical health. Let's stop fooling around!"

Rep. Kupferman needled Mayor Lindsay into creating a task force to formulate a plan for a quieter Fun City. Some minor improvements have been noted, at least in an abstract sense: Quieter garbage collecting has been promised a few million sleep-robbed citizens, and a few churches, including St. Brandon Rectory in the Bronx, have promised to soften the sound of their bells.

One day not long ago, Rep. Kupferman took to the city streets, armed with an audimeter. Here's how he found living in his home city:

Outdoors

Construction and demolition noise generated by air compressors, pneumatic drills, power saws and cement mixers; the shriek of traffic with revved up trucks and buses coughing right into people's ears; the swish-boom of jet planes; squealing subway trains above and below ground; transistor radios played by jerks, who should know better, in public places.

Indoors

No one's life is his own in today's paper-walled apartments. You can hear your neighbor singing, playing his TV, or battling with his wife. Or you may be driven out of your mind by the sonic invasion of vacuum cleaners, dishwashers, faulty air conditioners, or other instruments of torture originally called household appliances.

Sonic sufferers rarely are aware of what noise is doing to them. You know when you break a leg or come down with pneumonia. But noise damage creeps up on you over the years. No one can spot what's wrong. Meanwhile your friends realize that you're getting nervous—and slowly going deaf.

Dr. Julius Buchwald, a psychiatrist at the New York State Medical Center, says interrupted sleep can result in paranoid delusions, hallucinations, and suicidal impulses. And what about deafness?

Dr. Thomas H. Fay, Jr., chief of the Communicative Disorder Service at NYU's Medical College, discovered damage to nerve endings in the inner ear may occur gradually over a long period of time as a result of continuous exposure to noise.

This causes partial, and in some cases total or near-total, deafness.

"Here in New York deafness begins at 40", Rep. Kupferman added. "And we just sit back and accept the consequences as a part of urban living and progress.

"We very likely wouldn't have air and water pollution today if we had taken proper remedial steps 10 years ago. With our modern technology, some new laws and a little concentrated public pressure could work wonders."

While a great deal of money has been spent on production of silencing equipment and a vast depository of know-how is available, Kupferman said, practically nothing has been done to control noise generated by new construction equipment.

This is the *biggest* noise maker in New York, apart from street traffic, aircraft and the ever-present garbage collecting symphony. Air compressor acoustic housing, intended for adequate control, can very definitely be designed. But few, if any, can be found.

Muffle-bagged demolition tools, also jackhammers with built-in silencers, are available. But they are seldom used.

BARRIERS MIGHT HELP

The Citizens for a Quieter City Inc. has urged the enclosure of all demolition areas with a noise barrier—perhaps a tent-like shield as is used in Europe to protect passers-by and adjacent shops and/or apartments with an acoustic shadow zone.

Martin Hirshon of the Citizens Committee believes pile drivers can be quieted by portable and re-useable soundproof clogging similar to that in oil drilling equipment currently used around the country.

Hirshon says contractors should be obliged to operate under revised noise-control ground rules to be established by the city and public utilities.

The Diesel people, Kupferman noted, set an excellent example when they erected a 52-story office building in lower Manhattan. Foundation blasting was muffled with special steel wire mesh blankets, joints were welded rather than riveted or bolted, and demolition

was carried out during late hours and on weekends, when the district was deserted.

"This type of operation requires special effort and money", he said. "But builders and manufacturers don't want to be bothered, and we don't have the laws to force such action."

Kupferman cited a law, passed under Mayor LaGuardia, which prohibit motorists from blowing their horns except for an emergency. Whoever heard of a horn-blowing driver getting a ticket?

As ridiculous as it sounds, the legal noise limit in New York is 88 decibels at a distance of 150 feet. Make more racket than that and you're supposed to get a summons.

To conform, truck manufacturers installed new mufflers. This proved to be great in theory—useless in practice. Once the muffler wore out, it was rarely replaced. No one checked the drivers and the merry din continued. What can we do about din-din-din?

"Raise *your voice* in protest and mean it", Kupferman insists. "The people closed down Newark's airport a few years ago, with their jet boom complaints. Aircraft manufacturers now have experts working overtime to keep the boom at a minimum.

"The airplane has been singled out as a leading noise maker, with the jets getting bigger and more powerful", the Congressman continued.

"The path of the jet boom on the ground is about 33 miles wide when the plane is at an altitude of three and a half miles. It's 50 miles wide when the plane is nine miles high. If you're too close you'll have your ear drums cracked or risk other permanent injury. Some scientists claim the boom can even cause sterility!

"Boeing and the other jet manufacturers are trying to contain the problem. But Congress must act.

"We need an all-out national program for noise control. Is there anything more serious, including national security, than our national health?"

"New York is 10 years behind European cities in noise abatement," Kupferman concluded.

"In London and Zurich, jackhammers are muffled and air compressors are designed with silencing features.

"In West German cities, excessive construction noise is prohibited by federal laws that are strictly enforced. They don't just gather dust on the books the way they do here.

"Noise abatement is drilled into Europeans with government pamphlets, speeches and in the press.

"In many areas traffic police and building inspectors carry audimeters to check the decibel rate of noise and offenders are heavily fined.

"London has a British Noise Abatement Society which holds international congresses every year, and Americans are invited to attend and learn.

"But we are not learning much of anything. All we do is sit and suffer and wonder why so many people look so jumpy. We seem content to live in a noise slum."

The Congressman then gave his promise:

"Much as I hate noise, I'll continue to shout for real action against it at the top of my voice!"

Betsy Cohn of McGraw-Hill's Air and Water News was good enough to provide me with their special supplement of November 6, 1967, on noise, which follows:

BIG SOUND IN 1968—MORE NOISE ABOUT NOISE

The big sound in '68 may well be noise! "Noise control and solid wastes are becoming the most serious environmental problems," and noise pollution abatement programs are on "the list of topics for new legislative proposals, with action likely next year," prophesied Secretary of Interior Stewart Udall last month (AWN, Sept. 25, p.1).

Vibrations of '67 came from France this summer, when a shock wave produced by a supersonic boom shattered a Breton farmhouse killing three and injuring one. They were felt in Santa Barbara, Calif., where legislation was passed last month to "Ban the Boom" (AWN, Oct. 22, p.4), and simultaneously picked up by outraged neighbors of J. F. Kennedy International Airport in New York, who picketed an FAA meeting bearing signs of "We are being jet choked," "We've had enough."

But "had enough" can mean different things to different people. Dr. H. Bogard, a physicist and member of New York Mayor Lindsay's Task Force on Noise Control is the first to admit that the constant low level background din found in urban areas is only a nuisance and has never been proven to be a health hazard. "It's entirely subjective," Dr. Bogard told AWN, "If you are lying in bed trying to get to sleep, a dripping faucet can be very irritating but if you are up and busy you won't even hear it." Little research has been done in this area, according to Dr. Bogard, who feels the real question is largely a philosophical one regarding man's right to privacy from audio intrusions.

LEGISLATION

Congressman Theodore Kupferman (R-N.Y.) who represents New York City's noisy mid-city, tuned in last year and started introducing noise legislation. While none of his bills have gotten far in Congress, Kupferman is staking a claim in the noise field the way Sen. Muskie has done in pollution. Currently, he has two bills awaiting action in the House. One (H.R. 14602) calls for a comprehensive study of the noise situation and establishment of an Office of Noise Control under the Surgeon General to work specifically in the areas of jet aircraft noise abatement.

His other bill (H.R. 2820) would amend the Federal Aviation Act of 1958 and establish "Aircraft Noise Control and Abatement Standards" which might be used to suspend or revoke operating certificates of excessively noisy aircraft. Kupferman told AWN that noise pollution will become a pet political ploy, as did air and water pollution several years ago, and is likely to become a key sound in several '68 campaigns.

THE BOOMING METROPOLIS

New York, the city with one of the largest headaches, has for years been receiving shouts of complaints from its citizens. Their ailments are caused by cardboard walls, shrill whistles, horns and traffic sounds, construction, subways, transistor radios, and a host of other contributers to the background din that is rising about 1 decibel/year. Mayor Lindsay last April established a Task Force on Noise Control, consisting of acoustical engineers, doctors, lawyers and related industrial personnel.

The Task Force report, to be submitted to Lindsay within the next two months, is largely on evaluation of the problem rather than a recommendation for legislation. The report points out, however, that existing noise laws are seldom enforced.

SYMPHONY IN GARBAGE

As far as most New Yorkers are concerned, the worst sound in the city is from the ancient garbage trucks which howl an agonized predawn symphony accompanied by banging steel trash barrels in the brass section. Help, however, is on the way according to the Task Force and the Dept. of Sanitation. Eight hundred new trucks to be delivered by next year are to be made 60% quieter by means of a silent compactor, rather than the conveyor belt which now grinds and whines the garbage into the trucks.

AUTOMOBILES

A substantial part of the urban background noise comes from autos, trucks and buses, which growl the streets with improved mufflers and better sound insulation for passengers but, after a few years service, noticeably louder sounds coming from the engine compartment. The Society of Automotive Engineers has established a standard of 86 decibels measured 50 feet from an auto passing in low gear at 30 mph. SAE standards, however, largely reflect what Detroit has already accomplished rather than what should be the limit.

The British Ministry of Transportation, too, has recently drawn up noise limits and Sweden is actively pursuing a program for quieting auto noises.

AND WALLS

Urban dwellers, too, have the problem of thin apartment walls providing entertainment to and from their neighbors. Wall construction can be almost soundproof, but the added costs deter many builders. New York's new building code has specified limits for sound transmission through party walls and requires extensive soundproofing of air ducts, incinerators, elevators and machinery found in the building. Unfortunately, the code does nothing to prevent street noise from coming through windows and inundating apartments, even as high as 30 stories above the ground. And local laws which permit construction crews to unlimber their jackhammers and compressors at 7 a.m. are especially cruel in a city that has a mania for tearing down and constructing buildings.

SOUND IN FLIGHT

The boom is also being lowered in higher realms; aircraft and sonic booms. "Fear of aircraft noise, not lack of money, is the main threat to new airport expansion," remarked General William McKee, FAA administrator, last month. At present, there are more than 175 lawsuits involving noise at 34 airports, pending in U.S. courts. Concern over jet noise is also helping to delay building of a "long overdue" fourth jetport in the New York City area, according to an FAA spokesman.

Probably the greatest mystery in the aircraft noise field is why people build or rent homes immediately adjacent to airports. Most of the residents who live near airports have purchased homes there with the clear knowledge that living next to an airport isn't like living next to a cemetery.

FAA officials are dumbstruck by news that a building firm is about to throw up a high-rise apartment that will almost scrape the bellies of planes using the all-weather runway at New York's LaGuardia Airport. There is nothing FAA can do but await the hordes of angry tenants complaining about the noise within months of taking occupancy.

Both airlines and pilots are also alarmed about the situation. Take-off and landing procedures are already severely restricted by efforts to avoid flying over heavily populated neighborhoods and federal officials are considering increasing the standard glide slope from 3° to 6° in order to bring the planes in more quickly from higher altitudes. Pilots feel that safety is being sacrificed over crowded urban airports which can least afford it.

TESTING AT JFK

Noise tests being conducted at Kennedy involve the world's first automatic aircraft noise monitoring systems. The airplane sound is measured in perceived noise decibels (PNdbs), which represent the noises people can hear, but weighted toward the higher frequencies associated with jets. The devices record any noise made by a plane that is greater than 103 PNdb.

The maximum allowable noise has been set by the New York Port Authority at 112 PNdb and only 690 violations have been issued for the first 8 months of this year, when 98,443 take-offs were made.

SILENCE IS TAXABLE

Los Angeles, in an effort to maintain a hushed community, has put a tab on quiet. In August, a $1.00 tax for silence was tenta-

tively approved by the city legislature (AWN, Aug. 7, p. 8). Under this rule, each departing and arriving passenger at L.A.'s International Airport would be charged $1 for silence, as would each ton of airfreight loaded or unloaded at the terminal. The $1, in turn, would be used for soundproofing homes, schools and churches in the airport community.

Currently a $200,000 test program aimed at reducing the effects of aircraft noise on homes is being launched in the vicinity of the airfield (AWN, Sept. 11, p. 4).

QUIETER ENGINES

Problems created by noisy aircraft and the disenchantment of irritated citizens with the idea of having an airport anywhere in the vicinity, have forced a number of federal agencies to join hands in an effort to come up with quieter engines.

The National Aeronautics and Space Administration, acting for itself, the FAA, HEW and other agencies, this summer awarded Pratt & Whitney a $455,000 contract to design an engine considerably quieter than today's whining jets.

The introduction of fan jet engines has already proved a boon to noise-conscious airlines and has been a cost-saving factor to boot. Masses of air and hot gases are moved at a lower velocity by fan-jets than by the original turbo-jets, and since velocity of exhausted gases is the biggest factor in jet engine noise, fan jets have proved quieter, while delivering greater thrust.

The consortium of federal agencies is also to look into the fundamental mechanism of noise, noise muffling equipment on aircraft, and reduction of noise from planes on the ground.

THE BIG BOOM

Undoubtedly, the biggest boon to anti-noise groups has been the horror stories of the boom to be created by the supersonic aircraft going into commercial operation in the 1970's. Planes moving more than 660 miles per hour (the speed of sound at high altitudes) compress the air into shock waves. The shock waves then trail behind and beneath the plane, producing booming sounds as they strike the earth.

In August, a government report on the sonic boom tests reinforced widespread belief that supersonic airliners will not be allowed to fly at top speeds over land. The report, prepared by the Office of Science and Technology, contained preliminary findings of the effects of booms on humans, animals and buildings.

While no sound figures have been developed on physical damage or health effects of the boom, there is little doubt the boom will be an added unwelcome intrusion in already noisy lives. The Citizens League Against Sonic Boom, an academically oriented group top heavy in professional talents, was founded last March by Harvard physicist William A. Schurcliff and boasts 1,400 members.

Santa Barbara, Calif., has already banned the boom in their skies, condemned it as a "public nuisance;" and Switzerland is considering the same condemnation, calling the boom a major cause of landslides. Despite this international protestation, it is doubtful that the flight of the Boeing Supersonic Transport will be delayed. The new SST is expected to emit constant booms when making its record-breaking jaunts between Washington and Paris in three hours. And despite efforts of people like the Citizens League, Senator William Proxmire (D-Wis.) and a following of congressional disciples, delay of the SST is not likely. At most, they may be able to limit SST flights over land to less-efficient and more-costly subsonic speeds.

But realistically, whether noise is ever proven to be a health problem or is merely considered a nuisance is somewhat immaterial. American society has reached a state of affluence where it feels that it doesn't have to put up with even minor annoyances of this type. Besides, it's a beautiful issue for politicians casting about for something noncontroversial to champion.—BLC, TMD.

The Washington Building Congress Bulletin of October 1967, volume 31, No. 1—30th anniversary edition—at page 45, has an excellent article entitled "Now Hear This" which follows:

NOW HEAR THIS! WATER POLLUTION, AIR POLLUTION, NOW NOISE POLLUTION

(Note.—The following article is printed only as information to advise our members of the proposed legislation. The Building Congress has taken no stand on the measure, however, we appreciate your opinions and comments.)

When U.S. Representative *Theodore R. Kupferman* introduced his "Noise Control" measure in the Congress, the silence was deafening. However, this is one subject the New York Congressman is not silent about. If his efforts have failed to stir thunder from his colleagues, he has indeed received support elsewhere.

It has been firmly established that if the noise pollution continues at its present rate—one decibel per year for the past 30 years—noise may outrank harmful fumes in the air and organic wastes in water as this country's number one pollutant.

You may think at this time it sounds far-fetched—but it isn't. We have finally enacted certain measures to abate air and water pollution and now some efforts are taking root to curb our noise problems.

Mr. Kupferman's bill, the first of its kind, would provide for a program to control noise, including sonic boom, and would further provide grants to aid state and local programs designed to control excessive noise. Mr. Kupferman feels that if we had taken proper educational and remedial steps in air pollution ten years ago, we would not have the air pollution problem facing us today. "We are now at the same relative point with respect to the environmental problem of noise pollution", he said.

As the unpleasant sounds continue, man suffers from physical ailments ranging from insomnia to heart disease. The most probable ailment attributed to noise is the nervous tension headache. They are widespread today as the common cold, yet it is doubtful our grandparents suffered from such headaches because noise was not a sustained part of the American daily life until the 20th Century.

One of the greatest annoyances is traffic noise. Included as offenders are trains, industry, construction, children, telephones, pets, etc. However, construction and demolition noise is generally exempted from daytime control in areas that have established a decibel limit since this noise is sometimes considered a temporary nuisance and the price of progress.

Noise is nothing new to city dwellers but few of our cities have taken steps to abate the situation. However, 50 years before the birth of Christ, citizens of Rome complained so loudly about the noise created by hotrod chariot drivers that Caesar banned all night traffic.

Several countries in Europe have recognized noise as an environmental pollutant. England has prepared an exhaustive report on noise and adopted a national noise reduction code. Noise abatement laws are now in effect in France, Germany and the countries of Scandinavia. Moscow bans the blowing of horns and General de Gaulle outlawed transistor radios in public places in all of France.

A New York group feels that one area where relief from noise is urgently needed is the construction industry. A quieter pile driver has already been invented and they feel less noisy equipment could be developed.

The World Health Organization is showing some concern about noise-induced "mental pollution". Reports show there is an indisputable link between noise and mental illness; there is mere noise in America than any country in the world; there is more deafness in America than any other country, with one of every 12 persons suffering from impaired hearing; there is more mental illness in this country than any other, noise fatigue accounts for more accidents in American industry than in other, and America has done less to abate the problems of noise than any other country.

One organization, the Citizens for a Quieter City, Inc., located in New York, supports a proposed building code designed to reduce the "acoustical garbage" seeping from one apartment to the other, by soundproofing walls and floors, quieting of machinery, and limitations on noises transmitted through ventilators and ducts.

Silencers or mufflers to be attached to jackhammers, air compressors, and other construction equipment is advocated; or enclosing such equipment with a noise barrier on construction sites; and portable soundproof cladding for pile drivers.

Limited construction hours from 8 a.m. to 5 p.m. would be urged. Other noise preventive measures would include garbage cans enclosed in rubber, running freeways through sunken "groove ways" to absorb traffic noises; burying garages underground wherever possible to muffle excess automobile noises.

The American Legion magazine for February 1968 ran a feature article entitled "Our Noise," which follows:

OUR NOISE

(By Frances G. Conn)

(EDITOR'S NOTE.—We have a general rule that all pictures should have captions. The pictures with this article are no exception—but we feel that each reader can supply his own captions, and in some instances will come up with better captions than we consider printable.)

When President Johnson appointed a special panel on pollution in 1965, air pollution and water pollution got most of the headlines, but the study of "noise pollution" was part of the package too.

According to a lot of people, including physicist (and former Chancellor of the University of California) Dr. Vern O. Knudson, it was about time.

The United States is the noisiest country on earth and the racket we make is getting worse almost everywhere.

Dr. Knudson points out that if the noise we make keeps increasing at the present rate, it will be as deadly in thirty years in some of our downtown cities as were the ancient Chinese noise tortures for executing condemned prisoners.

In some American cities the honking, clanking, whining, whistling, roaring, pounding and vibrating from a host of sources is increasing by one decibel a year. Since the intensity of sound doubles with every six decibels, it takes six years, at that rate, to double the loudness of city noise. The strength of the general noise background in some of our communities is now four times what it was in 1956, and 32 times what it was in 1938.

Although it has long been recognized that constant exposure to intense sound may cause serious hearing loss, there are enough people around who can still hear what's happening to raise a fuss of their own.

In many places, police have added noise-testing devices to their radar speed-checking equipment inventory, particularly to enforce noise-restrictions on trucks. This has happened in Milwaukee, in New York State, and in Memphis, Tenn. Memphis has tackled the city noise problem so vigorously that it now claims to be "the quiet city." Many outsiders agree that it has earned the title.

Others are not making so much progress, but they have hopes based on determination, and here and there they make a little headway. Robert Baron doesn't claim any results yet, but he swears he'll keep trying in his fight against the ever-swelling racket in New York City. Baron, a theater manager, was so angered by three years of subway construction racket near his 6th Ave. apartment that he formed an organization to crusade against needless noise in New York. He and his "Citizens for a Quiet City" have gained a lot of attention—so much so that New York's Mayor Lindsay formed an official city Task Force on Noise Control, N.Y. Rep. Theodore Kupferman, who replaced Lindsay in Congress, has pushed two federal bills to further noise control (unsuccessfully to date).

Presently, Baron is waging a frontal attack on the noise caused by construction and demolition projects because, he says, there seem to be no legal controls on how much racket they can make anywhere in the United States. Last Dec. 18, Baron led a public demonstration outside the city's Lincoln Center. He treated onlookers to a comparison of the noise made by typical U.S. air compressors and pneumatic paving breakers with that of some muffled foreign designs. None of them were exactly quiet, but the U.S. types were well out front in disturbing the peace.

One member of Baron's committee is Dr. Samuel Rosen, consulting ear surgeon at New York's Mt. Sinai Hospital. Dr. Rosen is one of an increasing number of experts who don't along with some old and accepted notions about how harmless constant background noise is to society in general.

He and others suggest that it far more damaging than had previously been supposed.

Industry has taken excess noise-on-the-job seriously for a good many years. But as far as human damage is concerned, industrial experts have generally held (a) that hearing loss is the chief danger to humans, and then only in intensely noisy situations, and (b) that there is a "natural loss of hearing with age" which must be discounted in judging loss of hearing caused by noise.

Dr. Rosen and California's Dr. Knudsen suggest that hearing loss may be the least of it, and that you don't have to work in a boiler factory to suffer damage from our civilized hubbub.

Both of them take steady aim on the growing general racket that most of us are exposed to day and night—roaring tires and vehicle engines; honking horns; airplanes; whistles; jackhammers; household appliances; power tools; TV's and radios tuned up over the rest; howling transistor sets carried by pedestrians; unwanted loudspeakers on trucks; clanking, ticking, humming office equipment; construction and excavation projects; other people's noises coming through thin apartment walls; the hum of air conditioners, heating systems and pumps; gear noises; fan noises and you-name-it. All of these blended together, they say, cause far more than slow deafness. They are a factor in the celebrated "tensions" of modern living, and altogether they contribute to every one of the tension-related diseases—from stomach ulcers, neuroses and mental illness to allergie and circulatory diseases.

Dr. Knudsen calls the total effect of the background roar of modern life "decibel fatigue," and says that millions of Americans suffer from it. Dr. Rosen believes that medical science will one day recognize an entire "noise syndrome"—a family of symptoms related to unwanted or unexpected noises. He and others already cite dilation of the pupils, dry mucuous membranes, skin paleness, intestinal spasms and glandular secretions as candidates for membership in the full "noise syndrome" when it is recognized.

Dr. Lee E. Farr, public health professor at the University of Texas, agrees. He told the last convention of the American Medical Association that the effect of our noise on general health hasn't yet been taken with the seriousness it deserves. It can be an "unsuspected triggering agent" of the "tension" disabilities named above. And, contrary to older beliefs, the steady sound level "need not be intense" to trigger serious physical and nervous damage.

Dr. Rosen goes on to cast doubt on the idea that there is a "natural hearing loss with age." The "natural loss of hearing" in the United States, he suspects, is caused by the general noise level of our society, and there's nothing "natural" about it. Dr. Rosen has done homework in this field. Not satisfied that the loss of hearing among his older patients was "natural," he studied the hearing and health of older people in countries that are quieter.

He investigated Egyptians, Lapplanders, Germans, Finns, Yugoslavs, Bahamians, Cretans, Russians, and—most recently—aborigines of Southeast Sudan, who live in nearly noise-free surroundings. He concluded that hearing loss in old age is related directly to the noise one lives with throughout life. In the Sudan he found 90-year-old tribesmen who could hear as well as 10-year-old boys. At the same time he found that heart and blood vessel diseases were remarkably scarce among those whose lives were spent in quiet surroundings.

While he would be the last to say that he has yet proved the point scientifically, he finds the evidence to date persuasive and worthy of far more medical research.

Until recently, the most authoritative voices about noise have come from industry, because noise was a problem inside factories before it began to swell so much in homes and out in the open air.

If industry has spawned the most experts on noise control (and it has), it also looks at the problem from a defensive position. Industry is the defendant in claims for hearing loss on the job, and it can be the chief object of attack by irate citizens who claim that an industrial plant is a public noise nuisance. Claims for compensation for hearing loss on the job now run at about $2 million a year, while it has been estimated that 4½ million American workers who don't file claims might win them if they would.

The State Hearing Society of Colorado recently estimated that one in four people in the state are exposed to noise levels (not all of it on jobs) that can damage hearing in some people. Of nearly half a million so exposed, the Society estimates that about 71,000 Colorado citizens will actually suffer damaged hearing. Dr. Murray C. Brown, of the U.S. Public Health Service, feels that as many as seven million Americans work on jobs so noisy that their hearing will be impaired.

With liability ever on their minds, it is not surprising that industrial noise experts have tended to discount noise damage and complaints about noise, even while they have led in finding ways to control noise. The "natural loss of hearing with age" is an accepted phenomenon among industrial noise experts, while it is a commonplace with them that the people who complain *most* about industrial noise as a nuisance are neurotic people. Of that there isn't much question, but Doctors Rosen, Knudsen and Farr put reverse English on it when they suggest that the noise helps make the neurosis.

Industrial experts define noise as unwanted sound, but that doesn't quite fit. *Wanted* sound can be damaging, whether you call it noise or not. In Melbourne, Australia, noise researcher R. F. Burton set out to discover why he was noticing "tender ear" in two or three percent of teen-agers. He went to a rock 'n roll teenage dance and clocked 114 decibels of sound, a dangerously high level for the ear to tolerate. He came away predicting that many teen-agers who subject themselves to this wanted noise will lose their hearing earlier in life than usual, and many will be deaf at 40.

Some accepted ways to control noise may have to go by the boards if it is ever firmly established that unnoticed noise is as dangerous as the noises that irritate the most. People get used to a steady noise level or familiar sounds and tend to adjust to them. In that, indeed, lies the humor of the old joke about the lighthouse keeper who awoke with a start when the lighthouse fog horn *failed* to sound on schedule. "What was that?" he cried.

Noises that fluctuate are more irritating than those that are steady, and in some cases, faint noises annoy more than those that are louder.

One of the accepted ways to control irregular noises is to drown them out with an added steady noise. An oft-cited example is the fan put in a doctor's waiting room to smother conversations there that invade the examining room. But the idea of masking one noise with another is now subject to the challenge that unnoticed noises are still damaging to health and hearing. That puts in question all practices that control noise by adding to it.

New York's Robert Baron is among those who are insisting that unwanted conversations coming through walls should be controlled by building codes that require walls which are more soundproof. The trend in modern apartment and office buildings is to make thinner walls than formerly, and the many people who say that their neighbor's conversations, TVs and radios are driving them crazy aren't necessarily just using a figure of speech.

By all odds, the motor vehicle, and particularly the truck, is adding most to the steady noise increase in the United States. The airplane adds most to intermittent loud noise. Construction or demolition projects create the worst temporary rackets. The superhighway and the airplane are spreading our growing noise level into non-city areas. The increasing use of motor driven appliances, record players, radios and TVs makes the inside of the American home noisier than ever, from before breakfast until late at night. These noisemakers are taking some of the curse off the industrial plant, which, a long generation ago, shared the noise onus principally with the iron-shod hoof of the horse and the noisy and sooty thread of the railroad lines.

If the average reader of this page will stop for ten minutes during a typical part of his day and identify all the sounds he hears that he didn't ask for, he will realize there's no way even to list them in this space. On top of that, unless he's remote from town or highway, he will detect a constant roar of unidentifiable sound which is the "ambient" or background noise that's spreading and growing over most of American society.

Let's look at a small sampling of the typical noises, especially those that are: (a) commonest, (b) increasing and (c) ought to be controlled better.

Construction and demolition: A New York cab driver, asked what noises are the worst in his ears as he drives around the city, said: "Auto horns and engine accelerations, *except* that in a block where there's construction going on nobody can even hear the auto horns."

Construction noises are industrial sounds. Little attempt is made to control them, and Baron says the problem of *needless* construction noise is almost entirely a legal one. The typical American city zoning ordinances or anti-noise regulations more or less regulate the neighborhood nuisance potential of *fixed* industrial installations, but no movable ones. There is virtually no legal restriction on how much noise they can make in any neighborhood they invade.

If complaining citizens attack them as public nuisances, courts will generally rule

that if even the noisiest construction project serves a social purpose, it isn't a public nuisance—and of course construction serves a social purpose.

In the absence of legal control, what follows is logical. Existing industrial noise control knowledge isn't even applied to cut down construction noise. Air compressors twice as big as old-fashioned outhouses are set up curbside—amidst stores, homes and office buildings. Their engines run full blast, sometimes wide open to the air, sometimes hung around with metal sheets that only act as sounding boards. Little or no muffling of riveters, paving breakers, cement mixers, auxiliary engines and pumps is attempted. In their neighborhood, conversation is often impossible even at a yell.

The only answers are new laws and law enforcement to reduce the volume of construction and demolition noise as much as possible. Noise-control costs money and it is unreasonable to ask sympathetic construction firms to invest in noise control voluntarily, only to let the unsympathetic underbid them on jobs by avoiding noise-control costs.

Trucks, other vehicles, superhighways: The organized parts of the trucking industry—fleet owners, etc.—have for years recognized their fast-growing contribution to the national din. They have encouraged reasonable laws and fair enforcement. They want truck noise-control to be more legal than voluntary so that the "gypsies" must conform to the same standards as the fleets.

Truck tire noises haven't been a problem in cities where speeds are low. But all vehicles—of which trucks and buses are the worst—create a tire roar that spreads for miles beside our growing web of high-speed highways. So little can be done about this on the vehicles themselves that quieter paving surfaces are getting the most attention, where there is attention.

The New York and Connecticut turnpikes have brought such a roar to formerly quiet residential and rural districts that citizens of many communities have banded together to press local and state legislatures for sane and reasonable controlling laws and strict enforcement. And they are making some small headway. The state of California has taken the roar of its freeways very seriously on the state level.

Under present conditions, there is no escape from a rockbottom freeway roar, or from its increasing as traffic, speeds and freeways themselves multiply. Even reasonable standards, reasonably enforced, must allow such things as a truck to generate 85 decibels 50 feet away (as on the New York Thruway). But a beginning is now being made, albeit in a spotty way, against vehicles that ignore even this fairly deafening sound level with improperly muffled diesel exhausts and a host of other noisemakers on trucks and cars.

Many cities have laws against needless horn-blowing, but enforcement is hardly sufficient. The excess revving of motors taking off at a traffic light makes a hideous and little-controlled racket, and is virtually needless. Garbage trucks, and metal garbage cans being handled, are excessively and unnecessarily noisy. In some European cities metal garbage cans are quieted simply with rubber rings. New York City is investing in some experimental quieter garbage trucks—and a federal project is working on a design for a quieter bus. In city stop-and-go traffic, gear and engines noises on buses and trucks add significantly to background roar. Some owners of motorcycles, scooters and sports cars quite obviously enjoy unmuffled exhausts, and it is a question how much longer society's eardrums must be pounded by deliberate "sporty" noise on public streets.

Noise is not simply a sensation. It is power, transmitted by air to beat forcefully on body and eardrum. The decibel unit used to measure loudness is a unit of power, not of sensation. The deafening effect of noise is not simply a "numbing," but is physical damage to nerve receptors caused by a series of blows. It would not be wholly unreasonable to interpret excessive and *deliberate* public noise as a form of assault and battery—because that's what it is.

Aviation: Aircraft noise is a whole subject in itself. People living near airports or under low flight paths have made more complaints and gone to court more often about unwanted noise in recent years than anyone else. The enlarging of existing airports or the creation of new ones excites whole communities and chains of communities to protest. Airlines and airports alter flight paths and runways, while manufacturers drastically alter plane design to minimize the noise problem on the ground. Even the modern powering and design of planes for fast climbing is in part a reaction to vast pressure to get them and their noise away from the ground—but fast. The law of trespass and of nuisance has been altered by the advent of the plane (it is no longer a trespass to fly through the airspace over your property, but demonstrable damage and serious nuisance are actionable within limits).

What's new in all this is the sonic boom, now being debated heatedly on the national level. Britain, France and the Soviet Union are proceeding with supersonic passenger planes, while conflicting interests in the United States: (1) favor and (2) bitterly oppose development of faster-than-sound commercial planes here.

The bitter resistance concentrates on the sonic boom, which follows continuously behind any plane flying at supersonic speeds. If you haven't heard a sonic boom, it is like a nearby blast of too much dynamite—the loudest, most startling and most damaging noise yet made by any ordinary thing for routine peaceful human use. The Air Force has tested the effect of sonic booms on people and property in areas away from our very largest cities, to the tune of millions in claims and complaints in the thousands.

To anyone who has heard a sonic boom it's inconceivable that the people will ever tolerate routine supersonic commercial flights over settled areas. But you can follow the debate on this in the current newspapers and news magazines, because it is now a hot subject and promises to remain one. Not so hot are the lesser noises made by:

Thoughtless people—You can make your own catalog of these. There are the people who simply tune their home stereo up too high; social clubs that hold outdoor dances on their premises with bands or loudspeakers that can be heard a mile away; too-noisy parties or entertainment places; characters who carry transistor radios tuned loudly to their pet programs in public places, and people who chain up or pen their dogs in residential areas while they go to work, and never hear them howl all day.

America's law is lax in all these things compared to Europe's. There, many of these offenses are not only actionable as nuisances—as they may be on complaint here—but are specifically outlawed. England has a national noise reduction code, and mobile government sound laboratories that go from city to city, consulting and helping out with noise problems. Britain even makes "noise grants" to aid people in soundproofing their homes. Throughout Europe, transistor radios have been banned in many public places and horn blowing is almost passé.

In this country, Memphis won 16 national noise abatement awards in a row by setting fair standards and enforcing them firmly, without being disagreeable about it. Sound checks and anti-noise enforcement were made a regular part of police routine. All vehicle mufflers were mandatorially inspected several times a year. Teams of police were armed with portable decibel meters made by General Radio, whose engineers also counseled the police on what's reasonable and what's unreasonable noise.

The January 1963, "Fleet Owner," a trucking magazine, reported quite favorably on the enforcement of trucking noise limits in Memphis. Judges and police counseled with truckers to arrive at what would be fair and what would be unreasonable noise restrictions on trucks. Instead of being ticket-happy, police most often gave drivers in violation warnings first, and offending fleets received letters from Memphis police asking better cooperation. If a driver denied that his truck was too noisy, police would take him to a quiet street to let him hear his vehicle from the curb and read the decibel meter himself. For the worst offenders, and for repeaters, fines have ranged from $11 to $50. Basis of a violation is the policeman's charge. The meter simply backs him up.

Memphis chose wisely in relying chiefly on cooperation, while holding a get-tough policy in reserve. Police have too much to do to hold down noise by brute force, and the Memphis approach speaks for itself in its results.

Quite a few of the militant citizens committees that are agitating for better noise control in the United States are a step above agitators for many other causes. Instead of frothing at the mouth and going paranoid, a number of them have recognized that we aren't going to go back to hay wagons and rubber-tired buggies. These citizens committees have leveled their attack on *needless* noise and have studied the subject—which isn't a simple one.

The New York State Thruway Noise Abatement Committee, representing citizens in eight Westchester communities, enjoys a fine reputation with legislators and many commercial noisemakers because it has done its homework and doesn't demand the impossible. It took on the services of a top acoustic consultant, Stannard M. Potter. Though its attack is chiefly on truck noise, "Fleet Owner" commented that this committee is "roundly praised by trucking association officials for its cool, constructive approach."

Such groups emphasize that our fast-moving society makes more *unavoidable* noise all the time. We will live with that because we don't want to give up the good things our noisemakers provide. We like highway speed, we like the things the trucks bring to our store shelves, we like to fly cross-country in a few hours, we like the buildings that the riveters put together and we like the jackhammers to tear up the rough pavement to make way for the smooth. Soon we will like new things that new noisemakers will give us. So the time has come when we must clamp down on all the racket that is unnecessary, of which our great country seems to have the most ample supply in the world.

The Conservation Foundation devoted a whole issue of their newsletter, December 29, 1967, to the noise problem:

NOISE—STILL ANOTHER ENVIRONMENTAL POLLUTANT; WILL ALL REMAINING HAVENS OF SILENCE DISAPPEAR?

Now add "noise pollution" to the growing list of threats to our environment. Not that it's a new threat. Some 60 years ago, Dr. Robert Koch, renowned bacteriologist and Nobel Laureate, warned: "The day will come when man will have to fight merciless noise as the worst enemy of his health." Almost 30 years ago, the American Medical Association put us on notice that "the multiple and insidious ill effects of noise constitute an inadequately recognized, baneful influence on lives of millions of persons throughout the country."[1]

But man, in his infinite capacity to defile his environment, hasn't heard the message. Maybe he can't, what with all the noise.

Result: Noise "is one of the chief drawbacks to the enjoyment of modern urban

[1] C. P. McCord, E. E. Teal and W. N. Witheridge, in the Journal of the American Medical Association, May 7, 1938.

living," according to Dr. Vern O. Knudsen, physicist and former chancellor of the University of California at Los Angeles.[2]

Even if the decibel din should be held to its present level—which it will not—the total mix of environmental pollutants ought to jolt us into action. For as a task force reported to the Department of Health, Education and Welfare last summer:

"An individually acceptable amount of water pollution, added to a tolerable amount of air pollution, added to a bearable amount of noise and congestion can produce a totally unacceptable health environment."[3]

About the same time, Dr. Leo L. Beranek, a leading acoustics expert, sounded this cheerful note: "In all probability the noise level will grow not only in urban centers, but with increasing population and the proliferation of machines, noise will invade the few remaining havens of silence in the world. A century from now, when a man wants to escape to a quiet spot, there may be no place left to go."[4]

The hope, of course, is that voices of sanity will break through the noise.

Concern about noise spurted when large numbers of aircraft, piston and jet, started to fly low over communities in takeoffs and landings. It was further sparked by the feared effects of sonic boom from the proposed commercial supersonic transport (SST).

But the sources of today's barrage of noise are varied and seemingly limitless: Traffic (particularly heavy trucks, scooters, motorcycles and sports cars, as well as horns of all vehicles); private planes and helicopters in addition to commercial and military aircraft; motor boats; sirens from fire engines, police cars and ambulances; garbage trucks and garbage pails; power lawn mowers, snow shovelers and leaf rakers; outside air conditioners; construction equipment such as jackhammers, air compressors, riveters and pile drivers; gunfire; household appliances such as dishwashers, blenders, garbage disposals, vacuum cleaners, radio and TV sets (including those commercials which are louder than the programs); and a wide assortment of others such as public address systems, two-way radios, telephones and transistor radios.

Add them up and noise is clearly another waste product of our technological proficiency. How to cope with it? First, some definitions.

DECIBELS TO THE UMPTEENTH POWER

Most experts define noise simply as "unwanted sound." The lowest sound that can be detected by a keen human ear under very quiet conditions is called a decibel (db). The decibel scale is logarithmic—loudness, the actual sound pressure on the ear, increases 10 times with each 10-decibel increase. Thus a level of 100 decibels is really 10 to the 10th power—or 10,000,000,000—times as intense for the eardrum as 1 decibel. And when the level goes up from a normal conversational 50 db to 100 db (a loud outboard motor), the ear suffers not just a doubling of pressure but a 100,000-fold increase.

A variety of noises, relatively low in level and more or less steady, makes up what is called "ambient noise." This is an encompassing din or blanket of sound which partially masks loud noises in its midst, diminishing their startling effect.

The effects of noise fall into four general categories: Annoyance, disruption of activity, loss of hearing, and physical or mental deterioration.

It is obvious that noise annoys. Some sounds greatly disturb everyone, but individual reactions to most noise are highly subjective. They depend not only on the person, but the circumstances. Naturally, loud noises are usually more annoying (or damaging). However, if one is watching a building under construction, one could be expected to take in stride the battering noise of a jackhammer, whereas a man reading in absolute silence might well find the drip-drip of a distant faucet intolerable.

High-pitched sounds are generally more annoying and, with some exceptions, so are intermittent noises. (If a sound is loud enough to damage hearing, however, the damage will be far less if it is intermittent.)

"The tolerance threshold of each human being to noise is a subjective and individual matter," says Dr. Howard M. Bogard, chief psychologist at Queens Hospital Center in New York. "What only mildly annoys many well-adjusted people can acutely threaten the emotional stability of those who are making borderline psychological adjustments and barely holding onto reality."[5]

Noise can disrupt activities by interfering with speech communication. A noise may blot out all conversation for its duration. Measurements have shown how many words in a normal conversation are masked by an airplane takeoff. School classes and outdoor concerts are among the many other activities besides work which can be affected. Interference with communication is linked to loss of efficiency and reduced output among workers, and even to increased accident rates. Studies at Colgate University have indicated that the average worker spends one-fifth of his energy in fighting noise.

Actual loss of hearing, either temporary or permanent, is something else again. There is no dispute that it occurs and that it is widespread. It is normally associated with industrial workers who are exposed to loud machines for many years. This loss is far greater than the normal result of aging. Long daily doses of 90 decibels or more produce loss of hearing, it is generally agreed, with louder noises causing more damage faster. Dr. Aram Glorig of the Callier Hearing and Speech Center in Dallas, says a rough way of telling whether a noise is dangerous is if it "washes out voices and you have to shout about a foot away from someone's ear to make him hear you. If so, and you work in it all day long for a period of years, it can produce a hearing loss."[6]

But the problem is not just industrial noise. "What has passed unnoticed is that many noise levels encountered in the community exceed standards found in industry," says Dr. John D. Dougherty, Harvard School of Public Health, and Dr. Oliver I. Welsh, of the Veterans Administration Outpatient Clinic in Boston.[7]

On the effects of noise on physical and mental health (other than deafness and the aggravation of neurotic symptoms), the experts are in sharp disagreement. There is a conservative view that no hard evidence has been produced to condemn noise for various ills:

Says Dr. Beranek: "Sensational stories of the effects of loud noises on the well-being of man are often printed in the popular press. The noises of daily life have been blamed for increases in the divorce rate, social conflict, indigestion, inability to perform tasks with the limbs, or eyes, nervous breakdowns, high blood pressure, heart failure, and even insanity. Most of these allegations are the products of vivid imaginations. Of course, one cannot rule out the possibility that a few people are particularly sensitive to noise. But controlled social observations have indicated that the most important biological effects of loud noises are: hearing impairment, interference with speech communication; interference by distraction with mental or skill work; interference with sleep; and a feeling of general annoyance."[4]

But other experts strongly suggest that not enough is known about noise, and that its dangers to general health may be seriously underestimated.

Dr. John Anthony Parr of Great Britain, describing the reaction to a sudden loud noise: "Our muscles tense and we jerk, our abdominal blood vessels contract to drive extra blood to our muscles and this produces the feeling of the stomach turning over, and in an instant the liver releases stores of glucose to provide fuel for the muscles which may have to fight or run. This internal upheaval if repeated again and again is exhausting physically and mentally, and ultimately can cause a nervous breakdown and then it is but a step to contracting one of the stress diseases."[8]

Dr. Samuel Rosen, a New York ear surgeon, is another firm believer that noise is a health hazard: "One day, I believe, we will recognize a chronic noise syndrome. At an unexpected or unwanted noise the pupils dilate, skin pales, mucous membranes dry; there are intestinal spasms and the adrenals explode secretions. The biological organism, in a word, is disturbed."[9]

Similar conclusions could be cited almost indefinitely. They apparently do not constitute proof—certainly not absolute proof. Dr. Rosen compares the evidence to aspirins and headaches. "An aspirin tablet cures a headache. We don't know why. All we know is it does. If you delay until you get all the facts, you would never make a judgment."

WHAT CAN BE DONE?

In the last few years, despite a great deal of noise about noise, concrete results have been minor and scattered.

At the federal level, virtually the only voice to be consistently heard against noise in general is that of Rep. Theodore R. Kupferman of New York. He has introduced legislation, which so far has not emerged from a House Commerce subcommittee, which would:

Provide federal funds to help state and local governments set up their own noise control programs, as well as wage campaigns to foster an awareness of the benefits of a quieter environment.

Empower the Federal Aviation Agency to set noise abatement standards and to reimburse airlines and airports for up to 30% of the cost of modifying equipment or airports, to comply with them, and states and municipalities up to 90% of the cost of acquiring land around airports to reduce the effects of noise.

Also pending are a host of bills which would give the FAA greater authority to control aircraft noise—principally by permitting it to set standards and then refuse to certify, or revoke certification, of any plane which did not meet them.

Currently the FAA can only prescribe runway use, takeoff and approach patterns and other flying techniques, under its mandate to insure safety of aircraft. A few airports set allowable noise standards. For example, the Port of New York Authority requires that planes, while taking off from Kennedy International Airport, not exceed 112 decibels on the ground. They don't always succeed and, in any case, some of the neighboring communities consider that level too high for comfort. The town of Hempstead, Long Island, is planning to continue a long legal fight in support of its own ordinance, passed November 19, 1963, which sets more stringent limits

[2] Cry California, Fall, 1967.

[3] Report of Task Force on Environmental Health and Related Problems, HEW, June 1967.

[4] UNESCO Courier, July 1967.

[5] Testimony before New York State Assembly's mental hygiene committee, 1966.

[6] McCall's Magazine, January 1967.

[7] New England Journal of Medicine, Oct. 6, 1966.

[8] CONGRESSIONAL RECORD, vol. 112, pt. 7, p. 8747.

[9] Journal of the American Medical Association, May 15, 1967.

for overflights. However, last June 30, a federal judge ruled for the FAA and said the Hempstead ordinance couldn't be enforced because it would restrict airport use and infringe on federal control of airline commerce. The judge recognized the discomforts and distractions of the noise, but decided that the disadvantages to the residents were outweighed by the "total social interest" in having Kennedy continue to operate.[10]

As far as general community noise and nuisance is concerned, there is no scarcity of either police power or municipal ordinances to control noise. By and large, however, these ordinances are weakly phrased, cover only a limited range of problems (most commonly auto horns, truck noise and the like), and are lightly enforced if at all. California's new law limits truck and motorcycle noise to 92 db at a distance of 50 feet, higher than recommended by a consulting firm. New York has an 88 db limit for all vehicles.

Perhaps the most notable exception is Memphis, considered the quietest city in the country because of a noise abatement program started in 1940 and vigorously enforced by the police, who even hand out summonses for loud radio and TV.

Many ordinances limit the conditions and hours of construction work, as well as the creation of other noises; few establish maximum permissible decibel levels. A few places set noise levels for outdoor machines. The levels vary with time of day, zoning area, and character and duration of noise. These regulations are similar to modern zoning ordinances which limit the loudness of noise at a property line, or at the nearest residence.

But enforcement of such laws is difficult because some vagueness is unavoidable, because measurement is difficult, and because it may be necessary to weigh conflicting social values against each other.

The U.S. is generally far behind many other countries in noise control. For example, the Swiss Federal Anti-Noise Commission has established maximum day and night-time decibel levels for various types of areas, and they have been accepted by the Swiss courts. Similarly, in building construction there is apparently not a single code or ordinance in the United States which requires any protection against noise—either from the outside or from neighbors through the walls and floors. Yet Canada and a number of European countries have such control.

The Federal Housing Administration has issued model building techniques and noise level restrictions, but they are only suggested guidelines, not required by law. Economic considerations remain paramount. A New York apartment house builder has estimated that the cost differential for adequate sound proofing compared to none at all is about 5%. For individual homes, costs usually fall between $500 and $800.

WHAT SCIENCE GENERATES, SCIENCE CAN SUPPRESS

One hopeful aspect of noise control is that technology is rarely a stumbling block. Dr. Beranek said it well:

"Except for the sonic boom from planes and missiles traveling faster than sound, there's no noise scientific ingenuity can generate that scientific ingenuity can't suppress—if you give us money enough, room enough, weight tolerance enough . . . It can be done if society is willing to pay the price." [11]

This is not to say that many millions of dollars a year are not already being spent on research and production to reduce noise. Aircraft engine and plane manufacturers have put a great deal of effort into noise reduction (the Whisperjet is a small example) as have makers of cars, trucks, and certain appliances. Huge sums are spent each year on acoustical material to smother sounds in residential, commercial and industrial buildings. B. F. Goodrich estimates that the total market for acoustical products will reach $875 million by 1970.

It is possible to minimize noise on construction sites. Several countries in Europe have developed and are using quiet jackhammers, pile drivers, and air compressors. They also use small sheds or tents to muffle the noise of equipment in operation. Illustrating the possibilities was the construction of a 52-story office building in New York City in which blasting was muffled with special steel wire mesh blankets, joints were welded rather than riveted, and demolition was done during hours when few people were in the area.

And on December 18 in New York, Citizens for a Quieter City demonstrated a soundproofed air compressor which was developed in Britain and has been used there for five years. Measurements showed it reduced the noise level from 86 to 79 decibels. The compressor is enclosed in a plastic housing lined with foam plastic. A jackhammer was also demonstrated, with a decibel level of about 85 compared to the usual 96. Some European countries also boast rubberized garbage trucks, and now New York City is scheduled to get 800 of them—at a cost of a little more than $100 extra apiece.

LEANING ON THE LAW

There is a firm basis in the common law for various legal remedies against noise in general, since it easily classifies as a nuisance if it is unreasonable and disturbs the community. Indeed, citizens have often used court suits successfully to get rid of disturbing noises. One example occurred earlier this year when a court decided that a plant in Pennsylvania could only operate its air conditioning system from 8 a.m. to 6 p.m. and could not install another unit.[12] The company had been sued by a 77-year-old woman and her disabled veteran son. The court referred to an earlier case which ruled that noise imparing the reasonable enjoyment of a habitation is a nuisance.

Sometimes a nuisance is difficult to establish legally, however, because of the subjective reaction involved. And individual suits don't solve the overall problem.

Suits involving aircraft noise are legion, however. (Some 175 lawsuits involving airport noise are pending in the nation's courts.) In general there appears to be a slight trend toward more lenience by the courts. But a stringent view usually adhered to by the federal courts is that planes must fly directly over the landowner's property, rendering it "uninhabitable," or at least interfering substantially with the enjoyment or use of the property. Evidence of loss of property value can result in compensation.

At the other end of the scale are state court decisions which do not require a direct overflight, thus opening up claims for "lateral noise impact." In fact, an Oregon court in 1962 held that a plaintiff can keep his property and still collect damages without a complete "taking" in the eminent domain sense—and can do so under the rules against nuisances. An Oregon court in 1966 rejected the need to balance the social interests of operating the planes against the interest of the plaintiff.

Zoning and land use planning have been used in some instances, but there are serious drawbacks such as costs and the difficulty of getting a foot in the door early enough. An unusual example where it was possible to start almost from scratch was Dulles International Airport outside Washington, D.C. It is far enough from the city so most of the area was rural farmland, not expensive and displacing a minimum number of residents. Wide strips stretching a mile and a half beyond each of the three runways is clear. A large perimeter of trees—1.5 million seedlings planted in a pilot project in conjunction with the Northern Virginia Conservation Department—is designed to screen noise from the neighborhood. In spite of the cost, however, success has not been complete.

A World Health Organization study suggests that it is outdated to simply divide a city into light and heavy industrial or commercial areas and assign industries to them. Instead, performance standards should be used. City planning and zoning should take noise levels into consideration in advance, it says. "The results of past lack of forethought are aggravated by situations still developing that will certainly create noise problems in years to come. In some cities today, commercial activity is passing from the center to the suburbs, which must not be allowed to become the noisy slums of tomorrow. Whenever possible, a noise survey should precede any town-planning scheme." [13]

WHAT NEXT?

Where lies the answer to the growing noise problem?

Dr. Beranek says that it would probably be impossible to reverse the trend toward more and louder noise, even if we tried. "So we must view the problem not as one of eliminating noise, but rather of controlling it. Science alone is not the answer. Our most troublesome noise problems carry price tags; economic considerations must be weighed against people's desire for culture and 'the good life.' As in any democratic process the balance is struck in the political arena."

In the absence of clear-cut economic incentives, it is not likely that significant abatement or control of noise will be undertaken by the makers of machines, the builders and the producers of noise. That appears to leave the solution of the problem in the hands of:

Foresighted government officials, who could instigate meaningful controls and follow up with meaningful enforcement

The public, whose active indignation may be required to force those official to take the necessary steps. That indignation has already manifested itself in such organizations as Citizens for a Quieter City, Inc. of New York, and the Citizens League Against the Sonic Boom.

As the New York Times editorialized recently, the first step is for Americans "to realize that noise is not just an unpleasant annoyance, to be endured as part of the price of progress."

"The problem is our attitude," Robert Alex Baron, the crusading executive vice president of Citizens for a Quieter City, told CF recently. "The attitude of the public, public officials and industry—until that attitude changes, nothing effective is going to happen. There is no area in American society that fully understands the significance of the noise pollution problem. What I want to see is the emergence of a debate. I want it to come out into the open. The questions are all fascinating and we shouldn't be giving them pat answers."

With such a debate, the public could decide whether it wants to stuff cotton in its ears, or make enough noise of its own to force the changes it wants.

THE SONIC BOOM—EACH THUNDERCLAP'S SHORT BUT THE DEBATE'S LONG AND BITTER

Few if any noises have aroused more public animosity or more hand-wringing than the "sonic boom." It has caused a bitter lobby-

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[10] American Airlines et al., Port of New York Authority et al. v. Hempstead, D.C.E.D., N.Y., 63 Civ. 1280, 64 Civ. 45, 1967, etc.

[11] Saturday Evening Post, Feb. 6, 1960.

[12] DiCarlo v. Carmen Dress Co., Common Pleas Court of Luzerne County, Pa., July 6, 1967.

[13] "Noise: An Occupational Hazard and Public Nuisance," by Alan Bell, World Health Organization, Public Health Paper No. 30.

ing war between segments of the public and the aviation establishment. This war threatens to continue unabated for a decade, perhaps much longer, and to be fought in Congress and the courts.

Briefly, a sonic boom is caused by a plane traveling faster than the speed of sound (roughly 700 mph, depending on altitude). There is a common misconception that a plane causes only one boom, at the moment it accelerates through the "sound barrier." In fact, however, the plane drags a continuous shock wave path along its whole route, subjecting everyone beneath it (and from 20 to 30 miles on each side) to the sudden change of pressure. Each person hears this change as a single explosion. It has been compared to a sharp thunderclap or cannon shot, with a duration of about a third of a second of less.

So far, only military planes have flown supersonically, so that booms have been limited in number and controlled in location and severity. Thus the antiboom forces have focused their opposition on the proposed commercial supersonic transport (SST). Development of this plane has been approved by the Administration and Congress. In fact, the government intends to subsidize 90% of development costs. This is expected to run about $1.2 billion and may end up far above that.

Controversy over the SST has centered on its cost to the taxpayer (other programs being preferred for the money), its limited advantages—it would "benefit a small minority of affluent travelers anxious to gain status and save time on transoceanic trips," said the New York Times recently—and the alleged ill effects of its booms on humans, animals and buildings.

On the other hand, it is argued that the plane will keep the U.S. in the forefront of progress, will create jobs, and will help the country's balance of payments.

"In our opinion the sonic boom alone is sufficient ground for halting the SST program," say the Citizens League Against the Sonic Boom. The League, headed by Dr. William A. Shurcliff, a physicist, has been spearheading an intensive campaign against the SST from its Cambridge, Mass., headquarters.

Although military planes have been used for a number of tests designed to predict the boom effects of the SST, those effects are still shrouded in doubt. "We still have not made any judgment as to whether people will accept the boom or not," says Maj. Gen. Jewell C. Maxwell, head of the SST program.

There is voluminous data pro and con, but the experts can still merely estimate how great a shock the SST will produce under certain conditions, and they can only guess what the general public reaction will be. Gen. Maxwell staunchly maintains that all available evidence reveals no physiological damage to people and "negligible" property damage such as broken windows, cracked plaster, damaged bric-a-brac and the like.

(The Air Force, from 1956 through fiscal 1967, received 35,429 damage claims from almost $20 million involving sonic booms on routine military flights or test operations; it has approved in whole or in part 12,615 claims for a total of $1,325,972, some of which have been appealed, causing them to be counted twice in the totals. But government spokesmen play down the figures in many ways, blaming some awards on overzealous juries and others on their own desire to settle claims rather than fighting each one in court.)

Government officials and the press have recently stated or implied that the SST would be restricted to oceanic flights or very limited overland routes because of intolerable effects of the boom. Gen. Maxwell says, "We've made all our program and design decisions on the assumption it may be true." But he also says that no decision has been made that the SST will be kept off overland routes.

He says he does not believe the FAA currently has legal grounds to impose such a restriction, limited as it is to protecting lives and property on the ground. This, in Gen. Maxwell's view, covers physical damage only, and not annoyance. Pending legislation, however, would authorize the FAA to refuse certification to planes that didn't meet noise and sonic boom limitations.

SST opponents claim the craft won't be economical if confined to the oceans. Sen. William Proximire of Wisconsin predicts: "The SST will start by flying the ocean routes. Soon the economic pressures of flying these high-cost planes on limited routes will force admisison of the planes to a few scattered land routes. And ultimately they will be flying everywhere."

A standard Research Institute report on tests at Edwards Air Force Base concluded that peak booms of 1.69 pounds pressure per square foot (Gen. Maxwell's estimate for a cruising SST) are unacceptable to from 27% to 40% of the residents—depending on whether they were indoors or outdoors, or had been previously exposed to booms. At Edwards, 14% said the environment was unacceptable even before the tests, when booms averaged 1.2 pounds.

The Citizens League has criticized many of the tests as biased—because they have been held only during daytime, have concentrated on communities that are used to aircraft noise or identify with the military or aviation industry and have included warnings in advance.

Some government officials concede that not very much is yet known about the effects of boom on farm animals and wildlife (the Agriculture Department is being asked to make further studies). There is also insufficient knowledge about the effects of weather variations on the intensity of the boom (and this is being studied by the Environmental Science Services Administration).

Gen. Maxwell says the probability is that 1% of the booms will have twice the intensity of the others. "Nobody knows what causes these 'spikes' or how they occur. Many suspect air turbulence and heating close to the ground." Meanwhile, aviation men will be watching closely as the Concorde—the earlier British-French competitor of the SST makes its first flight, scheduled Feb. 28. (The Boeing SST is not expected to be airborne until some time in 1971.)

FOR MORE INFORMATION

Handbook of Noise Control, edited by C. M. Harris, McGraw-Hill, 1957. *Noise Reduction*, by Leo L. Beranek, McGraw-Hill, 1960. *Noise: An Occupational Hazard and Public Nuisance*, Public Health Papers No. 30, World Health Organization, Geneva. *Urban Noise*, Columbia Journal of Law and Social Problems, November 20, 1967. *Journal* of the Accoustical Society of America. *UNESCO Courier*, July, 1967. *Noise Abatement in Practice*. International Association Against Noise, Zurich. *Quiet Please*, Journal of Noise Abatement Society, London. *Citizens for a Quieter City, Inc.*, 136 East 57th Street, New York, N.Y. *Citizens League Aagainst the Sonic Boom*, 19 Appleton Street, Cambridge, Massachusetts. And various entries in *Congressional Record*, 1966–67 (see CR index).

LOVE THAT BOOM?

"We believe that people in time will come to accept the sonic boom as they have the rather unpleasant side effects which have accompanied other advances in transportation."—Maj. Gen. Jewell C. Maxwell, head of the SST program, Science Digest, July, 1966.

"Sonic booms are an environmental annoyance like pollution of air or water. Americans will have to learn to live with them."—Henning von Gierke, Air Force Aerospace Medical Research Laboratories, New York Times, November 11, 1965.

DECIBEL LEVELS

Some quick guidelines: Threshold of audibility, 0 db. Annoyance threshold for intermittent sounds in community, 50–90 db. Intolerable for phone use, 80 db. Discomfort threshold, 1–10 db. Pain threshold, 120 db. Short exposure can cause permanent hearing loss, 150 db.

Some examples: Whisper, 20 db. Quiet room, 40 db. Quiet street, 50 db. Normal conversation, 50–60 db. Sports car, truck, shouted conversation, 90 db. Electric blender, 93 db. Pneumatic jack-hammer, 94 db. Loud outboard motor, 102 db. Loud power mower, 107 db. Jet plane (passenger ramp), 117 db. Thunderclap, 120 db. Diesel engine room, nearby air raid siren, 125 db. Machine gun, riveting, 130 db. Jet takeoff (close range), 150 db.

"WE SHOULD HAVE LEARNED

"If there is one lesson that we should have learned from the current crisis of air pollution it is that if proper educational and remedial steps in that area had been taken 10 years ago, the problem of air pollution might not have reached the critical proportions it has today. We are now at the same relative point with respect to the environmental problem of noise pollution."—Rep. Theodore R. Kupferman of New York, testifying before a House Commerce subcommittee, Nov. 14, 1967.

UDALL STEPS IN, GATHERS TEAM OF SCIENTISTS TO STUDY NOISE EFFECTS

News item: "Interior Secretary Stewart L. Udall has taken on the job of trying to determine the effect of noise pollution on man and the nation's natural resources. He started the ball rolling today when he met with a team of scientists he has asked to study the problem of noise effects—from the sonic boom to the overall increase in noises in urban areas."—Washington Star, Dec. 20, 1967.

The full story behind that news item is not yet known. But at least this much seems clear: Udall is filling a vacuum and is stepping in where others in the Johnson administration have not yet tread. Although he has expressed concern publicly about noise pollution from time to time over the past two years, he always indicated—until now—that the noise problem might more appropriately come under the jurisdiction of some other department—HEW or Transportation or HUD.

At a press conference in early 1967, Udall was critical of the "intrusion of the sonic boom on the fragile masterpieces of nature" after sonic boom damage in Arizona's Canyon de Chelly National Monument and suspected damage in Bryce Canyon National Park. He added that he intended to speak to the Federal Aviation Administration (part of the Department of Transportation) about it.

Has he now given up on the FAA and decided to mount his own campaign against the sonic boom and noise in general? And has he also given up on HEW?

Interestingly, HEW was urged last summer by its own special task force on environmental health to develop "basic data sufficient to establish human levels of tolerance for noise" and to "develop urban and rural model codes and suggested standards for the prevention and control of various sources of noise in the environment." Attempts by CF in late December to find out what HEW is doing about the task force recommendations on noise produced these official reactions from HEW sources:

"I am aware of nothing going on concerning noise . . . The Secretary (of HEW) has never accepted or rejected any of the recommendations made by the task force . . . Any follow-up on noise recommendations will appear as part of the President's legislative recommendations to Congress in 1968 . . ."

Unofficially, there's concern at HEW that

the department has so far failed its obligation to exercise leadership on the noise pollution question under its general environmental health mandate.

A large unanswered question is the position of President Johnson. Did Udall have White House blessing before stepping into the noise pollution problem? No one is saying. But the President has spoken out against noise and he was visibly annoyed when jets flew overhead during a memorial service to Carl Sandburg on the steps of the Lincoln Memorial in September.

Meanwhile, back to the hard news: The scientists asked by Udall to study the problem of noise include Athelstan F. Spilhaus of Franklin Institute, Rene Dubos of Rockefeller University, Joseph Fisher of Resources for the Future, Gordon J. F. MacDonald of the Institute for Defense Analysis, Harrison Brown of Caltech, and John C. Calhoun, Jr. of Texas A&M.

The medical and health aspect is emphasized in my correspondence with Dr. Lee E. Farr, of the University of Texas School of Public Health, and the articles and material which follow:

THE UNIVERSITY OF TEXAS SCHOOL OF PUBLIC HEALTH AT HOUSTON,
Houston, Tex., November 20, 1967.

HON. THEODORE KUPFERMAN,
House Office Building,
Washington, D.C.

DEAR SIR: Having followed in the *Congressional Record* in some detail your campaign against noise, I believe that you will be interested in the enclosed article recently published by me in the *Journal of the American Medical Association,* October 16, 1967, relative to the effects of noise on health.

May I point out that whereas the effects of noise insofar as hearing is concerned are an effect almost exclusively of its intensity which can be measured in decibels, the total effects of noise on man's emotional well-being, my area of special interest, are related not only to the intensity of the sound, but the harmonics, the tone, the pitch, the rhythm and the total quality of the sound itself. A sound barely perceptible to the ear may have as great an emotional impact as a very loud one. Therefore, it seems to me that this is an area in which we are most concerned in conserving health in our urban areas. I believe that the conservation of hearing by protection against high intensity sounds is a very important one, but that there are already many organizations actively working in this area. Whereas, in the concern for preservation of a healthy emotional state, there are very few endeavors presently under way.

I am,
Very sincerely yours,

LEE E. FARR, M.D.,
Professor of Environmental Health, Head, Department of Environmental Health.

[From the Journal of the American Medical Association, Oct. 16, 1967, vol. 202, pp. 171–174]

MEDICAL CONSEQUENCES OF ENVIRONMENTAL HOME NOISES

(By Lee E. Farr, M.D.)

(NOTE.—An examination of the home for sources of sound which may be of medical significance reveals by measurement of sound levels in actual homes that many home devices operate at surprisingly high levels of sound intensities. Operation of these devices results in intrusive and unwanted sound perception by the individual. Effects of intrusive sound may be deleterious to health, particularly for individuals with emotional disturbances and so-called tension diseases. A need exists to define the harmful potential of home noise disturbances and for physicians to become aware of noise as an adjunct in provoking manifest disease.)

Noise, or "unwanted and intrusive sound," as a pollutant of personal home environment is a matter of wide public interest. This concern has arisen from a combination of only a few factors. First is the increase in city populations indoctrinated with ideas of home automation. Second is the efficiency with which mechanical devices for household and individual use have been adapted from more costly commercial models. Third, there has been a period of extraordinary prosperity for the great majority of people in the United States which, in turn, has generated a financial capability previously undreamed of for each household and which now permits each abode to have several of the devices increasingly considered not as luxuries but as necessities of modern living. Fourth, the advertising and the general mood of the past few years has, in part, dictated a selection of devices based upon advertising impact rather than on personal need for these so-called labor-saving devices. The general mores of today's society have reinforced advertising appeals by making status symbols of these domestic units. On such a basis, possession is emphasized over performance. Fifth, and finally, an ever-increasing fraction of the ever-increasing number of city dwellers are living in the composite structures known as apartments.

Urbanization, population explosions, technology, and prosperity have thus set the stage for another phase of man's ever-broadening battle to control his surroundings sufficiently to prevent his environment from damaging him. In this instance, home sounds can threaten the health and well-being of one's emotional state.

Crowded conditions in cities have led to less space per home, with gradual abandonment of single dwellings for multiple, because of cost and convenience factors. In apartment dwellings a wall, frequently a very thin one, separates one from his fellows, and no sound-absorbent band of space, plants, earth, or trees serves to diminish sound transmittal from one household to the next.

Exposure to noise is upsetting emotionally and frequently may lead to outbursts of fury or threats, neither of which satisfies and each of which leaves frustration as a legacy. While sound can be generated at levels potentially hazardous to hearing by mechanical devices very frequently found in the home, exposure is not steady enough or sufficiently prolonged to cause hearing impairment—though Rosen's observations on the African tribe living in a quiet environment whose members retain youthful hearing acuity into the older ages gives one pause.[1, 2] Measurement of the intensity of some of these sounds reveals intensities sufficient to impair hearing if the exposure were for eight hours per day for the usual working week (Table). However, when one examines the impact of homemade sounds on man, it is his emotional status rather than his hearing acuity that is in the greater danger.

Both aspects of sound problems must be mentioned—presence and absence. Absence of certain components of sound in a heterogeneous environment may also be pointed to as capable of causing a type of trauma that should be mentioned. Absence of sound perception may follow absence of a given sound and be absolute, or it may appear to exist as a result of a loss of hearing acuity. This is well-documented for the older-age groups. The real or apparent absence of certain sound elements commonly perceived in the background spectra may result in a sense of uneasiness readily interpreted as annoyance. Through inability to effect proper selection and discrimination within certain sound spectra because of hearing acuity loss, a similar annoyance can develop. The effect can be of the same type and degree as that which ensues from sound intrusion. Gaps in sound spectra may have much the same psychological attributes as does noise.

[1] Rosen, S., et al: Presbycusis Study of a Relatively Noise-Free Population in the Sudan, *Ann Otol* 71:727–744 (Sept) 1962.

[2] Rosen, S.: Hearing Studies in Selected and Rural Populations: Series 2, *Trans NY Acad Sci* 29:9 (Nov) 1966.

INTENSITY OF SOUNDS COMMON IN THE HOME[1]

Appliances being operated	Apartment A (db)	Apartment B (db)
Living room:[2]		
Quiet	50	50
Vacuum cleaner (nozzle engaged on carpet)	72	72
Vacuum cleaner (nozzle free)	81	[3] 73
Hi-fi (loud but not vibrant)	70	75
Television (average volume)		68
Kitchen:[4]		
Quiet	56	56
Stove vent fan	[5] 84	[3] 68
Stove vent fan and dishwasher	88	[3] 71
Stove vent fan, dishwasher, and garbage disposal	91	[3] 84
Garbage disposal empty		72
Garbage disposal with ice cubes		78
Dishwasher only		69
Bedroom:		
Quiet	53	50
Air contidioner (central system)		55
Air conditioner and air filter fan unit		57
Bathroom:		
Quiet		53
Ventilating fan		63
Ventilating fan and toilet		72

[1] Measurements were made with a sound level meter (C scale). The apartments were in different buildings with different floor plans.

[2] Measurements were made 6 feet from the vacuum cleaner, 16 feet from the hi-fi and 8 feet from the television.

[3] Newer models.

[4] Measurements were from the center of the kitchen.

[5] Lower and steady sound productions. When hard materials such as bones were introduced into the disposal unit, the sound level rose to above 100 db.

During the last 30 years, much attention has been given to effects of various sound intensities upon the hearing acuity of workers. Maximum permissible levels of sound intensity for factories and offices have been established by regulation. In relation to home environment, until very recently there has been no evidence that design and operational criteria for any single unit in the home need be examined other than for performance or for salability. No attention whatever was given to its operational sound intensity.

In this same 30 years, only one paper on the subject is recorded in the literature, and it touches only obliquely on the necessity and desirability for control of sound in the home. It was written in 1938 by McCord et al, who stated:

"It follows as a natural consequence that occupants of buildings, living in artificial atmosphere and thus not dependent on open windows and doors, will in some measure be protected against extraneous noise arising from traffic, nearby buildings, or low flying aircraft.

"The multiple and insidious ill effects of noise constitute an inadequately recognized, baneful influence on lives of millions of persons throughout the country, especially those who live in urban areas. Noise deafness constitutes the most serious and tangible of the ill noise effects (echoseoses), but there is in addition a host of scarcely measurable injuries made evident by neurosis, loss of sleep, excessive fatigue, emotional disturbances and the like that jeopardise the complete well-being of most persons, and in which noise may well play a part." [3]

In December 1963, Farr read a paper at the

[3] McCord, C.P.; Teal, E.E.; and Witheridge, W.N.; Noise and Its Effect on Human Beings; Noise Control as By-Product of Air Conditioning, *JAMA* 110:1553–1560 (May 7) 1938.

Scientific Assembly of the American Medical Association calling attention to the mechanical devices in the home as sources of noise which could be of significance in health impairment.[4] In the last three years, industry has been extremely progressive in changing design to provide increased performance at less intense sound levels for many devices used in the home (Table). Industry now uses quietness as a selling quality—a market-tested attribute, which shows the need for such attention.

It must be reaffirmed that we are not concerned with noise as an agent in the home which induces hearing loss but rather with the attitudes of household members toward the inescapable sounds of household operation today and with the effects of those attitudes upon the person's health.

SOUND AS NOISE

Noise was defined earlier in this paper as unwanted sound, and it must be emphasized that high sound intensity *is not* a requisite component. Noise, thus defined, becomes a highly personal subjective reaction to, and interpretation of, sound perceived. While noise as a quality must not be confused with loudness, in general, a loud sharp sound will have all of the attributes of noise, since it is usually, particularly if unexpected, intrusive by virtue of its intensity and has a high annoyance value. It seems reasonable that under most circumstances sounds of high intensity are less easily ignored, day or night, than are sounds of low intensity.

We are thus dealing largely with what Kryter called the annoyance value of sound.[5] This he characterized under five qualities: (1) unexpectedness, (2) interference, (3) inappropriateness, (4) intermittency, and (5) reverberation. To Kryter's listing one additional and very important quality should be added—the origin of sound. Self-generated sound commands a very high tolerance in the individual generating it, yet it may have two or more of Kryter's annoyance values of sound. But sound generated by another person or an impersonal sound, such as a sonic boom, has a very high annoyance value, for external sound generally seems to amplify each of the qualities responsible for annoyance.

Age is another factor which may result in sound becoming annoying and irritating, for at advanced ages most people have a loss in hearing acuity. The gradual loss of hearing with advancing age increases the likelihood of extraneous sounds causing interference in communication with greater frequency and at lower intensities of the extraneous sound. Inability to discriminate effectively between some sounds of approximately equal intensities may lead to social embarrassment, which in turn leads to changes in patterns of behavior in efforts to mitigate the degree of interference. These behavioral changes are assumed to temper the source of embarrassment to the person who suffers from the loss of hearing acuity.

In some instances, such a changed pattern appears also to have been incorporated into "status symbols of success." During the era when the older patterns of executive privileges were established, it was undoubtedly true that the executive was an older person. The older executive may compensate, in part, for his loss of hearing acuity by reducing background noise. For example, the pattern of office privileges and amenities by which the executive has a quiet noise-controlled office may reflect the very simple fact that the executive, usually being older, may have lost some of his hearing acuity. If this be so, his ability to select and discriminate among a variety of sounds may have been reduced. This fact is then noted in establishment of a new criterion for executive behavior. This same type of behavior and status pattern is carried over into the executive's home where certain noise control mechanisms are effected, usually by distance rather than specific noise suppression or sound absorbing measures.

The ability to discriminate among sounds and select at will the desired sounds from a complex of heterogeneous sounds as a background or to reject the undesired sounds is in part a function of hearing acuity. When heterogeneous background noise becomes significant, as at a cocktail party in full progress, the problem of discrimination and selection of conversational sound from an adjacent person speaking may require a major effort in an older person. The inability to clearly distinguish what is said then can result in a rejection of participation in such gatherings by this individual, despite the fact that invitations to such affairs within some circles are a measure of success. The high and complex noise level in the background in the instance cited may be traumatic to an individual, because it transcends his speech interference level.

This suggestive pattern of executive behavior has been interfered with by the explosive advance of technology which has catapulted young men into executive positions, and now we are increasingly seeing executives sitting at open desks or at least in glass-walled cubicles.

The converse picture of this loss of discriminating ability is epitomized by a teenager studying in front of the television or radio set at or near full volume. This same teen-ager, if a telephone call be anticipated, will hear with astonishing perception the ring of a distant telephone and immediately sort this sound pattern out of a varied mixture of high-intensity environmental sounds. Perhaps this high level of discriminatory ability explains, in part, the tolerance of teenagers to a background of complex sounds of high intensity.

The differences noted above in ability to discriminate among various sounds in a complex background of sound may help to explain why certain sound backgrounds may be annoying to some and a matter of indifference to others. However, sounds of such intensity as are made by many household devices in present-day living quarters are well capable of generating sounds in excess of that necessary to transcend the speech interference level and of interfering with other types of sound communications as well.

SOUND IN THE HOME

While acoustical engineers and architects of this country have been aware of the deterioration of sound environment in the home, their major concern and effort have been directed toward control of noise in places of employment to protect the health of employees. Factories, offices, and many public gathering places have been engineered acoustically at but a small cost increment, with a readily observed return in increased industrial efficiency and improvement in industrial health. Home designers, meanwhile, seem to have concentrated upon appearance, with little thought of quality control of sound, and upon style, which could be merchandised as a status symbol.[6] The ultimate result has been inadvertently to turn kitchens into miniature transient simulators of old-fashioned boiler factories by introducing a variety of sound-producing mechanical devices useful in the performance of kitchen tasks. The ventilating fan over the stove, the dishwasher, the garbage disposal unit, the blender, all make significant contributions to sound, which the steel cabinets or hard plastic covered surfaces reflect, augment, and cause to reverberate. From a basic sound intensity level of 56 db, these may produce and increment to over 100 db in an ordinary kitchen (Table). A tired, taut person will certainly not leave a kitchen pleasantly relaxed; nor do the roars, squeaks, whirrs, and whines issuing from it lead to quiet contemplation of pleasant meals by those who are waiting.

Further, the sound intensity is of such loudness that for many apartment dwellers conversation in the living room is virtually impossible while some of these devices are in operation. In a large living room tested, a standard vacuum cleaner raised the sound level from 50 to 73 db when the nozzle was fully engaged on the rug, but when this was lifted, the intensity rose to 81 db. The occupants of this housefold consider their hi-fi record player to be very loud at 80 db. In each case, the instruments were placed in a position simulating that of the user's ear and about 6 feet from the sound source.

Neither have the bedrooms or bathrooms escaped this blight of noise. Bedroom air conditioners, bathroom ventilating fans, and poorly designed plumbing all make their contribution to this melee of sound.

EFFECTS ON ILLNESS

The effects of noise in exacerbating disease may be seen in a specific infectious disease, such as tetanus. In other disease states such as anxieties, duodenal ulcer, and other kindred so-called tension ills, the additive deleterious effect of noise is real and immediate. Any disease which may be associated with an emotional charge requires as part of the therapy a calm, relaxed, quiet environment. This is particularly true of disturbed emotional states. The frequency of the latter has brought the attention of psychiatrists to this problem, but it has usually been noted only in passing, although its significance was appreciated as the following quote from Denzel attests:

"We know that noise interferes with rest and relaxation and especially with sleep. While sleep, the complete withdrawal from the world around us, is an obvious necessity for physical and emotional health, less complete withdrawal into the quiet of our homes may also be necessary if we want to retain individual integrity . . . It appears rational and feasible to take positive steps to reduce the sound level of our modern environment if enough people feel the need to do so."[7]

It has already been noted that loudness is not a necessary quality of noise. The cacophony resulting from several radios and televisions tuned to low intensities, but to a variety of programs, can lead to a most annoying experience for the involuntary listener and may be just as destructive of sleep as a loud shot. Increasingly, thought has been given to temperature and humidity control within the home, as well as light, color and ventilation. It is time that man realizes that his home can be designed to acoustic criteria, resulting in a pleasant environment for him and medically conducive to a state of well-being—permitting him to daily relax, refresh, restore, and reinvigorate himself for the tasks, chores, and strains of life.

STUDIES ON SOUND CONTROL

While physicians and psychologists have not been unmindful of the desirability of maintaining sound control in homes, they

[4] Farr, L.E.: The Trauma of Everyday Noise, read before the Scientific Assembly of the American Medical Association, Portland, Oreg., Dec. 3, 1963; abstracted, *JAMA* 187, Jan. 25, 1964, adv pp 36–37.

[5] Kryter, K.D.: The Effects of Noise on Man, *J Speech Hearing Dis* [*Monogr*] 1:17 (Sept) 1950.

[6] Farr, L.E.: "The Increasing Medical Significance of Environmental Domestic Noise," in *Texas Conference on Our Environmental Crisis,* Austin, Tex.; University of Texas Press 1966, pp. 210–219.

[7] Denzel, H. A.: Noise and Health, *Science* 143:992 (March 6) 1964.

have done little experimental work on the problem. This stems directly from the complexity inherent in making objective measurements of effects resulting from subjective interpretation. Sound must jar the mood to become noise, and if it does so, then noise results whether the sound be a classical rendition of Bach or a soft offkey hum of a contented individual doing personal chores.

The trauma of noise may bring to the surface a scarcely submerged tension and result in an emotional outburst, or it may provoke symptomatology manifesting itself as a well-recognized medical syndrome. The control of pathways which lead to these diverse expressions is not known. Perhaps with telemetry now becoming a practical means of study, it may be possible to design adequate meaningful experiments dealing with this problem.

Because of a lack of medical clarity in estimating the significance of noise as an agent of disease, some have sought to control the bane of noise by advocating legislative enactments setting forth specific criteria of construction materials and designs to provide acoustic control in buildings to be used as homes.[8] It is true that often government is looked to as a source of authority which, if properly exercised, can banish many problems involving numbers of people, but there is also some disillusionment with this source as an efficacious agent for control of one's immediate environment. It is clear that the definitive control of a person's immediate environment must be exercised by that individual, both to promote health and well-being and to avoid or mitigate illness. Further, it is seen that especially in setting the standards of acoustic criteria for personal needs, no wide area exists for specific exercise of community police powers or extension of community health services. The questions to be resolved are essentially personal, though some broad limits may be set for guidance.

With a basic design which takes into account existing ambient sound patterns, it is possible to construct private quarters in which acoustical properties can be emphasized by choice of furnishings to augment or minimize sound effects just as these are used to accentuate light or color. The physician must join with the acoustical engineer, the architect, and the decorator to establish general acoustical standards of personal environment. Once these standards are agreed upon they can be readily attained by selecting construction materials for their special qualities of absorbance and reflectance. If necessary, these can be created to meet the need; for with the new plastic materials, surface qualities and hardness can be varied at will.

The Environmental Health Letter—September 1, 1967, issue—published by Gershon W. Fishbein has the following item:

EFFECTIVENESS OF HEARING CONSERVATION PROGRAMS QUESTIONED

Of considerable importance to industrial physicians and hygienists is the report by the Public Health Service questioning the effectiveness of many hearing conservation programs in the U.S.

Medical authorities at the National Center for Chronic Disease Control declared that the use of inaccurate audiometers to measure hearing ability and detect ear damage or disease is widespread, based on the findings of a three-year evaluation of audiometers recently completed by the University of North Carolina's Audiometric Calibration Center.

The Calibration Center evaluated the accuracy of 100 audiometers and none met the study's specifications. It was conducted by PHS.

"No hearing conservation program can be effective if its audiometers are not checked for calibration on a regular basis," said Dr. Joseph L. Stewart, Audiology Consultant to the Center's Neurological and Sensory Disease Control Program.

The instruments will be reexamined at three-month intervals to determine how often they need to be recalibrated, why they go out of calibration, and which functions of the instruments give the most trouble. At the same time, the Program is negotiating with non-government contractors for construction of a model audiometer free of the defects discovered in the study instruments.

Note: "Noise pollution" will be the subject of an address to a luncheon sponsored by the Chamber of Commerce of the United States Sept. 12 in Washington. Speaker will be Rep. Kupferman (R-N.Y.), who has introduced legislation for research and control of noise.

My constituent, Dr. Zhivko Angeluscheff, who recently attended the London Noise Congress held May 13 to 18, is quoted in an article by A. Zatz, of World Medical News, on his speech in November 1966 at the International Congress of Audiology in Mexico City as follows:

DOCTORS AND DEAFNESS

A sharp dissent from the general opinion of leading acoustic engineers and audiologists that the effects of environmental ultrasound upon the human ear are temporary and innocuous was delivered by an independent investigator together with a grave warning that such frequencies interacting with artificial substances employed prosthetically in operations to correct deafness are highly deleterious to nervous tissue.

Speaking at *the International Congress of Audiology in Mexico City, Dr. Zhivko Angeluscheff, City Hospital Center, New York City,** the first scientist to denounce the hazard of noise for public health, particularly of supersonic jets, before the WHO, asserted that there is an undeniable relationship between the noise of daily living and chronic progressive deafness due to osteosclerosis and deterioration of the nervous system.

"The reason for the discrepancy between my conclusions and theirs," Dr. Angeluscheff said, "is to be explained by the fact that investigators in this field either do not take into consideration or unaware of the biochemical effects of minute quantities of vibratory energy impinging upon the nerve cell. We have considerable knowledge derived from elaborate physical measurements of hearing but we are still in the dark about the chemical reactions in the biological structures involved in the process of hearing failure. Also, while a considerable amount of observation upon ultrasonic effects on these structures has been gathered, nothing has been done to clarify the specific effects on hearing. And, this is precisely where the key to the prevention and cure of progressive hearing loss is to be found."

Ultrasound as an etiological factor of otosclerosis was first considered by Dr. Angeluscheff in 1952, which has been supported by many experimental studies on the effects of exposure of the hearing organ to high sonic and low ultrasonic frequencies. These were summed up histologically as: tympanic membrane and middle ear—no change observed; labyrinth—pathological changes observed; organ of Corti—disruption of cell structure, plasma of hair cells cloudy, pillar cells broken; scala tympani—hemorrhages, particularly around the round window and basal turn, originating in the capillaries of the endosteal lining of the scala tympani; nerves and ganglionic cells—shrunken, fibers distorted and of more homogeneous character, plasma with increased staining qualities and filled with submilitary granules.

The periosteum and endosteum, the marginal layers of the bony structures, were found to manifest the initial and most intense reaction to ultrasonics, proliferating into the bone of the filaments which form partitions, causing colliquation foci and giving rise to new bluish osteoid tissue which penetrates into the surrounding area and may cause fixation of the stapes or invade the cochlea or the perilymphatic space of the semicircular canals.

The most important basic scientific research upon which Dr. Angeluscheff's conclusions are based was done by Dr. Linus Pauling and others which showed that sound (vibratory energy) generates a submolecular motion in the cell producing resonance at certain frequencies causing the disruption of chemical bonds under which conditions, the cell attains its maximum depletion of enzymes, electrolytes, and aminoacids. Japanese investigators have also proved vibration to have been the primary factor in producing experimental sclerotic foci in bone exposed to ultrasonics.

The manifold chemical changes provoked by ultrasonics were described by Dr. Angeluscheff. There is an H-ion concentration in the plasma as a direct response. This growing acidity promotes formation of Co_2, an important phase in the calcium metabolism of bone. By relatively long exposure to ultrasonics, the damage in the biological structures becomes irreversible. Their impact in the permeability of the cell membrane follows. A shift within the protein fractions, with an increase of gamma globulin is manifest. The vanishing of the spectroscopic bands in the serum indicates the disappearance of amino-acids, a sign of denaturation of the protein. The fibrinogen in blood increases, and a trend toward a fibrotic diathesis in the body is in the making. In this manner, the defense mechanism of the body tends to seal the gate of intrusion of the ultrasound and produces tapes ankylosis.

"Any taxing of the organ of hearing beyond its phylogenetic capacity endangers its biological functions and causes its progressive failure," the investigator observed. Whereas initiation of the phenomenon of subjective hearing requires migrations of ions with an infinitesimal energy of 10^{-16} watts/cm² at 1,000 cycles/sec. being sufficient to produce this sensation in man, ultrasonics of 0.1 watts/cm² will break down cells in organic tissue and cause otosclerosis. Chronic stimulation of the nerve cells provokes formation of Purkinje cells. In the brains of rats exposed to sublethal vibratory stimulations, these cells are found in higher percentages, are filled with granules of low physiological function, and decay progressively. The chemical substance of the granules has been identified as RNA. "This knowledge that the minute mitochondrium may be fragmented by vibratory energy is of paramount importance," he pointed out, "leading to the conclusion that any stress on this system by noise is capable of disrupting its synthethic system and undermining the highest biological activity of the cell. To what extent the cell protein is capable of withstanding submolecular vibrations which break chemical bonds is not yet completely clear. What is clear, however, is the failure of hearing function."

In passing on to discussion of the failures of surgery to restore hearing by creating artificial fistulas (fenestration, stapedectomy) and trying to keep them open through the introduction of various foreign substances, Dr. Angeluscheff remarked, "It is not so much a matter of blaming the medical profession for proceeding incorrectly but rather of their overzealousness in being ready

[8] Kupferman, T.: H.R. Bill 14602, CONGRESSIONAL RECORD, vol. 112, pt. 7, p. 8850.

* Fellow Academy of Medicine, N.Y. Member, Academy of Sciences, N.Y. Member, World Health Organization, (A.C.C.), N.Y. Hearing and Speech Center, City Hospital, N.Y. Manhattan Eye Ear and Throat Hospital, N.Y. Acoustic Society of America. Acoustic Society of France.

to accept the assurances of biologically ignorant technology that the materials it introduces into our operating rooms are inert. This is our basic error."

The use of polyethylene to form a bridge to take the place of the stapes was abandoned in 1953 after thousands of patients had been operated on over a period of a decade. Although its use was discredited by failure in practice, Dr. Angeluscheff pointed out that no research was ever conducted to find the cause. It was not until 1965, that he himself supplied the answer. His attention was caught by the announcement of a paper entitled. "Decomposition of Polyethylene by Oxidations with Formation of Crystals," by Bell Telephone Research Laboratory investigators. He entered into correspondence with them, inquiring what the velocity of sound was within those crystals. The answer, placing it well within the ultrasonic range, provided the last link in the chain of evidence explaining the failure of this prosthesis. The familiar collapse of the polyethylene and the embrittling of the strut at the oval window was the result of the exposure of this high molecular polymer to oxygen temperature, the blood carrying oxygen and favoring crystal formation. Finally, the polyethylene crystals having piezoelectric qualities generate harmonics of high frequencies capable of penetrating the molecular structure of the nerve cell and causing its failure.

"Thinking that the problem consisted of providing a tougher substance than polyethylene," Dr. Angeluscheff continued, "technology came up with Teflon. Although the otolaryngological literature was soon proclaiming Teflon as inert, less traumatic, with little likelihood of exciting osteogenesis, and as causing less sensorial loss, etc., knowing the parentage of that substance and remembering a statement issued by the 1958 Geneva Conference on Radiation, I remained skeptical."

Teflon is a derivative of disintegrating uranium and flourine and the statement referred to above is: "The radiation chemistry of uranium is assumed to extend the particle energy distribution upward more than one-half MEV. Such energy may be capable of producing other interactions including nuclear fission. Even very small radiation can cause unsuspected bio-electrical disorders in the brains of animals and man . . . . A cumulative effect of ionizing radiation could be of great danger for the nerve cell."

Dr. Angeluscheff proceeded to send two pieces of Teflon tubing for alpha and beta activity analysis. One went to a university biochemical laboratory and the other to a leading radiochemistry laboratory. The first came up with this result: inert, no radioactivity; it had done a rough test with a Geiger counter. The second, after disintegration analysis, gave figures running into 1 MEV emission, or an amount definitely capable of damaging the biological function of the nerve cell.

Dr. Angeluscheff said "Conclusion: Do not use Teflon in association with living tissue."

The stapes bridge of tantalum was also classed by him as a dangerous innovation to be treated with the same caution as Teflon.

Reverting to the problem of hearing loss, he concluded "One should keep in mind that a population not exposed to noise, preserves its normal hearing capacity usually until very advanced age, while that in industrial areas loses its hearing very rapidly and becomes hard of hearing in middle life. Recent investigations have confirmed the previously advanced assertion that the primary etiological factor in progressive deafness is vibratory energy, sonic and ultrasonic."

Rodale's Health Bulletin for October 21, 1967, volume 5, No. 42, has the following item:

INDUSTRIAL NOISE DANGER

An English steel company has found that 7,000 of its 10,000 employees are subjected to excessive noise levels. Because of the potential danger constant exposure to noise poses, United Steel Companies Ltd. has recommended that employees wear ear plugs as part of their protective equipment. (*New Scientist*, September 14, 1967)

In their issue for December 9, 1967, volume 5, No. 49, we find the following:

KITCHEN NOISES—NEW THREAT TO HEALTH

The modern kitchen has been turned into "a miniature simulator of an old-fashioned boiler factory." With those words Dr. Lee E. Farr of the University of Texas opens his attack on the noise produced by kitchen labor-saving devices and other appliances in the home. "Noisy appliances and electronic status symbols raise the sound level in some homes to the point where it threatens your health and well-being," Dr. Farr says. "Exposure to noise is upsetting emotionally and frequently leads to violent arguments among family members."

In a study reported in the October 16 *Journal of the American Medical Association*, Dr. Farr shows that a standard vacuum cleaner may produce 81 decibels of sound at a distance of six feet. The occupants of one household who took part in the study complained that the hi-fi set was very loud when it produced 80 decibels. (The Air Force has established a standard of 85 decibels as the level above which hearing is impaired.) "Constant exposure to the varied sounds of the city, commingled with specific office, industrial and manufacturing sounds, tends to produce a fatigue of itself which in turn may lead to exaggerated emotional responses which are generally frustrated, but which on the way home from work take a toll in freeway and intersection accidents," Dr. Farr explained.

In addition to emotional hazards, noise pollution produced by common devices and machines may actually be gradually reducing man's ability to hear high tones (Health Bulletin, October 22, 1966). Harvard School of Public Health researchers John D. Dougherty, M.D., and Oliver L. Welsh, Ed.D., believe that noise-induced damage to hearing is a problem not restricted to people working in loud factories or around jet engines. The sound of the home food blender and the loud outboard engine, for example, reach decibels of 93 and 102 respectively. "Both would require ear defenders to prevent hearing loss in industry," Drs. Doughterty and Welsh pointed out.

A report in the November issue of *Health News* published by the New York State Department of Health points out that a St. Louis physiologist recently told the Acoustical Society of America that background noises gets one decibel louder each year, causing city dwellers in particular to suffer gradual loss of hearing. According to that same report, some physicians suggest that excessive industrial and community noise can result in cardiovascular disease, ulcers and serious nervous disorders.

Today's Health magazine for October 1967, at page 87, has the following entitled "Noise Takes Toll, Say Experts":

NOISE TAKES TOLL, SAY EXPERTS

If the noise level we live with today continues to increase at the same rate for the next 30 years as it has for the last 30, it could become lethal.

This is the contention of Dr. Vern O. Knudsen of Los Angeles, a man who has spent 40 years studying sound. He is a physicist and former chancellor of the University of California at Los Angeles.

Although Doctor Knudsen is concerned about noise as a health hazard, he is not gloomy about it because Americans as they grow noisier also grow more ingenious in muffling it.

Noise, which is different from sound, has increased at a rate of one decibel (db) a year. A decibel is a measure of sound intensity. An acceptable level is about 25 to 30 decibels in a disc-recording studio, 30 to 35 in a theater, 35 to 40 in an office, and 50 to 55 in a restaurant. But we are apt to be subjected to much more than that frequently during the day. Subway trains often generate 90 to 100 decibels, and a typewriter-filled office area is just under 80 decibels.

Experts agree that exposure to noise of 95 to 100 db is hazardous. But not all sounds are noise and it is the way the individual interprets the sounds around him that oftentimes can change sound into noise, according to some experts.

A report in the *Journal of the American Medical Association* titled "Chronic Noise Syndrome Predicted" stated that "It is after all the 'inner man' that makes the distinction between noise and sound—not his hearing mechanism."

The ambulance's screaming siren gives the motorist useful information: "clear the road." This is sound. When the same intense sound wakes a light sleeper or baby it becomes noise.

The ear is perhaps more susceptible to damage than any other human organ, says Hollowell Davis, M.D., emeritus director of research, Central Institute for the Deaf, but he adds that it also is surprisingly adaptable and resistant.

Chronic noise also may affect one's health in subtle ways, both psychologically and physiologically, a number of scientists now believe.

Samuel Rosen, M.D., of New York City, for example, says: "At an unexpected or unwanted noise the pupils dilate, skin pales, mucous membranes dry; there are intestinal spasms and the adrenals explode secretions. The biological organism, in a word, is disturbed."

Whether or not a sound becomes annoying, however, depends on more than decibels. It may be the amount of sound one hears, or the pitch of the sound, or both. Pitch, or frequency, is the number of vibrations per second a sound makes.

Each sound-producing vibration is called a cycle, and the number of cycles produced each second is called the frequency. The hearing sensation produced by the frequency of the sound is the pitch—the higher the frequency, the higher the pitch. A high-pitched sound seems louder to the human ear than does a low-pitched one, even though the two may register the same on the decibel scale.

Although the psychological annoyance of noise is difficult to measure, recent events have spurred research in this area. The national plan to introduce a fleet of supersonic transports (SST) into civilian aviation has led to numerous studies on the effect of the sonic boom.

A National Sonic Boom Evaluation Office, under the technical direction of the Stanford Research Institute and the President's Office of Science and Technology, is coordinating the studies.

One reason is that the sonic boom will be the best-shared sound in history. In a transcontinental flight, according to Dr. N. E. Golovin of the U.S. Office of Science and Technology, this sonic boom would be spread over a corridor 30 to 50 miles wide below the flight path and could bring the sound to 10 million persons during a flight across the U.S. Consequently, future aircraft will be certified for noise as well as safety.

Two San Francisco ear specialists, Dr. Charles P. Lebo, assistant clinical professor of otolaryngology at the University of California Medical Center, and Dr. John A. Gar-

rett, resident in otolaryngology at the medical school, taped the sounds from a rock-and-roll establishment in San Francisco and conducted a scientific "listen-in" at a second place. They found that cumulative exposure to rock-and-roll-type music is likely to produce ear damage. Over-all background noise from rock-and-roll establishments ranges around 100 decibels and peaks of 100 to 115 decibels were recorded with the scale occasionally hitting as much as 120.

Doctor Garrett didn't wear ear plugs or muffs during one three-hour experiment. "I couldn't hear my watch tick for three hours afterward," he said.

Probably the greatest racket some Americans are exposed to is on the flight deck of an aircraft carrier when jet planes are launched. Crewmen are buffeted by 155 to 160 decibels. Researchers have killed mice with 175 db.

Though most Americans don't live on aircraft carriers, and those who do protect their ears, even softer noises take an often unnecessary toll in illness, jangled nerves, and loss of sleep, concentration, and serenity.

Why is noise harmful? Doctor Knudsen explains it this way:

First, noise blurs or masks wanted sounds—a spigot gushes and you can't hear what your wife is saying.

It interferes with rest and impedes convalescence. Before Doctor Knudsen began wearing ear plugs to bed, he discovered that in three out of four times he awakened during the night noise was to blame.

It impairs hearing. One research team found that Scandinavian shipyard workers on the job for 31 years were unable to hear a whisper a yard away.

It hinders concentrated mental effort (how many school classes can continue when a jet plane flies overhead?).

It causes stress and nervousness, thus the diseases that spring from tension.

And the situation is getting stickier. As machinery becomes more sophisticated, as the piston-driven plane gives way to the jet, and the jetliner to the supersonic transport, problems related to the noise level get knottier.

Doctor Knudsen believes that noises that can't be eliminated should at least be muffled by spending more to sound-proof structures. He suggests that noise from all sorts of combustion engines—cars, trucks, planes—should be controlled better, and houses, schools, hotels, and apartments should be built in such a manner that the noise level is decreased.

But though there are mechanical methods to cut noise, these must be balanced against possible losses of economic or work benefits. If a noise-abatement device cuts the speed of a jet, the decrement must be considered. Soundproofing apartments increases the construction cost of a typical unit so much that it affects the rent.

If health considerations can be documented chronic noise may be reduced more rapidly, and we may be more willing to foot the bill, too.

An editorial on noise pollution by Dr. Samuel Rosen in Medical Tribune of Thursday, January 4, 1968, points out medical aspects of the problem. Also other material follows:

[From Medical Tribune, Jan. 4, 1968]

CURRENT OPINION: NOISE POLLUTION: A NEED FOR ACTION

(By Samuel Rosen, M.D., clinical professor of otology (emeritus), the Mount Sinai School of Medicine, New York)

Noise levels in the world's urban centers have been rising steadily since the Industrial Revolution. In the United States today, jet and helicopter transport have raised noise pollution to a new peak, and tomorrow the supersonic plane will lift it further. Are noise intensity and chronicity nearing a point where they are becoming a serious hazard to public health?

Legally as well as medically, intense and steady noise is recognized as an occupational "disease" that can inflict irreversible damage in the form of neural deafness. Nineteen years ago, a United States court awarded compensation to a drop-forge worker who developed occupational presbycusis. Many industries now protect their employees against chronic noise levels in the dangerous range, exceeding 85 to 90 db. The number of workers exposed to excessive factory noise is relatively small, but what of the average city or suburban resident exposed to noise levels which equal or exceed the damage-risk criteria suggested for factories? Many city noises do aproach or exceed this limit, producing a crescendo of unwanted noise against which we are helpless and to which we think we are accustomed.

We do not know how much exposure to these intense city noises will cause hearing loss, but the danger is there. At the Central Institute for the Deaf in St. Louis, chinchillas and guinea pigs were exposed to brief, intermittent periods of above-normal—but supposedly tolerable—noise levels. They developed swollen cochlear membranes and obliteration of inner-ear hair cells. Stanford Research Institute studies show that electroencephalographic patterns of sleeping subjects are radically altered by sound levels that do not awaken them. It is known that loud noises cause effects which the ricipent cannot control. The blood vessels constrict, the skin pales, the muscles tense, and adrenal hormone is suddenly injected into the blood stream, which increases tension and nervousness.

Levels of presbycusis can be correlated with the environmental sound levels of various populations, and blood nutrition to the ear seems involved in the process. In 1960 I began a series of studies, with a team of investigators, among the Mabaans, a tribe living in a relatively noise-free environment in southeast Sudan. These tribesmen were surrounded by a village background noise level of below 40 db, and only on rare festival occasions did the noise level reach 110 db for brief periods. At age 75 their hearing was still acute. Plethysmographic measurements of capillary blood flow changes showed rapid constriction of the blood vessels at loud, unexpected noise, with the flow quickly re-established. The same rapid capillary constriction occurs in the New York businessman, but recovery is much slower. This would suggest generally impaired nutrition, including that to the ear, during the reflex action. It would seem that loud noise can increase body tensions, which can then affect the blood pressure, the functions of the heart, and nervous system.

The psychic effect of noise is very important. Noise can cause enough emotional response and frustration to make a person feel nervous, irritable, and anxious. Rest, relaxation, and peaceful sleep are interrupted and often denied to those suffering from illness. We now have millions with heart disease, high blood pressure, and emotional illnesses who need protection from the additional stress of noise. We make a great point of keeping our hospitals quiet, but the sudden and repetitive noises of street traffic, construction work, roaring jets, etc., penetrate the hosiptal walls.

We now recognize the hazards of air pollution and are slowly beginning, at this late date, to attempt some solutions. Physicians and acoustic experts warn against the dangers of noise pollution, and some solutions must be sought before the acceleration of noise becomes too great for effective control. Effective controls are possible. Granting the cost may be high and governmental regulation difficult to achieve, buses, trucks, construction equipment, sanitation trucks, planes, helicopters, street traffic, subways, elevated trains, air conditioners, office machines—all these and many more sources of high-level noise can be made quieter through proper engineering techniques. Acoustical science and technology have provided the Army with an inaudible motor for front-line use, the Navy with silently operating submarines, and the Air Force with an almost silent plane. Surely some of the same techniques applied to civilian use would do much to alleviate the health hazards of excessive noise.

Public pressure could help bring about legislation and its enforcement. All community organizations and others, such as Citizens for a Quieter City, Inc., in New York, should support and aid the cause of reducing noise levels in our environment. As physicians aware of the dangers to the health and well-being of our patients, we should be involved in the campaign against noise pollution.

[From the Air Line Pilot, February 1968]

AEROMEDICINE AND THE AIRLINE PILOT: NOISE—THE KIND PILOTS DON'T LIKE, AND ITS EFFECT ON MAN

(By Capt. Richard B. Stone, ALPA Aeromedical Coordinating Committee)

Except for concerted efforts, on the part of certain groups to reduce noise problems caused by airplanes, construction, garbage trucks, sirens, etc., noise is so much a part of our lives that its presence is accepted as an inevitability. To the pilot, certain noises in flight serve to indicate proper operation of the aircraft systems (this seems to be diminishing with the advent of the jet engine and its placement further away from cockpit). Since World War II, scientists have been concerned with noise and its effect on man. Effects such as hearing impairment are obvious, but others such as speech masking, and psychomotor or physiological effects are elusive.

For the past two years, a small group of pilots from various air lines have been investigating the cockpit environment with reference to noise. A number of Federal Agencies, aircraft manufacturers and companies specifically oriented in sound have been consulted. It is quite obvious that noise standards exist for other industries and the pilot operating an aircraft from certain high density airports. Yet there is no criteria which describes how much noise is allowed in the cockpit. More effort has been devoted to attempting to quiet the departing aircraft so television watching will not be interrupted than to insuring that one pilot can communicate with another during an in-flight emergency.

Noise is defined as unwanted sound. The actual level of the sound within the frequency spectrum is important. High frequency noise is not only more annoying, but is more dangerous to the ear. Intensity of noise is characterized in decibels (db). The decibel is defined as one-tenth of a bel (not much help is it?). More practically, a soft whisper at 5 feet is about 35 db, noise in a large office is usually 50 to 60 db, a riveting machine is about 110 db and a jet at the start of a take-off roll at full power is about 125 db to an observer in the run-up area. One of the more recent descriptions of noise is PNdB (perceived noise decibels). If you fly an aircraft over a remote microphone site near one or more of our busy airports and the noise associated with your fly over exceeds 112 PNdB, you may be involved in a violation (in one form or another). Briefly, PNdB is a method of relating noise to noisiness. The basis for this method was a test in which a number of persons subjectively rated different sounds. Since sound in higher frequencies was judged more objectionable, more weight was given to these components of noise. Out of this test grew a scale in units called "Noys" which related intensity in relation to frequency. Time was not a parameter in the study and has become one of the more common criticisms of this method.

Time, or duration of exposure to noise, is an important aspect of noise evaluaiton. For example, Figure 1 depicts the environment

existing during pre-flight of a B–727. This gives you an idea how acoustical engineers illustrate noise conditions. The left margin represents decibels (in relation to the International Standard) while the upper margin is graduated in octave bands (Hertz or cycles per second). OAL signifies the overall level of sound or the uniform response as a function of frequency (20 to 20,000 HZ) weighted logarithmically. When the noise level of the B–727, during preflight, is judged in light of current criteria, we find this environment is hostile over a period of time. A daily exposure time exceeding 30 minutes could, over a number of years, cause hearing impairment in the 2400 to 4800 octave band. Since most speech occurs between 600 and 4800 Hz, this is a critical octave band. Hearing protection, such as worn by many ground personnel (headset or earplugs) are an acknowledged necessity. Other aircraft have even more hostile environments during ground operation. The APU of the F–27 (Solar unit) emits noise that could cause hearing problems if the exposure exceeds 15 minutes per day for a number of years. Obviously, hearing is important for medical certification. *We should do our best to protect it.*

In flight, a number of our current turboprops are close to or in a few cases exceed maximum recommended noise levels. In almost all aircraft (exceptions are the F–227, DC–9 and M–404) the noise level during cruise causes face-to-face communications to be carried out in at least loud voices and may grow to a near shout at Vmo. Having to talk at or near a shout is a signal that risk of hearing impairment is a real potential, not to mention the additional and immeasurable amount of fatigue of having to work in this environment.

Decreasing noise is not an easy matter. Noise is an insidious intruder. Compare the difference between a closed door, an open door and one ajar a few inches. With a good noise source (such as a noisy office) on the other side of the door, little difference is realized between the door ajar and the open door. Probably the worst offender from the standpoint of cockpit noise are the poor window seals in the aircraft we fly. It's worth it to have them closely checked. Other areas that are generally troublesome are nose gear door rigging, nose wheel well soundproofing, and hard (sound reflective) surfaces in the whole cockpit area. During the highest speed regimes of flight, aerodynamic noise seems to have the greatest effect on cockpit noise. This problem has been the most difficult to deal with. The B–747 has a redesigned windshield which may help to diminish aerodynamic noise.

MORE CAN BE DONE

Much more can be done to reduce the level of noise within the cockpit. The best place to do it is on the drawing board. However, significant reductions can be accomplished with present aircraft, materials and methods. Four pilot groups have programs in progress.

A noise standard does not curently exist for aircraft evaluation by the FAA, manufacturers or ALPA. It is obvious we need one. Standards for risk of hearing loss and speech interference exist for other industries. If these are applied to our cockpits we find many of the turbo-props can cause hearing problems. Even the newest jets cause speech interference problems.

Will we have to wait until a misunderstood command, due to cockpit noise, during an inflight emergency causes a tragedy before remedial action is taken?

ALBERT EINSTEIN COLLEGE OF MEDICINE, YESHIVA UNIVERSITY,
Bronx, N.Y., May 7, 1968.

Hon. THEODORE KUPFERMAN,
House of Representatives,
Washington, D.C.

DEAR REPRESENTATIVE KUPFERMAN: I thought the following information might be of interest to you.

There will probably be a conference on noise sponsored by the National Institute of Health, Neurological & Sensory Disease Control Program. The person who is behind this is a Dr. George E. Urban, Consultant in Otolaryngolgy at 4040 N. Fairfax Drive, Arlington, Va.

Knowing of your interest in this field, I thought if you did not have this information that you would be interested in learning about this. The radio broadcast we did the other month seemed to turn out quite well and I even managed to listen to our various remarks when they were broadcast.

Very sincerely yours,
B. J. RUBEN, M.D.,
Director of the Division of Otolaryngology.

WEST PALM BEACH, FLA.,
March 6, 1968.

Representative KUPFERMAN,
House of Representatives,
Washington, D.C.

DEAR SIR: I received a letter today from Dr. Lee E. Farr, head of the Disaster Health Services Section, the department of public health in Berkeley, California. I had originally written to Dr. Farr regarding his findings related to the Environmental Medical Studies and he, in turn, has referred me to your remarks related to noise appearing in a recent Congressional Record.

As an agent in Col. James Coletta's behalf regarding the Noise Attenuating Device patent (copy enclosed for your interest), I feel that the potential use of the product by home, industry or educational aid uses, will readily be accepted by the general public.

The "Thinking Cap" or "Concentration Helmet" might be termed trade names once the device is manufactured. Its purpose is that of enhancing concentration powers by elimination of outside distractions and disturbances such as noise, deflection of sight and vibrations (airfoam lined cap style). I believe this to be an invention of a new dimension and the first break-through in a solution to the many problems and illnesses which arise due to the individual's lack of privacy and solitude.

Many recent articles have been published relating to the Environmental Medical Studies, and the effects of noise and distractions which could, and do, endanger health, disposition and functional abilities related to performance and accuracy. As the manufacture and dissemination of the product becomes familiar with the general consumer, the invention will also act as a social deterrent in that it will be known that the wearer wishes to be left alone for a certain reason.

It is to be appreciated that the patent has been obtained on the grounds of general function, theory and purpose of its use, and could, therefore, accommodate any variation of design or accessories which the manufacturer might deem desirable.

I would appreciate your comments regarding the patent and if possible, a copy of the Congressional Record.

Sincerely yours,
ELIZABETH A. WIGHT,
Patent Agent.

RÉSUMÉ OF POTENTIAL USES

Electric or battery operated accessories might be incorporated within the designs of the cap or helmet styles for the purpose of frontal lights and a timer. Another feature for the consumer might be collapsible models with handles to facilitate conveniences for commuters who might wish to wear theirs while traveling.

Educational: Study aid for students in classrooms. Homework. While taking examinations and thus eliminating the cheating problems in schools.

School and public library uses: (Disposable plastic covers could be used as a health precaution over the earpieces.)

Home: (Hotel and motel rental basis)—Reading, studying, art work, hobbies, sewing, typing, television viewing; while employing a machine requiring deep thought or concentration.

Industrial uses: Assembly line work, artists, draftsmen, seamstresses, technicians, postal workers (sorters, etc.), bookkeepers, court stenographers, typists (especially copy work), secretaries, and business machine operators.

Institutional: Patients in hospitals and nursing homes.

Any travel media: Planes, trains, buses or as a passenger in an automobile. (Battery operated lights could be used.)

INTENT OF DEVICE

Rapidity of reading.

Study boost with memory work; improved retention of thought, act, or achievement. Encourages study as a confidence builder for slow, nervous or excitable students. To provide relaxation, thus elimination of nervous anxiety.

Psychological encouragement—*Thinking cap!*

[U.S. Patent Office, No. 3,261,028, Patented July 19, 1966]

NOISE ATTENUATING DEVICE

(By James N. Coletta, 555 Franklin St., Elmira, N.Y. Filed Aug. 14, 1962, Ser. No. 216,929 1 Claim. (Cl. 2—209)

(NOTE.—References referred to are not printed in the RECORD.)

The present invention relates broadly to wearing apparel for the head and more specifically to a device to be used when extreme concentration is required.

It has been found by teachers and psychologists, particularly in the education profession, that there are many situations which call for extreme concentration in noisy and distracting surroundings. In some classrooms, there may be as many as 40 to 50 students trying to concentrate on some learning material. Obviously, distractions are numerous and, as a result, learning efficiency decreases to a low level. What is needed then is some device that will eliminate noise and limit the visual field such that concentration will be improved.

This invention thus has as an object the reduction of outside distractions from a student's visual field. A further object is the reduction of noise reaching a student trying to concentrate. A still further object is the reduction of other outside distractions such as bright sunlight, etc. Another object of this invention is to provide a device to help concentration which will be situated on the wearer's head, being adjustable to accommodate many differently shaped heads, said device being of such construction that it may be easily put on and off, and also taken apart and cleaned when desired. Yet another object of this invention is to provide a concentration device that is made of inexpensive materials such that the device can be economically disposed of after a single usage.

Other objects will be apparent from the following description of the invention, which is illustrated in the accompanying drawings. In the drawings:

Fig. 1 is an isometric exploded view of the device.

Fig. 2 is a side view of the device shown on the head of the user.

Fig. 3 is a back or end view of the device situated on the head of the user.

Fig. 4 is an enlarged side view showing the detail of the earpiece.

Referring to the drawings, in Fig. 1 the body 6 is situated between the band 7 and sound deadening device or earpiece 11. A screw or suitable fastener 10 connects the band 7 and earpiece 11 through a longitudinal slot 8 in band 7, said fastener then going through a slot 9 in body 6 and then fixed into the earpiece 11. Referring to Figure 4, as an example, the earpiece consists of a suitable thin wall plastic shell 14 containing a sponge rubber filler 15. In the center of

the shell 14 is located a hole 16 which is tapped such that screw 10 may be screwed into the earpiece. The earpiece fits circumferentially around or upon the outside ear 12, of the head 13, such that the earpiece prevents outside noise from reaching the sensory eardrum inside the head.

The body 6 of the device consists of a rectangular sheet of suitable material, being easily bent and of a sturdy thickness having the front shaped in a convenient fashion. The body may be made of plastic, aluminum, tin, steel, etc. as would be suitable. The width is determined by placing the body around the head as in Figures 2 and 3 such that the body 6 completely covers the head 13 with the ends disposed below the earlobes. The back of the body 6 of the device is situated on the head of the wearer as in Figure 2 such that it covers the wearer's head. The body 6 of the concentration device is positioned on the wearer's head by a spring steel or metal band 7. This band comprises a long rectangular sheet having two slots on both ends. The sheet is permanently bent into a U shape, such that when placed around the body 6 and secured to the earpiece 11, the whole apparatus is comfortably situated on the wearer's head (Figures 2 and 3), the band holding the body 6 in the bent configuration seen in Fig. 3. The slots 8 of the band and slots 9 of the body render the device adjustable for all sizes and shapes of human heads since the earpieces can be moved along the length of slots 8 and 9.

It can easily be seen that the earpieces or sound deadening devices might be made in any configuration and of material such that said earpieces eliminate noise from reaching the ear while providing a receiver that will affix fasterner 10 securely to the earpiece. The body 6 may conceivably be made of paper or cardboard, etc. such that the device could easily be disposed of for convenience or health reasons. Likewise the band 7 could be made of some suitable plastic or other readily manufactured material that would hold the body 6 in place and at the same time render the device economical and disposable.

The invention could also be applicable to learning Morse code, listening to music, learning foreign languages, etc. which in such cases, the sound deadening devices would be replaced by earphones. The device might also be constructed without the use of earphones or earpieces if the elimination of sound or noise was undesirable. In this case the device would consist of a body similar to that described heretofore in the specification and a band also similar to that described in this specification. A suitable fastener would then affix the band to the body and the whole device would be worn in much the same manner as the firstly described device with the exception that there would be no earpieces to affix the device over the ears.

It is noted by the inventor that the front of the body 6 might be cut away such that the desired visual field is obtained by the wearer.

It is well-known by psychologists and others concerned with the problem of deep concentration that as one's ability to concentrate increases, one's awareness of outside distractions decreases. It is also known that for some people concentration is extremely difficult when accompanied by outside noise and movement. It was thus assumed that if outside distractions were eliminated, concentration would be improved. The aforedescribed device eliminates distractions by deadening the sound through the earpieces (sound deadening devices) and by limiting the visual field by means of a shield (the body). With these two modes of distraction disposed of, the ability to concentrate is noticeably improved.

While the foregoing description was conceived by the inventor as the best embodiment of the principles of the device, it is to be understood that the inventor does not intend to be limited to specific details of structure or methods of manufacture otherwise than as specifically set forth in the appended claim.

What I claim is:

A headpiece comprising a U-shaped thin wall body adapted to be removably secured around the top and sides and forwardly of the head of the wearer; said body having an elongated configuration with two transversely aligned slots at one end and a sloped front end opposite to the slotted end; a permanently bent U-shaped rectangular metal band with a slot at each end; said band situated circumferentially around the body so that the band slots are aligned with the body slots; screws passing through the aligned slots and securing said band to said body; earpieces disposed on the inner face of said body opposite each other; said earpieces being tapped to accommodate said screws and thereby said earpieces are held in position to cover the ears of the wearer when the device is situated on the wearer.

REFERENCES CITED BY THE EXAMINER—U.S. PATENTS

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JORDAN FRANKLIN,
Primary Examiner.
W. C. COOPER,
G. H. KRIZMANICH,
Assistant Examiners.

Engineering professional groups are certainly involved.

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS,
Washington, D.C., November 27, 1967.

Hon. THEODORE R. KUPFERMAN,
U.S. House of Representatives,
Washington, D.C.

DEAR MR. KUPFERMAN: I have been in a travel situation for some weeks and hence am just finding an opportunity to thank you for your letter of November 1, 1967, and the material on your efforts to deal with the noise control problem.

You will be particularly interested, I think, to know that NSPE has adopted an official policy on the subject, a copy of which is enclosed (Professional Policy No. 90).

I have not really had a chance to discuss this matter in any detail with members of the New York State Society of Professional Engineers, but I am sending the NYSSPE Executive Director the material you provided with your letter, with the suggestion that the New York State Society may wish to refer this material to an appropriate committee to study its implications for New York. Having to visit New York City fairly often, I know that noise is a real problem there, at least as much as it is in other metropolitan areas.

Thanks again for your interest and cooperation in these matters of mutual interest.

Respectfully yours,

MILTON F. LUNCH,
General Counsel.

PP No. 90—NOISE—CONTROL, PREVENTION AND ABATEMENT

It is the policy of NSPE to urge all segments of the engineering profession and all levels of government to take appropriate action to meet the growing problem of noise and its detrimental effects on the human environment, particularly in urban areas.

NSPE believes that the engineering profession has an obligation to provide all possible assistance in the development of reasonable criteria, standards and methods for the control prevention and abatement of excessive noise. This obligation arises not only from the engineer's duty to use his knowledge and skill for the advancement of human welfare, but also because engineers in most cases develop the vehicles, machines, equipment and operations which combine to produce excessive noise.

The interstate nature of modern commerce, especially that involving aircraft and other vehicles, necessarily makes noise control, prevention and abatement a matter of interstate concern and responsibility. NSPE feels, therefore, that the development of reasonable and practical criteria for acceptable noise levels, and the publication and dissemination of information relating to such criteria, are the responsibility of the Federal Government, acting in consultation with industry and with professional assistance from the engineering and medical disciplines.

NSPE also feels that responsibility for enforcement within Federal establishments of standards based on such criteria, as well as appropriate legislative and administrative action to insure the vehicles and equipment used in interstate commerce are designed and operated to conform to such standards, rests with the Federal Government.

State and local governments should apply and enforce standards meeting such criteria as part of their responsibility for protecting the health and welfare of their citizens.

The work of Dr. Vern O. Knudsen and Dr. Leo P. Delsasso of UCLA is well described in "The Noise Haters":

THE NOISE HATERS

Two thousand years ago, the poet Horace wrote an angry diatribe against noise in the streets of Rome and thereby sounded a premature alarm for our time.

It is doubtful whether the squealing pigs and rumbling wagons that Horace accused of interrupting his work could have given him even an inkling that man-made sound would grow until it could heat the human body lethally or destroy hearing instantly. The Roman poet, in short, could not have foreseen that, in 1967, unwanted sound would be a waste product as threatening as smog to human well-being.

In some very quiet rooms three floors up in UCLA's Knudsen Hall, Horace's anti-noise campaign is being carried on by two physicists who have devoted 45 years to discovering how to manipulate sound to man's gain. Dr. Vern O. Knudsen, first dean of UCLA's Graduate Division and former Chancellor, and Dr. Leo P. Delsasso, former Associate Dean of the Graduate Division, have been scientific partners at UCLA since the University was known as "the junior college out West."

Their work recapitulates UCLA's evolution from its beginnings as the "Southern Branch" on Vermont Avenue to its role as a major research and teaching institution. In the years since Dr. Knudsen arrived at the Southern Branch in 1922, the two men have seen their research applied in fields as diverse as medicine, architecture, filmmaking, and warfare. They have trained more than 200 graduate students in the specialized discipline of acoustics. Although both are formally retired from teaching, they continue to draw graduate students into the orbit of their research at the University.

A roster of their distinguished graduates includes General William C. Bullock, the Army officer in charge of locating enemy artillery by acoustical methods during the World War II Normandy invasion; Dr. Waldo Lyon, who applied acoustical techniques to pilot the first atomic submarine under frozen waters of the North Pole; and Dr. Richard Bolt, chairman of the board of world-wide acoustical consultants Bolt, Baranek and Newman.

Dr. Knudsen took his Ph.D. at the University of Chicago, and was immediately offered an instructorship there. When he made known his intention to leave Chicago and go to UCLA as an instructor, his chairman, H. G. Gale "felt, and emphasized with his fluent

profanity, that it was senseless for me to accept the Los Angeles position at an unheard-of-institution—'only a junior college.' "

But Dr. Knudsen was intrigued by the chance to be involved in the shaping of a university, and UC vice-president W. W. Campbell had convinced him that "those Los Angeles people are determined to make this a distinguished university, and nothing can stop it."

His arrival at the Southern Branch in 1922 was not auspicious. Physics Department Chairman John Mead Adams, who had begun his department three years earlier with "a brick and a meter stick," would have been glad to offer his research facilities if there had been any.

"Searching before researching," Dr. Knudsen found six high school auditoriums in Los Angeles, among the world's worst, as far as acoustics was concerned. These became UCLA's first acoustical laboratories.

Assisted by Dr. Delsasso, then a sophomore and later UCLA's first Ph.D. in physics, Dr. Knudsen began his pioneering experiments on the hearing of sound in rooms. Working at night in the vacant auditoriums with testing equipment they built themselves, they rapidly evolved techniques for controlling room acoustics.

Their recommendations to local industry resulted in the creation of a whole new family of acoustical materials and construction techniques, which made it possible to scatter, attenuate, absorb or reflect sound to create almost any desired effect in an auditorium or home.

The impact of their work was felt almost immediately, when the movie industry began converting to sound and found that UCLA was the only place on the West Coast that was able to solve the difficult accoustical problems involved. Metro-Goldwyn-Mayer called in Dr. Knudsen to design the company's first two sound stages, where the first sound movie, "The Jazz Singer," was produced.

The artistic merits of this teary tribute to motherhood can be questioned, but the sound stages where it was born were the cradle of the sound film industry.

By making each sound stage a building within a building, with an air space between all walls to act as a 'sound lock,' Dr. Knudsen made it possible to record, at the same time, a gunfight on one stage and a symphony orchestra on the other.

Similar but simpler principles, he discovered, can make homes and apartments capsules of quiet in the clamor of cities. Architecture of the future, says Dr. Knudsen, must be acoustically designed if man is to live without nervous prostration in the environment he has created.

When human beings are exposed to noise louder than 90 decibels (the equivalent of an auto horn's honk) blood pressure rises and internal muscles contract. Dr. Knudsen says these reactions are the same as the physiological response to fear, and may be a holdover from the time when early man depended for survival on his alertness to sudden sounds. The crack of a twig could mean a predator was stalking. Man needed accelerated physiological processes to prepare him for defense.

But this "fear reaction" now is triggered time after time, day after day by noise, and the resulting tension is thought to cause physical damage to heart, arteries, and internal organs.

The twentieth century's "new noise" includes some stupendous noise-makers, like machines capable of generating sounds that can roast a rat with the heat created by sound wave vibrations. Sounds of this magnitude, fortunately, are rare in most people's experience. It takes between 160 and 175 decibels to create such immediately sinister effects, and only a few products of our technology can put out that much sound.

Our streets and cities do much more to unnerve the populace at large, says Dr. Knudsen.

He points out that there has been no general adoption in this country's building codes of the acoustical principles that could protect city dwellers against unending thrum and clatter from traffic and neighbors.

Until proper acoustical design prevails, Dr. Knudsen recommends that those who would at least rest calmly follow his example and wear "ear defenders" to sleep. These are acoustically-designed ear plugs which he invented in 1938 and has worn to sleep every night since then.

During World War II, the National Defense Research Committee, acting on information that the Nazis were using noise-making machines with aircraft as "acoustical weapons" to terrify the public, sponsored modifications of Dr. Knudsen's ear defenders to protect civilian populations. Four million pairs of these "ear wardens" were also issued to American servicemen who faced exposure to ear-damaging noise levels in such operations as mine-clearing.

By wartime, Knudsen and Delsasso had made UCLA a nationwide center for acoustical research and some 40 Army and Navy officers were sent here for graduate study under Knudsen and Delsasso. This training was applied militarily in submarine tracking and detecting the location of enemy artillery.

Since 1960, Knudsen and Delsasso have concentrated their research on the intricate manipulation of sound required for optimum hearing in concert halls and auditoriums. This work is being carried on in UCLA's Knudsen Hall, which contains some of the most advanced sound laboratories in the country.

Here, Knudsen and Delsasso devised what they consider to be their best acoustical design: the Grady Gammage Auditorium at Arizona State University, considered to be the most revolutionary departure from conventional concert hall design in this country.

The Grady Gammage was the last, unfinished work of architect Frank Lloyd Wright, who died before it was completed. The drawings left by Wright described only the building exterior, composed of two giant, intersecting cylinder. This shape, although dramatic visually, would have been impossible acoustically if it had been carried into the interior of the auditorium. The concave walls surrounding audience and stage would have mangled musical performances by making the sound focus in a few spots, fade elsewhere, and echo strangely.

Dr. Knudsen's remedy was to turn the interior inside-out. Additional big convex sections combined with scientifically-calibrated tilting of the ceiling and floor. These diffuse sound so well that orchestras are heard equally well from all 3,050 seats. A "floating balcony," suspended like a bridge, lets sound circulate freely.

The Grady Gammage, highly-praised by critics and conductors, is one of the numerous prestigious music centers designed under Dr. Knudsen's guidance. Among them are the Los Angeles Music Center and centers for the performing arts now under construction at Wichita, Kansas; Atlanta; Hunstville, Alabama, and San Jose.

At UCLA's sound laboratories, however, Drs. Knudsen and Delsasso continue to seek acoustical perfection through experiments with such improbable sound-diffusers as giant helium-filled weather balloons.

The bright red balloons, spotted around Knudsen Halls reverberation room, are not frivolous in purpose, although Dr. Knudsen says he has problems with faculty members who want to take one home to their children. In the reverberation room, constructed to give maximum reflection of sound, the balloons have been found to make sound die away exceptionally smoothly.

UCLA's resident Feri Roth Quartet recently was persuaded to play a string concert in Knudsen Hall's anechoic room, which has properties exactly opposite to those of the reverberation room: all reverberation is eliminated by fibreglass wedges which absorb sound. The recorded performance was played and re-recorded in the reverberation room, with twenty of the balloons strategically located.

"Feri Roth was quite excited and so were we about the results," says Dr. Knudsen, adding that the purpose of re-recording the music was to add the proper amount of controlled reverberation for richness of sound.

"All kinds of music want some kind of reverberation," he says. "It makes the separate sounds overlap, and produces a less dry, disconnected effect. But it must be controlled. In the Beethoven Ninth Symphony, for example, there is a mighty crescendo, and then everything stops. The sound, however, persists: it dies away, and ideally that should take about two seconds."

Timing as precise as this can be achieved by acoustical design of room shape and surfaces, says Dr. Knudsen, and the research and testing involved are worthwhile for the resulting musical experience.

"What attracted me to architectural acoustics in the first place was its human value," comments Dr. Knudsen. "People's tolerance for noise varies greatly, but everyone has the right to enjoy sound—conversation, music, the laughter of their children.

"We must have quiet homes, and buildings acoustically designed for the growth of culture and good living.

The literature on sonic boom grows constantly.

North America Newspaper Alliance—NANA—had for weekend release on October 14, 1967, "Can We Live With the Boom," a series by Hal D. Steward, as follows:

CAN WE LIVE WITH "THE BOOM?" SONIC BOOM THREATENS "TO SHAKE THE WORLD"—I

(By Hal D. Steward)

(NOTE.—According to many experts, the development of the supersonic transport may not only destroy peace of mind, but also historical and prehistorical sites, natural formations, cities, housing and hearing. The following is the first of a three-part series on the sonic boom by a close observer of the aerospace-air transport field.)

WASHINGTON, October 14 (NANA).—The development of the supersonic transport (SST) may well destroy the peace of mind of all Americans—except those already deaf.

It could, in the judgment of experts, become a major health hazard and cause irreparable damage to the hearing of the young and old alike.

But, that's not all.

The SST threatens "literally to shake the world" in the judgment of Karl Ruppenthal, director of the transportation management program of Stanford University's Graduate School of Business.

Ruppenthal, himself an airline pilot of 25 years experience, said there must be much more thoughtful discussion before the U.S. is irrevocably committed to the SST program.

The SST's biggest problem, he said, "is that of the sonic boom."

DEVASTATE SITES

What most Americans have yet to realize, said Ruppenthal, is that SST flights may well leave some ancient historical and prehistorical sites in ruins.

The sonic boom that would follow an SST could crumble Stonehenge, the group of ancient stone monoliths, believed to date from the bronze age, on Salisbury Plain, Wiltshire in southern England.

There is the possibility the Leaning Tower

of Pisa, which deviates from the perpendicular by more than 14 feet, could be smashed to the ground by an SST sonic boom. And what about the danger to the Acropolis in Athens and the Colosseum in Rome?

Ruppenthal said a comparatively small military aircraft already created a sonic boom that broke off 80 tons of rock and buried prehistoric cliff dwellings in Mesa Verde National Park, Colo.

He said sandstone formations in Utah's Bryce Canyon and Zion National Park have been reduced to dusty rubble by sonic booms.

"And the shock of sonic booms varies somewhat with the size of the aircraft," Ruppenthal said.

"If the SST goes ahead we can expect irreparable damage on a grand scale."

CITIES FEAR DAMAGE

Ruppenthal predicts ancient cities in Europe and other parts of the world would forbid SST planes to fly anywhere near them because of the fear of damage from sonic booms.

"Both the governments of Germany and Switzerland already have said they will forbid SST flights over their territories if their populations find them to be annoyances," he said.

"It is almost certain that cities like Paris, Florence, Rome, and Athens and many less venerable cities as well, will outlaw SST flights within their jurisdictions," he said.

Even if the airlines carried insurance to cover sonic boom damage, it would be meaningless in cases of destruction to ancient sites.

The sonic boom promises to become a national issue, warns Congressman Theodore R. Kupferman, R-NY. When the SST fleet gets into operation, the average American will have to put up with 20 booms per day.

A new anti-boom group, the Citizens League Against the Sonic Boom, has been formed by Harvard University physicist William A. Shurcliff. It's campaigning against the "horrible harassment of sonic-boom noise."

In Ruppenthal's judgment, as well as in the opinion of other experts, the SST will cause more ear-shattering noise than it's worth.

RESTRICTIONS REDUCE BENEFITS

Ruppenthal said restrictions placed on the SST by foreign countries because of its sonic-boom problem will substantially reduce the economic benefits to be expected from development of the aircraft.

Ultimately, the SST could be limited to flying only over the oceans.

Ruppenthal said it's estimated the cost of a single SST will be about $45 million—almost as much as the most profitable American airline reported in its most profitable year to date.

"It would take all the profits of 10 years of uninterrupted good business for an airline to equip itself with a fleet of SSTs," he added.

American experts aren't the only ones concerned about the threat of SST sonic booms.

Bo K. O. Lundberg, director general of Sweden's Aeronautical Research Institute, for instance, says the SST "boom carpets" will be at least 70 miles wide and cover the major part of the U.S. and Europe if no boom restrictions are imposed.

"The boom tests over Oklahoma City," Lundberg said in an official report, "proved that supersonic flight over land of the British/French Concorde and the Boeing Supersonic Transport will be unacceptable: Although the average boom intensity beneath the flight was never more than 1.6 pounds per square foot, considerable damage to buildings occurred and no less than 27 per cent of Oklahoma citizens polled declared they could not 'learn to live' with eight daytime booms per day.

NO NIGHT BOOM

"No booms at night were produced (the really critical test) but practically all day-sleepers were awakened and the morning boom, at 7 a.m., was widely used as an alarm clock.

"In over-land operation the SSTs will produce an average or 'nominal' boom intensity on the flight track of two pounds per square foot in climb and 1.5 in cruise. These averages will often be greatly exceeded due to focusing effects of winds as follows from theory and was confirmed by the tests.

"Briefly, the 'margin of safety' in the conclusion that civil supersonic flight over land is unfeasible is simply overwhelming," Lundberg said. "The tests indicate that sleep disturbance will be suffered by many even if the nominal boom intensity was reduced to 0.5 pounds per square foot, implying such a small SST that practically no payload could be carried."

An American expert, N. E. Golovin, Ph. D., who is more conservative in his estimates than Lundberg, said persons located within a corridor 30 to 50 miles wide below the flight path might hear the boom.

"This would bring the sound to 10-million persons during a flight across the United States," said Golovin, who is with the President's Office of Science and Technology.

Medical scientists say permanent hearing damage can result from a steady overall sound above 95 decibels (a unit of measurement for the relative loudness of sound).

Today's jet aircraft at takeoff has a sound level of 150 decibels; the SST is expected to have a sound level far above that.

"CHRONIC NOISE SYNDROME"

The SST could contribute to what Dr. Samuel Rosen, a New York medical doctor and an expert on noise, calls "the chronic noise syndrome."

"One day, I believe, we will recognize a chronic noise syndrome," Rosen said, "At an unexpected or unwanted noise the pupils dilate, skin pales, mucous membranes dry; there are intestinal spasms and the adrenals explode secretions.

"The biological organism, in a word, is disturbed," Rosen said.

Dr. William A. Shurcliff, the Harvard University physicist who heads up the anti-boom league, says the sonic boom "strikes without warning; the effect is startling, disrupting, sometimes even terrifying.

"It produces muscular spasm and, often, sharp increase in rate of heartbeat," he said. "Harm done to babies, nervous people, heart patients, etc., has not been evaluated satisfactorily. The boom can stampede cattle, cause mink to kill their offspring."

Although the sonic boom is not yet with us, aviation officials recognize even today the aircraft noise problem that already vexes large cities everywhere.

SOUNDPROOF HOMES

In Los Angeles, for instance, airport commissioners have begun a program to soundproof about a dozen homes near the International Airport. The Department of Airports is to spend $200,000 on the project, which has been urged by critics of airport noise.

"We consider noise to be as serious a problem as ground transportation—getting people to the airport," said Francis T. Fox, airports general manager. "It can only become more serious if we don't do something about it now."

Fox admits the project is necessary now because of the looming advent of such planes as the Boeing 747, larger than any aircraft currently used in commercial transportation and the SST.

Each will create more noise problems. The SST, for instance, Fox said, will create great "lateral"—to the side of runways—problems.

U.S. Transportation Secretary Alan S. Boyd has supported the idea of an airline passengers head tax to finance soundproofing of homes near airports.

CAN WE LIVE WITH "THE BOOM?": SONIC BOOM BLAMED FOR THREE FATALITIES—II

(NOTE.—The following is the second of three articles on the dangers of the sonic boom by a close observer of the aerospace-air transport field.)

(By Hal D. Steward)

WASHINGTON, October 15 (NANA).—In early August, this year, a French farm family, with eight neighbors and hired hands helping in the harvest, gathered for the noon meal in a farmhouse near the village of Mauron in Brittany.

Suddenly, without warning, a thunderclap was heard.

Timbers broke loose and eight tons of barley stored in a loft fell on those eating, killing three and injuring one seriously.

It was, apparently, the first time a sonic boom had been blamed for fatal injuries.

The experience of that French family may be the forerunner of what's in store for Americans when the supersonic transports (SST) become operational in the mid-1970's.

Already U.S. military jet aircraft have repeatedly created sonic booms that have damaged numerous American homes, although no deaths have yet been attributed to them.

SPLITS HOUSE

In Oklahoma, sonic booms tests in 1964 virtually split a house in two, and the owner was awarded $10,000 damages by a Federal circuit court. In all, almost 5,000 damage claims were submitted.

"An analysis of actual damage payments following sonic boom tests in Chicago and St. Louis," said the Citizens League Against the Sonic Boom, "indicates that a fleet of SSTs in routine use over the U.S.A. would be expected to damage windows, plaster, etc., to the tune of about $1 million per day."

What is a sonic boom?

After conducting a study of sonic booms at Edwards Air Force Base, Calif., the President's Office of Science and Technology explained the sonic boom is not, as many believe, a single event produced by "breaking the sound barrier." It is an intense pressure wave that follows the track of a supersonic plane.

At speeds above that of sound, waves generated by portions of the aircraft, particularly the nose and tail, build up, forming a cone-shaped surface of intense pressure with the plane at its apex. If this swift-moving cone touches the ground before being dissipated by distance, it strikes human ears as a boom.

The purpose of the government tests was to assess public reaction to the projected SST. They showed a sonic boom could be annoying to those on the ground even when the aircraft is flying above 60,000 feet.

BONE-SHAKING JOLTS

One sound expert has predicted an SST flying across the U.S. at 65,000 feet altitude could deliver a bone-shaking jolt to every man, woman and child over an area of 100,000 square miles—as many as 20 million persons.

Because of this there are indications the SST may never be permitted to operate over land at supersonic speeds.

Designed to fly at about 1,800 miles-per-hour, or about two-and-one-half times the speed of sound, the SST could fly from New York to London in less than three hours, carrying 350 passengers.

The SST, as currently being built by the Boeing Company, is 306 feet long, has gross weight of 675,000 pounds, stands 48 feet high, and it will have four 60,000-pound thrust jet engines.

Since the SST at supersonic speds may be unacceptable for flights over land, will it be acceptable to persons at sea?

It won't according to Bo K. O. Lundberg, director general of Sweden's Aeronautical Research Institute.

"No doubt a sonic boom of a given strength will usually be less disturbing on boats than

on land," Lundberg said. "But, on what grounds is it believed that people on boats can accept booms many times stronger than the level acceptable to people on land?

"Surely, it would be ruthless to consider people at sea an insignificant minority."

"The SSTs will produce a 'nominal' boom of 2.5 pounds per square foot in supersonic climb over water," Lundberg said. "Due to focussing effects the intensity will often exceed five pounds per square foot. By reflection close to cabin walls the intensity could easily exceed 10 or even 15 pounds per square foot. Such booms are exceedingly frightening and potentially dangerous to people with heart disease.

STRUCK BY BOOMS

"The disturbance, fright, and danger will, of course, be especially pronounced in areas with heavy concentrations of both SST and boat traffic, in particular south of Nova Scotia and New Foundland. Conservative calculations suggest that there will be, every year, many thousands of cases of people being struck by booms exceeding five pounds per square foot (disregarding wall reflection)."

Lundberg suggests tests be conducted to determine boom effects on boats and their passengers. He said this is vital to aviation in general and "SST investors in particular."

If such tests are not made before the Western world proceeds further on the supersonic road, Lundberg said, "there is a staggering risk of an economic disaster; people at sea will certainly find ways and means of putting an end to supersonic over-water flights—once the activity has reached a scale such that the incessant boom thunder has become unbearable and there has been a number of cases of serious incidents or fatal accidents, such as heart attacks. That would imply that most of the many hundreds of SSTs then flying would have to be scrapped."

Jet noises are already mangling men's nerves, even before the advent of the SST, according to Dr. Julius Buchwald, a New York psychiatrist, and they are producing hallucinations and suicidal impulses among those on the borderline of emotional stability.

One woman living near Kennedy International Airport threatened not long ago to blow up the airport's tower to free herself and her family from jet noise.

In a study conducted in Oklahoma by Dr. Zhivko D. Angeluscheff, a Fellow at the New York Academy of Medicine and Sciences, 10,000 chickens were subjected twice a day for six months to sonic booms of jet aircraft flying overhead at an altitude of 35,000 feet.

At the end of the six months, 6,000 of the 10,000 chickens were dead.

CAN WE LIVE WITH "THE BOOM?": CITIZENS NOT PROTECTED FROM SONIC BOOM, SAY CRITICS—III

(NOTE.—The following is the last of three articles on the dangers of the sonic boom by a close observer of the aerospace-air transport field.)

(By Hal D. Steward)

WASHINGTON, October 16 (NANA).—Critics insist the Federal government hasn't done enough to protect Americans from the ear-splitting, nerve-shattering sonic boom.

Such criticism may not be entirely fair.

Nevertheless, the seven-member Santa Barbara, Calif., city council became so angry at sonic booms over their city that they outlawed them, declaring them to be a public nuisance.

It may be difficult for a Santa Barbara traffic cop to flag down a 2,000 mile-per-hour aircraft—flying at 80,000 feet—and hand the offending pilot a ticket for disturbing the peace. But, by its action, the city council has served notice supersonic aircraft won't be permitted to rattle windows and bend eardrums in Santa Barbara.

The Federal government appears to understand the concern of Santa Barbara and other cities in the nation bothered by sonic booms. It has conducted numerous experiments in an effort to devise ways in which the sonic boom might be somewhat controlled.

Government scientists have learned, for instance, that sonic booms have a peculiarity of pathy behavior. That is, they may be twice as strong in one spot as they are a few hundred yards away.

WAVY LAYERS

The experts attribute this to wavy layers in the earth's lower atmosphere that like a succession of lenses, focuses the sound on certain areas.

It ultimately may be possible, these experts say, to devise operating procedures and take advantage of atmospheric peculiarities to reduce the sonic boom menace.

On the other hand, such critics as the Citizens League Against the Sonic Boom ask: "Can scientists find a way of eliminating the boom?"

"They have been trying for years," says the League, "And have failed. The boom is a fact of nature, like gravity."

However, the U.S. Air Force and the National Aeronautics Space Administration, in a joint project, are using the giant jet XB-70 in an attempt to find answers to reduce jet noise.

The objectives of the project are to reduce the noise radiated from the compressor and fan discharge ducts of turbofan engines in presently operating commercial jets, and to develop more accurate flight path control so jets can make steeper approach paths for landing and lower the noise level near airports.

But what about the sonic boom expected from the supersonic transport (SST), a prototype of which is currently being built in Seattle by the Boeing Company?

PHYSICAL PHENOMENA

"I am told that a sonic boom is a physical phenomenon that will exist when there is supersonic flight," said William Allen, a Boeing executive.

"The degree of intensity of the boom is affected by various factors, including the size and weight of the airplane, its design, the altitude at which it is flying, the existing atmospheric conditions and the nature of the surface over which the plane flies.

"I would expect," Allen said, "the principal solution to the sonic boom problem will lie in the manner in which the airplane is operated, the route followed, the altitude at which the sonic boom flights are conducted and the approach and takeoff techniques."

While Boeing proceeds with construction of the SST, President Johnson has called for a "concerted effort to alleviate the problems of aircraft noise."

To comply with the President's order, the Federal Aviation Agency has created a Noise Abatement Staff. It has begun to work closely with the Office of Science and Technology, NASA, the Commerce Department, the Housing and Uraban Development Department and the aviation industry.

But the major task of the staff appears to be to reduce noise at major airports rather than curb sonic booms.

FEDERAL LEGISLATION

Congressman Theodore R. Kupferman, R-N.Y., has introduced Federal legislation to establish a Federal Office of Noise Control.

His bill would provide for grants to aid state and local programs aimed at controlling excessive noise, particularly from jet aircraft and for research into "sonic booms" that can be created by travel at supersonic speeds.

"The jets are really a major problem," Kupferman said. "I've had letters from people who claim the sonic boom is causing cracks in the Grand Canyon."

The U.S. Air Force, probably responsible for most of today's sonic booms, frankly admits it can do nothing about them.

In a letter to Kupferman, Air Force Col. John E. Lingo wrote:

"The Air Force wishes it were possible to accomplish the air defense mission without disturbing private citizens.

"At the present time, there is no known method of dissipating the pressure wave that is produced when an aircraft exceeds the speed of sound. Notwithstanding, scientists are trying to find ways to eliminate, or at least reduce, the audible disturbance caused by the sonic boom.

"MINIMIZE DISTRESS

"In the meantime," said Lingo, "all feasible and practicable measures are being exercised to minimize the distress to our citizens without jeopardizing the air defense capabilities of the United States."

Lingo said the Air Force restricts supersonic flights to altitudes above 30,000 feet, but this does not eliminate the audible sound of the sonic booms.

"A supersonic flight of only 100 miles in length," he said, "could expose an area in excess of 5,000 square miles."

As far as present jet airports are concerned and the noise problems associated with them, the Airline Pilots Association has "strongly opposed the inclusion of residential property within close proximity and peripheral areas of jet airports."

John S. Stefanki, representing the pilots' association, said, "The problems of jet noise pollution to the residential owner has usually been created by myopic zoning boards.

"The airline pilot is saddled with the blame inasmuch as he is at the controls of the sound problem aircraft," Stefanki said. "This would not be so if residential property owners did not lie underneath or within the confine of aircraft flight paths."

Aircraft noise is and will continue to be a big problem for Americans.

Jet aircraft engines have been developed that generate less noise, although they're not yet in use. These new quieter jets will cost money; if the public wants quiet in the skies, it must exert pressure on the aircraft industry and the government to get it.

And, most of all, the American public must decide now before the point of no return is reached whether it wants supersonic transports that will cause what medical doctors term a "startle" reaction in humans.

Other items on sonic boom follow:

SONIC BOOM: THE ENEMY OF CIVILIZATION BY ZHIVKO D. ANGELUSCHEFF, M.D.*

* * * * *

Voltaire, the French philosopher, while a guest of the Empress Katherine II of Russia, wrote to Paris: "Today a letter from Peking did arrive. It took only six months! Incredible, isn't it? Progress goes forward with tremendous steps."

Progress has continued, and we marvel! Do we indeed progress?

The Academy of Sciences in New York, on the occasion of its 150th anniversary jubilee, arranged a referendum among its members for an appropriate solgan for the occasion. I answered the invitation in the following manner: "We have lost precious time and effort in our concern for things unimportant for the future of humanity. Man and his destiny must be the primary consideration of science. *Protection and Promotion of the faculties given to Man by Nature*—this is my proposal."

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* Fellow Academy of Medicine, N.Y.; Member, Academy of Science, N.Y.; Member, World Health Organization, (A.C.C.), N.Y.; Hearing and Speech Center, City Hospital, N.Y.; Manhattan Eye Ear and Throat Hospital, N.Y.; Accoustic Society of America; Accoustic Society of France.

The most distinctive characteristic of our mechanized civilization is its disregard of the biological limits of the human body. Technology today adds decibels and promotes deafness and mental illness among the people. Industrial and aviation noise intrudes into homes and exerts a deleterious effect upon human hearing and upon the nervous system. A population not exposed to vibratory energy (or noise), the natives of Morocco, the Congo, Sudan, can perceive frequencies as high as 28,000 c/s (32,000 c/s, Helmholtz). Our middle-aged population in Long Island, New York, an area highly infested with aviation noise, can hardly perceive 8,000 c/s; a pilot after long duty, 4,000 c/s.

Acoustics, which refers primarily to hearing, in its zeal for progress, has become the enemy of hearing. The decibel is its darling!

NORMAL HEARING

Shortly before the Congo was given independence, Belgian firms were equipping factories in the jungle. The French Institut National de Securite, an agency for preventing occupational hazards, was asked for an acoustical engineer to take care of the "desonorisation" of the machines destined for the Congo. The French acoustician inquired: Why all the fuss about desonorising machines for the jungle, when nobody does it for Belgium or France? He received this reply from a Belgian executive: "When we install machines in Belgium or France, the workers accept them and do not protest. When we do it in the Congo, the workers run away, and no power on earth can bring them back." The Congolese cannot stand the noise and leaves his job.

His natural capacity should be called normal hearing. The human ear can receive and interpret sound frequencies from 16 c/s to 32,000 c/s (Helmholtz). Vibrations above this range obey the same physical laws but are not perceived subjectively as sound; they are ultrasonics. Although not perceived, they exist objectively and act upon the biological structures. Every overtaxing of the ear leads to impairment of normal hearing.

A memory of my schooldays came back to me many years later when I became an ear specialist. A relative of mine, centenarian shepherd, was entrusted to me by my cousin. His sight was dimmed by age, and my friends and I would bring him to his bench, where he could enjoy the greetings of passing neighbors. One day our gang's "intelligence service" brought the news that the man who guarded the apples and prunes in a nearby garden was away for two days. It was an emergency call—there was nothing to do but go and help ourselves! We said to Grandpa, "You must go to bed—it is time." "No," he said, "it is not late. I haven't heard the cry of the bats."

At the time I didn't pay particular attention to his remark. But now I realize that a 109-year-old could hear the signals of the bat—120 c/s—while a man of 35-45 years, living in the city noise, cannot hear 8,000 or 10,000 or 12,000 c/s.

Can you help me with this problem, dear colleagues? Have we so greatly underestimated the capacity of the human ear—perhaps because of the effects of noise even in Helmholtz' time? Should the old man's hearing be considered the normal range?

Imagine that I am addressing you in my normal voice from the Rock of Gibraltar, and that you are seated 12 miles across the strait on the African shore. You will hear my voice as well as you hear me now, as is described in the Encyclopedia Magna.

Once I participated in a Congress in Istanbul; it was held in the Physical Institute, a modern building with a seating capacity of 1000 donated by the American government. I was seated in the 3rd row, about 10 yards from the speaker's platform. Since I understood the three official languages. I didn't use the earphone, and I didn't hear clearly. I was told it was because of the acoustics. In the evening I was the guest of Professor Ener, Dean of the Institute. "How could you accept such a gift with impossible acoustics?" I asked my host. "You have so many excellent classical achievements of acoustics—Haya Sophia, the theater of Pergamum with a capacity of 15,000 listeners. There, from the last row, you hear a dime dropped on the stage!" "You are right, dear colleague, very right!" exclaimed my host. "This year I was in Pergamum. You hear well every spoken or whispered word. Even more—you hear the breathing of the actors!"

If science—architectural and acoustical—had studied or discovered the secrets of the old masters, and simply copied them, we would not now need amplifiers, those contributors to the progressive deafness and nervous illnesses of man.

Will you agree with me, dear colleagues, that western civilization is not capable of accommodating an audience of 15,000 to 50,000 without using amplifiers?

"Technicians and politicians are rushing into experiments without the faintest idea of what the results may be" (Soddy).

At the invitation of the French speaking acousticians (G.A.L.F.), I addressed their Congress on October 5, 1967. My paper was "The tragedy of Beethoven and the failure of acoustics." Since I had many times, in Congresses, reproached engineers and acousticians for their disregard of the biological functions of human beings exposed to noise, I expected some criticism. Instead, when I finished my talk with the slogan, *"A bas les decibels!"* there was applause. I was puzzled—was this French politesse? Many came to express their appreciation. A colleague working on ultrasonics took me home. He told me about the tragic occurrence in the city of Vannes, where a supersonic jet, flying over the city, killed three persons with its sonic boom, and wounded two others. Protests flooded the press. Perhaps this terrible accident conditioned my French colleague to agree with me that S.S.T.—boom—is a dangerous weapon!

VIBRATION—NOISE

Vibration is a primordial phenomenon. Submolecular movement of electrons in the living cell is a manifestation of life. Organic matter consists of units of chemically bound atoms. These adhering atoms are easily broken down by vibratory energy.

The disruption of the molecules of the nerve cells can deprive them of their biological functions. When a submolecular motion is generated in the cell by adequate frequencies, resonance results. In such a condition, the nerve cell attains its maximum depletion of enzymes, electrolytes, and amino acids. These cell components, being freed of their chemical ties, are liberated. They leave the cell, and the specific band of the amino acids is no longer obtainable in the spectroscope. Succindehydrase, cytochrome oxydase, taking part in oxydation, are thus lost. Glycolysis in the hair cells of the organ of Corti and the spiral ganglion is stopped. The plasma itself undergoes degeneration (Vinnikov).

The Electron Transport System (ETS) accounts for more than 50 per cent of the total protein. Protein under the impact of vibratory energy drops (G. Hammer). The degeneration of the high proteins (RNA, DNA) leads to deficiency and failure of cellular function.

Experimental rats exposed to sublethal vibratory stimulation showed a higher percentage of Purkinje cells in the brain tissue than did control rats. These cells are "densified," filled with granules, with low physiological function, and they decay progressively. The chemical substance of the granules has been identified by staining and ultraviolet spectrum as Ribonucleic acid (RNA). This RNA proved to be denatured and denuded of its primordial physiological function (Dunaevsky). The new knowledge of disruption and fragmentation of the minute mitochondrium by vibratory energy is of paramount importance for medical, acoustical, and all human sciences. Any stress on the mitochondrial cell system by vibratory energy, noise, is capable of disrupting its synthetic system and undermining the highest biological activity of the cell. *The biological system which converts the vibratory sonic energy into electrochemical energy then disappears.*

"Frequencies which are not perceptible by the ear, *ultrasonics,* can be damaging. The effect of sonic and ultrasonic frequencies is especially dangerous for the ganglionic cells and those of the central nervous system of the spinal cord and brain. . . . An irreversible paralysis and, under circumstances, death of the cells can result" (G. Lehmann).

Resonance is a natural quality of matter. It results when vibratory frequencies acting upon a body coincide with its natural frequencies. Resonance is caused by fundamentals or their harmonics (including ultrasonics). Physicists and biochemists today assert that the concept of resonance has "helped to disperse the veil of mystery which has shrouded the chemical bond during the decades since its existence was first assumed" (Pauling).

The natural vibration of the chemical elements has been brought into view for the first time by D. Mendeleyev. In his attempt to classify matter chemically, he affirmed that the characteristics of a substance are conditioned by the specific vibration going on within the substance. Different vibrations condition different characteristics. The quanta of Planck, the photon of Einstein, the law of continuity of matter and energy are proving, step by step, that matter is a permanent motion and has a life of vibrating waves.

Many atomic nuclei possess their own momentum of movement or "spin" (Pauli). Such a movement generates a magnetic field of definite frequency (Rabi). When frequencies of an outer field coincide with the frequencies of the nucleus, resonance results. The shortest waves, the ultraviolet, are richest in energy; the red are the least rich.

Maxwell advanced the idea that very high frequencies of electrical vibrations are identical with light, and low frequencies resemble sound. Ultrasound, sound, and vibratory flow of electricity are governed by practically the same laws. An electric circuit being traversed by a rapidly vibrating current will set up waves of harmonics, as an elastic body does. Such harmonics, acting upon systems of identical frequencies in a natural body, produce resonance (Tesla). When resonance occurs, disruption of chemical bonds and excitement of submolecular particles in inorganic and organic matter take place.

OKLAHOMA

Before the mechanization of human life, supersonic energy was in the hands of the gods. When lightning flashed and thunder boomed, the mortals on earth whispered fearfully to each other:

"The gods on Olympus are drunk! they are angry! they are quarreling!" In our days man has assumed the prerogatives of the gods.

For the first time in history, from the sky over Oklahoma, the power of the supersonic jets created by man descended on a city. As an official delegate to the International Association against Noise (A. I. C. B., Association Internationale Contre Bruit, in Switzerland), I was witness to the fact that men were executing their brethren during six long months. Eight times a day the jets flew over the city at an altitude of 35,000 feet. With their thunder, sonic boom, they were punishing all the living creatures on earth. Those who could left. The only ones who remained were birds in cages and people chained down by their work.

This is what the owner of a chicken farm

told me: "Before the appearance of the jets, my chickens were healthy and gay and they peeped all day long. It was sheer pleasure to work among them. After the thunder of the first flights, the sonic boom, they became very nervous: they dashed around their cages as if they were blind and they would smash themselves against the nets. A few days later they started to shed their feathers. Subsequently, I might say, they were losing their mind; they lost their appetite, stopped eating, reached a state of complete exhaustion, and finally perished. The hens became morose, stopped laying eggs, began to suffer from internal hemorrhages, and finally died.

"Now, I ask myself: couldn't the authorities have established by laboratory test what harm sonic boom would do to the animal world? They should have established this and then forwarned us of what lay in store for us. My chicken farm, which counted 10,000 chickens before the flights, within six months was reduced to 4,000 because of the sonic boom! Why didn't the authorities think about it? I would like very much indeed to have an answer to my question."

The problem of noise is not, however, a new one for man. Ancient China solved it in its own fashion. In the third century B.C. under the law of Ming-Ti, criminals were executed by chiming bells! "Criminals should not be hanged, but flutes, drums, and the chime of bells should be sounded without let up, until they drop dead, because this is the most agonizing death man can conceive. Ring, ring the bells without interruption until the criminals first turn insane and then die!".

As the most techically advanced, the United States of America is more deeply involved than any other country in the problems of sound. The average American is awakened in the morning by the alarm clock. To shave himself, he uses a vibrating electric razor. He may even clean his teeth with a vibrating electric tooth brush. While he is eating his breakfast he is exposed to the vibrations of the radio. He makes use of the vibrating elevator and gets in his car, turns on the motor, and goes to work. During his working hours he makes frequent and prolonged telephone calls, thus exposing himself to the vibrating telephone membrane. And in the evening he looks at TV, listens to the radio or to his record player—all sound amplifiers depending on transistors which are composed of quartz, germanium, and similar sources of supersonic energy.

Add to this the thundering sound of jets which, alone, are sufficient to destroy the auditory nervous system of man and cause deafness—and the problem of sound is outlined in all its frightening, but unfortunately not perceivable, dimensions.

Thus it is not surprising that over 50 per cent of all the hospital beds in the United States are occupied by mentally ill patients.

However, other industrially developed countries are making great strides toward catching up or even overtaking the United States. For example, a report of the Federal Department of Workers' Insurance in West Germany stresses the significant increase of nervous diseases. In 1961, for every thousand sick men, five hundred were suffering from mental diseases: an increase of 20 per cent over 1959. Among female employees who applied for medical treatment, the number of those suffering from mental diseases reached 75 per cent (*New York Times*, August 16, 1964.)

A VERDICT ON NOISE AND VIBRATION

The Supreme Court of the United States, in March 1962, released a judgment on noise and vibrations. On this occasion I wrote the following letter to all the justices of the Supreme Court:

"SUPREME CUSTODIAN OF THE LAW: I read your verdict on 'noise and vibration.' This is the first of high authority defending not only the property—the homes, the walls, the ceilings—but the *very health of the people* who inhabit them.

"Your decision is a moral backing of the Hippocratic Oath: 'To enter into whatsoever houses to help, but never with a view to injury and wrong doing.' Noise and vibrations are intruding into homes, harming the health of the people.

"The health authorities of France have recognized noise as the 'Enemy No. 1!' Sustained vibratory energy depletes the blood plasma of its essential ascorbic acid. This inhibits the function of the adrenal glands; the nervous system becomes depleted in potassium electrolytes, which inhibits to a high degree the organs of sense. The normal body of a pilot is reduced to poor condition and actually becomes ill—with muscular and mental fatigue, lowered blood pressure, blurred vision and hearing, and depressed alertness. Such a sick person continues in charge of a highly responsible task—the safety of his passengers, crew, aircraft and cargo, and of the people on the ground over which he flies!

"With feelings of gratitude, I am most respectfully yours,"

Thanks and acknowledgement came from Supreme Court Justice William O. Douglas, who signed for all.

SONIC BOOM

Sonic boom is the Achilles heel of noise abatement. United States Senator Monroney, chief champion of the S.S.T., stated that the British and French designers of jets have completely overlooked the problem of sonic boom. Clarence L. Kelly Johnson, a designer of jets, admitted: "I am very concerned about the sonic boom of S.S.T. Something must be done." (*Time Magazine*, July 26, 1964.)

And this "something" has not yet been done!

The Journal of the Acoustical Society of America (May, 1966, vol. 39, No. 5, page 4) confesses:

"When supersonic flying became a reality, the phenomenon of the sonic boom had not been predicted. It was discovered because people heard it, reacted to it with surprise, and wondered about its source. Although the shock wave associated with supersonic motion of a body through air was well known, it had apparently *not* been expected that this shock wave would reach the ground from high altitude with such intensity and would create an audible signal. . . . Laboratory work in support of this question has hardly been started."

At least 30 Congressmen have introduced bills attacking jet noise. No bills have been passed. The nation's airport operators have withdrawn from the antinoise council, denouncing the airlines and aircraft manufacturers for laying a "smokescreen" over the problem of jet noise—a "hoax on the public." Their statement of February 7, 1968 continues: "We are tired of being the scapegoat for the airlines and manufacturers."

An "authoritative study" carried by *Physics Today* (Feb. 1968) attempts to prove that the damage attributed to sonic boom is "superficial" and due to "dehydration and poor workmanship."

In the meantime, in Canyon de Chelly, a National Park in Arizona, where many Indians live, raising sheep, goats, and corn, 83 sonic booms were recorded for the period of August 11 to December 22, 1966. Engineers have estimated that about 80 tons of rock have fallen on the cliff dwellings in Canyon del Muerto, causing extensive damage (*New York Times*, Jan. 12, 1967).

The Santa Barbara City Council has outlawed sonic boom, which caused damage to homes and physical injury to individuals (*New York Times*, Sept. 28, 1967).

Committed as we are to technical progress, we have to accept, not the chiming of bells, but sonic boom as the most modern executioner. And this not for convicted criminals, but—in the most democratic way—for all!

Thomas A. Edison ventured a farsighted augury that man in urban areas, exposed to the steadily increasing noise, confronts the possibility of being born deaf.

Down with decibels!

U.S. DEPARTMENT OF JUSTICE,
Washington, D.C., April 1, 1968.

Dr. WILLIAM A. SHURCLIFF,
Cambridge, Mass.

DEAR DR. SHURCLIFF: Your letter of March 6, 1968, addressed to Major General Maxwell, Director, Supersonic Transport Development, Department of Transportation, has been referred to this office for a reply to the question in paragraph 3 of your letter.

We know of only four lawsuits by Oklahoma City residents relating to the 1964 sonic boom testing program.

1. *Gravelle, et al.* v. *United States*, a suit by a number of residents of Oklahoma City was tried in Federal District Court and resulted in a judgment against the United States dated April 14, 1967, in the total amount of $18,081.09 for the nine cases litigated. This judgment has been appealed and is presently pending in the United States Court of Appeals for the Tenth Circuit. Because of the appeal, no sums have been paid by the United States. We have stipuated that if the judgment is affirmed in all respects the United States will pay the 60 plaintiffs whose cases were not litigated a total of $75,624.84. If the judgment is not affirmed the stipulation would have no effect and the dispos'tion of the cases would be governed by the appellate decision.

2. *Bailey Smith* v. *Valley Forge Insurance Company* was a suit in Federal District Court by Mr. Smith against his insurance company. This suit resulted in a $10,000 judgment for the plaintiff which was not appealed by the insurance company.

3. *Beckham* v. *Hartford Fire Insurance Company* was a suit in Federal District Court by Mrs. Beckham against her insurance carrier. The jury found that the claimed damage was not caused by the sonic booms and the judgment was for the insurance company. The plaintiff did not appeal that decision.

4. *Kunc* v. *Standard Accident Insurance Company* was a suit in the Court of Common Pleas of Oklahoma County by Mr. and Mrs. Frank J. Kunc against their insurance company. This suit resulted in a $2,000 judgment for the plaintiffs which the insurance company did not appeal.

Sincerely yours,

EDWIN L. WEISL, Jr.,
Assistant Attorney General,
Civil Division.

JOHN G. LAUGHLIN,
Chief, Torts Section.

DEPARTMENT OF TRANSPORTATION,
FEDERAL AVIATION AMINISTRATION,
Washington, D.C., April 4, 1968.

Mr. S. WEBER,
New York, N.Y.

DEAR MR. WEBER: Referring to your March letter addressed to the FAA, the Norair Division of Northrop Corporation has explained to us some of their experience in testing effects of electrostatic charges in fluid flow. Most of the publicity they have received on this project fails to state that their tests have been conducted with liquids only. These tests indicated some change in flow characteristics but the consequences of these changes have not been evaluated. Further, it is not known whether these effects would be obtained in a gas or in air. We see no serious likelihood that this concept could reduce sonic boom characteristics. According to the electrical power which Northrop used in these preliminary experiments, the electrical requirements for an airplane in flight would appear to be prohibitive.

If you wish further information on this subject, I suggest you write directly to the Northrop Corporation.

Sincerely yours,

C. L. BLAKE,
Chief, Engineering Division,
Supersonic Transport Development.

[Editorial channel 2, New York, N.Y., Feb. 14, 1968]

TRANSPORTATION 8

(By Michael F. Keating)

Take the noise of screaming jets that you hear around our airports, and make it three times louder. Then add the thunderclaps of sonic booms, and spread them across the countryside everytime one of those new supersonic jetliners passes overhead at top speed.

What you have then are the sounds of the 70s. Unless we do something in the 60s to muffle the impending din, the sounds of the 70s will be deafening.

Aircraft noise, which now helps make New York City the noise capital of the United States, is booming right along with air travel. And air travel is expected to triple in volume by 1975. Presumably so will noise. At the same time, supersonic jetliners, like the British-French Concorde will be zooming along at speeds up to 1800 miles an hour, and they'll be dragging thunderous sonic booms behind them.

Sonic booms, which travel in waves like the wake of a fast motorboat, will spread out as far as 50 miles from these new planes when they break the sound barrier. It has been estimated that in a cross-country journey, these sonic booms could assault the ears of up to 20 million Americans.

What can we do to protect our nerves, our eardrums and even our sanity from this sort of transportation "progress?" There's a great deal we can do through government and industry. But we must insist that it be done.

One of the first steps we should insist upon is the establishment of sensible zoning practices that would reserve land near airports for industry instead of housing. In far too many cases, New York City is now allowing apartments to be built too close to the airports. One project, a high-rise apartment, will be built within a mile and a half of a busy and noisy runway at LaGuardia.

Another step that local government should take is the enactment of special building codes that require soundproofing of housing that is built in noisy areas.

At the federal level, much more needs to be done about curing aircraft noise at the source. Scientific research may solve the sonic-boom problem, but until it does Washington should establish speed limits in the skies so that populated areas will be safe from these man-made thunderclaps.

More federal research funds may lead to a quieter jet engine. Washington spent $485,000 for such engine research last year; but at the same time, Congress spent $3 billion to develop supersonic jetliners and thereby sonic booms.

To us this indicates that government cares little about this problem now in the 60s, we're likely to be drowned out by the 70s.

[From Seattle magazine, March 1968]

THE SHATTERING SONIC BOOM

(By Patrick Douglas and James Halpin)

The pop art painting on this month's cover points up a major hazard of the supersonic transport, or SST, now being developed by Boeing at its Seattle plant: the reverberating sonic boom that SST's will trail when flying at high speeds. Although it is unlikely that Seattle itself will be plagued by many such booms—SST's approaching or leaving Seattle-Tacoma International Airport will be traveling at subsonic speeds—this whole area has an enormous stake in how the sonic boom dilemma is resolved.

When President Johnson announced at the end of 1966 that Boeing had been selected to build the SST, most Seattleites interpreted the news as a tremendous windfall. Small wonder, for government investment in the program will likely come to $4 billion, and Boeing estimates that SST sales might reach $50 billion by 1990, making the award, according to *Fortune*, "potentially the biggest competitive prize in U.S. industrial history."

The selection of Boeing over Lockheed as winner of the supersonic sweepstakes promised Seattle not only vast economic rewards for decades to come, but glory as well—the prestige of building a vehicle that will be reshape the world's economic, political and ecological patterns. Carrying 350 passengers at 1,800 miles an hour—or three times the speed of today's jets—the SST will be able to reach any place on the globe within 12 hours.

But stacked against these advantages is the problem that is literally earth-shaking—the inevitable sonic boom. In the first rush of excitement over the SST, the question of the boom was largely ignored; now, however, second thoughts are being voiced by responsible officials and scientists throughout the U.S. Chief among them is a new group called the Citizens League Against the Sonic Boom, with headquarters in Cambridge, Massachusetts, which presently claims more than 2,000 members.

Surprisingly, this growing criticism is not being answered by the other side—at Boeing, especially, mum's the word. Rather than responding, SST boosters seem to prefer "laying low" in hopes that the criticism will dissipate—at least until the plane is in the air. After that (so this line or reasoning goes) the public will simply learn to accept the boom, just as it has the roar of trucks and the rumble of railroad trains.

But whether Americans will ever learn to stop worring and love the sonic boom is doubtful. Almost certainly, the boom can never be entirely eradicated, for it is a consequence of physical laws. When a plane passes through the air at supersonic speed, it is flying faster than the speed at which air molecules can move out of its path. These air waves pile up in front of the plane, and once it has passed through them, they rush to fill the vacuum. Thus, the plane generates a pair of opposing, conical shock waves, one inside the other, which spread out behind the aircraft like the wake of a passing ship. In the case of an SST flying at 60,000 feet, these waves at ground level will be about 60 miles wide, and anyone in their path will hear a pair of loud explosions. Since these explosions always come without warning, their effect is apt to be frightening indeed.

Recently, for example, a Madison Park matron was nearly frightened out of her wits when a low-flying fighter-plane boomed her house. "At first I thought our furnace was exploding," she recalls. "Then I thought it was an earthquake, so I pulled the children into a doorway. When the second boom hit, I expected the ground to swallow us up."

Scientists have an apt name for this phenomenon: the "startle effect." As John Anthony Parr, a British physician, has observed: "Our muscles tense and we jerk, our abdominal blood vessels contract to drive extra blood . . . and this produces that feeling of the stomach turning over. . . . This internal upheaval, if repeated again and again, is exhausting physically and mentally, and ultimately can cause a nervous breakdown. . . ."

Some experts estimate that if and when SST's go into operation across the U.S., many areas will be boomed as often as 20 times a day. Though there is still no proof that this experience could actually produce mental illness, the damage which sonic booms cause to physical property is no longer a matter of speculation. (To keep tab on the effects of sonic booms caused locally by Air Force planes, the State Aeronautics Commission has set up a special answering service for complaints, which can be reached by dialing RO 7 3466.)

The Air Force no longer publishes damage claims filed against the federal government, but in 1962, the most recent year for which figures are available, these claims numbered more than 3,000. A farmer in North Dakota, for example, was paid $1,048 after a sonic boom caused one of his animals to run into a barbed-wired fence, while a store owner in Cedar City, Utah, was paid $1,900 for the replacement of plate glass windows and merchandise.

Although much of the damage caused by sonic booms is seldom seen, it is nonetheless real. The U.S. Department of the Interior claims that the booms have shaken tons of earth from the prehistoric cliff dwellings in Mesa Verde National Park in Colorado, just as they have reduced magnificent sandstone formations to piles of rubble in Utah's Bryce Canyon and Zion National Parks. So concerned is Interior Secretary Stewart Udall that, acting independently of the White House, he has formed a panel of a dozen scientists to advise him on all damages the SST will likely cause to geological formations and wildlife.

One of the problems in predicting the effects of sonic booms is that their intensity varies with atmospheric conditions as well as with the altitude and weight of the plane itself. Because of these atmospheric variations, every hundredth house in the path of an SST will be hit by a "superboom" of twice the normal size, while every thousandth house will be hit by a *triple-size* boom. Such superbooms can occasionally wreak fantastic damage; in 1953, for instance, a superboom caused $500,000 damage to the Will Rogers Terminal near Oklahoma City, while in 1959, an F–104 fighter flew over the Ottawa air terminal at 500 feet, causing a superboom that blew out the terminal's glass walls and twisted its roof.

Faced with such frightening prospects, some regions have taken countermeasures. After being bombarded for 75 consecutive days by jets from nearby Hamilton Air Force Base, angry residents of Santa Barbara, California, forced their city council to pass an ordinance which makes sonic booms an "unlawful public nuisance punishable by a fine of $500 and 60 days in jail." "I know we'll come in for some kidding about this," said City Attorney Stanley Tomlinson after the ordinance was signed, "but it's high time somebody somewhere spoke out against this darned nuisance."

Meanwhile, Canada has passed a regulation affecting all provinces, which stipulates: "No aircraft shall be flown in such a manner as to create a shock wave . . . likely to create a hazard to other aircraft or to persons or property on the ground." Switzerland and West Germany, for their part, have declared they will ban SST flights if their citizens raise strong objections.

At this point, however, it is unclear whether the public will rise up in protest or accept the sonic boom as part of the price of "progress"—assuming, of course, that physical damage can be kept to a minimum. So far, the most revealing indication of the public's tolerance level is found in a series of supersonic flight tests which the Federal Aviation Agency conducted over Oklahoma City in 1964.

The FAA is the agency through which government funds for the SST are distributed. Its tentative contract for firms competing to build the SST contained a clause which stated that any boom caused by the plane could not generate more than 2.0 pounds per square foot of overpressure (that is, pressure above the normal level) during acceleration, and 1.5 psf during cruising. Although the purpose of the Oklahoma City tests was to demonstrate that these boom levels would, in fact, be acceptable, the results were anything but reassuring.

From January through July, Oklahoma City was bombarded by 1,253 sonic booms at an intensity varying from 1.0 to 2.17 psf. After the first eleven weeks, less than 10 per cent of the population said that they could never learn to live with the booms, but by the end of July, this figure had risen to 27 per cent, and a total of 15,452 residents made formal complaints. Worse yet, 4,901 Oklahomans filed damage claims, of which 289 were granted at a cost to the U.S. government of $19,355. (More than half of this amount went to a couple who were able to prove that a sonic boom had split the walls of their basement.) When the tests were over, the stipulation regarding boom levels was quietly dropped from the contract.

"The idea now," says Major General J. C. Maxwell, who directs the SST program for the FAA, "is to go ahead and develop a supersonic transport as quickly as possible, even if the plane's boom level restricts it to oceanic flights." This will likely be the case—at least initially—with the Boeing plane. Interviewed by SEATTLE MAGAZINE, General Maxwell estimated that a Boeing SST flying from New York to Paris would produce booms of 2.4 psf during acceleration, 2.0 at the beginning of its cruise, and 1.7 toward the end. (When necessary, the plane can reduce it speed to subsonic levels to avoid booming the residents of England and northern France. Indeed, the Boeing innovation allowing easy adjustment between subsonic and supersonic speeds because of variable-sweep wing design is widely credited with its victory over Lockheed in the government-sponsored competition to build the SST.) "If the SST ever flies from New York to San Francisco," Maxwell added, "it will carry less fuel than it would for a Paris flight, and this decrease in weight will reduce the booms to 2.0, 1.7 and 1.6."

But to SST critics, the plan to restrict the planes to oceanic flights is small consolation. "On a flight from New York to London," says Dr. William Shurcliff, the Harvard physicist who has organized the Citizens League Against the Sonic Boom, "an SST will boom approximately 4,000 ship passengers, and once SST's become commonplace, each ship on that route will be boomed about 20 times per crossing." Moreover, continues Shurcliff, it is naive to assume that the airlines will ever be content to fly the SST only over water. "First," says Shurcliff, "they will get permission to fly over Cape Cod. Next it'll be Maine, and before long they'll be flying all over the country." When this happens, according to Shurcliff, each cross-country flight will boom some 20 million people, and all of the flights together will cause $1 million worth of damage per day.

The reason Shurcliff is so certain the SST will eventually be approved by overland flight is that the government body which is managing the program—that is, the FAA—will also decide whether the plane is suitable for service and where it may fly at supersonic speeds. "In effect," says Shurcliff, "the FAA will be asked to declare whether it has spent its own money wisely, and in my opinion, this constitutes a definite conflict of interest."

Shurcliff's assessment is vigorously disputed by General Maxwell. "The FAA," says Maxwell, "can't make a plane a success simply declaring it so. The SST's success will depend solely on whether the airlines buy it and make money from it." (Presumably, this yardstick would apply no matter how many people were being subjected to sonic boom.)

As Maxwell implies, the criteria by which the FAA presently passes judgment on a new plane have nothing to do with noise levels. "Our sole responsibility," says Maxwell, "is to decide whether the plane is safe or not. Any other considerations are outside our legal jurisdiction."

To close this gap in the law, the administration is sponsoring a bill which will give the recently-formed U.S. Department of Transportation the power to specify acceptable noise levels for new aircraft. Few sonic boom critics take much comfort in this proposed legislation, however, for as Maxwell himself points out, the FAA is part of the Transportation Department and is the most likely agency to influence any final decision.

For opponents of the SST, the one remaining hope is a group of skeptical congressmen led by Senator William Proxmire of Wisconsin. Like most SST critics, Proxmire fears that the plane's sonic boom will turn the world into what he calls a "gigantic drop-forge foundry." But beyond this, Proxmire feels strongly that the $4 billion being waged on the SST gamble could be better spent on other projects.

"I am as enthusiastic as anyone," Proxmire recently told Congress, "about the prospect of flying from Washington to London in three hours instead of seven and a half. . . . But is the duration of the average commercial flight between Washington and London a national problem of such magnitude that it deserves to be treated with as much concern and have as much public money contributed to it as the crisis in our cities, the education of our children, or the pollution of our air and our lakes and streams?" (Other critics, of course, name an even more troublesome dilemma crying for higher priority than the SST: the war in Vietnam.)

In reply, supporters claim that the overriding economic justification for pushing ahead with the SST is the nation's serious balance of payments problem. The British-French Concorde, they point out, though slower and smaller than the Boeing SST, is expected to go into service four years earlier, in 1971. (Schurcliff, however, believes that Britain, because of its present economic doldrums, will eventually pull out of the program, and that the Concorde will therefore never go into production.) Moreover, the Russian version of a supersonic transport, the TU–144, may be ready even before then. If either of these planes captures the world market, goes this argument, the U.S. will lose not only the potential foreign sales of the Boeing SST, but also the dollars which American airlines will spend for planes produced in France or Russia.

The only problem with this position, claim SST critics, is that no one knows just how large that world market will be. In the case of the SST, some economists have predicted a market for as many as 1,200 planes by 1990 (in which case the government would recover its investment, plus a $3.2 billion profit). If the plane is restricted to oceanic flight, however, this market will shrink substantially, but exactly how much is unclear.

Soon after the SST program got under way, the FAA commissioned a market study by the Institute for Defense Analyses. The results of this study predicted that if the SST was allowed to fly only over water, Boeing would sell a mere 279 planes—21 below the break-even point of 300. (Each of the planes will sell for $40,000,000.) The results of this study were kept secret for months—until objections were finally raised by the *Wall Street Journal*. Thereafter, the FAA's response was simply to commission another study from another agency. To no one's surprise, this second study declared that, even if the SST was restricted to oceanic routes, sales by 1990 would run to about 500 planes—providing the government a $1.1 billion profit on its investment. Already, the SST's supporters emphasize, 15 American airlines and 16 foreign carriers have deposited a total of $85 million toward the purchase of 125 planes. However, the plane's critics point out that, unlike most of the 74 reservations for the Concorde, those for the SST are not binding; airlines can recover their deposits whenever they wish—and if the sonic boom should prove a major problem, many may well wish to do so.

In the end, of course, any answer to the sonic boom question will have to come from the organization which is building the plane—The Boeing Company. At this point, however, Boeing isn't talking. Since receiving the contract to build the SST, it has been reluctant to release any information pertaining to the sonic boom—a curious policy in light of the fact that fully 83 per cent of the plane's cost is being paid for with public funds. (An exception to this self-imposed silence occurred when William T. Hamilton, Boeing's director of SST product development, announced that, because of the extra equipment required, the plan of two Northrup Corporation scientists to dissipate the SST's shock waves with electrical charges was impractical.) Last month, when SEATTLE sought the views of Boeing scientists, this magazine was denied any access whatever to Boeing personnel. Instead, it received a neatly-typed, one-page statement whose "reassuring" tone is revealed in the very first sentence: "Sonic boom is a natural phenomenon which occurs when aircraft fly supersonically."

But Boeing's silence, though regrettable—and certainly a *faux pas* in public relations—is understandable. Well aware of the growing opposition, as well as the rising skepticism of an economy-minded Congress company officials are saying nothing that might cause them to lose the biggest industrial contract in history—and any talk about the sonic boom, they fear, might help to accomplish just that.

Laments one Boeing public relations man: "Asking us about the sonic boom is like asking a man whether he's stopped beating his wife." Nevertheless, that is precisely the question that will be haunting Boeing bigwigs in the months ahead—and the answer they eventually come up with will play a decisive role in shaping the economic future of Pugetopolis.

[From the New Republic, Mar. 16, 1968]

SUPERSONIC SCANDAL

(By George Lardner, Jr.)

Congress has already appropriated more than $653-million for that glittering superjet called the SST. In his January budget asking for more, President Johnson said that "firm plans for construction" of two prototypes had been made last spring. Yet on February 22, the Boeing Company, which is building the supersonic transport, admitted that it did not yet have a design that it considered "safe, successful and profitable." Its engineers are still at the drawing boards. Flight tests will be delayed until at least 1972.

For the SST, it is a politically fortuitous slowdown, in tune with its charmed life. The controversial project has been insulated by powerful congressional support, but the steadily rising costs of the war and inflation are making federal spending on an airliner for the jet set more incongruous than ever. Despite this, LBJ had asked even more than last season for the SST—$223-million. The slowdown permits the Administration to scale down to a level calculated to arouse less opposition. Closed hearings will begin shortly before a House appropriations subcommittee, but if the past is prologue, the SST will fly through again. It can easily weather a show of frugality. Congress has been serving up cash for it faster than it can be spent. The SST has shown a remarkable ability to overcome the speed of any critical sound.

Sen. William Proxmire (D, Wis.) can rise on the Senate floor to denounce the SST as a "supersonic snow job," and find himself speaking to a quickly emptied chamber. Objections that once flowed from officials in the Treasury Department, Budget Bureau and Department of Defense have been hushed by implicit presidential decree. Government-commissioned reports full of embarrassing details have been suppressed for months, and then released in Washington in voluminous

confusion while the aviation and space writers of the country were off in Las Vegas drinking in counterclaims by the Federal Aviation Administration that grabbed the headlines. On Capitol Hill, the SST can mount a stable of instant lobbyists that includes Eugene Black, former president of the World Bank, several one-time FAA administrators, and even ex-CIA director John McCone.

Powered by General Electric and built by the Boeing Company, the sleek titanium superliner will slice through the skies before long at 1,800 miles an hour, carrying passengers from New York to Paris in 2½ hours, from San Francisco to Honolulu in 25 minutes less. "An outstanding example of creative partnership between your government and American industry," President Johnson called the arrangement last April when he ordered construction of two needle-nosed SST prototypes. The White House decision had been delayed for months, partly because of haggling over financing, but also to foster forgetfulness of the budget cuts the Administration had imposed on the poverty program that winter. The SST is not for poor folks. The chairman of the President's 1964 task force on transportation had written him to protest that the program was "thoroughly inappropriate, inegalitarian . . . and inconsistent with the Great Society." But the Johnsonian sense of priorities in times of war and inflation was unmoved.

The FAA lost no time in formally committing the government to the program. It signed contracts with Boeing and GE May 1, the first work day after the presidential announcement. At the contract signing in the FAA building on Independence Avenue, FAA Administrator William F. McKee turned to representatives of Boeing and GE, and told them sternly: "If you don't do a helluva job, you stand to lose a helluva lot of money." McKee pronounced the agreements with the government 'the toughest . . . ever written." Nonsense. Under the contract with Boeing, the government may never get its money back. As a long-buried Treasury Department report points out, the SST program is like "a wildcat oil-drilling venture." The profits could be spectacular, but it is more likely that the investors (taxpayers) will wind up losing their shirts. It is a fine example of socialism American-style; government ownership of the means of production for the benefit of private enterprise. Rushing in where Wall Street supposedly fears to tread, the government has already committed $1.3 billion to put the two prototypes in the air. Of this, an obliging Congress has appropriated more than half.

The entire SST program is expected to cost at least $4.5 billion before the first plane is sold. Buried in the FAA's financial feasibility report is the caveat that "the government may be required to act as a guarantor of or to provide any additional funds needed by the airframe manufacturer [Boeing]."

The FAA's own financial consultants—Booz, Allen & Hamilton—concluded, in a largely ignored report they put out, that the government may have to double the $1.3 billion promised so far. And still it might flop.

Enter Maj. Gen. Jewell C. Maxwell (USAF), gruff, square-jawed director of the FAA's supersonic transport development program. "If you can prove something is an outstanding success," he says, "you're too late. We've got to compete, to invest in our own future. We're in a preeminent position and enjoying the hell out of it." The "we" who are preeminent refers to the US aviation industry and its position in the world market. It is not unusual for officials of regulatory agencies to slip into the editorial "we" for those they regulate. As Federal Communications Commissioner Lee Loevinger once said: "The history of every regulatory agency of the government is that it comes to represent the industry or groups it is supposed to control. . . . Sooner or later all of these agencies end up with constituents. And they represent them damned well, too."

Some $300 million in federal funds largely devoted to a design contest won by Boeing and GE has already been kissed off as a free contribution to commercial America's high-flying future. Now the FAA has agreed to put up close to $1 billion more for the prototype program. Boeing and GE will put up $139 million—little more than 12 percent.

Domestic airlines with options to buy SST's, their arms squeezed by the officials who regulate them, will cough up $52 million—the remaining five percent—in return for tax write-offs and other assurances.

At first, the airlines had been unwilling to put up any of their own money, and FAA Administrator McKee saw no reason to inconvenience them when the federal Treasury was available. But the President, alerted to McKee's stubbornness at a White House meeting, saw the awkwardness of asking the taxpayers to put up money that the airlines refused to risk. At length, they were persuaded to chip in, says Stuart G. Tipton, president of the Air Transport Association, so that the Administration "could recommend appropriations [from Congress] more effectively." More recently, both domestic and foreign airlines have been required to put $750,000 down for each additional SST they order. But this has produced about another one percent of the prototype program's cost.

On paper, the government is supposed to get its near $1 billion back, plus sharply limited interest, through royalties on the sale of each commercial SST. GE will begin paying up as soon as the first engine is sold. But Boeing doesn't have to pay anything back until after it has sold 100 of the planes at $40 million each. And the kicker is that the Boeing royalties—beginning with plane 101—need be paid only for an SST made "principally of titanium" with a maximum cruising speed of 2,050 miles an hour (Mach 3.1). The GE engines will be able to go faster. Should Boeing manage to match them with an airframe that goes a hair faster than Mach 3.1 or build a production model of some other metal, it won't owe government a cent.

"The contract is a scandalous, shocking deal," says Proxmire. "Advances in metallurgy are perfectly possible. The government might have to write off most of its investment even if the SST is successful."

The FAA was forewarned. A government advisory committee representing the Treasury, Justice and Defense Departments, the Budget Bureau and the Internal Revenue Service had been assigned to suggest contract terms that would guarantee repayment. They told the FAA not to put a titanium clause in the contract. And they urged a broader speed range—up to Mach 4 or 2,640 miles an hour—to make sure the government would recover its money despite improvements in later models.

Instead, the FAA gave in to Boeing's corporate phalanx. The senior partner with most of the money, the FAA hit the bargaining table with a limp wrist. It was Maxwell who overruled the advisory group and agreed to limit the government's royalties to a Mach 3.1 plane made of titanium. Only then, Maxwell says, did Boeing agree to abandon still other demands "that would have been far more disadvantageous to the government." The company, it seems, wanted royalties limited to an SST with still slower speeds and a movable wing design. "Boeing came in and asked for the whole world," commented one government lawyer, "all they got was the Western Hemisphere."

Instead of blushing, the FAA blusters. A titanium airframe, it says, would practically fall apart at speeds over Mach 3.1 without a major redesign. Boron development, it says, is still in its infancy—15 years behind titanium technology. "If the Boeing Company is able to come up with a new metal that is better than titanium and can build a new airplane out of that exotic metal," McKee told an unquestioning Senate appropriations subcommittee, "then they deserve to make all the money they can because it would be the single biggest technological breakthrough in the last two centuries."

What the FAA chooses to overlook is that the government's tunnel-visioned bureaucracy, even now, is spending millions to euchre itself out of its SST money. The Air Force is testing boron components—"five times the strength of today's aircraft alloys"—on military aircraft such as the F–111 as part of an $8-million-a-year program. Meanwhile, the National Aeronautics and Space Administration quietly secured a $13 million appropriation last fall, partly to supply expert advice for the Boeing prototypes, but also to promote development of the next generation of *commercial* SST's.

Besides the FAA's $1.3 billion commitment, NASA has gotten $62.5 million over the past 6½ years for research and development of a commercial SST. Now that Boeing is building one, asserts a NASA spokesman: "Our function is to keep looking ahead. We're thinking of the next generation of SST's, the advanced supersonic transport. We're constantly looking for improvements, maybe a better metal . . . and changes in design and configuration of the airframe, yes, definitely. We've always wanted to go faster. We're assuming there may be a desire to go faster than the SST has been designed for."

The first SST won't be sold until 1975 or later. It will be close to 1980 before the government is scheduled to get its first royalties. It could take more than another decade, even if the FAA's rosy sales estimates are accepted, for the government to get back its investment plus a modest six percent interest. It strains the imagination not to expect the next generation of SST's long before then.

"This thing," as one economist told *The Wall Street Journal* in another context, "could become the FAA's Edsel."

That the taxpayers may never get their money back is not the only danger of the SST program. They may be even sorrier if they do.

The FAA insists that the public can learn to live with the sonic boom. "The first time you hear it," Maxwell says with a shrug, "you might jump. But the 1000th time, you don't do anything." Officially the FAA has managed to muffle the boom controversy by claiming that the SST will be a commercial success even if it is limited to overwater flights at supersonic speeds. But it has made no promises. Other SST backers have sought to suggest that the boom won't be so bad at the SST's high-flying altitudes of 65,000 feet or more. Boeing has even put out a brochure calling the boom "a 20th-century sound." "I've experienced booms that are no more than . . . well, rap your knuckles on the desk," says J. O. Mitchell, Boeing's man on Capitol Hill.

The boom of the SST will be much worse than that if the government's own tests are any guide. But the FAA has repeatedly refused to accept them as the last word, or even the first. In tests over Oklahoma City in 1964, slightly more than one of every four residents interviewed said they could not "learn to live" with the boom even though it was confined to daylight hours. From this, then FAA Administrator Najeeb E. Halaby (now a senior vice president with Pan American World Airways) concluded that construction of a prototype SST was "clearly warranted."

"God!" exclaims Proxmire. "Think of it. A boom stretching out in a carpet maybe 75 miles wide." Sonic booms are like that. Once started, they roll out like a rug that grows roughly a mile in width for every 1,000 feet the plane climbs.

In a single transcontinental SST flight, White House science Adviser Donald F. Hornig told a House subcommittee last spring, "all people located within perhaps 100,000 square miles, embracing perhaps 10 million people . . . would be likely to hear and react. . . ."

Recent reports of tests over Edwards Air Force Base in California showed that a boom slightly less than that expected of the SST—even at the superliner's high altitudes—is roughly equivalent to the noises of living 1,000 feet from the end of the runway at New York's Kennedy International Airport. Those hearing an SST-size bang for the first time called it as bad as having a Boeing 707 fly 300 feet over their living rooms. Those whose eardrums were numb from living at Edwards put the "20th-century sound" only a few hundred feet more over their coffee tables.

Sonic booms from military planes in the past have collapsed the roof of a French farmhouse, killing three workers; demolished a prehistoric cliff dwelling in northeastern Arizona; and fouled up the dedication of the Ottawa Air Terminal with $300,000 in damages. No doubt the booms that did the damage were worse than those generally expected of the SST. But Bo Lundberg, recently retired director general of the Swedish Aeronautical Research Institute and one of the best-informed critics of the SST, warns that atmospheric conditions will periodically turn its boom into a "superbang," producing deep fright and damage.

The FAA set boom limits for the design competition between Boeing and Lockheed, but neither entry quite made the grade. The FAA obligingly lifted the limits. No new ones were set down in the contract with Boeing. Since then, there have been reports that Boeing's engineers feel the plane's weight may have to be increased sharply—from 672,000 to 900,000 pounds. The bigger the plane, the bigger the boom.

Is that any way to run an airline? No, says National Airlines executive vice president G. Ray Woody. That may be partly because National doesn't plan to buy any SST's. Nonetheless, says Woody, "the sonic boom will be intolerable."

Federal funds, he points out, are much more badly needed to unclog the traffic jams above and around the nation's airports. Saving time on the SST doesn't mean much when the average peak-hour flight delay at Kennedy International is fast approaching one hour. The delays in getting to airports on expressways where you can safely drive and read the paper at the same time are often much worse.

The FAA claims that 500 of the planes can be sold, even with restrictions limiting the SST's supersonic speeds to overwater flights. Without restrictions, the FAA maintains that Boeing can peddle 1,200 of the 280-seat behemoths. But the prestigious Institute for Defense Analyses, the FAA's market consultant, was far less optimistic. With boom restrictions in force, IDA concluded that not enough SST's would be sold to repay the government's investment, much less interest on it. IDA calculated a market for only 279 SST's with boom restrictions, and for 661 SST's without restrictions. The precarious economics are a clear harbinger of pressure for overland flights once the SST is built. A few scattered land routes at first, Proxmire warns, and then "they will be flying everywhere."

Witness this exchange last spring before a House appropriations subcommittee between Rep. William E. Minshall (R, Ohio) and Secretary of Transportation Alan S. Boyd:

"Mr. MINSHALL. Coming back to the SST, do you believe, based on data available thus far, that the Boeing SST can be permitted to overfly the United States?

"Secretary BOYD. I am confident that at the present time the SST can fly at supersonic speeds over certain routes. I am not prepared to say I think it can fly on an unrestricted basis.

"Mr. MINSHALL. Would you amplify that?

"Secretary BOYD. Yes. For example, going out of Chicago to the West Coast. I think it will be entirely possible to operate a route over the Plains area and possibly across the Canadian border without discomfort or inconvenience to people on the ground."

With entrees like that, the SST could strike it rich with windfall profits for the manufacturer. If the taxpayers ever get their money back plus six percent, the government royalties will be promptly reduced. Boeing and GE will pick up the mounting profits. Though it is highly improbable, two young Treasury Department economists, in a 1965 report, figured out a way by which Boeing alone could turn a fantastic profit of $100 billion.

Beyond this, many critics, such as George W. Hilton, UCLA economics professor who served as chairman of the Great Society task force on transportation, object to bringing the sonic boom era closer at public expense in order "to subsidize the travel habits of the high-income classes." Tickets on the SST will cost more, perhaps 25 percent more, than seats on the slower, but roomier and more luxurious "jumbo jets" that Boeing is building. Windows on the SST will be tiny, to help protect passengers from the blood-boiling temperatures on the other side of the cabin wall.

Mr. Eugene Black thinks "it's too bad we have to build the damn things. But the Concorde forced us to. We certainly can't sit here and turn over the market to the British and the French—from the standpoint of prestige to our industry."

Subsidized by the British and French governments, the slower (1,450 mph), smaller (136) Concorde could turn out to be a paper tiger. The projected price for the aluminum airliner, scheduled for service in 1971, has already doubled, from $10 million to $20 million. Many expect the British to pull out. "Simply because other countries are doing something that is unjustified in an economic sense," says UCLA's Hilton, "doesn't mean that we should." If it is uneconomic, all the other arguments handed out for the SST—that it will have a fine military "spinoff," promote American prestige, improve the US balance of payments, create jobs—are spurious. Former Secretary of Defense McNamara who headed the presidential advisory committee on the SST, has made it clear it has nothing to do with national defense.

Prestige? Henry S. Rowen, former assistant Budget Bureau director and now head of the Rand Corporation, says, "There's no national prestige to be won if it's a failure."

Balance of payments? The Institute for Defense Analyses concluded that with sonic boom restrictions limiting sales, the SST could add to our balance deficit by promoting more US passenger spending on air tickets and travel abroad.

The SST will create jobs, but as Senator Proxmire points out, it needs "highly skilled workers for whom the demand already exceeds the supply. The SST would do very little to satisfy the real need—providing jobs to the unskilled or partially skilled."

Opposition to the SST—led in the Senate by Proxmire and in the House of Rep. Clark MacGregor (R, Minn.)—has logic but never enough votes. By contrast, the chief congressional whip for the SST, Sen. Warren G. Magnuson (D, Wash.), has IOU's from his colleagues spilling out of his pockets. The more persuasive the attacks on the SST get, the more Senate votes it seems to pick up in its defense. It won its first appropriation in 1961 after a move to kill it in the Senate failed by the narrowest of margins, a 35–35 tie. Then Vice President Johnson, who was presiding, could have broken the deadlock, but he kept silent, and saved the SST. It came up in the Senate for its most recent appropriation immediately after the "worlds greatest deliberative body" had refused to be generous with the poverty program. Sen. Robert Kennedy (D, N.Y.) had a field day. "Three hours ago," he reminded his colleagues, "the Administration was in favor of cutting $198 million from the poverty program which would have provided jobs. Now it is supporting this kind of legislation. . . . We are faced with a $29 billion deficit. We are spending approximately $30-billion a year in Vietnam. We have internal problems in our own country and they are not improving. We should not build a supersonic plane so that one percent of our population can get to Paris in four hours while so many of our people are in such desperate need."

PROS AND CONS OF THE SST AND ITS INEVITABLE SONIC BOOM

(Prepared by scientists of the Citizens League Against the Sonic Boom: Dr. Wm. A. Shurcliff, Director; Dr. John T. Edsall, Deputy Director; Cambridge, Mass., March 1968)

What is a supersonic plane? One that travels faster than sound. Sound travels at about 700 miles per hour (mph), and a plane that travels faster than this is called supersonic. The proposed Boeing supersonic transport plane (SST) is designed to fly at about 1800 mph, or about 2½ times the speed of sound.

Do any of today's planes fly at supersonic speed? Some military planes. Yes. But no civilian planes.

What plans are being made to build commercial transport planes that will fly at supersonic speed? The British and French have a combined program for building a supersonic transport plane called the Concorde. In USA, Boeing Co. is starting* to build a supersonic plane called the 2707. (The Concorde may be abandoned: expenses have spiraled, production has been delayed, and few planes have been ordered.)

How do these designs compare? The Boeing SST will be much larger, heavier, and faster. But the Concorde is now expected to be ready for use long before the Boeing plane is ready, i.e., about 1971 as compared to about 1976.

What is the advantage of the SST over conventional, slower planes? Its speed. On a trip from New York to London it could save a traveler about 3 hours.

Is the SST inferior in any way? Yes. Many ways. It produces a sonic boom that can jar as many as a million houses and startle as many as 20,000,000 people on a single trip across USA. It is far more expensive; each plane costs about $40 million. The fares charged may have to be much higher. Many new safety problems arise (see a later page).

Has it any rival as "plane of the future"? Yes. A most impressive rival: the jumbo jet, to be in use by about 1971, i.e., relatively soon. Each jumbo jet will hold 350 to 490 passengers, considerably more than the Boeing SST can carry; thus the jumbo jets can reduce the clutter and consequent delays at airports. The jumbo jet will have a much longer range than the SST, about 6,000 miles compared to about 4,000, hence can fly nonstop on routes where the SST must land and refuel. The jumbo jet, being of much more conventional and proven design, should be safer. Fares charged on jumbo jet flights are expected to be far below present-day fares, and perhaps only 50 to 65% as great as SST fares. Traveling at speed just below the speed of sound, the jumbo jet produces no boom at all.

Will the Boeing SST be a financial success? Some say Yes, some say No. It can be a success if every one of the many major engineer-

* In February, 1968, Boeing Co. admitted to "miscalculations," and a need for extensive redesign. One or two year's delay may result.

ing problems is solved, if financing problems can be solved, if the world remains at peace, if the affluent society becomes more affluent, if airports do not become overcrowded, if international goodwill and fly-over privileges continue, if the competition is moderate, and—most important—if the people of the world accept the jarring sonic boom that is the inevitable concommitant of supersonic flight through the atmosphere. If the number of Boeing SSTs sold is less than a few hundred, the program may be a financial disaster.

How many Boeing SSTs will be sold? Proponents of the SST say that 500 to 1,500 may be sold before 1991, and that there will then be big profits. Opponents say that only about 200 will be needed, in view of competition from the Anglo-French Concorde and from the bigger, safer, jumbo jets, that can carry passengers farther non-stop and at much lower fares. These competing planes are scheduled to be in use several years before the Boeing SST is ready.

Is Boeing bearing the financial risk? Only a part of it. The U.S. Government, through the Federal Aviation Agency, has already contributed tens of millions to Boeing and the other contractors involved, and is considering contributing hundreds of millions more in the near future; in all, it may contribute $3 or $4 billions, and possibly much more.

Will the Government get back the money it puts into the SST program? Possibly, in 15 to 25 years if all goes well. But there are many possible circumstances, including a number of circumstances outside the control of the engineers concerned, that could cripple the program—such as world-wide depression, international hostilities, unforeseen competition, public reaction to the sonic boom; the Government might then get none of its money back.

Is it true that the airlines themselves are contributing money now? A small amount, yes. Each time a U.S. airline places an order for a Boeing SST, it hands over about 4% of the cost of the plane. Such amounts are, of course, extremely small compared to the several billions that the Government is considering contributing.

What about the sonic boom: do people really object to it? Yes. In a five-month-long series of sonic boom tests conducted in Oklahoma in 1964 with supersonic military planes, investigators found that a considerable fraction of the population was greatly annoyed. Over 15,000 persons complained to authorities; over 4,000 filed formal damage claims. A poll taken near the end of the test series showed that about one quarter of the population were so startled and so annoyed by the booms that they declared they would never learn to get used to it. Laboratory tests of various kinds have shown that a large fraction of persons find booms to be extremely annoying; an appreciable fraction show a sudden, marked increase in rate of heartbeat when struck unexpectedly by the boom.

Why does the sonic boom bother people, if they are already accustomed to city noises of all kinds? Because of the suddenness. The boom is extremely sudden, something like the "Bang" produced by a moderate-size explosion a block away, or by the collision of two fast-traveling trucks. There is no warning. The effect can be very startling; disrupting; sometimes even terrifying. The boom is, of course, very loud; but it is the suddenness, not the loudness, that makes the boom so startling.

Will the boom annoy me less when I am indoors? No. Tests have shown that, often, it is more annoying indoors, perhaps because of reverberation effects, rattling of windows, or even shaking of the entire house.

Will scientists find a way of eliminating the boom? Most unlikely. The shock-wave phenomena associated with the boom have been known for more than 40 years, and we know of no evidence that any "cure" can ever be found. The boom seems to be an immutable fact of nature, like gravity.

But if the SST flies very high, can the boom still reach the ground? Yes. Even when the Boeing SST is flying at an altitude of 70,000 ft., the boom reaches the ground easily. Indeed it reaches out about 25 miles on both sides of the flightpath, thus creating a "bang-zone" about 50 miles wide. Everyone within this strip may be banged by the sonic boom.

Is the boom produced just as the plane is speeding up? No. It is produced steadily, throughout the entire duration of the supersonic flight. If the plane flies 2,000 miles across the country at supersonic speed, the 50-mile-wide bang-zone is 2,000 miles long. Such a zone has an area twelve times the area of Massachusetts and may contain more than 20,000,000 people.

Can the sonic boom break glass windows or damage plaster walls and ceilings? Yes. This happened thousands of times in the Oklahoma City tests. More than 4000 persons filed damage claims. Lawsuits are continuing after three years. One man, whose house was virtually split in two by the sonic boom, has recently been awarded $10,000 by a Federal Court jury. As a consequence of sonic boom tests in Chicago and St. Louis, the Government had to pay out more than $160,000 for damage to windows, plaster, etc. Straightforward estimates indicate that if 150 SSTs were in routine use over USA, day and night, the damage done would amount to more than $1 million per day.

Do superbooms exist? Yes. It is now agreed that unpredictable focusing effects occur, and about one percent of the booms that strike your house will be of double-intensity and will be far more destructive than typical booms.

Has the FAA banned supersonic flight over land? No. What's worse, it has refused to ban supersonic flight over great cities. Flying over a large city, an SST could bang a million people in 30 seconds! In five minutes an SST could bang every man, woman and child in Long Island—all 5,000,000 of them—and every hospital, school, and church, too.

About safety: is there anything dangerous about the SST? SST design engineers must overcome many technical problems of major magnitude, and accordingly they must employ engineering features that are new and bold. The Boeing SST is longer and wider than a football field; its wings are designed to swing, or hinge, in flight, while carrying a load of about 300 passengers and about 150 tons of combustible fuel. The 1800 mph airstream will heat various exposed, frontal portions of the plane as hot as a smoking frying pan; even the fuel must be cooled somehow. On hazy days the visibility of the pilot will often be limited to the distance the plane will travel in 10 or 20 seconds. Maneuverability compares unfavorably with most of today's planes. Many other serious problems could be mentioned. It is clear that the planes will have to fly for many months, perhaps even a year or two, before the statisticians will know whether the safety is satisfactory. One major accident, whether due to defects in design, poor construction, improper maintenance, metal fatigue, bad luck, or sabotage, could jeopardize the entire multi-billion dollar project.

OUR CONCLUSION

The Citizens League Against the Sonic Boom concludes that the Boeing SST project has few of the hallmarks of a truly worthwhile project. The gains it offers are merely quantitative; they consist of a modest saving of time, which, relative to delays in reaching the airport, checking in, waiting for runway clearance, etc., may not prove to be of major significance; and in any case the public may well prefer to travel in the safer, longer-range, lower-fare jumbo jets. The drawbacks are impressive: the sonic boom, the huge expense, the greater cluttering of airports, the uncertain safety.

In our opinion the sonic boom alone is sufficient grounds for halting the SST program. The SST would create a new kind of pollution a world-wide sonic pollution. Hour after hour, day and night, it would inflict its startling bang on literally hundreds of millions of defenseless persons, with no place of refuge. (As recently as Jan. 31, 1967, the FAA has stated that it is not banning supersonic flight across the USA or other land areas.)

We cannot believe that the public, if it were aware of the extent to which the SST's sonic boom can interfere with our daily living and our sleeping, would permit its Government to pay out billions of dollars to Boeing et al to create this new form of harassment. What is good for Boeing is not necessarily good for the people. Scientific progress is fine; but a major new source of pollution should not be called progress. Aviation should be the servant of man, not his scourge.

We urge all persons who value peace and quiet to write now, before it is too late, to their Senators and Representatives and to their newspaper and TV commentators, urging that the SST program be halted.

Further Reading: The Citizens League Against the Sonic Boom has an interesting file of technical reports, feature articles, and letters from FAA officials, Congressmen. Inquiry is invited.

This rapidly growing League, founded March 9, 1967, includes aeronautical engineers, physicists, acoustical engineers, doctors, surgeons, psychiatrists, lawyers, architects, teachers, writers, housewives, conservationists, business men, economists. The Director, Dr. Wm. A. Shurcliff, is a physicist at Harvard; the Deputy Director, Dr. John T. Edsall, is Professor of Biological Chemistry at Harvard. The League's International Advisor is B. Lundberg, for many years Director General of the Aeronautical Research Institute of Sweden.

The League's National Committee includes Prof. John Borden Armstrong, historian; J. Henderson Barr, architect; William Brower, professor of speech; Dr. Walter C. Clemens, Jr., political scientist; Prof. Bernard D. Davis, Head of Dept. of Bacteriology and Immunology, Harvard Medical School, Murry N. Fairbank, mechanical engineer; W. H. Ferry, Vice President, Center for the Study of Democratic Institutions; Mrs. Ferdinand Fetter, housewife; David C. Forbes, attorney and trustee; Dr. John H. Gibbon, emeritus professor of surgery, Jefferson Medical College of Phila.; C. Edward Graves, conservationist and writer; Dr. Herbert I. Harris, psychiatrist; Mrs. Franz J. Ingelfinger, artist, Mrs. Francis C. Lowell, conservationist; Dr. J. H. Meier, engineer; Mrs. Sara Owen, writer; Mrs. J. H. Parker, conservationist; Prof. F. V. Pohle, mathematician; Mrs. W. T. Pohlig, housewife; Dr. J. Reece Roth, engineering physicist; John M. Sayward, chemist; John M. Swomley, professor of Christian ethics; Robert J. Varga, teacher; Dr. William Vogt, ecologist; Dr. Donald A. Walter, aerospace medical researcher.

SONIC BOOM DAMAGE

(Estimate of damage that will be done to windows, plaster, etc., by the SST and its inevitable sonic boom; prepared by scientists of the Citizens League Against the Sonic Boom, Dr. Wm. A. Shurcliff, Director; Dr. John T. Edsall, Deputy Director; Cambridge, Mass., February 1968)

Summary: From an analysis of published data on damage done to windows, plaster, etc., in several series of sonic boom tests carried out recently by the Government, one finds that the average amount of damage per million man-booms is about $600.00. (By man-boom we mean the individual event of inflicting one sonic boom on one person.) Using this value, we estimate the total amount of damage that will be done when

and if 150 of the proposed Boeing SSTs are in daily use over continental U.S.A. The figure we arrive at, for damage to glass, plaster, and other forms of property damage, is $3,000,000 per day. This estimate is obviously approximate only; to be conservative, one may say that the damage will be at least $1,000,000 per day.

Sonic boom tests: The U.S. Government has carried out three major series of sonic boom tests over cities: in St. Louis in July, 1961–May 1962, in Oklahoma City Feb.–July, 1964, and in Chicago Feb.–March, 1965. Boom intensities were in the range pertinent to the proposed SST, i.e., in the neighborhood of 1 to 2 pounds per square foot (psf) or sometimes 0.8 to 3.1 psf. Various Government reports on the outcomes of the tests are available (References 1, 2, 3).

St. Louis results: A total of 150 supersonic flights were made over St. Louis (1960 population 750,000), Accordingly we estimate that there were, in all, about 113,000,000 man-booms there. Reference 1 indicates that about 5,000 formal complaints were made by citizens of the area: 1,624 claims for damage to property were filed; 825 of these claims were declared valid, and $58,648 was paid to claimants. Dividing the number of dollars paid in damages by the number of millions of persons boomed, we obtain the figure $530.00 damage payment per million man-booms.

Chicago Results: A total of 49 supersonic flights were made over Chicago (population 3,600,000), implying about 174,000,000 man-booms. About 7,116 formal complaints were made, 2,964 damage claims were filed, 1,442 claims were declared valid, and $114,763 was paid to claimants (Reference 2.) This amounts to $660.00 per million-booms.

Oklahoma City Results: In the Oklahoma City tests the number of supersonic overflights was very large: 1,253. However, the reports available to us do not give a clear indication of the damage payments. Reference 3 discusses only the smaller claims, and states that the larger claims were referred to Washington. Some indication of the importance of the larger claims, not mentioned in Reference 3, is found in a recent news item (Oklahoma Journal, Feb. 18, 1967) to the effect that, in February, 1967, a Federal court awarded a single claimant $10,000 for extensive damage to his house. Approximately 100 additional, medium or large, claims (aggregating more than $100,000.00) were pending.

Best Value: Until a more adequate account of the Oklahoma damage results becomes available, it seems best to rely on the St. Louis and Chicago results. The respective values of damage payments per million man-booms ($530 and $660) are in fairly good agreement, and it appears reasonable to employ the average of these values as the best estimate of damage payment per million man-booms. The average is approximately $600.

Estimate for the Future: The FAA has repeatedly stated that, by 1990, about 500 Boeing SSTs will be in use if supersonic flight overland is banned and 1200 if such flight is not banned. We presume this indicates that roughly half of the 1200 SSTs (i.e., roughly 600 of them) would be flying mainly overland, and perhaps one quarter of these (150 of them) would be in use over continental USA. If each of these 150 makes the equivalent of five trips across USA each 24-hour period, the total supersonic mileage of these planes will be about 150 x 5 x 2000, or about 1,500,000 miles per day. If the SST is at normal cruising altitude of 60,000 to 80,000 ft. its bang-zone will be about 50 miles wide, and the total area of all bang-zones will be 75,000,000 square miles. But the area of continental USA is only about 3,100,000 square miles; thus on the average, each square mile—and each person—will be boomed about 25 times per day. (In fact, of course, some persons might receive 50 to 100 per day if they live near "favored" routes, and millions of other persons, situated far from such routes, would receive few, or none.) Since there are about 200,000,000 persons in continental USA, the total number of man-booms per day will be about 5,000,000,000.

Multiplying the figure for millions of man-booms per day (5,000) by the amount of damage payment per million man-booms ($600.), we obtain the figure of $3,000,000 for the amount of damage payment per day.

The actual figure will, of course, be less if the SST routes are chosen so as to circumvent densely populated areas and "favor" more rural areas. The figure will be larger, however, if the fraction of claims declared valid increases; in the test series mentioned above, more than half of the claimants were told (rightly or wrongly) that their claims were not valid. In summary, it would appear conservative to say that the expected damage would exceed $1,000,000 per day.

Note: Our estimates are based on actual sonic booms delivered to actual cities. We have preferred not to include results from the White Sands tests, because the houses concerned there were few in number and were artificially arranged and supported. The Edwards Air Force Base tests are of even less significance since only 3 buildings were directly involved.

OUR CONCLUSION

It seems to us unthinkable that our Government should contemplate inflicting such widespread damage on its own people, day after day, or could associate the word "progress" with such a venture. Obviously, the total harrassment would be far greater than this $3,000,000-per-day figure suggests. We have not considered here the time wasted by homeowners in assessing damage, filling out claim forms, consulting with lawyers. Nor have we considered the horror and fear that many persons may experience: fear that flying glass, etc., may injure them or their children. Nor have we considered the effect of startling millions of people repeatedly, day and night, and repeatedly interrupting sleep. Shattered windows can be repaired, but shattered nerves cannot.

Ref. 1: C. W. Nixon & H. H. Hubbard "Results of USAF-NASA-FAA Flight Program to Study Community Responses to Sonic Booms in the Greater St. Louis Area," NASA TN-D-2705, May 1965.

Ref. 2: D. A. Hilton, V. Huckel & D. J. Maglieri "Sonic-Boom Measurements During Bomber Training Operations in the Chicago Area," NASA TN–D–3655, Oct. 1966.

Ref. 3: Anon.: "Final Program Summary—Oklahoma City Sonic Boom Study," FAA Rpt. SST–65–3, March 21, 1965.

Correlation of Public Reaction to Sonic-Boom-Induced Property Damage

(Prepared by scientists of the Citizens League Against the Sonic Boom; Dr. Wm. A. Shurcliff, Director; Dr. John T. Edsall, Deputy Director; Cambridge, Mass., May 1968)

ABSTRACT

Data on public reaction and property damage from sonic boom tests over Oklahoma City, Chicago, Edwards Air Force Base, and St. Louis are correlated. With one exception, the data are in good agreement and indicate that a single SST supersonic flight across the United States may be expected to cause about 219 complaints, 75 damage claims, and $3300 payment on such claims.

The proposed civilian supersonic transport planes (SSTs)—if really built—could boom large areas: a single SST flying at supersonic speed across U.S.A. would generate a bang zone about fifty miles wide and two thousand miles long. It is therefore of some interest to examine and correlate the results of past sonic boom tests and make a rough estimate of public reaction and property damage to be expected when and if such flights occur. Here we review the four major sonic boom tests that are documented in the open literature. It will be shown that, with one exception, the data from these four tests are in remarkedly close agreement, and thus provide a basis for preliminary estimates of the consequences of overland supersonic flights by SSTs.

The raw data from the four sonic boom tests are presented in Table I. The data from the Oklahoma City tests (Feb. 3-July 30, 1964) are shown in the first two rows. The data in the first row were taken from the official report (ref. 1, p. 68). Many claims were pending when this reference was issued. Data in the second row are more recent (ref. 2), and will be used in the subsequent discussion. The third row contains data from the Chicago overflights (Feb.-March 1965, ref. 3, p. 15). The fourth row contains data from the St. Louis tests (July 1961–May 1962, ref. 4, p. 19), and the last row contains data from the Edwards Air Force Base sonic boom tests (June 1966–Jan. 1967, ref. 5).

It is very difficult to make an accurate estimate of the number of individuals actually exposed to sonic booms during these tests. The fourth column of Table I lists the populations of the respective cities in the 1960 census. It will be assumed that only these populations were exposed to the sonic booms generated during the tests, and that the proportion of citizens living in suburbs was the same in all four cases. This assumption may result in overestimating the damage and complaint rates by a factor of two or even a factor of three under an extreme set of assumptions regarding the number of persons exposed to the sonic boom. The fifth column lists, for each city, the total number of supersonic overflights, and the sixth column lists the estimated number of sonic boom exposures (in millions). This latter number was obtained by multiplying the 1960 census population by the total number of supersonic overflights. The seventh column lists the total number of complaints registered in each city. These complaints took the form of a phone call, a letter, or a personal visit to the appropriate complaint center. The eighth column lists the total number of formal damage claims submitted by citizens who felt that sonic booms had damaged their property. The next-to-last column lists the total number of claims that were deemed valid and paid out by the responsible agency. The final column lists the total amount paid out for sonic-boom-induced damage.

In Oklahoma City, the complaints and damage claims were initially processed by a private claims-adjustment company under contract to the FAA (ref. 1). After this initial processing, the damage claims were further processed by Air Force personnel. It was widely felt among residents of Oklahoma City that the claims procedure was excessively cumbersome and that adequate compensation was not granted for damage suffered (ref. 1). Later, an Advisory Committee composed of Oklahoma City citizens was appointed by the FAA (ref. 1, p. 34), and this committee proposed a method of claims re-examination that was intended to alleviate dissatisfaction with the claims procedure. In the Chicago, Edwards, and St. Louis tests, complaints and damage claims were handled by Air Force personnel and contractors, using established Air Force criteria and procedures (refs. 3, 4, 5).

For three reasons the sonic boom damage listed in Table I is likely to be a minimal estimate of the damage that the proposed SSTs would produce. The first reason is that the average sonic boom over-pressure in the tests listed in Table I, (about 1.0 to 2.0 psf) are less than those anticipated for the SST (from 1.5 to 2.5 psf). The second reason is that not all the sonic boom damage resulted in a complaint or claim. In Oklahoma City, for example, at least 25% of the people interviewed in a public opinion poll felt that

they had sustained some property damage (ref. 6, pp. 229–231); yet only a small proportion of these individuals made complaints or claims. The third reason is that when refs. 1 to 5 were written many claims and lawsuits against the Government were still pending. A substantial number of these are pending at the present writing. Settlement of any of these claims and lawsuits in favor of the plaintiffs would increase the total of damage payments listed in Table I and also increase the Table II figures for damage per million boom exposures.

The similarities of the data for the four cities listed in Table I are not readily apparent because of the differing populations and differing numbers of flights. The data are accordingly exhibited in reduced, or normalized, form in Table II. The final row of that table presents averages of the quantity in each column, weighted with respect to the pertinent numbers of sonic boom exposures. The individual average was calculated by multiplying the quantity for a given city by the number of sonic boom exposures in that city, summing over the cities considered, and then dividing this sum by the total number of sonic boom exposures in all cities considered. The second column of Table II lists the number of complaints per claim filed, and this is approximately the same for each city—about one complaint in three led to a formal damage claim. The third column lists the number of damage claims resulting per million sonic boom exposures. This is also approximately constant for the four cities at 14 claims per million sonic-boom exposures. The fourth column lists the number of complaints per million sonic boom exposures. This quantity also was approximately constant for the four cities at 40 complaints per million boom exposures.

The fifth column of Table II lists the ratio of the number of damage claims filed to the number of damage claims paid out. In the Chicago, Edwards, and St. Louis tests, payment was made on about one out of every two damage claims filed. In Oklahoma City, however, only one damage claim in seventeen was paid. The next-to-last column lists the number of paid-out claims per million sonic boom exposures. This was about 8 paid-out damage claims per million sonic boom exposures in Chicago, Edwards, and St. Louis, but only 0.71 paid-out claims per million sonic boom exposures in Oklahoma City. The last column lists the damage payments per million sonic boom exposures. The payment was about $600.00 per million sonic boom exposures in Chicago, Edwards, and St. Louis, but only $48.00 per million sonic boom exposures in Oklahoma City. All of the data in Table II dependent upon citizen initiative were in excellent agreement for the four cities; only the data relating to Government payments of damage claims in the Oklahoma City tests were discrepant. Because of the magnitude of this discrepancy, the data from Oklahoma City in the last three columns of Table II have been excluded from the weighted averages in the last row of Table II. (One is tempted to conclude that the citizens of Oklahoma City were grossly under-compensated by the responsible Government agency.)

It is of some interest to examine the implications of the weighted average data in Table II for SST flights over the United States. The U.S. has a population of about 200 million and an area of 3,615,211 square miles; thus the average population density is about 55 individuals per square mile. A transcontinental supersonic flight 2000 miles long and with a bang-zone 50 miles wide could then result in 5.5 million boom exposures. A larger number of exposures may result unless the SST flightpath is deliberately routed away from heavily populated areas. Multiplication of this number by the weighted averages in Table II then suggests that a single transcontinental supersonic flight could result in: 219 complaints, 75 damage claims, 44 paid-out damage claims, and $3322 actual payment.

If the average SST carries 200 passengers, the latter figure suggests that a ticket surcharge of at least $16.60 per ticket may be necessary in order to pay for the sonic boom damage. The cost of processing and handling claims would, of course, increase the figure. (Such surcharge would be in addition to surcharges required because of the high cost of building and operating SSTs.)

The implications of Table II are even more disturbing if one looks at the yearly totals for a time when a total of, say, 150 SSTs might make 5 transcontinental trips daily, 365 days a year. This would amount to about 274,000 flights per year, and accordingly one might expect 21 million damage claims per year. The processing of these claims would require an effort comparable to the existing Income Tax Bureau. In a full year, the 274,000 flights would result in about $910 million in damage claims.

The above estimates of complaints and damage might be reduced by a factor of two or more if the exposed population for the tests included substantial numbers from suburbs not included in the census figures. The total of complaints and damage for an individual flight also might be reduced in some cases by adjusting flightpath over areas of minimum population. These possible reductions could be more than offset by the factors previously mentioned—particularly the higher overpressures that the SSTs are expected to produce.

REFERENCES

1. Federal Aviation Agency Report SST–65–3 (1965).

2. F. L. Zimmerman, "Supersonic Snow Job," Wall Street J. (Feb. 9, 1967).

3. D. A. Hilton, V. Huckel, and D. J. Maglieri, NASA TN D–3655, 15 (1966).

4. C. W. Nixon and H. H. Hubbard, NASA TN–D–2705 (1965).

5. National Sonic Boom Evaluation Office Report NSBEO–1–67 "Sonic Boom Experiments at Edwards Air Force Base," Interim Report 28 July, 1967. Pp. 9, G–I–2–14, 15.

6. P. N. Borsky, National Opinion Research Center Report 101, Part 2 (1965). AMRL–TR–65–37, Vol. II, AD–625332.

TABLE I.—RAW DATA ON SONIC BOOM DAMAGE

City	Date of test	Reference	1960 population	Total SS overflights	Total sonic boom exposures (millions)	Total complaints	Total claims filed	Total number claims paid	Value of claims paid
Oklahoma City	February to July 1964	1	324,253	1,253	406	15,116	4,629	229	$12,845
Do	do	2	324,253	1,253	406	15,452	4,901	289	19,355
Chicago	February to March 1965	3	3,550,404	49	174	7,116	2,964	1,442	114,763
St. Louis	July 1961 to May 1962	4	750,026	150	113	5,000	1,624	825	58,648
Edwards	June 1966 to January 1967	5	45,000	367	1.65	62	19	16	1,399

TABLE II.—ANALYSIS OF REPORTED DATA

City	Complaints per claim filed	Claims filed per million boom exposures	Complaints per million boom exposures	Claims filed per paid-out claim	Paid-out claims per million boom exposures	Paid-out damage per million boom exposures
Oklahoma City	3.15	12.0	38.1	17.0	0.71	$48
Chicago	2.40	17.0	40.9	2.05	8.3	660
St. Louis	3.08	14.4	44.3	1.97	7.3	519
Edwards	3.26	11.5	37.5	1.18	9.7	850
Weighted average	2.95	13.7	39.8	[1] 2.02	[1] 7.9	[1] 604

[1] Excluding Oklahoma City data.

The news report of the National Academy of Sciences for March 1968, XVIII No. 3, discussed sonic boom as follows:

LITTLE SONIC BOOM DAMAGE EXPECTED; MUCH HELD UNCERTAIN

The probability of serious damage to structures from the sonic booms generated by aircraft operating supersonically in a normal manner is small, according to a subcommittee of the National Academy of Sciences. But it conceded that current understanding of sonic boom stresses and of the responses of building materials and assemblies to such stresses is incomplete and urged that steps be taken to explore more thoroughly the areas of remaining uncertainty.

In a new report, *Physical Effects of Sonic Boom* (see "New Publications," p. 8), the Subcommittee on Physical Effects of the NAS Committee on the SST-Sonic Boom outlines these areas of concern and recommends a number of research and testing programs as a means of improving capabilities of prediction.

The report is the second of a series of four being prepared by panels of the parent committee as the result of its study of the effects of sonic boom as they relate to the development of a supersonic transport in the United States. The first, on the generation and propagation of sonic boom, held out little hope for dramatic reductions in the intensities of the boom (*News Report*, January 1968). The other reports, on the effects on people and on animals, are expected to be completed soon.

Although no final decisions have yet been made by responsible authorities on permissible overland flight patterns for the SST, the physical effects subcommittee assumed—in order to provide a baseline for the study—that commercial supersonic flights would occur over populated areas at some future date.

TOO LITTLE KNOWN

While large-scale damage to structures as a result of sonic booms is not anticipated, too little is known to predict accurately what kinds and amounts of physical damage will occur, the subcommittee says. "Understanding of material responses to transient loadings is not complete and may never be, but a higher level of understanding is attainable and is required before realistic answers to these questions can . . . be given finally."

Among the present imponderables discussed are the ways in which sonic boom intensities vary under different climatic and

geographic conditions and for different types of aircraft and aircraft operations; the exact nature of the responses of damage-susceptible materials and structures to the boom; and the extent to which sonic boom pressures contribute to the normal strains placed on structures by such commonplace occurrences as thunder, wind gusts, street traffic, and earth tremors.

The subcommittee argues against an early resumption of flight test programs to develop new knowledge in these areas. It points out that because atmospheric conditions are not always predictable controlled overflights experiments yielding reliable, reproducible data may not be possible.

Instead, the report urges the construction of two types of sonic booms simulators, one for testing typical construction materials in small (8 ft. by 8 ft.) assemblies and a second designed to test and evaluate structural components and whole structures on the order of 20 ft. by 20 ft. by 20 ft.

WINDOW PANES MOST SUSCEPTIBLE

In addition, the report recommends the repetitive testing in simulators of a wide range of damage-susceptible materials and assemblies. Chief among these materials is glass. Broken window panes accounted for a majority of claims submitted and damages paid during previous sonic boom testing programs, yet only limited static test data are available on the strengths and responses of glass. Accordingly the subcommittee proposes that a special testing program be undertaken with regard to commonly used glass and glass mountings. The group further recommends a sample survey of window panes in selected cities to determine the degree to which glass is used in building construction.

The subcommittee calls for an acceleration and expansion of sonic boom studies by the Environmental Science Services Administration. These studies should be enlarged, said the report, to include analysis of atmospheric and sonic boom data recorded at locations, particularly urban centers, having varied meteorological and topographical characteristics.

Much remains to be learned, the subcommittee feels, of the responses of building assemblies to transient loadings caused by natural phenomena such as wind gusts. Studies of frequency of occurrence and resulting damage might allow subsequent comparative evaluation or repetitive boom loads caused by supersonic aircraft operations.

The subcommittee also recommends an analytical study of those rare instances where earth structures may be susceptible to failure under dynamic loadings such as sonic booms, namely (a) slopes, either cuts or fills, which have critical or small safety factors, and (b) foundations either on unstable sand strata or on "quick" clays.

Anticipating a need for equitable legal guidelines in adjudicating claims of property damage attributed to sonic booms, the subcommittee proposes the appointment of an interdisciplinary group of lawyers and engineers to consider the legal aspects of structural damage.

The subcommittee also suggests that consideration be given to the possible need for a nationwide boom-monitoring network and recommends that several companies, competent in instrumentation and data retrieval be selected to study the feasibility of such a network.

The NAS Committee on the SST-Sonic Boom was established in 1964 at the request of President Lyndon B. Johnson. Chairman of the 18-man group is John R. Dunning, Dean of the School of Engineering and Applied Science at Columbia University. Everett F. Cox, Senior Research Scientist at the Whirlpool Corporation, is chairman of the Subcommittee on Physical Effects.

[From the New York Times, Mar. 5, 1968]

SONIC BOOM DAMAGE CALLED VERY SMALL; WIDER STUDY URGED

WASHINGTON, March 4.—A scientific panel said today that the probability of physicial damage from a supersonic airliner's sonic booms was "very small" but needed further study.

The finding was made by a Physical Effects Subcommittee of the National Academy of Sciences' Committee on the SST-Sonic Boom, which was created in 1964 at President Johnson's request

By physical damage, the subcommittee refers to the impact of the booms on homes, buildings and earth structures rather than damage to human beings.

No boom flight tests are planned at the moment. The subcommittee indicated that, since flight testing to date had left many questions unanswered, further research on the ground might make it possible to plan more meaningful flight tests.

The subcommittee spent a year studying the results of sonic boom test flights to date, including preliminary data from recent flights of the SR–71 strategic reconnaissance plane.

It assumed for the study that superjets eventually would fly over land and that the sonic booms laid down along the flight paths would be low enough in intensity to be acceptable to the public.

Given those conditions, "the subcommittee wishes to emphasize the fact that the probability of serious material damage being caused by a sonic boom generated by an aircraft operating in a safe, normal manner is very small," the report said.

Nevertheless, the subcommittee found that there was too little accurate statistical information in hand to be certain about some aspects of the problem.

It urged the building of large simulators in which pressure waves could be directed against structures many times an hour, simulating in a day the number of booms a home or office building might be subjected to in a year.

The subcommittee also said a "physical response research program should be "immediately undertaken and vigorously pursued." It would include simulator studies, laboratory tests of glass and "acceleration and expansion" of studies of the atmosphere's bending and magnifying effects on the shock waves of sonic booms.

See also Report R–118 "Demand Analysis for Air Travel by Supersonic Transport" in two volumes, prepared by the Institute for Defense Analyses for the Federal Aviation Agency.

[From the New York Times, Apr. 28, 1968]

CASE WOULD CURB SUPERSONIC CRAFT—SEEKS HALT OF SUCH OVERLAND NONMILITARY FLIGHTS

(By Edward Hudson)

Senator Clifford P. Case, Republican of New Jersey, said yesterday that he will introduce a bill tomorrow to ban overland flights at supersonic speeds by nonmilitary planes.

Senator Case said that the bill would maintain the ban "until all aspects of the sonic boom have been investigated and Congress has decided whether such flights should be permitted."

In addition to banning the flights over the United States and its territories and possessions for an "indefinite" period, the bill would establish a two-year Government study of the boom. The decision on whether to permit faster-than-sound flights over land would rest with Congress.

The sonic boom is the thunderclap heard by an observer on the ground when the shock wave trailed by a plane traveling faster than sound reaches its location.

OBJECTIONS WEIGHED

The possibility that such booms may be found so objectionable by the population that supersonic craft would have to fly at a limited, subsonic speed over land has long been considered by Government and industry planners of the supersonic transports. Sound travels 720 miles an hour in the air.

The consensus has been that such speed restrictions would raise the costs of supersonic operations but not enough to warrant discontinuing supersonic airliner projects.

The first of the supersonic airliners, the British-French Concorde, is scheduled to go in service in 1971. The American SST, a Boeing Company design that has encountered technical problems is expected to be in service in 1974 or 1975 if the project is continued.

Mr. Case said that his bill would direct the Federal Aviation Administration, which is charged with the development of the American SST, to conduct a comprehensive two-year research effort into all aspects of the sonic boom as well as place an indefinite ban on supersonic flights over land.

AMBIVALENCE CHARGED

The Senator declared that the F.A.A.'s position on supersonic overflights has been ambivalent, adding:

"On the one hand it states that further testing is needed before the question can be answered. But on another, the head of the SST project for F.A.A. has been quoted as saying that 'the public will have to learn to accept sonic boom to a degree.'"

He said that "even were the F.A.A. not in this awkward position, a decision on multiple overland supersonic flights is too important to be left in the hands of a single Government agency."

"Clearly the people themselves must be permitted to decide through their elected representatives in the Congress," he said.

Senator Case said that 10 million to 20 million persons might be "boomed" by a supersonic flight across the United States.

"Already initial tests have resulted in cracked plaster, broken windows and tumbling bric-a-brac, though studies on structural damage are so far inconclusive," he said.

"More importantly, yet to be answered are such questions as the effect of the boom on surgeons in the midst of delicate operations, on sleeping people, on weak buildings, on mountains laden with snow or loose rocks and on ancient geological formations.

Local areas are taking action on the "boom":

[From the New York Times, Saturday, May 18, 1968]

SUPERSONIC FLIGHTS BARRED

NEWBURGH, N.Y., May 17.—The commander of the First Air Force Aerospace Defense Command disclosed today that all supersonic flights over the Newburgh-Poughkeepsie area had been suspended because of complaints from residents of the area. The complaints increased recently after several sonic booms were heard. A spokesman for Maj. General Joseph L. Dickman, commander of the unit, said Stewart had no supersonic planes of its own, but such planes sometimes stopped here.

[From the New York Times, Sept. 28, 1967]

COAST CITY VOTES SONIC BOOM BAN—EFFECT IS DOUBTED

SANTA BARBARA, CALIFORNIA, September 27.—The Santa Barbara City Council has adopted an ordinance outlawing sonic booms. This is believed to be the first such municipal code in the United States.

The ordinance passed last night makes it unlawful "to pilot any aircraft over and in the vicinity of Santa Barbara at supersonic

speeds so as to cause loud, sudden and intense sonic boom impacts in the city of Santa Barbara."

Although it does not include a specific penalty clause, the city said a violation of any ordinance was a misdemeanor punishable by fines up to $500 and six months in prison.

The ordinance was introduced by Councilman Klaus Kemp, who said booms caused damage to homes and physical injury to individuals.

The only vote against was cast by the Mayor, who said, "I do not believe the law is enforceable."

The measure drew immediate reaction from Hamilton Air Force Base, where a spokesman said that "presumably nothing" would be done about the new law.

The presumption was based on court decisions that have ruled that the Federal Government through the Federal Aviation Agency has sole jurisdiction over aircraft movements.

But Mr. Kemp said, "We are not attempting to prohibit supersonic flights or military maneuvers or to interfere with them in any unreasonable manner.

"We are merely proposing that unnecessary flights over or immediately adjacent to this city at unreasonable and unnecessarily low altitude be prohibited."

The New York City Council, of which I am a former member, held hearings recently on resolution and a bill to ban "sonic booms," introduced by Councilmen Joseph Modugno and Morris Stein. The proposed legislation and related material follow:

THE COUNCIL OF THE
CITY OF NEW YORK,
February 18, 1968.

DR. WILLIAM A. SHURCLIFF,
Director, Citizens League Against the Sonic Boom, Cambridge, Mass.

DEAR DR. SHURCLIFF: The public hearing on my Resolution No. 1000, prohibiting the landing and takeoff of supersonic planes, and a Bill, Intro. 526, introduced by Councilman Joseph Modugno, providing that it shall be unlawful to navigate aircraft so as to cause a "sonic boom" in the New York City area, is scheduled for Monday, March 18th, in the City Council Chambers, City Hall, New York City at 10:30 A.M.

Public officials, experts and concerned citizens are welcome. The more speakers at the hearing, the better.

You may send a list of those who wish to present their views to Hon. David Ross, Majority Leader, City Hall, New York, N.Y. 10007, and to me, indicating whether they are for or against the Resolution and Bill, and how much time they wish. Each interested party may write personally if he chooses.

Enclosed is a copy of Resolution No. 1000 and Intro. No. 526.

Very truly yours,

MORRIS J. STEIN.

RESOLUTION 1000 OF THE NEW YORK CITY COUNCIL, JULY 11, 1967

(By Mr. Stein)

A resolution calling upon the Federal Aviation Authority to prohibit the landing and takeoff of supersonic airplanes in the metropolitan area or within 100 miles thereof

Whereas, The proposed supersonic transport plane has a speed of approximately 1,800 miles per hour, about three times the speed of sound; and

Whereas, The sonic boom created by a supersonic military plane is equivalent to a moderate size explosion produced as the plane hurtles through the air generating a shock wave with the noise hitting the ground below over an area 50 miles wide; and

Whereas, Such noise is sudden, and shattering; and

Whereas, Tests with supersonic military airplanes have indicated that the sonic boom can cause panic and stampede large animals, shake and split buildings, crack plaster walls and crockery and other reverberation upon the occupants of buildings; and

Whereas, Medical research reveals that excessive noise has an adverse effect upon health, that it can trigger physical and mental ailments; and

Whereas, The present jet airplane flying over residential areas with its shrill noises interrupts conversations, classroom activities, is a source of discomfort to the ill, and interferes with the peace and tranquility sought by our citizens in their homes and communities; and

Whereas, Since a supersonic plane travels at a great speed, reducing traveling time from hours to minutes, it therefore makes little difference to passengers to have them land and take off some distance from the metropolitan area and use private or public transportation to and from the City, now, therefore be it

Resolved, That the Council calls upon the Federal Aviation Agency to prohibit the landing and take off of supersonic planes in the New York City and other metropolitan areas or within one hundred miles thereof; and it is further

Resolved, That copies of this resolution be transmitted to General William F. McKee, Administrator of the Federal Aviation Agency and to the state and federal legislators from the New York City Metropolitan area.

RESOLUTION 608 OF THE NEW YORK CITY COUNCIL

(By Mr. Modugno)

A local law to amend the administrative code of the city of New York, in relation to flights of aircraft within the city of New York, causing "sonic booms"

Be it enacted by the Council as follows:

Section 1. Section 435–16.0 of the administrative code of the city of New York is hereby amended by adding thereto a new subdivision h and relettering present subdivision h to be subdivision i, present subdivision i to be subdivision j and present subdivision j to be subdivision k, to read as follows:

h. "Sonic booms." 1. Legislative intent—Great numbers of aircraft capable of operating at ever increasing supersonic speeds are and will continue to be produced. The operation of aircraft at supersonic speeds in the air above the city of New York often causes intense, severe and alarming noises and vibrations at ground level known as "sonic booms." These "sonic booms" result in physical and mental personal injury and damage to property. Such operations of supersonic flights in the air above the city of New York do not appear to be a reasonable necessity for the national defense, welfare or safety, or for the usual routine requirements of commercial air carriers, nor for any other purpose and for all these reasons such flights should be prohibited.

2. It shall be unlawful for any person to navigate an aircraft within the limits of the city of New York in such a manner so as to cause or produce loud, sudden and intense "sonic boom" impacts.

[h.] *i.* Rules and regulations. The commissioner is authorized to make such rules and regulations as he may deem necessary to enforce the provisions of this section.

[i] *j.* Violations. Any person who violates any of the provisions of this section shall be guilty of a misdemeanor.

[j.] *k.* Separability. If any clause, sentence, paragraph, subparagraph or part of this Section shall be adjudged by any court of competent jurisdiction to be invalid, such judgments shall not affect, impair operation to the clause, sentence, paragraph, subdivision or part or invalidate the remainder thereof, but shall be confined in its * * * thereof directly involved in the controversy in which such judgment shall have been rendered.

Section 2. This local law shall take effect immediately.

(NOTE.—New matter in *italics*, old matter in brackets [ ] to be omitted.)

[From the New York Times, Feb. 27, 1968]

CITY INVESTIGATES NOISE-LEVEL LIMIT—COUNCIL TOLD SOUND CAUSES FATIGUE AND ANXIETY HERE

(By David Bird)

In the face of increasing evidence that noise levels here are too high for comfort or health, the City Council's Committee on Buildings held hearings yesterday that may result in the first limits being set here on the sound level of construction equipment.

The Council members found—by an early-morning visit to a construction site and through testimony later at City Hall—that noise levels were indeed too high but that doing something about them would probably cost a lot of money.

Councilman Joseph Modugno, Queens, in a discussion about quieting the air compressors used in construction said: "We have to be very careful in setting the guidelines because we may make the product unmarketable."

The Councilmen began their day on 58th Street near Third Avenue, where a large air compressor was being used at an excavation site.

INTOLERABLE

"Intolerable," said Robert A. Low a Manhattan Democrat-Liberal who is the committee chairman as he stood close to the compressor.

"It's 96 decibels," said an acoustical engineer, adding a note of precision.

Later in a hearing at City Hall the committee heard testimony that physical damage to hearing can be caused by levels only as high as 85 decibels.

"And the psychological level should be considerably below that," said Dr. Howard M. Bogard, chief psychologist of the Queens Hospital Center.

He explained that even lower noise levels could trigger psychological difficulties ranging from simple outbreaks of rage to psychosomatic attacks of stomach ulcers.

Dr. Bogard said New Yorkers "pay an enormous price in fatigue and anxiety" because of the noise level. To say that people can adapt to excess noise levels successfully "is a gross inaccuracy," he added.

With the aid of elaborate audio equipment Stannard Potter, an acoustical engineer, played a selection of city noises caused by sources ranging from jet aircraft to subway trains.

The Councilmen winced as most of the sounds rattled the elaborate crystal chandelier in the hearing room, but Mr. Potter singled out the air compressor as "one of the most magnificent examples of intolerable and unnecessary noise."

A 50-DECIBEL LIMIT URGED

Another acoustical engineer, Martin Hirschorn, called for a daytime upper limit of 50 decibels in the city's residential areas. But he conceded that achieving that level on the streets might take some time.

Most of the speakers said that the technology existed to quiet noisy compressors but that it was a matter of creating a demand—by such legislation as the City Council is considering, for example—and meeting the added cost.

An industry viewpoint on how long it would take to get quieter compressors into service and how much it would cost was provided by Thomas Holmes, a vice president of the Ingersoll-Rand Company.

He said his company now built large com-

pressors that emitted noise up to 112 decibels. Within two years, he said, this level should be down to 90 decibels, adding 20 per cent to the cost of a $40,000 compressor.

He had no estimate of the cost of a drastic reduction to 50 decibels, the level suggested by Mr. Hirschorn.

[From the New York Times, Mar. 19, 1968]

CITY MOVE TO BAN JET BOOM OPPOSED—HEARING TOLD UNITED STATES CONTROLS REGULATION OF AIR NOISE

(By David Bird)

A proposal in the City Council to control the noise of sonic booms from jet planes ran into opposition yesterday from the Lindsay administration, the Federal Aviation Administration and a representative of a community that had failed after "many costly years" to regulate air traffic by local law.

The opposition came at a City Hall hearing held by the Council's Committee on General Welfare and the Committee on Health and Education, on a proposed new law and a resolution that would be addressed to the F.A.A.

The bill would make it a misdemeanor "to navigate an aircraft within the limits of the City of New York in such a manner as to cause or produce loud, sudden and intense 'sonic boom' impacts."

The resolution, noting that sonic booms hit "the ground below an area 50 miles wide," calls for a prohibition on "the landing and take-off of supersonic airplanes in the metropolitan area or within 100 miles thereof."

The proposals drew support from community organizations, mainly around the city airports, and from anti-noise groups.

THE CITY'S VIEW

The administration opposition was led by Herbert B. Halberg, Commissioner of the Department of Marine and Aviation. He was followed by the department's first deputy commissioner in charge of aircraft operations, Charles G. Leedham.

Both men emphasized that enforcement of the proposed legislation would be impractical and they urged that the matter be left to the Federal Government.

Mr. Leedham said that not only would it be difficult to catch offenders because the plane would be far away when the boom was felt, but that such a law would run counter to the principle of Federal control of the airways.

Mr. Leedhan said he was opposed even to additional Washington legislation because it would limit the ability of the Federal Aviation Administration to solve the problem on its own.

The F.A.A. submitted a statement to the hearing urging that the matter be left to the Federal Government.

TRIAL BY FIRE

Ralph G. Caso, Presiding Supervisor of the Town of Hempstead, told the Councilmen at the hearing "that some five years of trial by fire has convinced me that you are using the wrong approach."

Mr. Caso said his town, which is in Nassau County in the path of approaches to Kennedy International Airport, had come to that conclusion after dragging "through the courts for many costly years" in a vain attempt to make a local law effective.

He suggested increased pressure for more Federal and state legislation to control the noise of all jet planes, including supersonic craft. But he also called for the closing of Kennedy Airport to supersonic planes.

"This will, of course, immediately be challenged in the courts," he said, "but at least you'll have a fight worth fighting."

Councilman Joseph Modugno of Queens, sponsor of the bill, said that even if the law could not be enforced he still would like to see it passed as "symbolic of our desire to do something about" sonic booms.

Among his supporters was Eugene Galanter, a professor of experimental psychology at Columbia University representing the Citizens League Against Sonic Booms.

Professor Galanter asserted that the booms could cause serious mental and physical ailments, and that perhaps the convenience of a few people "flying at 1,800 miles per hour may not be as important as the peace and tranquility of the 8 million to 15 million people living in and around New York City."

He said he was "completely opposed" to the spending of the estimated $400 million the United States already has committed to developing a supersonic plane.

Other local items are included:

NATION'S CITIES,
Washington, D.C., February 7, 1968.

Hon. THEODORE R. KUPFERMAN,
House of Representatives,
Washington, D.C.

DEAR CONGRESSMAN KUPFERMAN: Thank you very much for your manuscript for the Nation's Cities article on "Noise Control". It is perfect for our editorial needs and we plan to use it in a forthcoming issue. Unfortunately, I am not able at this time to let you know exactly which month it will be.

We certainly want to extend our sincere thanks to you for your efforts in preparing this article for us. I am sure it will go a long way toward informing our 60,000 municipal official readers throughout the nation about what is certainly a significant—and so far somewhat overlooked—urban problem.

Sincerely,

RAYMOND L. BANCROFT,
Managing Editor.

TOWN OF LOS ALTOS HILLS, CALIF.,
December 14, 1967.

THEODORE R. KUPFERMAN,
Member of Congress,
New York, N.Y.

DEAR MR. KUPFERMAN: Transmitted herewith are letters and documents indicating action by the City Council, of the Town of Los Altos Hills, and efforts of the Town's Noise Abatement Committee relative to noise emanating from the Junipero Serra Freeway (Route 280).

Any assistance you may give will be greatly appreciated.

Very truly yours,

DONALD A. MILLER,
Chairman, Noise Abatement Committee.

TOWN OF LOS ALTOS HILLS, CALIF.,
November 6, 1967.

Mr. ALAN S. HART,
California Division of Highways,
San Francisco, Calif.

DEAR MR. HART: The noise from Interstate Freeway 280 has created a profound and disturbing effect on Los Altos Hills. The impact of this noise on the community has caused numerous residents to express their displeasure and to bring pressure upon the Town Council and Mayor. Consequently, the Mayor appointed a Noise Abatement Committee to work with Highway and other State officials to institute measures for reduction of the noise and to recommend actions and programs to the Town Council and the Mayor. The Committee is listed in Enclosure #1.

The preliminary surveys and investigations by the Committee have resulted in two items for immediate action and four subjects for continued investigation to determine appropriate action.

We respectfully request action relative to:

1. Steps to eliminate trucks, busses and small motor bicycles from Interstate Highway 280 between Page Mill Road and the Foothill Expressway exits.

2. Investigations by the State Division of Highways and its Acoustical Engineer, as requested by the Town Council (Enclosure #2), in order to give special attention to the five (5) principal trouble areas identified by the Committee through surveys of residents. We refer to these areas from north to south as: 1) Little League, 2) La Barranca, 3) Robleda, 4) El Monte, and 5) Magdalena areas. These areas are delineated in Enclosure #3.

Actions under consideration by the Committee are:

1. Investigation of adequate muffling techniques, laws, and of noise measuring devices.

2. Review of landscaping plans and investigation of potential barriers, additional landscaping, and/or other techniques suitable for noise abatement.

3. Investigation of the effect of reduced speeds upon the noise.

4. The legal aspects associated with the passing and enforcement of noise abatement laws.

Sincerely yours,

D. A. MILLER,
Chairman, Los Altos Hills Noise Abatement Committee.

SEPTEMBER 20, 1967.

Mr. DONALD A. MILLER,
Los Altos Hills, Calif.

DEAR DON: With your permission I am appointing you Chairman of a Committee to investigate and advise upon the problem of noise generated by the recently opened freeway.

Your members are as follows:

Mr. David Berstein, 12998 Vista de Valle Court, tele. 948–0633.

Mr. John E. Cavanagh, 23675 Taaffe Road, tele. 941–4801.

Mr. Robert B. Lewis, 13038 Vista de Valle Court, tele. 948–6333.

Mr. Frank N. Shriver, 12451 Stonebrook Drive, tele. 948-8812.

Mr. Robert B. Swatosh, 12897 Viscaino Place, tele. 948–8707.

The Council member with whom I ask you to keep in touch is Mary Davey.

Faithfully,

ALBERT T. HANLEY,
Mayor, Los Altos Hills.

RESOLUTION 409

(A resolution of the City Council of the town of Los Altos Hills relating to noise emanating from Interstate Freeway No. 280)

Whereas, the noise from Interstate Freeway No. 280 has created a profound and disturbing effect on Los Altos Hills, and

Whereas, numerous residents of the Town are greatly concerned over the impact of this noise on the community,

Now, therefore, be it resolved, that the City Council of the Town of Los Altos Hills inform the State Division of Highways about this situation and request them to send an acoustical engineer to look into the problem and offer possible solutions to the Town.

I hereby certify that the foregoing Resolution was Passed and Adopted at a regular meeting of the City Council of the Town of Los Altos Hills held on September 18, 1967, by the following Roll Call Vote.

Ayes: Councilmen Aiken, Benson, Davey, Fowle, Mayor Henley.

Noes: None.

Absent: None.

Attest:

CLAYTON J. MUTL,
Deputy City Clerk.

Approved:

ALBERT T. HENLEY,
Mayor of the Town of Los Altos Hills.

THE FIVE ACOUSTIC TROUBLE AREAS FOR INTERSTATE 280 IN LOS ALTOS HILLS

(Los Altos Hills Noise Abatement Committee Letter)

1. The Little League area is that portion of the northbound lane from a point approximately 700 yards northwest of La Bar-

ranca overpass extending north toward Elena about 440 yards. The sound from the northbound lane is many times louder than from the southbound lane along this area. This section is most troublesome to residents on the northeast side of the freeway.

2. The La Barranca overpass area is in the immediate proximity of the overpass. The topography here has the unique quality of focusing the sound into the hills on each side of the freeway to such an extent that some residents who cannot see the freeway get objectionable sounds from the overpass.

3. The robleda area is that section of freeway from a point approximately 350 yards southeast of the Robleda overpass to about 350 yards northwest of the overpass. The southbound lane is most objectionable in this area to the homes on the west side of the freeway.

4. The El Monte Area consists of two strips of freeway exposure. One from 350 yards northwest of El Monte overpass to 530 yards west and the second from 700 yards west to 960 yards west of the overpass. This section is most troublesome to residents on the northeast side of the freeway.

5. The Magdalena area consists of the section of freeway from Magdalena overpass to Mora Drive. Although outside the Los Atlos Hills' city limit, this section is troublesome to residents on the west side of the freeway.

COMMUNITY PLANS, INC.,
Los Angeles, Calif., Mar. 8, 1968.

Hon. THEODORE R. KUPFERMAN,
The House of Representatives,
Washington, D.C.

DEAR SIR: I am taking this opportunity, on behalf of Community Plans, Inc., Westchester-Playa del Rey, to express to you our concerns about aircraft-generated noise and to comment on pending federal noise legislation.

The problem of aircraft-generated noise is reaching critical proportions at Los Angeles International Airport as it is in most areas throughout the country where major airports are located. Passage of federal legislation is a vital first step toward the resolution of this very serious problem.

Your bills HR 2819 and HR 2820 incorporate items we feel are important in dealing with the overall problem of aircraft noise abatement. We support your efforts to obtain appropriate legislation in this session of congress.

I am enclosing information about Community Plans, Inc., our noise resolution, the Los Angeles City Council's resolution supporting federal legislation, and an editorial from a recent issue of the Los Angeles Times.

Again, we wish to express our support for noise legislation and we would appreciate any suggestions you might have on ways we might further support this effort.

Thank you.

CARL E. NIELSEN,
President.

CITY OF LOS ANGELES RESOLUTION

Whereas, the problem of airport noise is evident at the Los Angeles International Airport and every major airport throughout the United States; and

Whereas, the development and adoption of rules and standards to regulate noise abatement are still pending; and

Whereas, the impact of aircraft-generated noise upon the residents near our airports is increasing in both volume and area and will be intensified by projected aircraft volume; and

Whereas: thirty-five bills prescribing remedial action have been assigned to the House Interstate and Foreign Commerce Committee; and

Whereas, H.R. 3400 and S. 707 authorizes federal rules and standards to regulate aircraft noise abatement;

Now, therefore, be it resolved, that the City Council urge the Chairman of the House Interstate and Foreign Commerce Committee to schedule this subject for early hearings; and

Be it further resolved, that the City Council urge the adoption of H.R. 3400, S. 707 or similar legislation that will provide an early solution to this problem and that the City Clerk with the assistance of the Chief Legislative Analyst provide David L. Wallerstein, the City's Legislative Representative in Washington, with sufficient copies of this action for distribution to appropriate persons.

Presented by:

L. E. TIMBERLAKE,
Councilman, Sixth District.

Seconded by:

JOHN FERRARO,
Councilman, Fourth District.

[From the Los Angeles (Calif.) Times, Feb. 12, 1968]

FEDERAL JET NOISE CONTROL NEEDED

The only things louder than the roar of jet aircraft are the screams of property owners and airport operators calling for quieter engines and noise controls.

So far their pleas have fallen on deaf ears.

The Airport Operators Council Intl., which represents an estimated 86% of the domestic airline business has broken a nine-year association with the industrywide National Aircraft Noise Abatement Council. They charge that airlines and aircraft manufacturers are not effectively seeking solutions to the problem, which, operators insist, requires immediate federal standards and controls.

We agree it is now time for such action.

Congress recognizes the national nature of the problem and is considering the creation of maximum noise levels to be federally enforced. Research by the government and private aircraft manufacturers is also under way to develop quieter engines.

In the meantime harassed homeowners, such as those around the Los Angeles International Airport, are waging anti-noise campaigns and filing lawsuits against airports and officials who do not have the power to effectively act to control noise.

The problem is not a local one. This area of "noise pollution" ranks with the air and water pollution problems now plaguing metropolitan areas across the country.

It is conceded that there will aways be aircraft noise. The challenge is to reduce it to a livable level.

There are several ways to approach the problem. These include noise suppression devices on today's engines, quieter new engines, revised flying operations and restricted land use and condemnation. Cost, safety and engineering problems are involved in all of them.

In the next 10 years more than 1,000 new aircraft, including jumbo jets, will be needed to meet the mounting passenger and air cargo demands. That adds up to a lot of noise.

Standards to control the noise are needed now. To be effective they must be nationwide, realistic and give the airlines and manufacturers sufficient time to meet the new rules. Research must also be stepped up on the quieter new engines.

As technology improves, regulations may be modified and stricter standards adopted. But the first step must be taken now to curtail the environmental pollution that now plagues our airports—and the crowded communities around them.

COMMUNITY PLANS, INC., WESTCHESTER-PLAYA DEL REY, EVOLVED FROM THE WESTCHESTER-PLAYA DEL REY PLANNING COMMITTEE

The Westchester-Playa del Rey Planning Committee came into being as a result of two community forums concerning the future of Westchester, sponsored by the Chamber of Commerce through its Community Development Committee in the spring of 1966.

The interest generated by these forums had two main thrusts: people wanted more information, and they wanted to be able to participate actively in the future of their community. The Community Development Committee of the Westchester Chamber of Commerce, acting in the role of "parent," supplied the needed leadership and called the first meeting of the Planning Committee last August.

The meetings were open to any interested individual, and the 25 to 30 people who attend represent a broad cross-section of the community, including homeowners, senior citizens, civic groups, co-councils, churches and schools. The committee's time has been spent exchanging viewpoints, gathering information, hearing reports and exploring the process of planning. Communication has been established with the Los Angeles Planning Department, the Departments of Airport, Highways, Parks and Recreation, Loyola University, and professionals who are in the business of planning. The emphasis has been, and continues to be, a positive one: the formulation of planning goals to insure the orderly growth of the Westchester-Playa del Rey communities.

A concise statement of what Community Plans, Inc., Westchester-Playa del Rey hopes to accomplish is summed up by our purpose:

1. To formulate planning goals for the communities of the Westchester and Playa del Rey. To relate these planning goals to the goals of the metropolitan Los Angeles region.

2. To promote community interest and participation in the formulation of these goals.

3. To provide coordination and communication between the individual citizen, other citizen organizations, and public agencies.

Community Plans, Inc., Westchester-Playa del Rey has incorporated as a non-profit corporation. It has a 25 member Board of Directors which represents a broad cross-section of the communities of Westchester and Playa del Rey. It is our objective to have a broad general membership consisting of individuals who live or work in the area, business and industrial organizations, and community groups such as churches, service and fraternal organizations, etc.

[From the Westchester (Calif.) News Advertiser, Feb. 11, 1968]

WESTCHESTER PLAN STUDY BEGINS—CPI UNIT ASSISTS PROGRAM

Official start of the Westchester-Playa del Rey community plan study was announced February 7 by Councilman L. E. Timberlake and Calvin S. Hamilton, city planning director.

Assigned to supervise the research and development of the community plan is Arden E. Stevens, city planner.

Community Plans Incorporated, a representative citizen group, has been formed for the purpose of assisting in the development of the community plan.

ADVISORY UNIT

Councilman Timberlake and Hamilton have recognized CPI as an appropriate body to serve as the citizens planning advisory committee.

Slated to be completed in 18 months, the project will be comprehensive in approach.

It will encompass five phases of technical planning work, including (1) design study (2) background data for planning (3) preliminary plan proposals (4) proposed community plans, and (5) proposed implementation program.

LONG RANGE

Officials noted that it must be a long range, community wide study related to the rest of the city and attainable.

It will entail considerable cooperation with other city departments, offices of Councilman Timberlake and Mayor Samuel Yorty, and with community civic groups, represented through the citizens planning advisory committee.

Councilman Timberlake announced that the office of city planning will be able to handle any further inquiries on the progress of the community planning study.

Stevens may be reached at the Los Angeles City Hall by calling, 624–5211, extension 1386. Senior city planner is Robert D. Wilson.

FEDERAL NOISE LEGISLATION

Federal noise legislation introduced in the 90th Congress but not yet enacted gives recognition to the serious impact aircraft-generated noise has upon millions of persons who live in close proximity to airports. The area surrounding Los Angeles International Airport, like other areas throughout the country, is adversely affected by aircraft-generated noise and the projected volume increases in air transportation will further intensify this problem.

Community Plans, Inc.—Westchester-Playa del Rey recognizes the need for federal legislation to control aircraft-generated noise. By resolution of the Board of Directors on 25 January 1968, Community Plans, Inc. recommends that the following items be included in federal noise control legislation:

Department of Transportation have overall responsibility for administration of noise programs.

Standards for measurement of aircraft noise be established.

Standards for the correlation of aircraft noise with human discomfort be established.

Standards for aircraft noise be used in aircraft certification.

Provide funds to develop methods and devices for noise abatement, both procedural and mechanical.

Provide funds to develop quieter aircraft.

Provide funds for soundproofing public structures that are adversely affected by aircraft noise.

Provide funds for the acquisition of land surrounding an airport where noise levels exceed established standards.

CITY OF EL SEGUNDO, CALIF.,
November 22, 1967.

Representative THEODORE R. KUPFERMAN,
Congressional Office,
Washington, D.C.

DEAR REPRESENTATIVE KUPFERMAN: As a representative of a community much beset by the problem of noise and stymied by the lack of legislation for relief in this area, I have read, with a great deal of interest, your concept of an office of noise control to be established within the office of the Surgeon General of the United States.

I have felt, personally, for many years that basic medical research must be done to establish safe noise levels for human habitation and expected results from exceeding these levels. Your concept would provide the vehicle for establishing these guidelines.

Please keep me advised as to progress made in this direction or as to what help, if any, may be extended by me.

Sincerely,

RICHARD G. NAGEL,
Councilman.

AIR LINE PILOTS ASSOCIATION,
Burlingame, Calif., November 15, 1967.

Congressman THEODORE R. KUPFERMAN,
House of Representatives Building,
Washington, D.C.

DEAR MR. KUPFERMAN: Enclosed please find a self-explanatory local newspaper article pertaining to newly developed noise pollution in Los Altos Hills, California, and the concern of its citizens to help decrease the unwanted sound.

Approximately a month ago, I wrote your office requesting any data that you could furnish me regarding the elimination of road noises and any other information regarding this mushrooming problem. I would hope that you could do this for me inasmuch as you are the foremost noise pollution authority on the floor of the Congress today.

The noise pollution information you have furnished my committee was very instrumental in eliminating a proposed 5,000 residential complex adjacent to the San Francisco International Airport. I hope the same can be done for the highway noises.

Hoping to hear from you regarding the article, and to receive some of the data requested, I remain,

Very truly yours,

JOHN X. STEFANKI,
Chairman, Legislative Committee,
UAL Council 34.

[From the Los Altos (Calif.) Town Crier, Nov. 8, 1967]

THE NEW AUTO NOISE LAW—WILL IT HELP?

Los Altos Hills residents, plagued with increasing traffic noise since the opening of Junipero Serra Freeway, might be in line for a little relief because of the new law regulating vehicle noise. It goes into effect today, but the problem is far from solved.

Using the decibel scale of sound level, the new law sets maximum limits of noise at which a vehicle may be operated in posted zones along highways. The noise level will be registered by instruments set up at roadside, but just how this measurement is transmitted to the California Highway Patrol has not been spelled out.

The law is on the books, however, and, speaking hopefully, it's a start.

Few residents in Los Altos or Los Altos Hills, who get the brunt of traffic noise, expect any change in the near future, nor do freeway experts. And Hills officials are acutely aware of the noise pollution, because they have a citizens' committee studying the matter, known as the Sound Abatement Committee.

It's the committee's job to find which of two opposing views is correct, that extensive planting of trees and shrubs along a freeway will, or will not, diminish traffic noise.

The State Division of Highways contends heavy landscaping will have little if any effect on reducing the decibel level, according to Robert Jahrling, an executive assistant at the Division of Highways District 4 office in San Francisco. He said engineering studies have revealed little noticeable reduction in noise.

Challenging the state's viewpoint is Robert B. Ward of Los Altos Hills, who took sound level recordings with standard noise measuring equipment from his patio, 800 feet from the freeway.

Ward claims his findings show a definite reduction in decibels when a vehicle passes a lone tree. He illustrates one finding of a passenger car that registered 44 decibels along an open stretch, but dropped to 34 decibels as it passed a tree and slightly under 34 decibels as it passed a hillslope between the car and the recording device. (The new law requires trucks and motorcycles not to exceed 92 decibels, and cars not to exceed 86 decibels, from a distance of 50 feet.)

Since the decibel measurement is logarithmic rather than linear, an increase of 10 decibels means the loudness is increased by 10 times. Thus, a reading of 44 decibels at 800 feet would be much, much higher at 50 feet.

Ward also recorded the sound level of a poorly mufflered sports car; it increased from 34 decibels to nearly 54 decibels traveling from a grove of orchard trees into the open. Ward's findings were made at 4:30 a.m., 800 feet from the source of the noise. (His findings were to have been studied at last night's meeting of the Sound Abatement Committee.)

How much effect the new law on noise has remains to be seen, but already it has been labeled ridiculously inadequate by many observers, including the Division of Highways. The California Highway Patrol, whose job it is to enforce the law, agrees the standards set are not expected to affect the vast majority of motorists who operate vehicles with standard equipment.

Jahrling told the Town Crier the new law would not effect future landscaping procedures along freeways and termed the new law somewhat less than had been hoped for.

Although convinced landscaping would not reduce the noise level generated by traffic, Jahrling did agree landspacing would produce a visual effect that would be agreeable to residents in Los Altos Hills and surrounding area.

He said advertising for the proposed landscaping along Junipero Serra between west of Foothill Boulevard to Page Mill intersection would be called for this month, with the bid awarding and work to begin in early 1968, probably January or February.

The $430,000 project will provide extensive and random planting along the median strip with eucalyptus, redwood and coffeeberry trees, and with additional trees and shrubs along both sides of the freeway that are native to the area, namely oak, laurel and cherry, that "will reflect a countryside atmosphere."

In answer to the question about whether the state would allow additional landscaping that might be initiated by either Los Altos Hills, an organization, or individual, Jahrling said the state would be happy to meet with interested groups for such a proposal. Also, the state would maintain the additional plantings as part of its overall maintenance program.

Landscaping will not control the noise factor, he said, adding, "the solution is in controlling the source of the noise."

Another area under study by the Sound Abatement Committee is the possibility of banning trucks from using Junipero Serra Freeway.

"It's possible that trucks could be banned from the freeway," Jahrling said, "in much the same way Oakland managed to have them banned from McArthur Freeway." However, he indicated the ban remains in effect only until January of 1968, when authorities will review the matter and then decide whether the ban should be continued after January. That decision could have a strong bearing on Los Altos Hills' efforts to be granted similar relief.

Traffic along Junipero Serra Freeway will greatly increase after the link from Page Mill Road in Los Altos Hills is extended into Woodside to connect with construction in progress in Daly City. Still another link of the freeway between San Bruno and Millbrae was opened to traffic on Nov. 1.

AIR LINE PILOTS ASSOCIATION,
Burlingame, Calif., November 20, 1967.

Representative THEODORE R. KUPFERMAN,
House of Representatives Building, Washington, D.C.

HONORABLE KUPFERMAN: I am in receipt of the anti-noise pollution data regarding highway noises and subsequent alleviation thereof with suitable landscaping projects. For this information, I should like to thank you sincerely.

I have forwarded the above information to the chairman of the noise abatement committee, and I am sure that it will be invaluable in helping us eliminate the noise problem in Los Altos Hills.

Expressing my appreciation once more, I remain,

Sincerely yours,

JOHN X. STEFANKI,
Chairman, Legislative Committee,
UAL Council 34.

"ORDINANCE NO. 67–1574: AIRCRAFT NOISE ORDINANCE

"An ordinance regulating the operation of aircraft over the city of Dearborn and providing for the violation thereof

"The City of Dearborn ordains:

"Whereas: It is necessary for the safety, health, life and general welfare of the citizens of the City of Dearborn that aircraft flying within the corporate limits of said city be regulated in order to prevent ever present danger to the safety, health, life, and general welfare of said inhabitants;

"Now, therefore, be it ordained by the City Council of the City of Dearborn:

"Section 1. Definitions:

"(a) Aircraft. The term "aircraft" as used in this ordinance means any airplane, flying machine, or other contrivance now known or hereinafter invented, used or designed for navigation of or flight in the air.

"Section 2. Minimum height limits for aircraft.

"No person, firm or corporation shall fly or permit any aircraft to be flown within the corporate limits of the City of Dearborn, except at a height sufficient to permit of a reasonably safe emergency landing, which in no case shall be less than 5000 feet, provided that the provisions of this section may be deviated from when special circumstances render a departure necessary to avoid immediate danger or when such departure is required because of stress of weather conditions or other unavoidable cause.

"Section 3. Operation of aircraft to be subject to air traffic rules of Federal Civil Aeronautics Authority.

"No person shall operate any aircraft over or within the City of Dearborn in violation of any valid air traffic or other rule or regulation established by the Civil Aeronautics authority or the Federal Aviation Agency, or their successors thereof.

Section 4. Noise by aircraft operation.

"Unnecessary noise by operators of aircraft within or over the corporate limits of the City of Dearborn is hereby prohibited.

"Section 5. Violation penalties.

"Any person, firm or corporation violating any provision of this ordinance shall be guilty of a misdemeanor and, upon conviction thereof, shall be fined by not more than $500 or be imprisoned for a term not exceeding ninety (90) days, or by both such fine and imprisonment.

"Section 6. Separability.

"It is the intention of the City Council for the City of Dearborn that each separate provision of this ordinance shall be deemed independent of all other provisions herein, and it is further the intention of the City Council that if any provision of this ordinance be declared invalid, all other provisions thereof shall remain valid and enforceable."

AUTHENTICATION

This is to certify that the undersigned do hereby authenticate the foregoing record of the Ordinance therein set forth.

ORVILLE L. HUBBARD,
Mayor.

I hereby certify that the foregoing is a true copy of the Ordinance adopted by the Council of the City of Dearborn at the meeting thereof on November 8, 1967, and became effective by publication by authority of the Council in the official newspaper published in the City of Dearborn, November 16, 1967.

JOSEPH CARDINAL,
City Clerk.

UNIVERSITY OF CALIFORNIA, LOS ANGELES,
Los Angeles, Calif., February 9, 1968.

Congressman THEODORE R. KUPFERMAN,
17th Congressional District, New York, House of Representatives, Washington, D.C.

MY DEAR MR. KUPFERMAN: Enclosed is a Xerox copy of a brief article that appeared in the Los Angeles Times for February 7, 1968, dealing with certain aspects of aircraft noise that I believe will be of interest to you in connection with your pending congressional legislation.

With cordial greetings,

Yours,

VERN O. KNUDSEN.

[From the Los Angeles Times, June 7, 1968]

AIRLINES, PLANE MAKERS CALLED LAX ON JET NOISE—BOTH USE "SMOKESCREEN" TACTICS ON ABATEMENT, AIRPORT OPERATORS SAY

(By Marvin Miles)

Major airport operators broke with the airlines and aircraft manufacturers Tuesday, charging these two segments of the aviation industry with ineffective "smokescreen" tactics in seeking solutions for the jet noise problem.

Meeting in San Diego, directors of the Airport Operators Council International, representing airports that handle 86% of the domestic airline business, voted to withdraw from the industry-wide National Aircraft Noise Abatement Council.

The noise abatement organization, formed nine years ago, includes the Air Transport Assn., the Air Line Pilots Assn., the Aircraft Industries Assn. and the American Assn. of Airport Executives.

LACK OF CONTROL TOLD

"We are tired of being scapegoats for the airlines and the manufacturers," explained Francis T. Fox, general manager of the Los Angeles Department of Airports, and James R. Mettler, AOCI president and director of El Paso International Airport.

As airport operators we can exercise no control over the types of aircraft being built for the airlines. We have no control over flight patterns or air routes or airline schedules.

"In brief, this is a federal matter and the sooner we achieve the necessary legislation, the sooner the public can be assured of noise relief."

"POSITIVE ACTION" PROGRAM

The San Diego meeting adopted a threefold "positive action" program the AOCI will push on its own, including:

1—Immediate modification of all present jet (airline) engines to lessen noise in the area of domestic airports.

2—More money and urgency for the "quiet engine" program now under development by the National Aeronautics and Space Administration for future jet engines.

3—Total support for pending congressional legislation (H.R. 3400 and S. 707) which would authorize federal standards and control of jet aircraft noise.

These bills, Fox said, would give the Department of Transportation the power to certify new aircraft for noise standards and to regulate noise in the operation of present-day aircraft by modifying jet engines.

PANCOAST, FERENDINO, GRAFTON & SKEELS, CONSULTING ARCHITECTS TO THE BOARD, BOARD OF PUBLIC INSTRUCTION,
Miami, Fla.

To: Dr. Joe Hall, superintendent, Dade County Board of Public Instruction.

From: Andrew J. Ferendino, architect to the board.

The members of the Dade County Board of Public Instruction have expressed a desire to solve the noise problems in forty schools, which are caused by aircraft and street traffic. This situation is steadily getting worse and is presently compromising the educational program to a point where it seriously jeopardizes the education of the children in these schools.

Under the school construction research program, the school board architect is now studying the various individual school problems and seeking effective economical solutions.

The first step in this program was made by the Dade County School Board Maintenance Department under the direction of Carl M. Kolosna, coordinator of materials testing division. This resulted in a report of the noise problems in the various schools involved.

The second step was taken by this office assisted by Edward Hurst, associate superintendent. This report included a detailed list of the physical changes in the school buildings to eliminate noise problems and the cost of these changes.

The third step was taken by James H. Church, director, school construction research. This report is attached and was prepared by George Paul Wilson, Ph. D., of the Dariel Fitzroy firm, acoustical engineers, San Francisco, California. The Fitzroy firm is recognized as one of the outstanding acoustical consultant firms in the country. This report confirms the findings of Mr. Kolosna and also supports the general approach suggested by this office for the correction of noise problems.

Through this report and the conversations we had with Dr. Wilson during his visit, we have obtained very capable and experienced professional direction in detail regarding the solution of the acoustical problems we face. We are now in a position to carry out this program when the money is made available.

National Safety News of November 1967, at page 51 contains the following article. Unfortunately, we cannot reproduce the many fine illustrations:

INDUSTRIAL NOISE

(NOTE—It is imperative that the safety engineer have an understanding of the fundamental concepts for the evaluation and control of noise to avoid on-the-job hearing losses. (This is the 10th in a series of articles developed to acquaint safety men with the basics of industrial hygiene.))

(By Herbert T. Walworth,* director of industrial hygiene and occupational health, Lumbermen's Mutual Casualty Company, Chicago.)

Hearing loss is an affliction which has existed throughout the history of mankind. It occurs in all walks of life and is due to many causes. Until the development of the audiometer in recent years, there was no means of measuring the degree of hearing loss with appreciable accuracy. Now partial losses are easily measurable by use of commercially available instruments.

That workers in noisy occupations develop a greater than average degree of hearing loss has been known for more than 100 years. Prior to 1948, hearing loss was not regarded as a significant factor in workmen's compensation. Some claims occurred, but these were primarily due to traumatic injuries from such causes as blasts, concussions, blows to the head, and foreign objects or infections in the ears. Since 1948, a number of states have passed hearing loss legislation or revised existing laws to include noise induced hearing loss as a basis for workmen's compensation benefits. Now it is reported that there are at least 16 states with workmen's compensation laws providing compensation in varying degrees for partial hearing loss due to industrial noise exposure.

WHAT IS NOISE?

Technically defined, noise itself is any unwanted sound. It is a form of vibration which may be conducted through solids, liquids, or gases. It is a form of energy in air, invisible vibrations that enter the ear and create a sensation. Almost every conceivable

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* Walworth is past chairman of the Intersociety Committee on Guidelines for Noise Exposure Control. The report of his committee appeared in the October issue of *The American Industrial Hygiene Association Journal.*

kind of sound can, at one time, be welcome—at another time abhorred. It follows that before attacking a noise problem it must be asked: Who doesn't want it? When? Why? When these questions are answered, steps can be taken to solve the problem.

In the operation of industrial machines, unbalanced forces are applied to parts of the machine and cause displacement or movement of these parts, or of the whole machine. These displacements or motions are vibrations which set up air-borne sound waves. When men come into direct contact with noise, undesired effects may result.

Properties of noise

Some of the properties of noise are intensity, or pressure, frequency, and duration. All of these are important factors in evaluating the effects of noise on man's hearing. Sound pressure or intensity follows the inverse square law: i.e., as the distance from the sources increases the sound level decreases as the square of the distance.

The decibel

The ear is a remarkable organ, responding to sound pressures from 0.0002 to 2,000 dynes per square centimeter. To avoid working with unwieldy large numbers in evaluating intensity, however, a logarithmic scale is used with the decibel as the unit of measure. Because decibels are logarithmic units, they cannot be added or subtracted arithmetically. In fact, if the intensity of a sound is doubled, there will be a corresponding increase of three decibels, not double the number. On the decibel scale, zero (decibels) is the threshold of hearing, and 120 (decibels) is the threshold of pain.

Frequency

Frequency is the number of variations in sound pressure per unit time, usually expressed in cycles per second (cps). The sounds usually encountered in industry consist of many frequencies depending on the size, shape, and actions of the noise source. Each frequency of a given sound contributes to the total sound pressure level or intensity. The normal young adult can hear sounds over a wide range of frequencies, from about 20 cps to 15,000 cps.

The human ear responds differently to different frequencies. Because different sound frequencies may have differing psychological and physiological effects, it is important that knowledge of the frequency components of a noise be obtained. The amount of information required varies with the problem and determines the technique to be used in the frequency analysis. For general industrial hygiene work, it is usually sufficient to separate the total noise into frequency ranges of eight parts called octave bands. The octave bands most commonly used in noise measurement start with the 37.5 to 75 cycle band through the 4,800 to 9,600 cycle band. In each octave the highest frequency is twice that of the lowest.

NOISE EFFECTS ON MAN

The effects of noise on man include the following:

(1) *Psychological effects*, for example: noise can startle, annoy, and disrupt concentration, sleep or relaxation.

(2) *Interference with communication by speech*, and as a consequence, interference with job performance and safety.

(3) *Physiological effects*, for example, noise induced loss of hearing, or aural pain, nausea, and reduced muscular control (when the exposure is severe).

MECHANIC OF HEARING

The human ear is composed of three major sections: the external, middle, and inner ears. Each of these has a distinct function in the hearing process.

The external ear captures and funnels the sound waves to the middle ear where they strike the ear drum, which sets in motion the process of hearing.

The middle ear consists of the ear drum and the space and structures just inside. The space of the middle ear is filled with air. There is a chain of small bones in the middle ear with one end of the chain resting against the ear drum and the other end connected to the inner ear.

The inner ear consists of a spiral tube filled with fluid. The spiral tube contains the organ of Corti, which consists of many sensory cells with delicate hairs or hair cells projecting into the fluid.

As the ear drum vibrates, the chain of bones comprising the middle ear are set in motion. These motions, in turn, vibrate the fluid of the inner ear. When the fluid vibrates, the hair cells are stimulated, sending nerve currents or impulses to the brain. Exposure to excessive noise for extended periods overactivates the hair and nerve cells, causing injury or destruction, resulting in a permanent loss of hearing.

Hair cell deterioration also increases with advancing age, thus decreasing the hearing acuity of older age groups.

Hearing loss

Loss of hearing may be defined as any reduction in the ability to hear from that of a "normal" person. Such loss may be classified into two general categories:

(1) Temporary hearing loss from exposure to loud noises for a few hours, with normal hearing usually returning after a rest period. The recovery period may be minutes, hours, days, or even longer, depending upon the individual and the severity and length of exposure.

(2) Permanent loss of hearing may occur as a result of the aging process, disease, injury, or exposure to loud noises for extended periods of time. The hearing loss associated with exposure to industrial noise is commonly referred to as "acoustic trauma."

The most common levels of industrial noise exposures are well below the pain threshold. There is a wide range of noise levels and frequencies to which long-time exposure may cause a slowly developing impairment of hearing. The part of the inner ear that may be damaged depends on the frequency components of the noise field that are present at the levels of exposure. Individual susceptibility of the exposed worker may also be a factor. Noise-induced permanent hearing loss is first evident in a reduction in the ability to hear high frequency sounds. As the exposure continues, the reduction progresses to the lower frequency sounds in the speech range. Exposure to noise that will produce this slow damage may sometimes be accompanied by other signs, such as a sensation of tingling or ringing in the ear when one moves out of the noise field.

Present day evidence indicates that any permanent effect on the hearing organ is unlikely unless it is preceded by a temporary threshold shift of the hearing level. This shift can be detected by an appropriate program of monitoring audiometry, and this information can serve to warn management personnel that there is risk of permanent damage to the hearing organ.

Effects are similar to, or perhaps identical with, those produced by industrial noise are also produced by other agents, or result from other causes. Certain drugs used for the treatment of disease may reduce the sensitivity of the ear. These effects are frequently indistinguishable from those resulting from long-time exposure to industrial noise.

Another complicating factor in the industrial noise picture is the loss in hearing sensitivity that takes place as people grow older. Technically, the decrease in hearing sensitivity accompanying the agent process is known as presbycusis.

There are numerous infectious diseases (for example, frequently recurring or persistent colds) that may produce loss of hearing, which may be confused with those resulting from exposure to industrial noise.

It is important that otologists and industrial physicians give these other factors appropriate consideration when evaluating the effects of industrial noise on man. Management personnel can make themselves more aware of the significance of these non-noise-induced hearing losses by establishing a regular program of preplacement audiometry. This program will inform them of the hearing status of the individual at the time he is assigned to a job in which he may be exposed to industrial noise under conditions that could induce hearing impairment.

INDUSTRIAL NOISE EXPOSURE

As man moves through his industrial, home, and recreational environments, he is exposed to many noise sources. He may be exposed to car or other transportation noise during the day. He may be exposed to different noises where he works. He may be exposed at home to noises from radios, or a home work shop. Jet planes or construction in the vicinity of the home may be considered, in some cases, a noise exposure. Thus it can be seen that man in his many environments is exposed to different noises having varied frequencies and intensities.

Noise is considered synonymous with industry in general and with certain specific industries in particular. A noise survey in 1953 of 600 typical industrial operations [1] indicated that 75 per cent of the measurements exceeded 90 decibels overall—the noise level roughly adopted by some organizations as the level that should not be exceeded for hearing conservation.

Noise measurement

The purpose of making noise measurements is to evaluate exposures in relation to speech interference, comfort or hearing loss, and to collect information for use in control.

The measurement of noise may be accomplished with a sound level meter, or a sound level meter in combination with an octave band analyzer. The sound level meter records the overall level of the noise produced without regard to the frequencies incorporated in the total makeup of that noise. The octave band analyzer, when used in conjunction with the sound level meter, measures noise levels in various octave bands (frequency bands) over the audible range to the human ear.

More sophisticated equipment is available for noise measurement, but these two instruments can serve most of industry's needs for noise hazard evaluation and for the accumulation of information on which to establish hearing conservation programs.

The evaluation of industrial noise involves more than the simple reading of an instrument taken in the area of a suspected noisy machine. Many factors enter into the making of a noise study. Some of the factors to be considered are: type of noise produced (steady or intermittent), background noise; location of the exposed workers; and time workers spend in the noise exposure.

Damage risk criteria

If the ear is subjected to high levels of noise for a sufficient period of time, some loss of hearing may occur. A number of factors can influence the effect of the noise exposure. Among these are: 1) variation in individual susceptibility; 2) the total energy of the sound; 3) the frequency distribution of the sound; 4) other characteristics of the noise exposure, such as whether it is continuous, intermittent, or made up of series

[1] "A Noise Survey of Manufacuring," Karplus, H. B. and G. L. Bonvallet, *American Industrial Hygiene Quarterly*, Vol. 14, December 1963, p. 262.

of impacts; 5) the total daily time of exposure; 6) the length of employment in the noise environment.

Because of the complex relationships of noise and exposure time to threshold shift (reduction in hearing level and the many possible contributory causes, establishment of criteria for protecting workers against hearing loss presents many difficulties. An added complication is whether such criteria should be designed to protect against any hearing loss or just loss in the speech frequency range, which is the only portion ordinarily considered for compensation purposes.

A number of tentative noise exposure standards[2 4 5 3] have been proposed as interim guides, pending the development of reliable scientific data. These standards relate exposures to steady-state, wide-band types of noise, because the relationship between intermittent and pure-tone types of noise exposures are more difficult to evaluate mulated. Impact or impulse noises are difficult to measure. At present so little is known about their effects on hearing that not even tentative standards have been suggested.

The most recent effort to establish the basis for reliable noise criteria is the work of the Intersociety Committee on Guidelines for Noise Exposure Control. The report of this committee was published in the October 1967 issue of the *American Industrial Hygiene Journal* (page 420).[6] A significant part of this report is the graph, which is reproduced on page 56. This chart relates the incidence of significant hearing loss to age and the magnitude of noise exposure over a working lifetime.

Without attempting to explain the full significance of the chart, it can be stated that 20 per cent of the general population at age 50 to 59 will have hearing losses of 15 decibels or more, without any industrial noise exposure. Groups of workers exposed to steady-state industrial noises over a working life-time will show an increased incidence of hearing loss. For example, exposure to 90 db on the "A" scale of the sound level meter will result in significant hearing losses to 27 per cent of the group. If the working life-time exposure is to 95 db on the "A" scale, 36 per cent of the group will show significant loss.

Essentially, this chart supplies industry and others with information on which to evaluate the risk of developing compensable hearing loss among groups of workers exposed to noises of different magnitudes.

NOISE CONTROL

Every noise problem breaks down into three component parts: 1) a source radiating sound energy; 2) a path along which the sound energy travels; 3) a receiver such as the human ear.

The control of noise at the source is an engineering problem which requires modification or redesigning of the source. The modification of compressed air jets for parts ejection, to reduce noise by altering the jet flow, is an example of this type of control.

Noise reduction along the path can be accomplished in many ways—by shielding or enclosing the source, by increasing the distance between source and receiver, or by placing a shield between the source and the receiver.

Noise control at the receiver, when the receiver is a person, can be accomplished effectively in a number of ways. Some common approaches include placing the worker in a booth or enclosure, the use of ear protectors and regulation of exposure time.

The "system" approach to noise problem analysis and control will assist both in understanding the problem and the changes that will be necessary for noise reduction. If each part of the system—source, path and receiver—is put in its proper perspective, the overall problem will be greatly simplified.

Translating these principles into practical terms, the following are specific examples of controlling industrial noise exposures:

(1) *Isolation of the Worker*—In situations where the number of operators is small and the process is such that the work task can be confined to a limited area, isolation of workers in a separate noise insulated room provides effective control. This control method has been observed in chemical processing, power, and metal products plants with noise reduction inside the rooms of as much as 30 decibels.

(2) *Machine Insulation*—Machines mounted directly on floors and walls vibrate them, resulting in sound radiation. The proper use of machine mountings insulates the machines and reduces the transmission of sound vibrations to the floors and walls.

(3) *Control of Noise by Absorption*—Noise produced at a sound source travels out in all directions. When the sound waves encounter other machinery or walls, they are reflected. Thus, the total noise exposure within the room is equal to the sum of the direct and reflected noise. The application of sound absorption material to walls can reduce the noise exposure in the room. However, this method has limited industrial application as the absorption material has no effect upon the direct noise from the source.

(4) *Substitution of Less Noisy Machines*—This approach to noise control may have limited application. However, there are certain areas in which substitution has potential application. These include "squeeze" type equipment in the place of drop hammers, welding in place of riveting, and chemical cleaning of metal instead of high speed polishing and grinding.

(5) *Reduction of Exposure Time*—Experience has shown that limiting the total daily exposure reduces the noise hazard. As a general rule, for each halving of the daily exposure time below five hours, an increase of three decibels can be made in the noise criteria selected for safety in continuous exposure.

(6) *Personnel Protection Against Noise*—There are many operators in industry that cannot be quieted by engineering methods. Ear plugs and muffs worn by the worker can provide effective protection in such cases. Numerous scientific reports have shown that such devices can provide 25 to 40 decibels of protection if properly worn.[5] As with the usual safety protective device, ear protectors may cause a degree of discomfort to the wearer. These devices are, however, used successfully in many industries where adequate attention is given to program development and employee education.

HEARING EVALUATION

Hearing evaluation is an important part of a hearing conservation program and will involve audiometric testing. Such testing should be done at time of hiring and may be done at periodic intervals, at the time of job change, or upon leaving employment. While there may be need for all of these evaluations in an industrial hearing conservation program, the preplacement test is the most important. An audiometer is required for assessing an individual's hearing ability. Depending on the type of test signal used, audiometers may be called "pure tone audiometers" or "speech audiometers." Manual and automatic models of both types are available.

Pure tone audiometers are standard instruments for industrial use. For hearing tests likely to be required in industry, the test frequencies of 500, 1,000, 2,000, 3,000, 4,000 and 6,000 are needed.

Audiometric testing facilities

In industrial situations, medical facilities may be relatively near noisy industrial areas. Background noise levels in these facilities may be relatively high. If these noise levels interfere with the audiometer signal, the subject will appear to be "partially deaf." To obtain reliable audiometric tests, it is necessary to maintain the background noise level in the test area below certain values. This may be accomplished by the design and construction of special rooms, or by the use of a prefabricated, commercially available audiometric test booth.

United States of America Standards Institute Standard S3.1–1960 gives criteria for background noise in audiometer rooms.

Audiometers must be calibrated periodically to insure accurate test results. The calibration must include both the electronic circuits and the earphones, and calibration should be repeated at intervals not longer than one year and more frequently when erratic operation or erroneous test results are suspected. Rough daily calibrations can be made by testing the hearing of persons with established audiometeric patterns.

At the present time, there is a proposal before the United States of America Standards Institute to change the standard sound pressure levels for each test frequently when the test instrument is at at the "O" or normal threshold hearing level. If approved, the signal will be about 10 db weaker than the currently used level at audiometric "0." Until such time that the change is approved by the United States of American Standards Institute, continued use of the present standard is recommended.

Industrial noise problems are extremely complex. There is no "standard" program applicable to all situations. In view of developments in the workmen's compensation field however, it behooves industry to consider and evaluate its noise problems and to take steps toward the establishment of effective hearing conservation procedures.

Detailed references to noise, its management, effects, and control will be found in a great variety of books and periodicals.[5] For those companies needing assistance in establishing hearing conservation programs, consultation services are available in a number of professional areas through private consultation, insurance, and governmental groups.

NSC SAFETY TRAINING INSTITUTE ANNOUNCES ADVANCED COURSE "INDUSTRIAL NOISE"

An advanced Industrial Hygiene Course will be offered in the Spring of 1968 by the NSC Safety Training Institute. The topic is Industrial Noise and the objectives are to train engineers, medical, and safety personnel in its measurement, evaluation, and control.

This will be a one-week course, and the following subjects will be covered:

Physics of Sound will include discussions on sound generation and transmission, sound pressure level, sound intensity, and sound power.

Instruments and Techniques of Sound Measurement will include discussion of sound level meters, octave band analyzers, instrument specifications, auxiliary equipment, and calibration.

Procedure of a Sound Survey will include an outline of the types of surveys, instrumentation, survey procedures, and a discussion of engineering surveys.

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[2] "Tentative Estimate of a Hearing Damage Risk Criterion for Steady State Noise," *Journal of Acoustical Society of American*, Vol. 24, 1952, p. 756–761.

[3] "Guide for Conservation of Hearing in Noise," Subcommittee on Noise, Committee on Conservation of Hearing, Research Center, Los Angeles, Revised 1964.

[4] "Damage Risk Criteria and Noise Induced Hearing Loss," Glorig A., D. Ward, and J. Nixon, *Archives of Otolaryngology*, October 1961.

[5] *Industrial Noise Manual*, Chapter 7 (Second Edition), 1966, American Industrial Hygiene Association, Detroit.

[6] "Guidelines for Noise Exposure Control," *American Industrial Hygiene Association Journal*, 14125 Prevost, Detroit 48227, October, 1967.

Anatomy and Physiology of the Ear and Effects of Noise on Man will discuss the effects of continuous noise upon auditory mechanisms, damage risk criteria, susceptibility, effects of noise upon behavior, annoyance, and communication.

Hearing Measurement and Audiometry will discuss pure tone audiometry testing rooms, technician, records, test procedures, and conservation practice.

Personal Protection will take into consideration the acoustic problem, ear protector requirements, characteristics of ear protectors, and discuss ear protection programs.

Administrative and Human Relation Aspects of Industrial Hearing Conservation will be offered to show that adequate education is needed to overcome resistance to protection programs.

Engineering Control will include an outline of control methods, plant planning, substitution, reduction at the source, reduction during transmission, and miscellaneous methods.

Legal Aspects of the Industrial Noise Problem and Background for Loss of Hearing Claims will summarize the legal, medical, and scientific and technical factors involved in workmen's compensation claims for noise induced hearing loss.

The advanced course will be open to graduates of the "Fundamentals of Industrial Hygiene" and "Training Methods" courses, or at the discretion of the director of the Safety Training Institute. The tuition will include text and other course materials but does not include housing and meals.

Enrollment will be limited to 24 students. For additional information contact: Director, Safety Training Institute, National Safety Council, 425 N. Michigan Ave., Chicago 60611.

Elwood T. Driver, Chief, Control Branch, National Highway Safety Bureau, Federal Highway Administration, was good enough to bring to my attention from the Stanford Research Institute Journal, No. 16, of September 1967, an article on noise in mass transit systems. His letter and the article follow:

U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, NATIONAL HIGHWAY SAFETY BUREAU,
Washington, D.C., October 26, 1967.

Hon. THEODORE R. KUPFERMAN,
House of Representatives,
Washington, D.C.

DEAR CONGRESSMAN KUPFERMAN: I sincerely appreciate your placing my speech on noise in the Congressional Record, and am pleased to be able to contribute to your noise abatement campaign.

I have just come across an article pertaining to noise which may be of special interest to you. It concerns noise in mass transit systems and appears to be a very well written and documented article. Although technically written it does point out that anti-noise measures are feasible and practicable.

Thank you again for your consideration.

Sincerely yours,

ELWOOD T. DRIVER,
Chief, Controls Branch.

[From the Stanford Research Institute Journal, September 1967]

NOISE IN MASS-TRANSIT SYSTEMS

(NOTE.—This article was prepared by Vincent Salmon, senior research scientist, who has been engaged in, or administered, research in sonics at SRI since 1949. He obtained his degree in Physics from Massachusetts Institute of Technology in 1938. He has engaged extensively in research on electroacoustics, noise theory, noise and vibration control, and underground explosion phenomena.)

Noise, a particularly obnoxious form of air pollution, has long been regarded as the tribute we pay for progress. For the convenience of miniature radios we are privileged to have our ears assaulted by those who are afraid of quiet. The power escalation race in home vacuum cleaners is well evidenced by their cheery scream of joy while gobbling up dirt. Along with the rapid and stimulating transportation afforded by motorbikes, we are treated to a distinctive exhaust note whose crack, blat, and snarl are calculated to keep our adrenals stimulated. Yes, it's a noisy world!

But it need not continue to be so. As with population control, we have learned that the best time for noise control is while the idea (for a new device or system) is still a gleam in the eye. This is particularly true for so complicated an assemblage of facilities and equipment as a mass-transit system. This system ordinarily comprises multi-passenger vehicles using an exclusive right of way.

Both customers and community are affected by the noise. Customers react against excessive noise by using other modes of transportation. In a less quiet fashion, an offended member of the community can take his case to court. For both situations the result is the same: reduction of net income for the transportation organization. But controlling the noise also costs money, mostly with capital investment plus maintenance. What, then, should be the criteria for balancing these opposing losses?

In the purely economic sense, the balance is reached when the equivalent yearly cost of an increase in noise control devices and procedures becomes greater than the increased net annual income that would result from increased patronage and reduced community complaints. If we could quantify the social value of decreased noise, this would also be a factor in the cost-effectiveness evaluation procedure. However, it is already difficult to estimate the reactions of people to noise, and we can only guess at the weighting of such a factor.

CRITERIA FOR ACCEPTABILITY

As used here, noise is a two-faced word. It refers to both the sensation and the physical stimulus associated with it. A procedure is needed by which objectively measured attributes of noise can be transformed into a measure of the sensation produced, and thence to a prediction of reaction expected. Several schemes have been proposed. The one most widely used is based on calculation of perceived noise decibels. The decibel (dB) is a physical measure of the intensity of a noise; perceived noise decibels (PNdB) describe the unacceptability or annoyance of the noise. The concept and procedure were developed by Kryter for evaluating annoyance from aircraft noise, but it has also proved useful in studying motor-vehicle and mass-transit noise. For most people, a change of 2 or 3 PNdb is a just noticeable change in annoyance.

In evaluating annoyance from noise, we start with the fact that usually annoyance increases with loudness and the amount of high-pitched sound in the noise. A squeal is more annoying than a roar. Thus, we first analyze the noise to determine the intensity (in dB) for each pitch range. In the calculation procedure the higher pitched (high-frequency) components are weighted more heavily than the lower pitched ones. At present, the perceived noise decibels obtained are useful for comparing sounds of the same character. Difficulties arise when comparing noise sources as different as typewriters and jet aircraft.

Annoyance in PNdB is especially useful in evaluating community reaction. For those living next to the right-of-way, a mass-transit system often represents an intrusion into the community. If they prefer commuting by auto, then this intrusion has no compensating return, as it does for passengers. Thus it is often found that community reaction must be judged from the intrusion of privacy point of view. This is especially true if minimal community participation has been sought in decisions affecting taxes, routes, station sites, service, and right-of-way beautification.

Despite these difficulties, it is possible to obtain an estimate of community reaction to mass-transit noise. The procedure is to weight the PNdB by amounts corresponding to various psychological factors. Because pure tones (as wheel squeal on curves) are more annoying than smooth noise, add 5 PNdB when such components are prominent. Any sound that is sudden in onset will be more objectionable than a slowly starting one. Hence, add 5 PNdB if such impulsive sounds predominate. A well-known example is the sonic boom. When a noise event is repeated, its annoyance increases. Weighting factors employed vary from 0 PNdB for one event pet minute or oftener, down to subtracting 25 PNdB for the single-event annoyance per day. Of course, night-time noise is more annoying, when members of the household are trying to relax. For noise at night, therefore, add 5 PNdB. If the noise occurs only during the day, or in winter (windows closed), subtract 5 PNdB. The amount of background noise has a strong effect; add 5 PNdB for rural conditions, but subtract 15 PNdB for an area with heavy industry. More difficult to quantify is the effect of habituation, ranging from no weighting for a new noise to subtracting 15 PNdB for extreme conditioning.

Several intangible factors require consideration for which no weighting is yet satisfactory. If the noise is associated with one's livelihood (as an airport worker), it is more tolerable than if not. In the absence of other data, the habituation weightings above may be used. When the person annoyed can see the noise source or feel its vibrations, the sense of intrusion is reinforced and increased annoyance is reported. Another nebulous but real variable is the knowledge of the community as to where complaint can be lodged. A community of business leaders, engineers, architects, physicians, and attorneys usually has access to the sources of political and economic power, and hence shows more rapid and massive reaction to noise than more ordinary communities. Finally, if community organizations (or individuals) contain strong leaders, a moderate annoyance situation can readily be internally escalated to one leading to severe political and economic threats. Ballots and bucks are devastating weapons. For all of these factors, no simple weighting schemes are available. Nevertheless, they must be considered in evaluating any existing or potential complaint situation.

Once the weighted PNdB values (WPNdB) are available, community reaction can be forecast and criteria set. If sporadic complaints can be tolerated, then about 90 WPNdB would be the maximum at the location of the nearest complainant for California-style housing. At 100 WPNdB, threats of community action should be expected; these may easily escalate into direct action if the community has aggressive leaders and knows to whom to complain. Such a noise limit criterion as suggested is but a beginning, for experience is simply insufficient for a prediction of the conditions under which complaints will begin for mass-transit noise.

Turning now to the other audience—the passengers—we find a completely different situation. Rather than intrusion, the complaint of excessive noise will ordinarily be based on interference with conversation, termed speech interference. Here the situation is under better control in that a considerable body of experience derived from office noise is available. The results are expressed in terms of a series of curves in which the intensity of the noise at low, intermedi-

ate and high pitch (frequency) is specified such that in each frequency region about equal interference with speech is obtained. When the actual spectrum is compared with these standard noise rating (NR) curves, a number is obtained that characterizes the speech-interference expected. At NR 60, speech in an ordinary conversational tone of voice should be intelligible at 2 feet. Hence this is a rational criterion for in-vehicle noise. For underground station-platform noise, a similar limit should apply, especially if express vehicles are rushing by. Because the duration of the exposure is short, it should be possible to relax this limit somewhat for station-platform noise, perhaps to NR 70.

Thus far we have considered only air-borne noise. However, solid-borne vibration can have strong effects on those living near underground rights of way. The perception of vibration is two-fold; the motion can be directly felt in the body, or noise can be radiated from vibrating walls or rattling objects. Separating the effects is difficult, but usually the air-borne sound is responsible for most of the complaints. Thus, annoyance is the chief factor to be considered. Because most dwellings provide 10 to 20 dB isolation, the criterion inside will be about 75 PNdB, weighted for the appropriate factors.

If low-frequency vibration perceived directly by the body is considered, the limit for easy perception is near 1 inch/sec^2, or about 1/400 the acceleration due to gravity. However, there are no accepted limits in terms of annoyance, so the above value is merely a reference, not a definite annoyance limit.

TRANSIT SYSTEMS

Consider now the general types of mass-transit systems, the subsystems in them, and noise problems with each. These may be classified as to right of way—surface, tunnel, or aerial; vehicle support—as the roadway, rails, water, or air; and propulsion, as solid, liquid, or water reaction. In any noise-control study, a first task is to identify the individual noise sources, and if possible to determine the noise output of each. Comparison with the criteria then indicates which sources need attention first.

Community noise is very considerably reduced when a subway right-of-way is used. However, because the benefit is ordinarily local, it is usually necessary for those benefited to bear the additional cost. In most instances this cost is so large ($10 million or more per mile for urban locations) that most taxpayers will not assume this added burden. When the right of way traverses a municipally attractive area, as a park, it has been seriously proposed to enclose the right of way completely. This leads to the anomaly of an elevated tunnel, but the end result can be considerable reduction in noise.

SUPPORT SYSTEM NOISE

If wheels and rails are of steel, and rolling stock is poorly maintained, this support combination may be quite noisy. By far the best control means is to keep wheels round and balanced, and rails flat. If maintenance is poor, the noise level can increase as much 15 PNdB from this cause alone.

A common support noise source in railed vehicles is wheel squeal on curves. With solid axles one wheel must slip. This usually occurs in a stick-slip fashion at a rate corresponding to a wheel resonance. Because this is inherent in a solid-axle system, the suggestion to use a split axle has been investigated. However, high-speed instability often results, probably due to not completely redesigning the truck to handle the new situation. Several palliatives exist. Fine-grained roughness of wheel or rail cause more continuous release of torque build-up; the contact can be lubricated with water (with trouble in freezing weather!); or damping material can be added to wheel and rail. Lubrication is the easy palliative, but introduces many other problems. Wheel squeal remains a largely unsolved problem of railed vehicle systems.

If the support mechanism is a roadway with pneumatic tires on the vehicles, support noise is no longer the chief source. Why then is not this system used more, in both surface and monorail variants? One difficulty is in achieving safe and reliable high-speed switching from one track to another with the guidance system usually used. Also, the running gear cannot simply be a railroad truck with rubber tires. It must be redesigned to make best use of resilience in a location (the tires) unfamiliar in conventional railroad vehicle design. Finally, a differential gear box is often needed and may itself be quite noisy.

Ordinary steel aerial structures carrying ill-maintained rolling stock can be intolerably noisy to the community. Flat wheels shock-excite the structures. If it is suspected that this can occur, then resilient rail pads should be installed during construction. These pads are placed between rail and roadbed or tie. In the past, solid pads of elastomer have been used. However, they have not been completely successful, because elastomers are practically incompressible. Thus under load the pad becomes almost a rigid connection. Much better results are obtained from designing the pads to have the desired force-displacement curve, using elastomers in shear. Reductions in aerial structure vibration of up to 30 dB are possible, limited only by the instability of extremely "soft" rail pads. With completely safe pads the noise reduction can be expected to be between 10 and 20 PNdB.

If the support system is hydrodynamic (air or liquid cushion), then the support interface is ordinarily much quieter for shear motion than a solid contact type (wheel/rail). However, the means of producing the cushion may often be intolerably loud, as in ground-effect machines used over water. Enclosure in a tunnel and use of semi-closed fluid circulation will of course shield the noise from the community, but a solid contact support system can then be used to advantage. For extremely high speeds (above 250 km/hr), the common wheel/rail system can be unstable, and research is needed to determine which support system best minimizes instability, cost, and noise.

In a railed vehicle it is possible to reduce support noise by special wheels that incorporate both resilience and damping. The old PCC streetcars (vintage of middle 30s) had such a wheel, but occasionally reports on its noise performance are contradictory. Several modern approaches show promise, but there has been no concerted research effort to determine the analytical details of vibration excitation and noise radiation by the solid axle-wheels-rails system. The common approach is pure empiricism.

PROPULSION SYSTEM NOISE

Propulsion systems may use positive solid contact or reaction drive. In solid-contact types, gear noise remains a major component. The experience of automobile manufacturers and the naval service in quiet gear design does not seem to have been adequately transferred to noise problems in the propulsion gears of self-propelled railed vehicles. Precision of manufacture is necessary, but installation and maintenance of alignment under load are equally important. Gear-case design for low noise still remains an art. In a conventional mass-transit system using railed vehicles, gear noise usually predominates at higher speeds when the wheels and rails are well maintained.

Other propulsion schemes show promise of reduced noise, but cost factors still make their immediate utility doubtful. Air or solid-contact supported vehicles in a closely fitting tunnel can be driven by a centrally supplied air-pressure difference. Presumably the central source can be quieted to any desired degree. If the drive is from self-contained air screws or reaction motors, the noise advantage is lost, at least upon the passengers.

Linear electric motors have long been suggested for a smooth and quiet propulsion system. In this, one part of the magnetic field structure (of an ordinary circular motor) is "unrolled down the middle of the track. The mating portion is on the car. The cost of installing, and maintaining close clearances (for efficiency) has been one factor in preventing use of this scheme. Because of its potential application to relatively quiet, smog-free and automated freeways, we may see more developmental effort applied to the linear motor.

BRAKING SYSTEM NOISE

What starts must stop—on earth, anyway. A braking system will be an essential and often noisy part of any mass-transit system. In self-propelled railed vehicles, a promising development is in wider use of dynamic braking. Indeed, by thus using the motor as a generator, the kinetic energy of the vehicle can be transformed into heat for heating the car, stored in a battery, or fed back into the supply line. Mechanical brakes are still needed, at the initial deceleration from high speed (where forces on motor windings and gears are quite large) and for stopping from low speed where dynamic braking is only asymptotically effective. Nevertheless, the net result is much quieter operation.

If all-mechanical brakes are used, a quieter system usually obtains if shoes bearing directly on wheel treads are replaced by disk brakes, one disk per axle. Heavy application of tread brakes may cause local melting of the tread, with consequent increase of support system noise from the rough surface developed. With all brakes there is the danger of sliding the wheels, thus developing a flat that can increase radiated noise by over 15 PNdB. However, several devices are on the market that sense the approach to sliding, and release the braking force enough to maintain maximum non-slipping friction. These devices are in extensive use on aircraft landing gear, and their application to railed vehicles should be straightforward.

Some of the completely enclosed, fluid-supported, mass-transit systems may have to use reaction motor braking. This can be noisy, but not to the community if the enclosure (tunnel) is thick enough.

MISCELLANEOUS NOISE SOURCES

Auxiliaries can be an annoying source of noise. Compressors and blowers can contribute to community annoyance, but ordinarily their contribution is lost in support and propulsion system noise. However, low-noise components are available, and control of this noise at the source is relatively straightforward.

Vehicle air conditioning and ventilation systems usually annoy only the passengers, and even then in a secondary fashion. The duct work and the points at which it pierces the vehicle boundary represent weakening of the noise isolation afforded by the vehicle body. Under these conditions, careful design is needed to retain the needed isolation without incurring the operating penalty of excessive vehicle weight.

Several miscellaneous sources exist in most high-speed mass transit systems. The noise radiated to the community as a string of vehicles emerges from a tunnel is objectionable in part because of the rapid rate of noise increase. There are few data, but it appears that a rate of 5 dB/sec is only marginally acceptable to those close to the right of way. To decrease the rate of onset of exciting noise, the tunnel opening should be gradual. For example, the first opening can be in the top of the tunnel, gradually widening over to the sides and down. Even retaining walls that

taper down to track level can be helpful. Worst, however, is the abrupt opening from a hillside, with the vehicles emerging on to a trestle. The synergistic effect of the usually unsightly or out-of-place trestle reinforces the annoyance of the noise. Here the trestle design should include esthetic considerations, preferably with suitable landscaping. The track may even have to be enclosed in a tunnel on the trestle, for both visual and aural shielding. This was actually proposed for a mass-transit system that traversed a ravine in a park.

THE PASSENGER

The above discussion is chiefly in terms of annoyance to the community. But what of the man who supports most mass-transit systems, the passenger? Whether he is waiting on a station platform or is in a vehicle, he is closest to the noise source, and receives a concentrated and almost continuous exposure during his trip. We have noted criteria based on speech interference only. This admittedly still results in an in-vehicle noise environment that would not be tolerated in a living room. For the passenger on the platform of an underground station, an effective but sometimes expensive noise control means is to wall off the platform from the tracks. With the vehicles stopped in the proper place, doors in both vehicle and barrier wall are arranged to open at mating positions. Because the required attenuation of the wall is only 25 to 30 dB, its construction need not be expensive. Probably most of the noise will come through the doors, which are difficult to seal inexpensively.

It is the passenger in the vehicle on whom our attention should be directed, for his noise exposure is almost continuous. About the only good thing about the noise he ordinarily experiences is that it effectively excludes all other stimuli. This isolation will be useful for someone who wants to concentrate on a problem. But for most passengers the noise will be a frustrating, conversation-inhibiting nuisance that is to be suffered in internal silence until a mass-transit bond issue is up for approval.

The chief noise protection for the passengers is afforded by the vehicle body. Because the amount of noise varies around the vehicle, the acoustical isolation can be graduated to be most where the noise is greatest. For bottom-supported vehicles, maximum noise occurs next to the support and propulsion systems. Thus the floor should afford the best isolation.

Measurements on railed vehicles indicate that in the open the noise beside a window may be as much as 20 dB less than under the car. In a tunnel, reflections from the walls can increase the noise levels outside the windows by as much as 10 dB, depending on clearances and wall absorption. Even a moderate amount of absorption can reduce the in-tunnel levels noticeably. However, the practical problem is one of maintenance—how to remove pore-clogging dirt and grease from the absorbent. Open-pore concrete or ceramic absorbents can withstand severe cleaning, but are too expensive for lining the whole tunnel.

It has been suggested that large amounts of absorption be used near the tunnel opening. This would be graded to zero in a few hundred feet. The gradual increase in level on tunnel entry is conjectured to be more acceptable to the passengers than the abrupt rise usually experienced. Although this seems plausible, there are no psychoacoustic data to support the argument.

The above discussion bears out the fact that the vehicle floor should usually have the best isolation, perhaps 30 dB better than the windows. Although single-glazed windows are notoriously transonant (transparent to sound), it may often occur that in a lightweight vehicle the floor is the acoustically weak element. This is particularly the case when the floor is pierced by several air ducts. The noise can enter through the thin walls of an ordinary duct, travel inside the duct, or pass through imperfectly sealed openings. The ventilating system must be carefully designed to defeat all of these incursions into the vehicle. Duct walls must be of sound-isolating construction, noise attenuating duct sections are needed at appropriate positions, and all openings must be thoroughly sealed with a compound that remains elastic (does not dry hard). Duct openings to the outside should be at minimum noise locations.

If roof ventilators are employed, these become a leakage path for noise. Not only this, but on sudden tunnel entry there is sizable transient increase in pressure, enough to be felt easily like a mild sonic boom. On Japan's famed Tokaido line, with a maximum speed of 150 mph, the tunnel entry pressure pulse (also a species of noise) was so severe that automatically closing roof ventilators when entering a tunnel were investigated to reduce the annoyance and the startle reaction.

A difficult engineering problem arises from the conflicting requirements of light weight and low noise. For high noise isolation, the structure should be heavy, or made from several relatively independent layers. Thus vehicle weight or strength may suffer. This problem still represents a challenge that requires close cooperation between designer and acoustical consultant.

In tunnels the passenger receives much of the noise that is reflected from the walls, particularly if the side walls of the vehicle are acoustically weak. Much of the noise can be confined below the vehicle by maintaining wall clearances at a minimum near the support system, and by using as much absorption as possible below the vehicle. Tuned absorbers—a cavity with absorbing material in the opening—can be very effective if the noise spectrum shows pronounced maxima.

NOISE CONTROL IN OPERATING SYSTEMS

Once the system is in operation, there will no doubt be situations for which unanticipated adverse reactions of passengers and community to noise develops. When complaints are such that lost revenue and law suits cost more than added noise control, noise reduction becomes worthwhile on a purely economic cost/effectiveness basis. Assuming that system maintenance is not at fault, a most useful noise-control device is the acoustic parapet. This is simply an absorbent-lined wall on both sides of each vehicle path. The higher the wall and the smaller the clearance to the vehicle, the greater the noise reduction. For closely fitting parapets extending up to just below window height, noise radiated to the community can be reduced as much as 15 dB. On curves the value of the parapets is reduced, because their clearance must be much larger than on the straight. For a 50-ft vehicle on a curve of radius 1000 ft. the parapet clearance must be at least 4 inches greater, thus allowing much more noise to escape. Nevertheless, acoustic parapets are a most useful facility, to be used as needed. It should be noted that such parapets will cause some increase in the noise in the car, but not nearly as much as will a tunnel. However, no data has been reported on this effect.

If steel aerial structures are used, it has been noted that properly designed and installed rail pads should be used for the utmost reduction in noise radiated from the structure. However, if additional structure noise reduction is needed, damping materials can be added to the steel. The best of these materials set to a very hard layer, and are specially compounded to change vibratory energy into heat. Unsatisfactory are materials that remain soft or mastic. On thick steel, foamed elastomers are useless as damping materials.

Damping materials can also be added to wheels that, despite all care, are too noisy. The material is most effective at the tread portion. A major consideration is safety. The centrifugal force at the rim of a 30-inch wheel going 80 mph is over 300 times that due to gravity. Thus the damping material must be securely held down, lest it become a rather lethal missile.

Gear noise may often become the chief source of noise as vehicles age. There is essentially no satisfactory solution to this problem. As noted earlier, more research is needed on noise-conscious gear case design. Damping material on the case may possibly help if much of the radiation comes from that area. However, the gear will probably then run hotter and become noisier more rapidly.

A major factor in any noise-control program is the public relations aspect Many a situation has been saved by prompt, concerned attention to noise complaints. For example, planting a thin line of trees and shrubs has little effect on measured noise, but to complainants it is evidence of concern that is always of assistance in preventing escalation of a complaint situation.

Perhaps the most effective means of control is to mask the noise—site the mass transit system down the middle of a busy freeway. However, that solution is not often available. In the meantime we shall have to rely on constant attention during the design stage, careful maintenance, and alertness to developing complaint situations. The noiseless system will never be built, as long as there are ears to hear it. But we can at least be interested in people not merely as taxpayers or fares, but rather as humans whose needs are to be fulfilled without exacting the tribute of noise, or polluting their air with audio smog.

Asphalt magazine, a quarterly publication of the Asphalt Institute, in the July 1967 issue, has the following:

ASPHALT: ANTIDOTE TO NOISE—FRENCH STUDIES PROVE ASPHALT PAVEMENTS QUIETEST

(NOTE.—Information for this article was extracted, with kind permission, from Etudes Routieres (Geneva) Volume VIII–9.)

Car travel, over the years has reached a stage of high comfort. Manufacturers offer engines that are whisper quiet. Suspension systems afford smooth riding over less-than-good pavement surfaces. And Robert Thompson's 1845 invention—the pneumatic tire—has gained such refinement that in optimum conditions its contact with the pavement is almost noiseless.

Nonetheless, vibration noise caused by tires rolling over pavements offering less than maximal quietness can be a wearying distraction to both driver and passengers. Also, it is a noise that in multiplication may physiologically affect those having to spend time in proximity to streets and highways.

Aware of the subject's importance, and taking the lead in the definitive investigation of pavement noise levels, French authorities recently studied the decibel differences[1] between cars traveling over the normal[2] pavement types, asphalt and portland cement concrete. The results were:

(A) Average-powered car traveling at 35 mph on city roads: Asphalt pavement, 82–84 dB (average 83); concrete pavement, 92–96 dB (average 94).

For the city pedestrian the results were significant in that the pressure of the sound

[1] The formula used in the studies was:

$$N(dB) = 20 \log_{10} \frac{P}{P_o}$$

where N = number of decibels
P = pressure emitted by the adiabatic sound wave
P_o = minimum audible pressure, being 2.10-4 dyne/cm².

[2] Included in the French studies, but not in this summary, were noise level measurements on cobblestone streets.

wave for a concrete pavement is some 3.5 times greater than for an asphalt pavement.

(B) Powerful car traveling at 62 mph on country roads: Asphalt pavement, 64 dB; concrete pavement, 67 dB.

The decibel difference, although less perceptible than those for city roads, is significant in that the sound pressure relative to a concrete surface of average quality is 40 per cent greater than that for an asphalt pavement.

According to the French investigators, sound pressure findings, when related to forces unavoidably picked-up by human ears, must necessarily be mathematically squared. For the 35 mph city roads experiments, this results in the *sound energy generated when driving on concrete being ten times greater than when driving on an asphalt pavement.*

The quiet-ride properties of asphalt pavement have, of course, been known for many years. For example, engineers responsible in 1947 for overlaying with asphalt the granite-block pavement of New York's Holland Tunnels still recall the resulting dramatic drop in traffic noise. And asphalt coatings are in regular use as architectural sound deadeners and insulators.

The French studies serve to place in cogent perspective the fact that asphalt pavements are not only superior from the economy and engineering aspects, they are also of inestimable value in reducing a bane of modern living—Noise.

Labor, the weekly newspaper of 18 unions representing railroad and airline workers in the issue of September 23, 1967, has the following item:

NOISE POLLUTION

The U.S. government is studying ways to reduce the "noise pollution" near major airports.

The National Aeronautics and Space Administration is examining the idea of increasing the angle of descent for planes approaching an airport. NASA officials feel this would cause planes to remain at a higher altitude for a longer period, thus cutting the "circle of loud noise."

Rep. T. R. Kupferman (R., N.Y.), commenting on the same subject, declared that something must be done on a national scale to reduce noise pollution. Otherwise, he said, "we are building . . . the noise slums of the future."

The UNESCO Courier for July 1967 devoted an entire issue to the subject to noise pollution. Unfortunately, many of the illustrations cannot be reproduced. The first article is entitled "Down With Decibels":

DOWN WITH DECIBELS

(By O. Schenker-Sprüngli)

(NOTE.—O. Schenker-Sprüngli of Switzerland is Secretary-General of the International Association Against Noise. A lawyer by profession, he is director of the Swiss Anti-Noise League.)

Noise has always been with us, but never has it been so obvious, so intense, so varied and so pervasive as it is today.

Modern life has been made easier by numerous technological innovations, but some of the side-effects make progress as a whole seem problematical and indeed, in some respects more like regression. In addition to the serious problems of air pollution and water pollution we now have to contend with "noise pollution" in many forms.

Unlike the lucky few who can spend their lives far from the clamour of our technological age, most people, at least in industrial areas, are obliged to live and work under conditions in which noise often attains an alarming level. In the home, children are unable to sleep or are suddenly aroused by the roar of a passing aircraft or the din of a noisily revving automobile.

Older people also suffer from these disturbances. Deprived of a proper night's sleep in a well-ventilated room, many people are unable to recuperate the physical and mental energy they have used up at work and will need again next day. They try to shut out noise by keeping windows closed or wearing ear plugs. And even then they cannot be sure of sleeping undisturbed.

Next morning they have to face another day of hard work, often in noisy surroundings, which means that more nervous energy is burned up in resisting the stress of noise, instead of being used productively.

Insufficient rest and relaxation inevitably reduce efficiency. Noise, in fact, causes an incalculable loss of nervous energy to the detriment of the health and well-being of the individual and ultimately to the detriment of the national economy as a whole.

Although these facts have been confirmed by studies and research in Switzerland and many other countries, a few people still maintain that until noise "has turned a grey mouse into a white one", all that has been affirmed about the effects of noise is merely theoretical and therefore inconclusive.

Such persons are merely side-tracking the problem. It is just as though the painstaking research on noise that has been going on over the past ten years, leading in each case to identical conclusions, has been a complete waste of time.

Yet anyone who observes present-day conditions of life not only in our cities, but increasingly in the countryside, too, can see for himself the direct and indirect effects of incessant noise on modern man; nervous troubles, reduced powers of concentration, inefficient work, increasing absenteeism, among others.

These few examples give us a general idea of the present state of affairs. How did we come to be in such a situation? Primarily because social and legal measures were not taken to prevent it, and for the failure to act in time the public authorities bear the major responsibility. For far too long the spread of noise was accepted as a natural process, as a price to be paid for our technological progress. Law, justice and public authorities all capitulated to technology.

In such a situation the average person tended to feel, and to become, helpless. The first wave of protests gave way to resignation. People shrugged their shoulders and said "There's nothing we can do about it".

But just over ten years ago organizations were set up in a number of European countries to wage campaigns against the spread of noise. These bodies, whose organizers were often eminent doctors, jurists, engineers and specialists in acoustics, decided to unite their action and in 1959 formed the International Association Against Noise. The Association has so far held four important congresses on noise abatement (Zurich, 1960; Salzburg, 1962; Paris, 1964, Baden-Baden, 1966) and will hold its fifth congress in London early next year.

It is all very well to set up organizations and hold congresses and meetings in different countries but what practical results have been achieved by all this? Here are a few examples:

By stimulating new activities, meetings and congresses have given an impetus to basic research and have promoted progress, often of outstanding value. But it obviously takes more than a few years to eliminate even the major part of all the noise that has been accumulated by the unbridled expansion of technology over several decades. Achievements during the past ten years in acoustics, sound-proofing techniques and the introduction of anti-noise regulations have nevertheless been remarkable.

Each of the congresses of the International Association Against Noise has enabled over 500 specialists to exchange ideas, pool their experience and establish fruitful contacts on both the personal and scientific levels.

Since its foundation and especially on the occasion of its four congresses the Association has established contacts with major international organizations, including the United Nations Office in Geneva, the World Health Organization, the Council of Europe, the European Conference of Ministers of Transport and the International Organizations for Standardization. It also works closely with other organizations concerned with anti-noise campaigns, and its specialists are frequently consulted on major problems and decisions in the field of noise abatement.

Since its directorate has always comprised a physician, an engineer, a specialist in acoustics and two jurists, the International Association is in a position to give prompt and authoritative opinions on questions of international scope within its field.

If the problem of noise is to be resolved several factors will have to be kept constantly in mind:

Although the campaign against noise is a global problem, its starting point must be the individual. An individual effort to overcome egotism is a prerequisite of any collective anti-noise campaign. Anyone unable to make this effort of self-restraint and incapable of recognizing the real meaning of technical creativity, is already a victim of the technological era along with its unwanted products: noise and the pollution of air and water.

Noise and reflection are mutually exclusive. Noise is an obstacle to brainwork and can easily disrupt a vital train of thought.

It would be wrong to blame technology for all the noise, past and present, that has afflicted man. Technology as such is neither good nor bad. It is the men behind it who are responsible for noise, and it is for them to seek the remedies. As Professor Gunther Lehmann, President of the International Association Against Noise has said, "Noise is not a measure of the progress of technology, but a sign of regression".

When it comes to doing something practical about excessive noise, it is clear that most people are unwilling to take the initiative. Noise can be tackled with some hope of success only with the backing of public opinion and proper laws and regulations. Lawmaking is therefore a vital factor in anti-noise campaigns.

But laws are effective only when they are rigorously enforced. And public interest in anti-noise campaigns usually needs arousing, since many people, even the well-educated, fail to realize the harm that permanent and excessive noise can do to the human organism.

To stimulate this interest, effective public information campaigns are needed, based on the authoritative scientific data collected in the past ten years by national and international bodies, whose members include many distinguished specialists.

One example is the report submitted to the Swiss Government in 1963 by specialists in the Swiss Federal Anti-Noise Commission. Its conclusions, by the way, agree with those presented to the U.K. Parliament the same year by the British Committee on the Problem of Noise.

The Swiss Anti-Noise Commission is composed of 52 specialists and its studies and research are carried out by five sub-commissions dealing with basic medical, acoustic and technical questions; road, rail, sea and river traffic; aircraft noise; noise in industry, building construction, homes, etc; and legal questions.

Their work has enabled encouraging progress to be made in Switzerland. Public indifference to the increase of noise is gradually disappearing. More vigorous legal and administrative action is being taken against persons failing to comply with noise regulations. An official research, testing and advisory centre (the Acoustics and Anti-Noise Division of the Federal Materials Testing

Institute, at Dübendorf, near Zurich) has been set up.

The "maximum noise level" scales established by the Swiss Anti-Noise Commission have also been of great value (see below).

MAXIMUM NOISE LEVELS ESTABLISHED BY THE SWISS ANTINOISE COMMISSION

[In decibels]

Areas	Basic sound		Frequent peaks		Infrequent peaks	
	Night	Day	Night	Day	Night	Day
Recreational	35	45	45	50	55	55
Residential	45	55	55	65	65	70
Mixed	45	60	55	70	65	75
Commercial	50	60	60	70	65	75
Industrial	55	65	60	75	70	80
Main traffic arteries	60	70	70	80	80	90

Figures are given in decibels (dB, the measurement unit for noise). A level of 80–85 dB is what is normally expected from the continuous noise in a busy main street of a large city. These maximum noise levels have been accepted by the Swiss courts.

Like those already in force for automobiles in many countries, the Swiss maximum noise levels are easier to enforce nowadays thanks to technical advances in noise prevention during the past ten years.

In building construction, for example, relatively silent machines have taken over the job of foundation digging from the far noiser pile-drivers, electro-mechanical drills replace the clattering compressed-air variety and special screens now absorb the din of compressors.

Automobile noises can be reduced by the more effective exhaust mufflers now available and also by non-slam doors and boot lids.

Much can be done to reduce the din of aircraft. Already some have been fitted with silencers and further improvement has come from the installation at airports of acoustic check posts and sound-proofed hangars for testing engines. The enforcement of stricter flying regulations has also played its part.

Sound absorbing materials, drapes, curtains and carpets which deaden noise, quieter air-conditioners, ventilators and other household appliances, and sound-insulated ceilings, walls, doors and windows all help to make the home a quieter and more restful place.

Combating noise is above all a question of showing consideration for others and of the right kind of upbringing. It thus has to begin in the home as part of the education of children and adolescents.

To sum up, it seems certain that our present understanding of the problem of noise coupled with our technical knowledge and resources now give us the means to bar the way to disturbances from noise. But those who undertake this task will need great courage and determination, since many people still fail to recognize the real importance of anti-noise campaigns, especially those who rate technical progress higher than ethical values.

A current example of this attitude is the effort now being made by the aeronautical industry to persuade us that we shall enjoy the din of supersonic airliners. Public relations machinery and techniques are working on an unsuspecting public with the slogan "learn to live with the boom". But booms and bangs are incompatible with daily life. Anyone who cannot see this is gambling with nature, instead of living in harmony with it.

The program for the recent London Conference on "The Conquest of Noise" held May 13 to 18. My correspondence, and the news report thereon, follow:

Following the AICB Congresses held in Zurich (1960), Salzburg (1962), Paris (1964), Baden-Baden (1966), the Noise Abatement Society is now making preparations for the Fifth International Congress, the theme of which will be: "The Conquest of Noise."

The Noise Abatement Society has pleasure in extending to you a cordial invitation to participate.

The Congress will take place in the newly built Queen Elizabeth Hall and a simultaneous interpreting service in three languages, English, French and German will be provided.

There will be a grand Exhibition held in Battersea Park to coincide with the Congress.

At the conclusion of the Congress and Exhibition from Saturday, May 18th onwards, visitors are invited to take the opportunity of visiting places of current and historic interest in London and the Provinces, for which arrangements can be made through American Express.

This provisional Programme is intended merely as a preliminary notice from which we hope to gain an idea of the approximate number of Delegates. We shall be extremely grateful if you will let us know as soon as possible on the enclosed Reservation Form if you wish to attend.

If you would like to give a short talk on any particular aspect of Noise Abatement (lasting approximately 5 minutes), will you please send us the full script in triplicate and a short summary in English, French and German. We would especially welcome reports by delegates of practical noise abatement measures recently taken in their town/country, as well as medical evidence of the effects of noise.

It is intended that all talks will be printed and published in the final Congress Report even if some of them cannot be given during the actual Congress owing to lack of time.

JOHN CONNELL,
Chairman, Noise Abatement Society.

NOISE ABATEMENT SOCIETY,
March 7, 1968.

Congressman THEODORE R. KUPFERMAN,
New York, N.Y.

DEAR CONGRESSMAN KUPFERMAN: Many thanks for your kind letter of 4th March. We are most happy to know of your interest in the International Noise Abatement Congress to be held here in May, and have pleasure in enclosing the provisional programme.

We are, of course, very well aware of your own fight against noise and if, as we very much hope, it is possible for you to attend the Congress, a Paper from you would be an important contribution to the proceedings.

I am not yet able to give you the detailed programme for the Congress, as Papers are being submitted every day, but you will be interested to know that they are coming in from top level experts, Heads of Government Departments, etc. all over the world. We believe it will be a most important occasion which will attract world-wide attention.

With kind regards.

Yours sincerely,
NOISE ABATEMENT SOCIETY,
A. CROSSE, *Organizing Secretary.*

NOISE PARLEY ASKS SONIC FLIGHTS CURB

(By Alvin Shuster)

LONDON, May 18.—Amid signs reading "No Noise Is Good Noise," delegates from more than 30 countries concluded a week-long conference here today on the need to make life quieter.

The delegates to the Fifth International Congress for Noise Abatement heard speeches deploring the rising assault on the human ear and pleading for quieter aircraft engines, more insulation in new buildings, mufflers on factory and construction equipment and more governmental action to do something about it all.

The congress adopted a resolution today urging governments to prohibit supersonic flights over their territories in view of what John Connell of Britain, chairman and founder of the Noise Abatement Society, called the "physical and mental disturbance" such flights might cause.

In a report on noise in the United States, Dr. Charles Wakstein of Dartmouth College said that the 150 million American urban dwellers are "subjected to annoying noise levels in their homes on account of traffic."

WARNING ON NEW PLANES

If overland flights of the SST, the projected supersonic transport plane, are permitted, he continued, about 50 million people in the United Sates could be exposed to an average of 15 sonic booms a day. The flights, he estimated, could cause $100 million a year in damage to homes, mostly to plaster and windows.

Dr. Wakstein's paper was based on a study carried out this summer by a group at Carnegie-Mellon University under the sponsorship of Resources for the Future, Inc., a private foundation based in Washington. The report has not yet been published.

"In spite of the great interest in the United States in the problem of annoyance caused by jet aircraft noise near airports," Dr. Wakstein said, "it seems inescapable that hearing damage caused by exposure to noise is serious. As it happens, most of this hearing damage is caused by noisy jobs."

EXPOSURE OF WORKERS

About eight million workers, he said, may be exposed every day to levels of noise above 95 decibels—sound intensity is measured technically in decibels—for more than five hours a day. This could be enough, he said, to cause hearing damage. Yet, he noted, there is a serious question as to how many workers are aware of the danger.

"We found tree workers, for example, bithely exposing themselves to 120 decibels from their chain saws," he said.

An ordinary conversation, for example, has a noise level of about 50 decibels at a few feet. The loudness of a sound doubles every 10 decibels.

Dr. Wakstein, calling for more studies of all aspects of the effects of noise, said that the evidence so far indicated little psychological harm to those surrounded by constant noises.

"Some people active in noise abatement make statements that noise drives people crazy," he said. "As much as we might have wanted to confirm this, we couldn't."

In other talks in Queen Elizabeth Hall, the delegates heard two New Yorkers—Robert Alex Baron, executive vice president of Citizens for a Quieter City, Inc., and Ralph G. Caso, Presiding Supervisor in Hempstead, L.I.

Mr. Baron asked the delegates to urge their communities to postpone center-city landing strips for helicopters and the new vertical and short take-off and landing planes until there could be thorough investigations into their impact on the urban environment. He noted that New York had plans for such a strip in Manhattan "along the river's edge just two blocks from my house."

The congress adopted a resolution that he proposed calling for a ban on the building of heliports in areas of high-density population.

Mr. Caso suggested that a subcommittee of international experts be set up to formulate a code of uniform regulations to curb commercial aircraft noise at major airports and to propose acceptable noise levels.

I have had the opportunity of meeting with Horace Weston, scientific officer, Division of Occupational Health, in Sidney, Australia. His letter to me of October 19, 1967, and articles on noise in Australian journals follows:

DEPARTMENT OF PUBLIC HEALTH,
Sydney, Australia.

Hon. TED KUPFERMAN,
New York, N.Y.

DEAR MR. KUPFERMAN: I have received from you the copy of the Bill which you introduced on "Noise", dated January 18, 1967, and also the extract from the Congressional Record, April 21, 1966, concerning "Noise Pollution", for which I thank you. These are of considerable interest to me.

My discussion with you regarding noise was most interesting and very helpful to me, and I would like to express my appreciation to you for so kindly making your valuable time available to me.

I feel that my tour of the States was not only interesting, but very useful. During the trip, I saw evidence that engineers and executives in many industries are very much aware of noise and are working with a view to reducing it, where practical, in future. Of course, thre is still a long way to go, and no doubt, there are many who have not yet been sufficiently motivated.

I am attaching reprints of articles, viz. "A Survey of Tractor Noise and the Effects on Hearings", which I did in 1963, and "Industrial Notes in Residential Areas", which I wrote prior to my visit to the States. You may find these of some interest.

Wishing you every success in the future,
Your sincerely,

HORACE R. WESTON,
Scientific Officer.

[From the Journal of the Australian Institute of Agriculture Science, March 1963]

A SURVEY OF TRACTOR NOISE AND THE EFFECTS ON HEARING

(H. R. Weston) *

[Figures referred to not printed in the RECORD.]

It is well known that the man on the land can be exposed to a wide variety of occupational accident and health risks, such as the use of pesticides which involves considerable danger if they are not handled in the correct manner.

Prolonged exposure to excess noise may also be a potential hazard to which he is subjected (Glorig 1958; Sataloff 1957).

EFFECTS OF NOISE

Many people are of the opinion that noise often contributes to discomforts such as headaches, irritability, fatigue and nervous tension. While this is generally accepted, there are many interrelated factors, and a definite relationship is difficult to prove.

A major effect, in which we are interested, and in which some proof has been established, is a noise-induced impairment of hearing. Exposure to noise, at a high enough level, for even short periods, will often cause temporary impairment of hearing with a rapid recovery to normal after the noise ceases. However, if the noise is repeated continually over a period of years, it may cause physical damage to the nerve cells of the inner ear, eventually resulting in permanent impairment of hearing. When this occurs, there is usually a greater loss of hearing of higher frequency, about 1000 cps, than of lower frequency sounds. The term 'frequency' is expressed in cycles per second (cps) and refers to the number of pressure impulses per second of a sound wave (Glorig 1957, 1958, 1961; Sataloff 1957).

The most important function of our ears is the hearing of everyday conversation. Our speech is made up of vowels and consonants. The bulk of the sound energy is in the vowels, and is below 1000 cps. However, it is also necessary to hear the consonants, which are mainly above 1000 cps, in order for speech to be intelligible. It has been found that when a person suffers a greater loss in the high frequency range, his ability to hear the consonants is reduced without a corresponding reduction in the hearing of vowels or the total volume of sound. If this impairment continues, the hearing of speech may eventually become distorted and unintelligible. This is a serious social disadvantage (Glorig 1961).

Such an impairment usually occurs without discomfort or pain in the ears. The first indication may be a difficulty of hearing speech clearly, or a loss of tone of music.

Considerable investigation has been carried out on noisy occupations by overseas research groups, primarily the Sub-Committee on Noise Research Centre, Los Angeles, and also in Australia, by the Commonwealth Acoustic Laboratory. Based on the consensus of opinion, criteria have been established for noise levels above which there is a likelihood of hearing impairment (Glorig 1957). The figure, for a particular noise, above which prolonged exposure is considered a potential risk, is usually referred to as the 'hearing conservation level.' In industry, this level is taken as 85 decibels in any one of the four octaves from 300 cps to 4,800 cps; the ear is most sensitive in this range. When this limit of 85 db is exceeded, the term 'excess noise exposure' indicates the amount of this excess in decibels.

Audiograms showing hearing loss at various frequencies (see Figure 1) illustrate the typical trend in the development of permanent noise-induced impairment of hearing. In the later stages it extends to lower frequencies, and increases further in the high frequencies so that the hearing of speech becomes distorted and muffled.

SURVEY OF TRACTOR NOISE

As it was considered that tractor noise could be a potential occupational hazard, a survey was carried out by the Division of Occupational Health in conjunction with the New South Wales Department of Agriculture, in two areas, viz:

The Richmond-Windsor district, which is typical of coastal farming where the tractors were generally less than 50 H.P.

The Parkes district, which is inland, where many of the tractors were larger, in some cases up to 60/70 H.P.

In addition, measurements were taken at distributor depots on latest models, some up to 80 H.P., running at speeds estimated to represent field conditions.

Farming in the Richmond-Windsor area is devoted mainly to vegetables and citrus, so that tractor work is varied. It may be partly seasonal for 8 to 10 hours a day for two weeks or up to two months at a time. Generally it appears to be spread over long periods with some driving at frequent intervals.

In the Parkes area the farms, mainly wheat-holdings, are larger, and the tractor work is seasonal, mainly fallowing, sowing, and harvesting. During these periods drivers may operate 8 to 12 hours a day for several weeks at a time. It was estimated that, on the average, a driver could be regarded as operating "all day" for a total of about 10 to 12 weeks a year. During the remainder of the year work is intermittent and usually is for short periods at a time.

Two distinct sets of data were collected in each area:

1. Sound levels were measured in the driver position under normal operating conditions.

2. Hearing tests were carried out on the tractor drivers under quiet conditions. This was done before they had driven on the day of the test, to avoid temporary loss.

Noise level measurements

Sound levels can be measured with a meter consisting of a microphone which converts pressure to electrical impulses which are amplified and measured. The unit used is the decibel (db). It is a logarithmic unit related to the 'threshold of audibility' at 1000 cps for good ears, which has been found to be approximately 0.0002 dynes per square centimetre. This is taken as zero decibels. When the sound intensity is doubled the measurement on the decibel scale increases by 3.

The ear responds differently to different frequencies. Two noises of the same sound level may differ considerably in loudness and risk of damage. Consequently in evaluating a particular noise, in addition to the overall sound level, a sound analysis can be carried out to determine the sound level in each octave band, referred to as the acoustic spectrum.

Tractor noise was measured and recorded on tape with a sound level meter and a tape recorder. The recordings were later analysed into octave bands by feeding from a playback into a sound analyser, which electrically filters out frequencies as required. Before carrying out measurements in the field, the sound level meter was checked and calibration tones were recorded on the tape, as shown in Figure 2.

The noise levels measured under operating conditions were considered representative of the average noise conditions to which drivers are likely to be exposed; the power output of the tractor in work was not measured.

Hearing tests

It has been found that exposure to noise causes a typical early loss of hearing at 4000 cps; with further exposure this loss increases at 4000 cps and extends to other frequencies.

Hearing tests were carried out on tractor drivers, as shown in Figure 3, with an audiometer, a device which produces pure tones at various frequencies. The sound level in the earphones can be varied, and the lowest level at which the person can just detect it, known as the person's hearing threshold, is determined.

The tests were done, at frequencies from 500 cps to 6000 cps, on persons who had spent 8 years or more on tractor work. In both districts the average time on tractors was given as 18 years. In the Parkes district figures were taken for 34 drivers, and for 19 in the Richmond-Windsor area.

RESULTS OBTAINED

Noise

A number of drivers felt that the noise affected their hearing for some time after finishing work, and some mentioned subsequent ringing in the ears. Although this can be due to other medical reasons, when it is noticed after driving it most likely indicates that there is, in fact, a noise risk which may, in time, effect the hearing. In a few cases, plastic ear plugs were used, and some drivers attempted to get some protection by using cotton wool.

The general range of figures in Table 1 shows the overall sound levels, octave band sound levels, and calculated 'excess noise exposures' in two broad tractor groups, below and above 50 H.P.

Generally, farm tractor noise levels ranged from 92 to 106 db, but some were up to 114 db with 'excess noise exposures' up to 15 db.

The 'excess noise exposures' shown in the Tables 1 and 2 for tractors are based on noise levels in the four octaves from 300 cps to 4,800 cps, in relation to the standard of 85 decibels. However, noise outside of this range can be damaging if high enough. Some tractors showed particularly high levels below 300 cps.

Considerable variations were sometimes observed on machines of similar nominal power capacity. Generally, the figures in the lower power group would not be regarded as excess noise exposure. It should be noted, however, that the tractors were not necessarily working at or near full power, when the noise level might be expected to be at a maximum. In the over 50 H.P. group, noise levels were frequently in the excess exposure class.

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*Mr. H. R. Weston is a Scientific Officer in the Division of Occupational Health, Department of Public Health, New South Wales.

TABLE 1.—THE OVERALL SOUND LEVEL AND DISTRIBUTION IN OCTAVE BANDS OF TRACTORS UNDER OPERATING CONDITIONS

Tractor group	Decibels									
	Overall,	Octave bands (cycles per second)								Estimated excess noise exposure
	20 to 10,000	37.5 to 75	75 to 150	150 to 300	300 to 600	600 to 1 200	1,200 to 2,400	2,400 to 4,800	4,800 to 9,600	
25 to 50 horsepower:										
Diesel 30/40	93	90	83	79	74	76	70	67	65	−9
Do	92	86	88	84	77	82	75	70	63	−3
Kerosene 30/40	92	85	89	79	75	73	67	64	68	−10
Kerosene 25/30	93	84	89	83	81	76	79	79	80	−4
Diesel 25/30	101	94	98	90	91	90	91	85	77	+6
Kerosene 25/30	100	94	97	86	84	86	89	87	83	+4
Over 50 horsepower:										
Kerosene 50/60	97	85	91	94	86	83	79	76	72	+1
Diesel 50/60	106	104	99	98	92	92	93	92	87	+8
Do	95	88	91	90	81	82	81	74	69	−3
Do	98	93	90	90	88	84	85	83	81	+3
Diesel 70/80	101	98	98	91	84	80	77	74	68	−1
Diesel 60/70	106	104	101	97	98	92	87	85	78	+13

TABLE 2.—OVERALL SOUND-LEVEL MEASUREMENTS AND OCTAVE BAND ANALYSES OF CRAWLER TYPE TRACTORS UNDER SEVERAL LOAD AND MOVEMENT CONDITIONS

Tractor and operating particulars	Decibels									
	Overall	Octave bands (cycles per second)								Estimated excess noise exposure
	20 to 10,000	37.5 to 75	75 to 150	150 to 300	300 to 600	600 to 1,200	1,200 to 2,400	2,400 to 4,800	4,800 to 9,600	
20/30 horsepower, old model:										
(a) Towing 20-prong scarifier	99	91	95	88	86	87	86	78	73	+2
(b) Plowing with 20-prong scarifier	101	94	98	90	91	90	91	85	77	+6
40/50 horsepower, old model:										
(a) Stationary under open shed	113	109	103	103	100	96	93	92	95	+15
(b) Normal working gear without load	113	110	105	102	95	96	93	93	89	+11
50/60 horsepower, new model:										
(a) Stationary, estimated normal engine working level	94	91	89	89	86	84	83	73	69	+1
(b) Stationary, under load of blade	98	95	91	92	87	86	84	76	69	+2
(c) Normal forward working	99	95	93	92	87	86	84	75	69	+2
(d) Reversing	94	89	86	87	85	83	80	72	64	Nil
(e) Forward travel	93	87	86	87	84	84	80	72	65	−1
70/80 horsepower, new model:										
(a) Stationary, estimated normal engine working level	103	89	102	93	91	85	83	73	65	+6
(b) Traveling very slowly under heavy load (slow enough to avoid track noise)	103	92	102	92	89	88	85	75	68	+4
(c) Normal operating forward	103	92	102	92	90	86	83	74	66	+5
(d) Reversing	103	90	102	92	91	86	83	73	66	+6
(e) Normal fast travel	105	95	102	95	92	91	87	79	71	+7

Figures for two new machines operating at normal governed working speeds without load and with the same type of spark arrester, which also acted as a muffler, are shown in Figure 4. In this case the higher power machine was the quieter of the two.

Most of the tractors over 50 H.P. that were measured were diesels. In the lower power group they were mainly diesel or kerosene machines. The figures showed no significant noise differences between these types.

It was noticed that some tractors were fitted with mufflers and some were not; some of these mufflers were burnt out and had little value for noise reduction. Other tractors were fitted with spark arresters, specifically intended as such, which also had some value as mufflers. Some operators used a combination of both, and in several cases they were not using any except in the summer, when a spark arrester is necessary. Measurements taken on several machines showed considerable increase of noise when operating without a muffler. The increase was mainly in the important middle and high frequencies and did not always result in much difference in overall noise levels. Several cases are illustrated graphically:

(a) Figure 5 shows that a simple perforated-pipe type of muffler, on an old model 50 H.P. kerosene tractor, made little difference to the overall sound level, but there was considerable reduction in the more important high frequencies.

(b) Figure 6 illustrates considerable reduction in overall sound level throughout the whole frequency range on a new 40 H.P. diesel tractor.

(c) Figure 7 shows an interesting muffler effect observed on a 60 H.P. diesel tractor with, and without, a spark arrester. Although there was considerable reduction in the important high frequencies, this was partly counteracted by an increase in low-frequency noise. This is most likely due to resonance, and would indicate, in this case, some need for attention to suitable design for the particular engine if the spark arrester is to have optimum value as a muffler.

Some people consider that track noise, as distinct from engine and exhaust noise, may be a major factor on crawler type machines. This view may have originated with the older machines of this type.

It was not possible to operate the tracks without the engine and associated noise; consequently, the contribution of the tracks could not be determined. However, in order to gain some idea of the relative importance of track noise on crawler type machines, the following sets of measurements were carried out:

(1) With the engine operating under load:
(a) While moving.
(b) Remaining stationary.
(c) Moving very slowly.
(d) Traveling fast.
(2) With the engine and tracks operating together at normal ploughing speed:
(a) With a light load.
(b) Under a heavy load.

Details are shown in Table 2.

Sound levels for tractors under load did not show any trend to a decrease in noise when the tracks were not moving, indicating that track movement here was not a major factor.

With the engine and tracks operating together at a constant track speed, and varying load, the noise levels increased with the load, which might be expected of engine exhaust noise. This trend indicates that engine exhaust is the major factor.

It is realized that track noise could vary with the type of ground, condition of tracks and so on, but the measurements taken gave no indication that, on modern crawler type machines under average conditions, the track movements make any signficant contribution to noise in the driver position.

Hearing

The two audiograms in Figure 8 represent the average hearing loss to operators in the two districts, for 19 subjects in Richmond-Windsor, and 34 in the Parkes area.

As there is some loss in hearing acuity with age, known as "presbycusis", all figures were corrected in accordance with research carried out in the Laboratory of Industrial Medicine, Eastman Kodak Company, Rochester, New York (Riley, Sterne, Fasset, and Sutton 1961). The average corrected figures are shown in Figure 9.

The results show greater impairment in the Parkes area, and indicate that there is a potential risk of impairment of hearing when driving heavy tractors over prolonged periods.

As 4000 cps is the most sensitive region of noise-induced impairment, the mean loss in decibels at this frequency, for each group of drivers, was compared with no loss to see whether it was statisically significant. The differences were statistically significant at the 1 per cent level.

Tractor suppliers who co-operated in the survey, appear to be increasingly aware of the problem and are showing considerable interest in noise reduction. The investigation indicates the importance of continued efforts to this end.

When it is not practicable to reduce noise, ear protection can be adopted when driving continuously on heavy work. Plastic ear plugs, designed by the Commonwealth Acoustic Laboratory, or similar plastic ones, are suitable if correctly fitted, and can be obtained from many safety equipment suppliers. These will provide a worthwhile attenuation of the order of 35 db., reducing noise to a safe level without preventing conversation.

In previous work carried out on this subject at the State University of Iowa (Lierle and Reger), tractor noise was regarded as sufficiently high in intensity to produce high frequency losses of hearing in tractor operators; it was considered that individuals with noise susceptible ears usually experience ringing in the ears, known as tinnitus, for some time after work.

A group of tractor drivers in New Zealand was found to show greater hearing impairments than a group of clerical workers; the use of ear protection by drivers was recommended (Bell 1956).

SUMMARY

Investigations showed that tractor noise is generally predominantly low frequency, but the middle frequencies are of sufficient intensity to be of consequence.

Under operating conditions, the noise levels are frequently excessive. Consequently, when driving over a number of years, there is a potential risk of impairment of hearing This risk is increased by operating the tractor without a suitable muffler.

Mufflers, and in some cases spark arresters, do not necessarily reduce the overall sound level to any extent, but they may make substantial reductions on the middle and higher frequencies. In some cases, owing to resonance, a muffler, or a spark arrester, may actually increase the sound level in the lower frequency range.

Tests of hearing acuity showed greater impairment on inland farmers where the tractors are of higher power and the exposure is for long periods.

When driving continuously on heavy work the use of suitably fitting plastic ear plugs is recommended.

Many tractor suppliers are now aware of the problem, but further attention to reducing noise is necessary.

ACKNOWLEDGMENTS

I would like to thank those farmers in the Richmond-Windsor and Parkes areas who so willingly co-operated in this survey; Dr. A. Bell, Director, Division of Occupational Health, for his helpful discussion and advice; and Dr. E. S. A. Meyers, Director of State Health Services, for permission to publish this article.

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Industrial Noise in Residential Areas

(By H. R. Weston, Scientific Officer, Division of Occupational Health, Department of Public Health, N.S.W.)

(Note.—This article refers to noises which originate from industry and reach residential areas at levels high enough to cause complaints; it does not deal with occupational noise. Reference is made to likely community complaints and the assessment of noise to determine their validity. This is considered from the point of view of annoyance, based on average community reactions and not health implications; there are many sounds which annoy the majority of people. It is desirable for managers and engineers to have an awareness of noise and to plan to avoid it in future developments.)

INTRODUCTION

Community complaints may arise from many activities such as go-carts, model cars and planes, sporting activities, howling dogs, noisy clubs, parties, aircraft, road traffic and industrial undertakings. Noise from industry is referred to in this article.

In recent years there has been a great increase of industry in suburban areas, often near to residential sections, so that, where adequate precautions have not been taken, new noises, to which residents have not been accustomed, have been introduced into the neighbourhoods with consequent complaints.

The growth of industry in some country centres may present potential noise problems if sufficient care is not taken in the planning stages.

REASONS FOR COMPLAINTS

Existing industries

Sometimes complaints arise in connection with an established industry. One may ask why should people complain when an industry has been operating and has been accepted by the community for many years.

Such complaints may originate for various reasons, which are quite valid. Some of these reasons are shown below:

(a) A new noise may have been introduced as a result of one, or more, of the following factors.

(1) Lack of proper maintenance, wear and tear, misalignment of machinery, etc. If you take notice of your own car, you will probably realise that the noise can increase with age if regular maintenance is not carried out.

(2) The introduction of a new machine which may do the job better but, in doing so, creates more noise, or a different type of noise, such as timber planing machines, exhaust systems, metal presses.

(3) The relocation of equipment to an area more likely to worry residents, or perhaps, the extention of ductwork and exhaust cyclone dust catchers with an increase in resonance and area of propagating surfaces.

(4) Substitution of equipment, which is perhaps an improvement in many ways, but in which noise has been overlooked. Eg., an oil fired package boiler, which is cleaner and presents much less risk of air pollution than its coal fired counterpart, may not be noticed as noisy in an undertaking where many other masking sounds are present, but when it propagates a low frequency drumming tone to nearby residential areas, where the ambient noise level is low, it may considerably disturb residents. Such low frequency sounds are likely to be transmitted greater distances than those of higher frequency.

(5) Extension of the hours of operation to times when the ambient noise is lower.

(6) Increased production and staff. This may also lead to more cars, banging of doors and loud voices. This is particularly important with shifts commencing or finishing between the hours of 10:00 p.m. and 7:00 a.m.

(7) Increased storage outside of the factory building and work in the yard, such as nailing up boxes, etc. This may be accompanied by unintentional yelling or loud talk from employees making periodic excursions to the yard from within the factory, where the noise level is high.

(b) People may purchase blocks and build houses on land in proclaimed residential areas, to find out later that a nearby factory, at times, produces irritating noises.

This may be a result of situations such as the following:

(1) The factory may not have been operating at the weekend when the prospective buyer visited the block of land with the land agent.

(2) Visits may have been made when the factory was operating in the daytime, at a time when there were present many other acceptable random sounds to mask the unpleasant nature of a noise, such as a continuous tone, which perhaps continues into the night when it is most irritating.

(3) An unsuspecting person may purchase a house and later discover that a nearby factory produces a noise to which his family have not been accustomed.

(c) Changing personal conditions.

(1) A person in ill health may be worried by a noise which he would otherwise find acceptable.

(2) An aging person, owing to some loss of hearing in the high frequency range, may be more aware of an annoying low frequency noise than a person with good hearing.

New industries

A factory is likely to cause complaints if it introduces a new noise which is loud in relation to the existing background, which possesses annoying characteristics, or, one which is out of character with the existing ambient sounds.

INFLUENCING FACTORS

In many cases, there are several factors which are likely to irritate residents such as an untidy appearance of the factory, a reduction in the value of their properties, or a fear that there will be a reduction and that the standard of their living area will be lowered.

A poor public relations policy and personal dislikes may help to set off a complaint; noise may be used to amplify general dissatisfaction with a nearby industry.

The picture, in some cases, is partly changing because the general public expects an improvement in the standards of living.

ANNOYANCE AND PERSONAL JUDGMENTS

Complainants sometimes refer to residential noise as a health hazard.

While it may irritate an existing state or ill-health, in many cases, it would seem that noise does not directly produce injury; however, it is an intrusion on the privacy and comfort of the home, for the most part, people's well-being is diminished by noise and life in general is made miserable. The community should not have to suffer these discomforts. Sometimes circumstances exist when, for various reasons, a resident will exaggerate the situation.

In other cases, a factory owner or manager is unsympathetic and is not willing to do anything about it; he may have no consideration for his neighbours, or, and perhaps this is more usual, he may not realise that his factory is, in fact, creating a noise which is annoying.

Individual judgments are often misleading; there may be variations in hearing, personal prejudices, different psychological approaches and observations may be made at times when masking sounds, of an acceptable nature, are present.

ASSESSMENT OF RESIDENTIAL NOISE

Many noise problems can be solved by commonsense and consultation between the parties but, at times, misunderstandings and disputes occur and then there is a need for some form of evaluation.

Such an assessment can be quite complex; the ear sensitivity varies with the frequency and the type of noise, and the annoyance, in addition to this, depends very much on the character of the noise and the environment. Noises which cause complaints may vary considerably in nature and intensity; in some cases, annoyances shows little, or no relationship to the physical quantity of the noise.

Considerable thought has been given to suitable standards for the judgment of noise, but owing to the complexity and differences,

from place to place, progress has been slow. The average judgment of noise intensity which corresponds with the boundary between "tolerable" and "annoying" is found to vary, with circumstances, over very wide limits.

It is, however, possible to make an evaluation of a particular situation, and to determine with a reasonable amount of assurance whether, or not, complaints are valid and to predict whether, or not, a noise is likely to cause complaints. It is not possible to predict what each individual's reaction will be, but it is possible to predict what the average community reaction to a noise will be.

Objective methods proposed

A number of methods have been used for assessing the likely public reaction to a noise.

Perhaps it should be pointed out that such methods are not based on health implications, but simply on the types of sound, and levels, with which experience has shown that people will live without complaining.

It would be very helpful if an assessment could be made with simple single figure measurements, such as the "A" weighting scale of a Sound Level Meter. Some people are hopeful in this respect and there is a trend towards this as a quick means of judging a situation.

The "A" weighting gives an approximation of the ear response by filtering out some of the sound to which the ear is least sensitive. These figures can give very useful information to experienced sound engineers, but there is still some doubt as to their reliability in all cases; they have limitations such as, the possibility of errors in the assessment of noise spectra and in the evaluation of noise, particularly when annoying low frequencies are present, or in cases where the background levels are very low at the low frequency end of the spectrum, which situation arises in some of our outer suburbs.

Where possible, simplification is good, but it does not simplify the matter if it is less reliable in the long term, and incorrect interpretations might well aggravate a noise problem by increasing the misunderstanding between the parties concerned.

Although more time consuming, in the first place, experience has indicated that an octave band analysis of the alleged noise at the residential boundary gives a more complete picture and perhaps more reliable information.

A Noise Rating method was proposed by the International Organisation for Standardisation (1963); this document was in draft form and did not constitute an officially recognised standard. This method has been used in this country with some degree of success, as a guide, for assessing the acceptability of a noise.

In this method, the Sound Pressure level is measured in eight or nine octave bands of frequency. By comparison with noise rating curves such as those illustrated in Figure 1 [not printed in RECORD], the rating in each octave is determined and the highest rating in any one octave is then taken as the Noise Rating Number or, in effect, a loudness estimate for the particular noise. It is then necessary to apply corrections for the character of the noise and the environment, taking into consideration factors such as, the type of spectrum, if periodic in character, peak factor, duration, time of day, or night, type of locality and degree of previous conditioning; these corrections sometimes depend on an opinion which can differ between observers.

The proposals in the above I.S.O. document are still being discussed and a number of objections have been raised; it is not simple enough and monitoring is not possible with equipment available.

In a more recent proposal December, 1966, the use of single figure Sound Level "A" measurements has been suggested with provision for frequency analysis to assist in rating doubtful cases or cases where corrective measures are required.

A method which can be very helpful, in some cases, is to carry out a frequency analysis of the background noise for the area in the absence of the alleged offending noise; this can provide useful information for deciding the correction applicable for the environment. By making a comparison of the spectra, of the alleged noise and the background sounds, the relationship between the irritant and the basic environment can be determined. Figure 2 [not printed in RECORD] shows a comparison between the very low background sound in an outer suburb and a noise, predominantly low frequency, originating from an oil-fired furnace.

A noise from outside, even if it is in excess of the background level by as much as 10 dB, may be quite acceptable if it is similar in character and if it does not contain irritating features, such as pure tone components. Figure 3 [not printed in RECORD] shows a comparison between the spectrum of the background sound and that of an acceptable noise from a nearby factory.

AWARENESS, CONTROL AND PLANNING

Generally, a scientific investigation can help to develop a better understanding between the parties.

When it shows that there is some justification for complaints, it can assist the industrial manager by showing him which sounds offend, and to what extent. Managers become pre-occupied with production problems and often they do not fully realise that their plant is a nuisance to neighbors; the sounds of a plant in full operation may be music in the ears of some managers.

As a rule, managers are co-operative if they know that they are causing an annoying noise.

Similarly, persons will not usually make trivial complaints if they understand the nature of the problem; however, in some cases, undue publicity may make residents more conscious of it.

Many problems of noise from industry could be avoided by a greater awareness, on the part of owners, managers and engineers, to the fact that there are many noises which the majority of people do not like. Most people do not want to annoy their neighbors.

Some industrial managers have never considered noise to neighbours in the planning and operation of their plants. If proposing a new factory, an extension to an existing set up, or if installing a new machine, it would be wise for management to survey the existing background noise at the residential boundary, to ascertain the likely noise from new equipment and to then design, plan and build so that the industry will not introduce a new noise, which is out of character with the existing background, and does not exceed it by a sufficient amount to become an intrusion on the privacy of the residents. Attention to this beforehand may save a considerable amount of time and money later. In addition, it will achieve much better public relations.

Some manufacturers have never considered noise in designing their products. They must be encouraged to do so. Quieter equipment should be more often sought after.

Industry must also be made aware of the need to eliminate unnecessary noise from outdoor employees, within the industrial premises, and from associated activities such as loading of trucks, shouting, banging of car doors, etc.; these may be as much a source of complaint as the manufacturing operations.

This article has referred to annoyance as a result of noise from industry reaching residential areas. When dealing with this aspect, the possibility of an occupational noise problem within the factory should be kept in mind, as it would seem logical in many cases for the management to consider both aspects when taking corrective action.

Similarly, when planning a new factory, a wise and well informed management will consider all aspects of noise within the industry together with likely annoyance to the outside community; the importance of planning cannot be too strongly emphasised.

It is very desirable for a keen awareness of noise to be cultivated among managers and engineers.

I wish to thank Dr. C. J. Cummins, Director-General of Public Health, and Dr. E. O. Longley, Acting Director, Division of Occupational Health, for permission to publish this article.

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As John J. Coffey, Jr., research associate on environmental pollution of the Chamber of Commerce of the United States, has pointed out, in a speech October 16, 1967, by their Michigan president, Harry R. Hall, given in St. Paul, Minn., and entitled "We Had Better Be Better," in discussing the problems of our era, "Noise" is the springboard.

The appropriate excerpt from the speech follows:

WE HAD BETTER BE BETTER!

(By Harry R. Hall, president, Michigan State Chamber of Commerce, Lansing, Mich.)

(Prepared for presentation as the keynote address, fifty-third annual management conference, American Chamber of Commerce executives, at St. Paul, Minn., October 16, 1967)

As we convene here this morning, during the infant days of Phase III of the 20th Century, we have been given a microcosmic view of the best of America, 1967:

The pride and glory of one state.

The pride and power of 50 states.

At the identical moment that we gather here, this jet propelled century surges violently ahead to join the volcanic uncertainties, of the year 2000 and we observe an America at the apogee of its economic prosperity, its political authority, its technological advantage. These imposing sights that we have seen on the screen project a 1967 version of America, The Beautiful—

Magnificently endowed with natural beauty by nature.

Ingeniously nurtured for material wealth by man.

Majestically beautiful despite the concrete and steel scars of man's relentless march through modern civilization.

The ecstatic, boastful, but pleasing sounds that we have heard reflect the dynamism, the pragmatism, the optimism of a Phase III American Chamber of Commerce, firmly committed to the idea of progress and acceleration of progress.

These are sights and sounds of our speeding Century as we plunge into Phase III—October 1967.

NOW

Look and Listen to some other sights and sounds!

(Approximately 90 seconds of psychedelic color film SOF projected on screen.)

These, too, are sights and sounds of Phase III of this aging Century:

Weird sights and ominous sounds.

Fascinating sights with horrifying connotations.

Discordant—noisy!

This has been a *noisy* century. It is getting more noisy. Dr. Vernon Knudsen, a physicist and former chancellor of the University of California at Los Angeles, claims that noise is a slow agent of death and if it continues unabated for the next 30 years, it can become lethal, because even now ordinary urban noises to which we are subjected routinely impair hearing, jangle nerves, hinder concentrated mental effort and distort judgments.

But it seems to me we need to be more disturbed by the sociological implications of noise than with its detrimental physical effect. Some of these noises reflect a social hemorrhaging in the main arteries of an affluent, sophisticated society that prides itself in its vibrant economy and noble national purpose.

Some of these derisive noise are indicants of—dissent, frustration, hopelessness, abandonment of ingrained standards of conduct, revolt against established values, renunciation of cherished institutions.

We do not like to discuss this grating cacophony. We would like to turn off these irritating noises. But, instead, they are increasing, frightfully, in volume.

They will not, any longer, be drowned out by the counter noises that we make about our progress and prosperity.

They will not be muted by angry expressions of disgust and disdain.

They will not be stilled by indifferent neglect or irrational evasion. As Winston Churchill said, "Things do not get better by being left alone. Unless they are adjusted they explode with shattering detonation."

These shattering noises of social discontent represents problems—chamber of commerce problems. Along with our trophies of success, these passion packed casualties of failure accompany us into Phase III of this fleeting century.

The Christian Science Monitor of Tuesday, May 14, 1968, has the following item under the heading "Noise Crisis":

NOISE CRISIS

(Air craft din has the men who run American airports in a tizzy. It gets steadily worse. How to cope with it? Dr. Walton W. Jones, of NASA, says people can adjust and live with this era of sonic boom.)

(By Neal Stanford)

WASHINGTON.—Aircraft noise gets intensive study. It's about time. Aims are to uncover:

How bad it is.

Where the noise comes from.

What can be done about it.

How people can adjust to sonic-boom intensities, and how much.

Dr. Walton W. Jones heads NASA's biotechnology and human-research division. He heads up noise studies and research for the National Aeronautics and Space Administration.

In an interview he talks about his current airport-noise survey, his sonic-boom simulator, the nature of noise, and how it can be minimized or modified. One surprise: In all four cities studied, people were found who were not disturbed at all.

An aim by the Federal Aviation Administration is to have Congress set up fair maximum flying-noise levels. Too-noisy airplanes would not be allowed to fly.

Dr. Jones, I understand you are in the midst of some studies of the aircraft-noise problem at some of our big airports. What cities are you studying?

Our studies this last year have centered on four cities, Chicago, Denver, Dallas, and Los Angeles. We are shortly choosing four other cities for similar studies. Our research centers on what we call the psychoacoustic aspects of aricraft noise and sonic boom, on how humans react to these noises, on the different characteristics of these noises, and what might be done to minimize or modify them.

The data we have collected is presently being reviewed by a National Academy of Sciences panel, and until they report we won't choose the next four cities to study.

In the four case studies made how did you go about getting data and what kind of data was it?

We interviewed some 3,500 people in these studies in communities being overflown, trying to measure the reaction of the people to different kinds of noise: high frequency, low frequency, spikes in the spectrum of noise, and the like. We turned up some surprising and interesting things. For example, we found people in each of these communities who really were not disturbed by the noise at all, weren't actually aware of it. Then there were others who objected strenuously. The explanation is psychological, possibly sociological. It has to do with their being, their makeup, their interests, what they do.

You know, some men have developed very nice ways of just tuning out their wives at times, and maybe this same thing happens here.

How do you go about questioning these people? Do they know you are trying to find out how they react to different aircraft noises?

We don't advertise our studies, for we don't want any bias in them. So our interviews in going into homes do not say they are inquiring about aircraft noise. They ask a lot of questions about other noises in the community. It is really a community study. We even put in some questions for the Housing and Urban Development people so they won't have to make their own study. We only raise the question of airplane noise indirectly.

Dr. Jones, I am curious. How do you indirectly ask a person if aircraft noise bothers him?

Well, other questions may lead up to it. If they don't volunteer their reactions we can work it around so they do. I'm not so sure I should give you the questions we ask to get our information since our job is only half done.

But it is true if you ask them outright what they think of aircraft noise in their community, you will get biased answers. So our interviewers get it indirectly.

Also they notice the type of house, type of construction, number of windows, any noises from appliances, refrigerators, fans, etc. Then we have sound trucks in the neighborhood measuring the aircraft noise at the time—so answers can be related to actual noise measurements.

This may all be interesting, but how will it prove useful?

The FAA (Federal Aviation Administration) has asked Congress for authority to add to their certification requirements for airline use of airports one on noise. So if future airplanes emit noise of certain value characteristics over what criteria have been found to be acceptable, then these airplanes won't be allowed to fly. The FAA won't certify them.

The noise level agreed to, of course, must be fair—fair to both sides, and that is what we are working on now—trying to help find a fair noise level.

There are other ways of helping to improve the noise problem—quieter engines, for example, retrofitting existing engines, but those are hardware approaches, and out of my area of research.

Different kinds of planes make different kinds of noises. From your study, what planes cause the most noise problem—jets?

That is part of the reason for this study. Some people are annoyed by some aspects of noise more than others. For example, we found in work this fall that certain helicopters give very low frequency, have a very low frequency spectrum, but pictures on the walls of a house are apt to rattle. This can be very objectionable to some people.

There are several ways of handling this problem. One very simple one is to tell the people to modify their picture-hanging methods. The annoyance did not come from the noise of the helicopter but the rattle of the pictures!

Did you find that people questioned about aircraft noise while outdoors objected more strongly than those questioned indoors?

That was what we expected to find. But startlingly enough, that isn't what happened. We asked people to judge the seriousness of noise outside, and then had them enter their homes before asking again. As soon as they entered the house and closed the door, it appears, their criteria dropped, that is, their noise threshold went up, to about the attenuation of the building.

Noise that was objectionable outside on the graph indicators at 110 was just as objectionable when inside the house and registering 95. Apparently people have a built-in filter they slip off as soon as they walk inside. Part of the reason for this study is to learn such things as this, so we don't do something unnecessary in setting acceptable noise standards for airport areas.

I gather that your work also includes a psychoacoustic approach to the problem of the sonic boom. What are you doing in this field?

We have several research studies going on. One is out at the Stanford Research Institute, where we have a sonic-boom simulator measuring the effects of sonic boom on sleeping individuals.

This is a room comparable to a bedroom, furnished as in a home. One end, however, is a diaphragm that can be driven in a small adjoining room by a motor to give the effect of various boom characteristics. Tapes are used that record actual booms of varying strengths. The person is wired to an apparatus which measures levels of sleep.

Then after he has slept there for several nights and become accustomed to his surroundings the simulator is turned on.

A sonic boom is referred to as an "in-wave," and an in-wave can be low and wide, or tall and skinny, meaning time-duration widths and intensity for height. When the room is hit with a sonic boom the effect on the sleeping person can be recorded.

Does the simulator prove that people can become adjusted to sonic booms, and do they sleep through them?

So far this experiment seems to prove that people do adapt to sonic booms, but we are not prepared to say, on what data we have, what they will adapt to. But there is an adaptive mechanism, apparently.

Also, we have found that the deeper sleep they are in the more boom it takes to awaken them. People seem to get accustomed to some booms, but we can't say this applies to the whole population.

I believe your shop is also involved in the matter of improved aviation safety. What particular approach are you taking to this problem?

We are doing some interesting experimentation along with the FAA and the federal air surgeon on safer passenger and crew seats.

The military have been working on this for some time, on the question of using energy-absorption techniques in seats. If we can get some of the energy imparted to the passenger in a crash taken up by some energy-absorption device, then the passenger gets a reduced load.

Many injuries could be avoided if seats were designed to dissipate more energy. . . . If stronger seats were designed and combined with dissipation techniques, these seats could dissipate about 16 times the energy dissipated by present seat designs.

What about the talk of having passengers sit backward as a safety measure?

Not all forces are directly forward or aft in a crash. If a passenger pitches to one side he may still need a good harness. A good forward seat, with possibly a shoulder harness, would be better in many ways than turning seats around.

We are looking into all these matters. Our work on research into aircraft noise, the sonic boom, and passenger safety is really only part of a much broader study. As explained, we concentrate on the psychoacoustic aspects of the noise problem and the energy-absorbing techniques in seat construction.

The Massachusetts Audubon Society, at Lincoln, Mass., has a pamphlet on noise pollution, which follows:

NOISE POLLUTION

FOUR DEFINITIONS

Noise—unwanted sound. Luckily, with noise two-plus-two does not equal four. Ten motorcycles are not ten times as noisy as one motorcycle but twice as noisy.

Decibel—the unit of measuring loudness (intensity) of a sound. Zero on the decibel scale is the slightest sound that can be heard by the best ears and so weak that it moves the eardrums one-tenth the diameter of a hydrogen atom. The scale goes up logarithmically, the perceived loudness approximately doubling every ten decibels. Since the blast of a jet engine at takeoff can reach 150 decibels—1,000,000,000,000,000 times as intense as the threshold of sound—the human ability to hear anything from rustling leaves to a jet blast make the ear like a balance which can weigh anything from a postage stamp to an ocean liner.

Pitch—tone level. Pitch is determined by how many times per second the sound waves vibrate. The lowest note on a piano has a frequency of 30 cycles per second; conversation ranges between 200 and 6000 cycles; and a "silent" dog whistle gets up to 14,000 cycles. The high-frequency noises that we can hear seem louder to us and are more disturbing, decibel for decibel, than low-frequency noises.

Sonic boom—the loud *bang* and change in air pressure of the shock wave which every plane flying faster than the speed of sound (about 700 miles per hour) drags along behind it. The boom isn't a one-time nuisance, occurring only at the precise moment the plane crosses from sonic to supersonic speeds, but follows along behind the plane for the entire duration of the supersonic trip.

DECIBEL SCALE

Eardrum ruptures 140: Jet taking off.

Painful to ear 120: Siren, jet revving its motors for takeoff—maximum allowable for hearing, roar of a two-engine prop plane.

Deafening 100: Thunder, car horn at 3 feet—loud motorcycle, loud power lawn mower.

Very loud 80: Portable sander, have to shout to be heard, food blender, continued daily exposure brings about loss of hearing, noisy cocktail party, impossible to use telephone.

Loud 60: City playground, vacuum cleaner, noisy office, average traffic, point at which use of the telephone becomes difficult.

Moderate 40: Suburban playground, all right for a restaurant, average living-room.

Faint 20: Quiet enough for courtroom or classroom, private office, a whisper at 5 feet.

Threshold of audibility 0: Rustling leaves, breathing.

Noise is a true environmental pollutant. Like air and water pollution it damages our health and lowers the quality of our life. In Europe the malignant effects of noise on the total environment are well recognized. In Sweden, for example, the State Power Board's one-year course in pollution control trains engineers to deal with water, air, *and noise* problems. Here, we are barely beginning to realize what a growing menace noise pollution is and that it must be curbed.

HOW NOISE AFFECTS US

Reactions to noise are more subjective than they are to smog or a drink of polluted water. About a fourth of the population say they are not disturbed by any noise, however loud; these are the people who should live near airports. One in ten is hypersensitive, but because he dislikes almost any noise not of his own making, his complaints are ignored. In between come the rest of us, and we are more sensitive to noise on some days than others. In general we find high-pitched noises harder to take than low, and any noise sounds twice as loud at night.

The most specific effects of noise are on hearing. A loud blast such as an explosion deafens everyone momentarily. (At the same time it arouses an "alarm" reaction so primitive and automatic that even newborn infants cry out with terror.)

Permanent hearing loss comes only from repeated or continuous exposures. Everyone agrees that an eight-hour daily exposure to 80 or 85 decibels leads to severe hearing damage. Until recently this was thought to be the only damaging effect of noise on the ears. But doctors now suspect that our high *community* noise level—traffic in morning and afternoon and TV at night with occasional additions from police sirens, planes overhead, car horns, and vacuum cleaners—helps account for the deafness of older people in all industrial countries and especially in ours.

Noise has other measurable effects. It raises blood pressure, lowers efficiency, and triggers ailments like stomach ulcers and allergies. It is the main cause of loss of sleep. The World Health Organization says it can be harmful even when it is not consciously heard. Dr. Vern O. Knudsen of the University of California sums it up as "a slow agent of death." And, as a matter of fact, 160 decibels—only a few more than the sound of many jet planes at takeoff—is lethal to mice and similar small animals.

WHAT WE CAN DO ABOUT NOISE POLLUTION

Noise is pollution. And the United States is the noisiest country in the world and getting noisier.

The background din of modern life comes from machines. Noisy power lawn mowers and motorcycles generate levels of loudness formerly found only in boiler factories. American kitchens with three of four appliances operating at once have been clocked at 100 or more decibels. We also have long exposures to air-conditioners (often 70 or 80 decibels), city traffic (with a mean average of 78 decibels at a Boston school playground during recess) and all-day drives (which leave most people with a temporary loss of hearing).

Since the machines are here to stay, what can we do about the noise?

We can begin by making better use of the mechanical mufflers and other silencers we already have. The Paris and Montreal subways are equipped with rubber-tired wheels, and ours could be too.

Actually, most noise nuisances can be controlled by new devices. Among recent American inventions are a "silent residential quality" attachment for pneumatic drills, steel mesh blankets to muffle blasting, a quieter pile driver, and even a portable ground muffler for jet planes to reduce sound during warm-up periods. Acoustical engineers, who can build quiet motels in the middle of airports, know all the techniques for soundproofing buildings, from what kind of partition makes the best sound barrier to how to mount apartment doorbells so that the only ring you hear is your own.

The din of traffic, rated in one large survey as more annoying than all other noises put together, can be reduced with the improved mufflers now available for all vehicles including trucks and motorcycles. New materials have been developed to make quieter road surfaces, and there are even quieter tires.

The rewards of a quieter environment need more publicity. They are much commoner than most businesses and individuals realize. It is no accident that of the four main centers of noise pollution (industry, airports, traffic, and buildings), the noisy industries have made the best progress in solving their noise problems. They began to worry about noise in 1948 when a New York worker won the first damage claim for loss of hearing acquired on the job. Now that claims amount to $2 million a year, noise abatement gets serious attention.

Practical incentives exist for builders too. In New York City some new high-rise apartments are unprofitably empty because of internal noisiness. And in the suburbs sound-conditioned houses sell faster than similar houses without anti-noise features even though they cost several hundred dollars more.

Noise abatement pays in many other businesses. Studies at Colgate University showed that the average worker spends one-fifth of his energy fighting noise. When the noise level drops, output goes up and absences and employee turnover drop.

When incentives are lacking, noise control laws and regulations must take over. Julius Caesar originated the legal approach to the quieter life by banning night chariot-driving in the streets of Rome. His example is followed today by every country in northern Europe from Britain to the USSR. European noise-abatement regulations include acoustical building codes, local ordinances forbidding the use of motorcycles during sleeping hours, and even national laws forbidding transistor radios in public places.

In comparison, we have no federal noise-abatement laws, very few state laws, and nothing more helpful on the local level than ordinances against disturbing the peace. Typically, the peace can be disturbed only after 11 P.M. and then only by a noise nuisance coming from a nearby home.

The final and most important weapon against noise pollution is public pressure. For years the people who live near airports have been writing their Congressmen, signing petitions, and attending hearings by the busload to make their objections to the racket known. They sue the government for loss in real estate values and incite their public schools to sue the airports for impairing education. They have made the airport noise problem so notorious that towns unite instantly to keep proposed airports as far from their borders as possible And while airports are still very noisy, they would be much noisier if public pressure had not forced the aircraft industry to spend millions of dollars a year on noise-control research and the federal government to regulate flight patterns and even set up noise limits at night.

If nothing is done about noise pollution, in ten years our environment will be twice as noisy as it is today.

Do we want that?

HOUSE LOTS AND NOISY STREETS

There are several ways of mitigating the noise nuisance, says Dr. Robert B. Newman of Bolt, Beranek, and Newman, the country's leading research and consultant firm in acoustics.

Q. Will it help to plant a barrier of trees and shrubs between the house and street?

A. Not at all as far as *sound* is concerned. Of course, if your house is separated from the highway by 500 to 1000 feet of thick deciduous woods, you will get more traffic noise in the winter when the leaves are gone, but this isn't a typical city or suburban situation. A barrier to keep out sound must be bulky and solid like an earth embankment or even a tall apartment house—trees won't do.

However, there's a lot of psychology in how we react to noise so trees, shrubs, and fences do have a function. They act as a visual barrier—out of sight, out of mind.

Q. Can an existing house be soundproofed?

A. Double windows on the street side will keep out some street noise; carpets, draperies, and acoustic tile will subdue the reverberations inside. The open layout of much modern architecture is an enemy of quiet in itself. The front rooms of a house on a noisy street should be segregated from the back with solid doors and floor-to-ceiling partitions, and then the back at least will be quiet.

It sometimes helps to provide a constant subdued background sound like a quiet fan, air-conditioner, or soft music which will mask out the annoying noises. But as with perfume, the masking technique has its limits—up to about 35 decibels which is still barely noticeable.

Q. The outdoor living area should obviously be located behind the house, away from the street. But should it be put near the house or at the far end of the lot?

A. Near the house. Sound barriers do a better job either close to the source or close to the hearer than halfway between.

It takes more distance than most people realize for sound to fade away. And when the noise comes from a constant line of moving traffic instead of a single source, it takes a greater distance for the sound to drop as much. This is one reason why people living in the country are bothered by night-time traffic on highways miles away. Another reason is that natural country sounds are too low to do any masking, say 20 decibels even when the crickets are singing.

Q. Can anything be done to mask sounds outdoors?

A. Try two or three little fountains or an artificial waterfall. The sound of running water is an ideal masking noise. It is continuous and unobstrusive, it carries no information, and it has pleasant associations for almost everyone.

SONIC BOOMS

With sonic booms the worst is yet to come. When—and if—Boeing's supersonic transports (SST's) crisscross the country, millions of Americans every day will jump with alarm, feel the house shake, and hear the windows rattle. From time to time they will watch plaster crack and fall and will sweep up shattered glass. And this is the *least* in the way of annoyance and property damage that we can expect from the SST.

Any plane flying faster than the speed of sound trails behind it the cone of noise pollution called the sonic boom. Although the bangs only last a fraction of a second, they usually come in pairs and are as loud as a medium-sized explosion in the next block.

A few years ago the U.S. government decided to find out exactly how annoying they are. Every day for five months Oklahoma City was jarred with eight sonic booms a day, none of high intensity and never at night. A poll taken after the test was over showed that the bang startled, disturbed, and annoyed almost everyone living within eight miles of the center line of the boom path.

Property damage is caused by the sudden change in air pressure that accompanies the boom. Two booms a week for a few weeks from the Air Force's new twin-jet spy plane over Los Angeles drew 564 damage claims, mostly for window and plaster damage. Jury awards have been as high as $10,000 (for an Oklahoma City house which was virtually split in two by the sonic boom tests).

Protest groups like The Citizens League Against the Sonic Boom (11 Appleton St., Cambridge, Mass.) are being organized here and there but on the whole Americans take the boom nuisance more meekly than Europeans. Sweden and other countries are considering forbidding any supersonic flights over their territory. The British flooded their newspapers with angry protests. The French have been especially successfully in getting cash settlements. In 1965 the French authorities paid more than a quarter of a million dollars for boom damages and immediately tightened flight rules, even to banning all supersonic flights over metropolitan areas. Yet one year later the number of damage claims almost doubled and settlements for the single area around the base of a new supersonic bomber approached $400,000.

Today's supersonic planes are all military. The first SST's, the Anglo-French Concorde and the Russian TU–144, are expected to begin delivering cargoes as well as booms in 1971. The Boeing 2707 is scheduled for a few years later. A law of physics says, the bigger the plane, the bigger the boom. The Boeing SST will be longer and wider than a football field and by far the largest supersonic plane in existence. Even when it is flying at 65,000 feet it will produce on the ground a boom covering a belt twice as wide and almost twice as intense as the Oklahoma City booms.

But until the Boeing monster comes along, the place to write for damage claim forms is the U.S. Air Force.

"It's not enough to win yesterday's battles. There are new forces at work we must be ready to contend with. The sonic boom, in my judgment, is one of the most serious ones . . . you cannot make out a case against the sonic boom by damage to the frail historic places nor, probably damage to wildlife. But you can make out a case in terms of damage to man's habitat . . ."—Stewart L. Udall.

Other pertinent material follows:

[From the New York Times Magazine, Jan. 14, 1968]

THE JET IS GETTING AWFUL

(By Robert Sherrill)

WASHINGTON.—To millions of Americans who live near major airports and are being driven frantic by the noise from jet engines, President Johnson must seem the luckiest guy in the world. No planes, propeller or jet, are permitted to fly over *his* home, and when the boistrous world or air transportation intrudes on his private or political life, he can silence the intruder with a command—as he did recently during Carl Sandburg services at the Lincoln Memorial. The commercial airliners landing and taking off from National Airport were interfering with outdoor eulogies and Johnson, not wanting his own speech interrupted, told a Secret Service man to call the airport tower and have the planes temporarily rerouted. They were.

The ordinary jet-noise victim, however, cannot command relief. He can only complain or sue, and neither does him much good. At last count, there were $200-million in lawsuits pending in courts around the country initiated mainly by citizens who felt that aviation noises had destroyed the value of their homes—and sometimes so thoroughly as to constitute actual confiscation of property. In the past, few of these suits have been successful; aviation noise has reigned as one of the era's most privileged nuisances.

This victimization of the public has been very democratic, touching alike all economic classes, from the wealthy homeowners of Playa del Rey, near Los Angeles' International Airport, and the elite of Georgtown, in the path of jets from Washington's National Airport, to the residents of walk-up flats in South Queens.

Congressmen from districts that include major urban airports have files containing many thousands of letters, accumulated over the years, begging for Federal help in muting the engines that make normal life an impossibility. The letters have piled up in a huge snowdrift of despair.

Scoop out a few from the La Guardia and Kennedy airport areas: A Flushing physician complaints that "it is sometimes impossible to have a conversation with patients and even less possible to listen to a heart or take the blood pressure of patients." A Flushing music-lover claims he "cannot listen to a complete symphony without 10 to 15 interruptions." A Whitestone father says he cannot talk with his family at the dinner table "without being interrupted every three or four minutes while the parade of jets goes by overhead." A pupil of No. 3 School in Cedarhurst complains: "We cannot hear the teacher's questions and she cannot hear the class' answers. Every two minutes a plane passes over our school." A Rosedale housewife calls the situation "unbearable . . . there are no hours when this horrible shrieking noise is not overhead . . . my baby cries constantly from the noise." A Floral Park mother, finding conversation impossible, spends two hours counting 76 planes passing overhead.

Congressmen Benjamin Rosenthal and Herbert Tenzer, whose constituents are battered around-the-clock by La Guardia and Kennedy traffic noises, warn that the prevailing mood is not merely one of unhappiness but of desperation, and some of the letters support this. From an East Rockaway housewife: "My nerves have me at the point of a nervous breakdown from the constant noise of the planes passing over my house. I don't know how much more I can stand." A letter signed by Bernard Landers, president of the Woodmere Park Association, and 100 neighbors: "Right now the noise is so bad in some areas that not only the comfort, but also the health and well-being of families are being affected. Many people cannot sleep later than 5:30 in the morning when a continuous volume of noise begins."

Consider the life of Martin Kaplan, 35, a former Air Force and airline pilot whose home in Inwood, L.I., is about half a mile from the northwest runway at Kennedy Airport. Kaplan, who had earlier appealed to Congressman Tenzer, gave me a follow-up report by telephone. He sounded keyed up, as if he were relaying observations from a front-line battle. I almost expected to hear the thumping of mortars in the background.

"They're using the runway tonight! Wish you were here! Ho, man, I wish you could feel the walls. When they take off, it's like they were shooting at us. It's like they were firing guns at us. I really mean it. Everything vibrates. It's vibrating right now. There are cracks in the walls. The beams are giving way in the basement. The floor slants. I'm constantly repairing and plastering the place. If you were here, you could smell the fuel. They've been using the northeast runway for two weeks, and that means we're catching it."

Kaplan admits he isn't *sure* the house is cracking up as a result of the jet-induced vibrations, "but this house is 15 years old and that seems a bit old to be settling from natural causes. It's ridiculous already." Worse, Kaplan believes that he and his family, like the house, are beginning to give under the strain. "I honestly think it's getting to us." When the wind is wrong, the stench from the jet fuel washes over the house and makes his 11-year-old asthmatic son sick. His 8-year-old daughter wakes up with troubled accounts of how the wall by her bed shook all night. Kaplan feels cornered. He may sue. "Either the New York Port Authority moves the airport," he said, "or it moves me."

What is happening in New York is also, of course, happening wherever traffic concentrates. For example, the neighbors of O'Hare Airport in Chicago—it is the busiest field in the world; a jet lands or takes off on the average of every 40 seconds—must put up with what their Congressman, Roman C. Pucinski, recently described as "the unrelenting, unremitting, intolerable boom and whine of tidal waves of sound." Similar Miltonic descriptions of misery are even being heard from such places as Minneapolis that used to be considered way stations.

For more than 15 years, Federal officials have been aware that these things would happen as a result of the urban build-up around airports. If they had not known it before, they received a warning in the Doolittle report, "The Airport and Its Neighbors," which was issued in the last year of the Truman Administration, before the jet age had really begun. But only now is the Federal Government making any measurable effort to coordinate its own regulatory bodies (the Department of Transportation, the Federal Aviation Agency and the Civil Aeronautics Board) with state and local authorities, and with the aircraft-manufacturing and operating industries, to bring relief before the public rebels.

Even now the Government's commitment is questioned by some critics, who point to the fact that the only important legislation pushed by the Administration (and passed by this Congress) pertaining to air transportation was an appropriation of $150-million to begin development of the nation's first commercial supersonic transport (SST), which will generously *increase* the noise.

If the SST is permitted to fly overland instead of being restricted to ocean travel—and Maj. Gen. Jewell C. Maxwell (U.S.A.F.), head of the SST program, says that overland supersonic travel is "inevitable"—the plane will drag along a 50-mile wide sonic boom, coast to coast, which could reach the ears of 20-million Americans.

It is a possibility that chills even some of the men normally most loyal to President Johnson's programs. Interior Secretary Stewart Udall, concerned about the effects of the sonic boom on wildlife and on geological formations and ancient Indian structures that can be destroyed by the boom's shockwaves, recently acted independently of the Administration to seek the advice of half a dozen scientists on the question of possible damage from the SST. Among White House intimates, however, he is a lonely dissenter. The birth of the SST and its potential monster boom was the Administration's contribution to the noise problem for 1967.

But this year, White House lobbyists have assured some Congressmen, they are going to give top priority to legislation attacking jet noise. They say that if they can just pass a bill giving Department of Transportation Secretary Alan Boyd authority to set noise standards for the industry, he will start setting standards all over the place and that will help a lot.

It sounds good, but it might as well be acknowledged by everyone involved that the victims of airborne chaos cannot look for any relief within a decade. The delay in dealing with the problem has guaranteed that, short of moving the major airports or moving most of the people away from them—neither of which seems likely—the situation will become much worse, if not intolerable, before it gets better.

Air travel is expected to triple in volume by 1975, which means that the noise it creates will also triple. At the same time there will be few pro-public counterforces. The momentum of special interests will continue for much of this period. Aircraft industry spokesmen, most of whom concede that noise is their No. 1 problem, admit that the immediate future is barren of solutions; so do officials of the Department of Transportation. Here are the major traditions and influences working against a quicker solution:

Confusion of regulation by whom of what. Some Congressmen want to give the job of regulating aircraft noise to the Surgeon General and to the Department of Housing and Urban Development on the grounds that they are primarily concerned with people and homes, whereas the Department of Transportation—which the Administration wants to have regulatory authority—is primarily interested in aviaton industry. Inasmuch as Secretary Boyd is on record, as of 1962, in opposition to the idea of Government control of aircraft noise—"the Government ought not to involve itself in matters which are primarily the business of business"—these Congressmen have a good argument, but at this stage the jurisdictional dispute is just a bit sad because technical difficulties as well as the economics of the industry are expected to block the introduction of a quieter engine for at least seven or eight years.

The National Aeronautics and Space Agency (which is doing, or supervising, most of the impressive noise research these days) has contracted with Pratt & Whitney, manufacturers of the engine of the upcoming 747 jumbo jet, to turn out a blueprint for a "quiet engine" within the next few months. After that, the industry will spend the next five or six years building the prototype engine at an estimated cost of $200-million.

But even then (and now we are speaking of 1973 nor beyond), there is no assurance that the prototype will in fact be suitable for commercial use. It is not intended to be more than a demonstrator. If a commercial engine is adapted from it, the airlines may not want to use it for a few years anyway becuse they may still be paying for their current fleet and may not be in a financial position to switch to another engine just because it is quieter.

If all goes well, this prototype engine will be 20 decibels quieter than anything flying today. A decibel is an arbitrary unit of sound measurement (10 decibels for breathing, 70 for heavy traffic, etc.) and the best way to suggest what the 20-decibel reduction will mean is to point out that most big jets taking off today are recorded at 120 decibels and up—about the same loudness as a machine gun at close range. A 20-decibel drop would be very noticeable and doubtless very welcome, but it would still leave the jets of the future making more noise than is considered the maximum tolerable level. Community complaints, which can be expected to begin at 90 decibels, usually boils over at about 105 decibels.

And when the aircraft industrialists talk of a 20-decibel drop, they talk of their ideal. Dropping back to reality, the major manufacturers recently sent Gen. William F. McKee, F.A.A. administrator, a private memorandum saying that after much soul-searching they had concluded that a six-to-eight decibel drop is all that they can promise, sometime in the nineteen-seventies. So that's that: a commercial "quiet engine" which, in fact, is still a noisy engine is 7 or 8 to 10 years away, and it will be absorbed into the commercial fleet thereafter very gradually.

With these technical obstacles ahead, it is not clear why Secretary Boyd is pressing for immediate jurisdiction. It will be many months before even the most general standards are ready. Some observers fear that Boyd's legislation can only result in shifting the risk of damage suits from industry onto the Federal Government. If that were the effect of the legislation, it might cause the aircraft industry, which now is conscientiously spending millions of dollars seeking a quiet answer, to ease back in its research. As a Senator told Evert B. Clark of The New York Times recently: "If the Department of Transportation would come up here and say, 'We've got to have this new power because Lockheed or American Airlines or so-and-so isn't doing its part,' then we might do something. But there is no point in passing a bill and conning people into thinking we've solved their problems when we know we really haven't."

Some officials think noise protestors are a little odd. Secretary Boyd suspects the mental and nervous balance of people who hate airplane noises. Five years ago, when he was chairman of the C.A.B., Boyd testified at a Congressional hearing on the noise problem that the Government should get the advice of psychologists on how to deal with the protests, which, he said, could probably be traced back to the "anxiety phychosis that seems to dwell over a great many people nowadays." He called for "more tolerance of noise." In a recent interview with a reporter from Science magazine, Boyd said that most of the opposition to the SST's inevitable supersonic boom comes from the "periphery," a statement which the reporter interpreted as Boyd's "euphemism for 'nuts.'" Boyd did not ask the magazine for a correction.

More recently he has given further indication that he thinks the anti-noise forces are composed largely of fanatics who would like to go back to the horse and buggy. In a November appearance before a House committee, Boyd's opening plea was for the committee to disregard those who would "eliminate aircraft in the United States" simply because planes are noisy—a radical suggestion that, in fact, nobody had made.

Boyd is not alone in this fear. General Maxwell told me that the opponents of the supersonic boom give him the impression that they are "little old ladies in tennis shoes who don't think we should travel 1,800 miles an hour when God clearly intended we shouldn't fly faster than 600 miles an hour."

A variation of this attitude finds the bureaucrats convinced that the public can be brought back to normalcy through repeated exposure to aircraft noise. "I think it is fair to say that as one lives with noise one tends to develop a greater tolerance of it," said Boyd, in a statement that has been repeated, in one form or another, by every important official of the Department of Transportation.

It is, somehow, a myth that has survived scientific studies showing the contrary. Dr. Karl D. Kryter of Stanford University, in an often-cited study, showed that the more exposure to noisy flights a community is subjected to the feebler its tolerance becomes. With one aircraft blast per day, the community will put up with a rating of 115 decibles. But with 128 flights a day, the tolerance level drops to 94 decibels. (And where does that put the neighbors of Kennedy Airport, who contend with about 700 jet flights a day during the peak tourist season?)

A recent experiment at Edwards Air Force Base in California demonstrated that one-third of the people who have worked to the constant accompaniment of airplane noise for several years still find the sonic boom "intolerable." The most famous tests—tests intended to prepare the way for public acceptance of the SST's boom—were conducted in Oklahoma City in 1964, when the area was bombarded with up to eight sonic booms a day over a six-month period. The F.A.A. had been shrewd in choosing Oklahoma City for this test, inasmuch as a third of the city's residents depend for their living on some phase of aviation. Nevertheless, even if Oklahoma City is a hospitable place for aviation, after six months of booming 27 per cent of the people said they could not stand to think of living with the noise indefinitely.

Experience helped very little; only one in five who started out being annoyed with the boom had adjusted in some degree to it by the end of the tests. Most of the population said the noise was more detestable at the end of the test than at the beginning.

A second variation of the crackpot theme holds that the trouble is all in the public's imagination. This theme is especially common among F.A.A. . . . to property damage from sonic booms and noise vibrations. The test homes in Oklahoma City that were exposed to the sonic boom developed hundreds of cracks. General Maxwell has an explanation: "I think it is an interesting fact that irritation brings with it an idea that somebody is doing damage." He laid most of the blame to green lumber and imagination, although he admitted there might be some exceptions. (One resident successfully charged that the booms split his home in two and won a $10,000 damage suit.)

Like Boyd, General Maxwell sees the answer as a fundamental choice between accepting noise or doing away with airplanes altogether, with nothing in between. "If you don't like supersonic airplanes," he said, "you can go back to the good old days and get a horse. You're either going to have to accept the boom, or . . . well, I don't see any probability—I don't want to say anything isn't possible, but right now I don't see anything coming down that is going to rid the airplane of it. Anyway, I've never tried to convince people that the boom is going to be acceptable, and I don't now."

Officials at all levels are oriented to payrolls and profits rather than to public comfort. Local zoning officials continue to permit realtors to build right up to the landing strips, rather than insisting on an empty buffer zone or a commercial-only zone around the airport. More high-density, high-rise apartments are already on the drawing board for the Kennedy Airport area. At Dulles Airport, the semi-ghost facilities serving Washington, Federal officials tried to get country officials to keep the houses away but they were turned down.

People sometimes seem to have a mysterious moth/flame attraction to noise centers. In the early days of railroads, towns were strung out along the tracks as it everyone were trying to get his share of the soot and rattle. But Federal housing officials are convinced that for the most part people buy houses near airports either out of ignorance—"not realizing that within five years the noise will be driving them crazy," as one H.U.D. official put it—or as victims of real-estate hucksters who show them the houses during the hours of least traffic and when the wind is blowing favorably.

When Federal officials attempt to exert some corrective pressures, they are often stymied. A perfect example of this was the directive issued by the Federal Housing Administration to withhold F.H.A. financing of new homes within a certain proximity of the New Orleans International Airport. Representative Hale Boggs of Louisiana, testifying at a Congressional hearing recently, *boasted* of getting that directive reversed, although he went on at once to complain that the homeowners who had built near the airport with his help were now finding life "intolerable" because of the noise.

In a recent letter to Washington officials, Alfred N. Warwick, chairman of the aviation committee of the Queens Borough Chamber of Commerce, recalled proudly how in the nineteen-thirties the Chamber had "selected the actual sites for what are today's Kennedy International and La Guardia airports. Our business vision has been more than justified." He ticked off the resulting thousands of jobs and millions in payroll dollars and hailed the two ports as "without question, Queens' biggest single industry . . . good for borough, city and state." Only as a kind of second thought did he mention that passage of some noise-abatement legislation might be a good idea for the people who want to live, rather than only work, in Queens.

The embodiment of this philosophy at the national level is Secretary Boyd, who holds that economics and noise "are completely interrelated." He has always taken the position that the best way to "cause people to look at the discomfort of the airport in a somewhat different light" is to remind them of how many jobs air transportation creates and how unpleasant it is to be out of work. Still very much a favorite saying around the F.A.A. is an old slogan of the agency's former administrator, Najeeb Halaby: "What is one man's annoyance is another man's livelihood."

The C.A.B., which certifies airlines for operation, makes its judgments on the premise that the amount of noise and soot and other nuisances created by airplanes is none of its business. If an airline gives good service, that's all the C.A.B. cares about. To it, air transportation is a matter of efficiently launched ledgers and the public is made up only of paying passengers—not of people who sleep, watch TV, sit in their backyards and converse or participate in a variety of other activities that require some quiet.

Congressman Rosenthal once protested that if the Government could build a national aquarium "so that fish could have a quiet place to spawn, I think that for the perpetuation of the race as I know it, at least in my district, my constituents are entitled to the same thing as the fish."

C.A.B. officials would probably sympathize, but when they certify an airline on the basis of "public convenience and necessity," they are thinking strictly in terms of getting people from one place to another safely, on time and for the industry's profit.

The same bookkeeping philosophy brought the SST program into being, but even more so. SST promoters seldom talk of the convenience of faster trips; they talk about the SST's providing the aircraft industry with 50,000 jobs and sales of between $20-billion and $48-billion; they talk of the threat of losing the jetliner market to the French-British supersonic plane, the Concorde, which is expected to be in production by 1971, and they speak of the dangerous outflow of gold if the Concorde and other European-built supersonic jetliners are left without competition.

The SST is strictly a money proposition. The comfort of the public at large has nothing to do with it. The spirit of the SST era was captured in a recent Minnesota Law Review article: "If the national interest in acquiring a cross-continental SST fleet cannot be sacrificed to the interests of a more quiet society, cost balancing not unlike that underlying the general airport noise problem seems in order." Translated, this means: go ahead and break the crockery and let the people sue.

The future, however, is not altogether hopeless for the advocate of moderate quiet. In fact, there is one positive influence that is developing along such healthy lines that it may eventually balance these negative influences. It deserves a title, so let us call it:

The New Environmental Putsch. Two months ago in Anaheim, Calif., M. Cecil Mackey, Assistant Secretary of Transportation for Policy Development, warned a group of aerospace engineers that if something isn't done to make jet noise acceptable, "people will just say, 'Sorry, we don't want airplanes around anymore, we don't want to travel that way.'" That is a far-fetched threat, but Mackey's speech was considered something of a landmark simply because he was the first important official who seemed to be aware of the bitter rebelliousness developing in airport communities.

Just as revolutionary for a bureaucrat was his admission that the airlines and the airport operators and the aircraft manufacturers can no longer be treated as a privileged industry, as they were in the beginning, but must from now on be considered as just another part of the environment and subject to the total environmental goals of the community.

"As a nation we have changed our standards," he said. "We are no longer satisfied to have additional airports, new aircraft, more freeways, modern buildings or new industries. We must have them on *acceptable terms*—even if this means greater costs. And if they are not available on acceptable terms, they may be rejected altogether."

It is doubtful that Mackey spoke for his department as a whole. The idea that air transportation can only be measured by its community impact and can only be considered in its social context, and that the solution to its problems will be political as much as economic and technical—this doesn't sound much like the kind of traditional thought one finds in the F.A.A. and the C.A.B., whose umbilical cords stretch back unfrayed into the good old days when Government regulatory bodies were tied altogether to the market place.

However, the cord-cutting precedents have been established, one of the most famous being the Second Circuit Court of Appeals' ruling that the Federal Power Commission should not have licensed Consolidated Edison of New York to build the Storm King Mountain plant on the Hudson River without considering the total environmental impact of the plant—not just engineering and profiteering questions but also such things as esthetics and the tranquillity of the community.

The courts are beginning to demand that regulatory agencies view the public as more than consumers, and one of these days, probably soon, the same kind of demand is going to be made of the F.A.A. and the C.A.B. There are several organized efforts to hurry that day along. One of the most militant groups is trying to cancel jet operations out of Washington's National Airport. Headed by Frank C. Waldrop, formerly executive editor of the now defunct Washington Times-Herald, the movement includes many Washington notables, such as Justice and Mrs. William O. Douglas, Mr. and Mrs. Dean Acheson and the wives of several Senators. Not only are they outraged by jet noises, they are also (like airport neighbors everywhere) angry about the pollution from jet traffic.

F.A.A. officials protest that the jets are not great polluters. One of the big jets like the Boeing 727 uses 450 pounds of fuel (kerosene) a minute, they say, and only four-tenths of 1 per cent of this comes out in smoke, soot and other debris. It take a jet about two minutes to clear the area. This means that the plane will deposit only about two pounds of fuel cast-offs on the city. F.A.A. officials insist that this is a negligible amount; but those who live under it contend that it adds up to several thousand pounds of filth each year.

Waldrop, a highly efficient organizer of the militants, feels that the noise and soot have tightened his army's ranks to the point where they are ready to break through the C.A.B.'s defenses.

"Eddie Rickenbacker told the National Press Club recently that 'the public will just have to get used to aircraft noise'," said Waldrop, smiling grimly. "Well, we will not accept it. The mice are rebeling. We're the mice and we intend to be heard. Heretofore, the C.A.B. has dismissed individual protestors as crackpots. Maybe we are crackpots. But crackpots as a *class* deserve to be heard.

"The C.A.B. has so far said they don't have to hear our story, but they only said it by a three to two vote. They're shaking in their boots. If they tell us, 'You have a case but we don't give a damn,' then we'll go down the street to the courts and sue everybody all over the place for damages—including the C.A.B. They have ignored the public as long as they are going to."

Waldrop's assault on the C.A.B.—and on the courts, if it comes to that—will follow a new route that others also are considering: the qualitative route. Heretofore, aviation has had to adhere mostly to quantitative measures: speed, safety, efficiency. But the elusive index of community impact has not been measured, nor even much considered. As Dr. Patrick J. Doyle, not only one of Waldrop's supporters but also chairman of the Community Medicine and International Health Department at the Georgetown School of Medicine, put it recently: "No matter what euphemisms are offered, this is a real physiological and psychological hazard not measurable by noise machines or computers."

It is a fuzzy area, poorly explored, but the C.A.B. is going to be dragged into it one of these days. "The technological age," says

Waldrop, "has run smack dab into the esthetic and psychological age."

If airline and airport and Government officials can limit the growing rebellion to legal action, they will be lucky. When Waldrop complains that his opponents "don't understand anything less than a punch in the nose," he is not speaking literally, but it is still a good measure of the kind of emotions that the noise problem has aroused.

Assistant Secretary Mackey believes that "the methods of protest that are becoming rather widespread in areas like civil rights are equally likely to be used in environmental disputes." Already it is being tried. Some groups have blocked access to airports with their autos; some mothers have tried to wheel their baby carriages onto the landing strips; there has been considerable picketing; here and there an irate citizen has actually taken a potshot at a passing plane. Tempers are short.

Increasingly, airport neighbors would agree with Congressman Pucinski that "a lot of the vested interests, a lot of the special interests who have been trying to skirt around this problem are going to face up to the fact that progress does not mean virtually destroying the lives of some 30-million Americans."

But as a matter of fact, laying all the blame on special interests is the very way to delay progress. The reciprocating machinery of capitalism is propelled by the aggression of special interests balanced by the restraint of government. Aviation's special interests have become overbearing only because Pucinski and his political colleagues at all levels of government haven't done their restraining job. If the politicians are ignorant of how to proceed, it is only because they have not listened to their hirelings.

At least eight agencies and an interagency task force have experts working on the problem, and these are some of their better suggestions for making the airplane a more civilized disturbance.

(1) Manufacturers should be induced (subsidized or bought off) to reverse their present emphasis on engine development. Now they design their engines first and try to silence them after; they should design quieter engines first and then modify them upward in power.

(2) If the quieter engines cannot lift as many passengers per load, fares should be increased to make up the difference. If this chases some travelers back to the rails, thus encouraging the development of faster surface transportation, all the better. If it calls for more Government subsidization of aviation, this will scarcely embarrass the industry, which is perhaps already the most subsidized industry we have.

(3) Future airports should be laid out as nearly as possible to imitate the generosity of the one being prepared for Fort Worth and Dallas. It spreads over 18,000 acres (nearly twice the acreage of the second largest field, Washington's Dulles), and this may even be enough to hold back rapacious real-estate developers.

(4) Wherever possible, neighboring homeowners should be bought out along the paths of maximum noise. Los Angeles, often cited as a model on this point, floated a $20-million bond issue, of which some will be used to buy private property bordering the take-off route. (But as 80 per cent of the complaints come from landing noises, this is a limited relief. Around New York City's airports, where hundreds of miles of premium real estate are involved, the cost of buying would be impressive, indeed.)

(5) Airports established in distant suburbs, like Dulles or Baltimore's Friendship (30 miles from Washington), should be made more attractive by servicing them with really high-speed and cheap transportation.

(6) Within earshot of every major airport in the country are dozens of schools and several hospitals; there are 40 schools within noise distance of the Los Angeles airport alone. By 1975, at least 460 cities will be getting jet service. Schools and hospitals built-in these cities in the future should be insulated against noise; the materials have been available for years.

In proposing all these things, the experts are quite correct. The only trouble is, with Government planners the good ideas are almost always canceled out by timidity and by niggardliness. Dorn McGrath, director of metropolitan area analysis for H.U.D., after estimating that $240-million would be needed to insulate the homes most plagued by noise around Kennedy, O'Hare and Los Angeles International airports, said that one should not expect Congress to pick up such a bill.

In saying so, he exposes the operative psyche of Washington's legislators, who are expected eventually to appropriate up to $3-billion to develop the supernoise of the SST but are not interested in spending 1/12th that amount to insulate homes against jet bedlam.

McGrath's pessimistic appraisal is probably justified, just as is Mackey's warning that "the Federal Government *cannot* be looked upon as the principal source of capital" to pay for aircraft reform. The reason is simple: Congress just doesn't care enough. Perhaps 50 to 60 Congressmen are really worked up over the problem, but no more than that. The results are exactly what one would expect.

More than two years ago, the brand-new Housing and Urban Development Department was statutorily ordered to "undertake a study to determine feasible methods of reducing the economic loss and hardship" suffered by people who live near airports. The study was to include "feasible methods of insulating such homes from the noise of aircraft" and it was supposed to be completed within one year. It still isn't complete. In fact, it has hardly been started. Congress refused to supply the money for the job.

The default was symptomatic of why the noise problem will continue for a while. There is nothing metaphysical about it. It is just a matter of buying land, of developing quieter engines, of paying the airlines to use them, of soundproofing homes and schools and hospitals, of *not* filling in more Jamaica Bays to please real-estate operators, of *not* subsidizing the development of noisier SST's.

It all comes down to a matter of budgetary priorities and esthetics—the very things, unfortunately, that politicians understand least and that an exasperated public will probably have to teach them.

BOOM

The phenomenon known as "sonic boom," the thunderlike clap that hovers over the future of the supersonic airline like a thundercloud, is caused by aerial shock waves.

All aircraft, as they push through the sky, compress the air ahead of them, causing a pressure disturbance. The pressure rises as a plane's speed increases; but at subsonic levels, since the pressure disturbance travels with the speed of sound, it can move out from the aircraft in all directions and be dissipated without affecting those on the ground.

But when the plane exceeds the speed of sound, the pressure field is forced out behind the aircraft where it assumes the shape of two cones—one extending back from the nose, the other from the tail. The pressure field is thus contracted, and the pressure radiates out in high-intensity shock waves. When the bottom edges of the cones reach the earth, their waves are received by the ear as an explosive sound—usually single, sometimes double.

As long as the aircraft exceeds the speed of sound, it continuously sends forth waves of "boom" intensity. Any one person on the ground experiences only the one boom from a plane passing overhead at supersonic speed, but he has the dubious satisfaction of knowing that all those in the shock cones' path will share the experience.

THE NOISE RECEIVER: THE CITIZEN*

(By Robert Alex Baron, M.A., executive vice president, Citizens for a Quieter City, Inc., New York, N.Y.)

You will find little humor in my dissertation. Not that I take myself all that seriously, but a sense of humor is one of the casualties of noise assault. I sometimes wonder if I am more of a masochist to passively experience the noise or to fight it.

When I was invited to present this paper, I was referred to as "the other side." This gave me pause. I hate noise. Does this mean you like it? Of course not. You and I and our families are all on the same side as far as noise is concerned.

The acoustician describes the noise problem as a chain of events. It starts with the noise source, in the middle is the transmission path, and low man on the totem pole is the citizen receiver of noise. Punch-drunk from taking all the unmuffled noise sources thrown at him, the citizen receiver must and is organizing to defend himself. He could use your help—for model codes—for designing less noisy machines.

The old bromide of "you'll adjust" won't do. The citizen receiver, like a wornout rubber band, is finding it difficult to continue to adjust to the noise. Maybe his ancestors did a better job of adjusting to Caesar's chariots than he does of adjusting to today's buses, trucks, and jets. But today's dawn-to-dawn noises are too much. They are not yesterday's, either in energy content, spectrum distribution duration, stimulus frequency, or any other noise characteristic. Air pollution at least is killing us silently; noise makes each day a torment.

The majority of human noise receivers live in congested cities, noisily bursting from their seams. Our population, now 200 million, has doubled since 1914. By the year 2000 it will exceed 300 million. Eighty percent will live in cities. Few will escape the noise explosion. Not the suburbanite, already receiving motor vehicle noise radiating from the new nationwide network of throughways not to mention a variety of noises from jets, motorboats, drag strips and a hundred other sources. Not the rural community, recoiling from this same barrage of noise plus that of agricultural machinery. The sonic boom will be a great leavener. City, suburban and rural man will all be receivers from the same source. As each attends his house of worship he can answer for himself whether five or six or what have you sonic booms per sermon constitute an annoyance. What will be the NC for churches in sonic boom land—35–45–50, or will it depend upon the sermon? Those of you involved in setting the criteria are invited to install your families in SST flight paths and let them serve as your jury.

The urban noise receiver's day can start at 7 A.M. Jackhammer reveille. Garbage truck reveille. Jackhammers and portable air compressors are permitted to be as noisy today as they were forty or more years ago.

The urban noise receiver is forced to remain tuned in to excessively noisy kitchen blenders, exhaust fans over range hoods, dishwashers, garbage disposal units, and vacuum cleaners. En route to work, the urban man endures 90 or more decibels, whether he travels by subway, by bus, or by automobile with window open.

At work—and I am sure many of you know what factory noise is like—he may be assaulted by high-level ear damaging noise from automated clerical and computing

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*Presented at the Community Noise State of the Art Seminar held at the Seventy-Fourth Meeting of the Acoustical Society of America, November 14–17, 1967, Miami Beach, Florida.

equipment, equipment perhaps like that in the check tabulating room of a large New York bank, equipment so noisy the bank is now hiring the deaf to reduce employee turnover.

The city noise receiver in his office suffers speech interference from helicopters, sirens, and soon VTOL's and hovercraft. Lunch hour, in some restaurants, is a nerve wracking cacophony of dish clatter and loud voices. After work another dose of transit noise. At home he is bombarded by noise from within his dwelling and from without. He is forced to listen not only to his family's and his neighbor's TV sets but to the details of his neighbor's personal life as well as to the air conditioners in his own quarters. Any time during the night his sleep may be disturbed by many noise sources: buses, trucks, motorcycles, fire engine sirens, police car sirens, ambulance sirens, autohorns, barking dogs, planes—and his neighbor's air conditioners.

There is no escape during leisure time, in the city or in the country. Street noises prevent his sleeping late on Saturday and Sunday. The jets may follow him to the beaches, power lawnmowers may follow him to his country retreat. Motorboats, highway traffic and jet flyovers can make ear pollution as distressing at campsites as anywhere else. Where can he go for quiet, undisturbed relaxation? Resort hotels and motels that may not be sound-proofed? Even patients in hospitals are exposed to noise which interferes with their rest and sleep, so necessary for healing and convalescence.

How do we abate traffic noise? We don't.

How do we abate 100 decibel construction noise? We don't.

How do we control noise within dwellings? We don't.

This neglect of urban man's acoustic environment is of long duration. In 1930 the New York City Health Department tabulated a list of 11,000 complaints. At the top was traffic noise. Next was transportation: elevateds, subways. Then came garbage collection, emergency vehicle signals and construction noise. Today, some thirty-seven years later, all of these noise sources are still at the top of the list of complaints. I would hazard the opinion that a noise survey five years from now would show little change, except we could add complaints from helicopters, VTOL's, hovercraft, the SST, and air conditioners.

Is it any wonder that it takes the urban receiver of noise by surprise to learn that there is a science and technology of noise control?

Yet there is an acoustical science and technology. It provided the Army with an inaudible motor for front-line use, the Navy with silently-operating submarines, and the Air Force with a silent plane, and the space agency with sound-absorbent launch pads for ICBM's. I am told billions are spent on underwater acoustics. Sometimes the earthbound receiver of noise wonders if man doesn't know more about the noise environment of the fish receiver of noise than he does about his own.

It is more than a century since the Industrial Revolution, yet millions of factory workers receivers of noise grow deaf while waiting for the application of noise control or a hearing conservation program that includes noise control. This in spite of the fact that hearing conservation is the consuming interest of some acoustical experts. A study of hearing conservation programs recently reported in the Journal of the American Industrial Hygiene Association revealed that only a small percentage, 16%, of the aerospace industries that replied to a questionnaire reported hearing conservation programs. This study also revealed a lack of uniform techniques for conducting such programs. Mind you, we are not talking about the ancient weaving mills, but the modern aerospace industry.

If even industry, which has had the benefit of years of acoustical attention is virtually without effective noise control standards, it is not surprising there is acoustic anarchy in the everyday environment.

The unavoidable fact is that basic guidelines are lacking. Action is frustrated by a plethora of measurement techniques, none of which has won universal acceptance. Instead of noise suppression we find an alphabet soup of decibels: A,B,C, Perceived Noise, Effective Perceived Noise, SIL, NC, NCa, NNI, etc., etc.

One of the standard jokes among acousticians, I am given to understand, is that there is an inverse ratio of noise suppression to noise measurement. The story goes that nit-picking measurement is necessary because noise suppression, especially in the field of jet engines, is so minimal as almost to defy detection with existing techniques.

To the poor uneducated citizen, how do you explain the inability to curb the noise of a fractional horsepower vacuum cleaner or air conditioner, but the 300 HP explosive-type engine of a Cadillac or Rolls Royce can be made so quiet you can hear that clock tick?

Does it make sense to worry about fractional decibels when the receiver is experiencing community noise in the 100 decibel range?

In concentrating so hard on measurement, are we making the mistake that the Mayan civilization made? As reported by Dr. Albert Carewe in the October 1967 issue of Physics Today, "the Mayan civilization . . . concentrated to such an extent on measuring the length of the year to incredible precision but failed to consider the needs of their own society, even to the extent of inventing the wheel." The Mayan civilization destroyed itself.

Why do we have to have such precise standards? Almost every community has an ordinance that prohibits disturbance by barking dogs. These ordinances do not specify the size of the dog, or the decibel level of the bark. It is accepted that barking disturbs sleep, and sleep must be protected. Yet when it comes to jet planes or trucks or air conditioners, all of which can and do disturb sleep, we are asked to wait for the perfect measurement—or accept standards that do not abate the noise source.

To illustrate. Air conditioner noise is a growing problem. Here on this program the Air Conditioning and Refrigeration Institute is promoting a "model" code. Here is what the editor of Air Conditioning and Refrigeration News said about this code at the Jan.-Feb. 1967 meetings of ASHRAE:

"Our industry's present recommended code suggests a 60 dbA level be permitted at the property line. In five years of actively monitoring the noise problem, I have yet to meet one person outside our industry who does not consider 60 dbA an unreasonably permissive level . . . In Cincinnati, the code authorities openly laughed at our industry's 60 dbA recommendation . . . The majority of manufacturer's don't take the problem seriously enough . . . The industry's noise code is unrealistic."

When I read this can you blame me for wondering if I shouldn't prefer the noise maker's neglect to his good intentions?

Another needed guideline is for building codes. You have heard about New York City's proposed new building code. We look into the suggested standards and it proves to be another example of the lack of effective guidelines to protect the American receiver. I quote from an analysis prepared by Martin Hirschorn for testimony before the New York City Council:

"The basis of this code is the assumption that an NC–40 criterion is acceptable to the majority of people living in city apartments; this is an incorrect assumption, and, in effect would legislate noisier apartments than we have now in this city."

Referring to the STC 45 rating proposed by this code, Mr. Hirschorn testified that this was in sharp contrast to the Russian STC 55. "The STC of 45", he testified, "is actually below the lowest standard reported in Europe." Why must the American public always have to settle for less?

Not only is the American noise receiver denied effective, practical noise control guidelines, his efforts to gain noise controls are hampered by attempts to hold him to ridicule. I quote one of the most distinguished acoustical experts writing in Scientific American:

"The noises of our daily life have been blamed variously for the high divorce rate, social conflict, indigestion and other organic disabilities, nervous breakdown, high blood pressure, heart failure, and even insanity. Most of these allegations arise from over vivid imaginations, but one cannot rule out the possibility that some people are particularly sensitive to noise just as others are allergic to nuts, eggs, or household dust." How many of you would agree?

Even if only a small minority were disturbed by noise, would we be justified in ignoring their problem? I would like to believe a civilized society such as ours is concerned with the minority. Are we not to have schools for the deaf because the deaf are a minority? Are we to be against the articificial kidney machine program because only 50,000 people have kidney disease?

Of course, the fact is that the number of people who are disturbed by noise is far greater than anyone today realizes.

Is the acoustical expert so afraid of noise control legislation that he must make the noise victim seem foolish, his needs seem unimportant?

Is it any wonder that the critizen receiver is taking measures for self-defense? He realizes if he does not act now, if he delays action, the noisy horsepower will roar out of the stable before we close the door. The hovercraft and the SST are around the corner, and we have not even begun to cope with the bus and truck.

The citizen receiver of noise, with few scientists and technologists interested in his problem, or at his disposal, with no governmental agencies capable of protecting him, with some acoustical scientists emasculating his arguments for abatement, now realizes if he is to live, work, and play in a decent acoustic environment he must accept the responsibility for his own protection from decibels, just as the pioneers of early America had to protect themselves from Indian arrows.

The noise maker can expect that every disturbing noise source will be scrutinized. If the public will find itself balked at controlling the noise, it will try to suppress the noise source. The air conditioning industry is learning about this approach to noise abatement in the cities of Coral Gables, Florida, Beverly Hills, California, and Irvington, N.Y. The FAA is hearing from the Citizens League Against the Sonic Boom.

There is no law, either natural or manmade, which says that every piece of noisy equipment somebody chooses to make must be permitted to degrade the human environment.

Where does Citizens for a Quieter City fit into this picture? We believe one reason our noise levels are so insufferable is that most of us in post-World War II America have been busy making things, to the neglect of our environment. Citizens for a Quieter City believes that education and applied research are prerequisities to intelligent action. Our purpose, therefore, is to create an awareness of the need for the control of city noise and of the means available for such control. We want to stimulate research not only on hard-

ware and legislation, but on the effects of noise on man.

The Officers, Board of Directors and Advisory Board represent a broad spectrum of community life, including medicine, religion, business, civic affairs, public relations, advertising, ecology, law, and, of course, acoustical engineering. Unfettered by preconceptions of noise control doctrine, we can look at the noises in our environment, examine their causes, and seek practical solutions. Perhaps we have been referred to as "the other side" because we believe that the machine, like children, should be seen and not heard.

To quote our president, Jerome Nathanson, a Leader of the New York Society for Ethical Culture: "Because of a difference in attitude towards noise in the environment, some European cities and nations are a decade or two ahead of us in demanding and employing noise-reducing measures. To help change our attitude is one of our purposes."

Here is a German book of noise laws. Excessive construction noise is prohibited. Here are German standards for permitted noise levels. How was this possible in Europe, but impossible in the United States?

Our message is that noise abatement involves the active interest of the entire community of science and technology, of medicine, sociology, planning, public health. Citizens for a Quieter City especially seeks the cooperation of acoustical science and technology. This is why I am here today. To start with, help us eliminate construction noise. Agree with us that the public has been intimidated long enough by noisy jackhammers and air compressors.

Seek to encourage manufacturers to design for less noise. It is not all altruism. There is economic gain in silencing for the urban received. You may have heard about New York City's "quiet garbage truck" purchase. For a long time I had suggested that the solution to the ancient problem of garbage collection noise was to require a quieter garbage truck, to specified a quieter garbage can. We were finally able to present our concepts to receptive Commissioners of Sanitation and Purchases. Fortunately, for the necessary follow-up, there was a Mayor's Task Force on Noise Control, and serving on it a perserving acoustical consultant, Stan Potter. General Motors came up with a quieter and less air polluting truck to win a $4 million order. It cost the city only $100 additional per truck.

I hope to see the same economic advantage accrue to the company that is working on a quieter garbage can. We hope to see one in the near future.

Help us get simple, effective and practical standards for noise legislation. Help us locate and stimulate the development of silenced equipment and appliances. We would like to see the acoustical engineer have the final say-so in prouct design instead of the cost reduction engineer or the cost control accountant.

If we are to improve the human condition by controlling the Urban Age problems of environmental pollution, shouldn't the acoustical expert expand his sense of loyalty and responsibility to include the noise receiver? I am here today because our organization, and I as its representative, believes it is to your enlightened self-interest as acoustical experts, who also are violated by noise, to cooperate with and support Citizens for a Quieter City. With the right kind of dialog, you the experts, and we the receivers, can take effective action.

The human receiver of noise must not remain low-man on the totem pole. We must put our acoustical knowledge to work—for protecting model codes, or silencing in design. It should be obvious the citizen noise receiver is no longer willing to put up with the lack of control of noise which assails his ears, offens his dignity, and could injure his health. We hope the members of the Acoustical Society of America will joint with us in a cooperative effort to achieve a healthy acoustical environment.

A quieter everyday environment is possible, reasonable, and long overdue.

[From Air Transport World, March 1968]

THE AIRPORT ISSUES AND ANSWERS

(By Joseph S. Murphy)

Just when it appeared that an all-time high level of cooperation was being achieved in airline-airport relations, a seam must have broken somewhere. If not quickly amended, it could spell trouble ahead in tackling the problems that must be solved and the facilities that must be planned for the immediate years ahead.

The pullout by the Airport Operators Council International and also the American Association of Airport Executives from the National Aircraft Noise Abatement Council is a real blow. It also is a signal that airport managements, guided by the Port of New York Authority, are against land use to cushion airport neighbors against noise and from now on will preach noise kit retrofits, even if they don't exist or offer little but expensive cures if developed. The airport people are talking 15 to 20 "Perceived Noise Decibel" reduction now; airline and engine people say 5 PNdb may be in six years, but no guarantees. Somebody's right and somebody's dead wrong.

It is urgent that the top officials of the airlines and their counterparts who guide the affairs of AOCI get together and seek out the source of this breach and do something about it immediately. The job of planning and coordinating the facilities, and financing airports for the jumbo jets and SSTs, is a gigantic one even with 100% cooperative effort of airport and airline people. Without this cooperation, it could become an impossible, if not disastrous exercise.

Now is *not* the time to put political motives ahead of objectives. Airlines are nothing without good airports and good airports might as well be museums without airlines. The two go together and there's no reason in the world why the two industry segments can't work together to give the flying public what it deserves—the best facilities operating climate that their combined talents have to offer.

While meeting on this subject of airports, it might be well to add another item to the agenda. The new war of propaganda between the airlines and general aviation over airport congestion could stand some high level attention, too. Here, we urge that Secretary of Transportation Alan Boyd or FAA Administrator William McKee meet with airline, general aviation and airport people, form a task force charged with coming up with answers tailored to specific congested areas and make decisions in the public interest—not in the light of the special interests of any of the parties.

There are hopeful signs that the Department of Transportation is coming to grips with the problem. In a recent speech in Washington, D.C., M. Cecil Mackey, Asst. DOT Secretary for policy development, hit the nail on the head: "The capital requirements for air transportation," said Mackey, "must be recognized as presenting straightforward economic questions of allocation. All of us who are concerned with air transportation . . . who have the responsibility for promoting and fostering its growth and development, must do everything we can to insure that the funds which are available for aviation are used in the most efficient way possible. As with any scarce resources, airport capacity and airspace capacity must be allocated in a way which takes in account the productivity of the users in the light of our overall transportation objectives. This means that allocative techniques must be established that yield the greatest return on our investment."

Some basic decisions have to be made now to shape the system to meet the demands of tomorrow. But they must not be made to serve the special interests of any segment of aviation—airline, corporate or general aviation. They must be judged in the light of what is in the overall public interest and not just the flying public.

The present round of propaganda might well serve to stifle action by anybody to face up to the problem. It might well put off much needed action by all segments of aviation to get good answers now. It might well bring about a future situation wherein, through its own failings, the aviation industry is saddled with solutions that are intolerable for all.

[From Parade, Washington (D.C.) Post, Jan. 21, 1968]

WHAT DO YOU HEAR

(By Sid Ross and John Molleson)

VIRGINIA, MINN.—If you have worked ten years next to a pneumatic hammer, chances are you can't hear the rustle of this page. Millions of us, bombarded daily by noise, have suffered some loss of hearing. Even if you don't work next to pounding machinery, your hearing is in danger. Day in and day out, the clatter, whine, rumble and roar in homes, streets, offices and factories are wearing down the delicate hearing nerves of your inner ear. You hear less of the world's racket (which may be a form of self-defense), but you are also less able to distinguish the music of a child's laugh, the conversation of friends, or the warning honk of a horn in a rainswept street.

A NATIONAL PROBLEM

Constant exposure to "noise pollution"—a term scientists use to describe the problem of excess manmade sound—is now recognized by the U.S. Health Service as a national problem, requiring public and private action. Here in the Mesabi country, amid the not-so-silent taconite plants and iron mines, a group of sound specialists has begun a campaign to protect Americans against the effects of industrial din. Hearing Conservation, Inc., is waging what is believed to be this country's first coordinated attack on noise pollution.

Dr. Tom Summar, an otolaryngologist, heads the H.C.I. team of doctors, acoustical engineers, audiologists and psychologists whose goal is to help industry reduce noise and employees to conserve their hearing. Dr. Summar and his associates have tested the hearing of thousands of workers and gone into plants to measure noise levels and duration of harmful exposure.

When does noise begin to hurt? The subcommittee on noise of the American Academy of Ophthalmology and Otolaryngology says continued exposure to noise levels above 85 decibels—slightly greater than the noise of a busy street—can damage the inner ear. But miners, boilermakers and some heavy equipment operators, Dr. Summar says, may have to endure noise up to 115 decibels, for eight hours a day. Slaughterhouse workers are not much better of. Their plants can generate noise levels of 100 decibels, Dr. Summar says. By comparison, subway trains roar into stations at 115 decibels, and the scream of a jet engine at takeoff reaches peaks of 120 decibels or more.

Loud noise is, of course, conspicuous. We are less aware of the insidious effects of more stealthy machinery—the clatter of typewriters, hum of computers, whir of high-speed machines. Noise that doesn't seem loud may resound at wave lengths and frequencies that can abrade our hearing. Herbert H. Jones, associate chief of the Public Health Service's national noise study, says that as little as five hours' daily exposure to moderate sound levels over a period of ten

years can cause hearing losses. He estimates that as many as 16 million of us are exposed to noise levels that may be hazardous to our ears—if not to our sanity.

What can be done about it? For practical reasons, Dr. Summar's immediate answer to noise pollution is protection. The quickest way to cut down the noise in a worker's ear is by earplugs or earmuffs. Later on, a plant may adopt H.C.I. recommendations for quieter assembly lines, as part of a long-range program.

In the three years since its beginning, H.C.I. has surveyed 15 plants across the country. The specialists offer industries a complete program consisting of a noise level study, recommendations for noise control, hearing checks for all workers, data and record system for continued hearing evaluations, and—perhaps most important—education of workers about the effects of noise on hearing and the importance of protection.

H.C.I. has found that in large plants where workers are continuously exposed to sound levels of from 85 to 105 decibels, about 70 percent of the employees will wear earplugs and earmuffs, if they have been told of their significance. About one-third of the men won't wear them, or will do so only sporadically, because they say the plugs hurt or are uncomfortable.

Resistance to the plugs is often strongest among older workers. Some of them say the protection is "an insult to a man's masculinity." Others find the protection interferes with the aural bond between a man and his machine which constantly lets him know how it is working.

Dr. Summar's eight-year study of 2500 miners in Minnesota showed that 98 percent who wore protection suffered no significant loss of hearing. Armed with such statistics, he has a strong argument for protection, but some workers remain unconvinced. "The only time I wear those things," said one miner, "is when I go home and listen to my wife."

ECONOMIC ARGUMENT

For management, Dr. Summar has an economic argument. He estimates that there are about 4.5 million Americans who have suffered a loss of hearing as a result of industrial noise. If only 10 percent of them were to file for compensation (the courts have lately upheld claims for hearing impairment caused by noise on the job), an average settlement of $1000 would amount to a total bill of $450 million, he says.

But the country grows noiser and some of us apparently enjoy it. Housewives want vacuum cleaners with a robust level of loudness, to be certain of their pulling power. Hotrodders demand an exhaust VROOM! second to none. TV and radio commercials increase in volume, as do the complaints about them, but the commercials are still ahead. Hi-fi delivers a purer sound, but part of the fun is making your neighbors aware of it—even across the street.

Mr. Jones foresees a time when all states will enact laws limiting noise pollution. Until now, only California, Washington and Oregon have done so, though Sen. Robert F. Kennedy has asked for changes in New York's building code to cut down noise levels in new construction, and to regulate the maximum noise generated by everything from airplanes to machinery.

"The noise situation in this country is becoming intolerable," he says. He can say that again.

CHAMBER OF COMMERCE
OF THE UNITED STATES,
Washington, D.C., October 3, 1967.

Hon. THEODORE R. KUPFERMAN,
U.S. House of Representatives,
Longworth House Office Building,
Washington, D.C.

DEAR MR. KUPFERMAN: Your remarks in the September 27th *Congressional Record* were greatly appreciated, as were your remarks at our Chamber luncheon. The comments by yourself and the other speakers were received by our corporate representatives.

In line with your remarks about our publication, "The Need: To Manage Our Environment," you will be pleased to note that our Environmental Pollution Advisory Panel will consider adding an appendix on noise pollution (similar to the appendices on air, water, and solid waste) at its January meeting.

Thank you again for your able contribution to our luncheon.

Sincerely,

JOHN J. COFFEY,
Research Associate.

GUILFORD COLLEGE,
Greensboro, N.C., November 24, 1967.

Hon. THEODORE R. KUPFERMAN,
U.S. House of Representatives,
Washington, D.C.

DEAR REPRESENTATIVE KUPFERMAN: I have received the 25 additional copies of the Congressional Record you were so cooperative as to have sent to me, and also your informative letter of November 20.

Thank you so much for your keen interest. This is a serious problem which requires action, and I wish you every success in seeking establishment of an Office of Noise Control.

Next summer I expect to be back in New York, and hope to be able to drop in to visit your district office to express my personal appreciation for your services.

Kindest regards.

Sincerely,

FREDERICK W. PARKHURST, JR.,
Associate Professor of Economics.

[From the New York Post, Mar. 13, 1968]

THE ROCK SOUND—EAR POLLUTION

GAINESVILLE, FLA.—An ear specialist, the father of a teenage daughter, has found that a rock 'n' roll band can generate a noise level close to that of a jet aircraft.

Dr. George T. Singleton, head of the division of otolaryngology at the University of Florida, tested his daughter and nine other teenagers before and after a rock 'n' roll party and discovered a measurable hearing loss in all 10.

The loss was regained, but a ringing in the ears persisted for about 18 hours. Most of the teens admitted being fatigued.

"We don't know how much sustained exposure of this type will result in a permanent hearing loss," he said in an interview. "We intend to continue our study.

FACTORY NOISE

"We do know that some individuals working in a noisy factory, say around punch presses, can lose hearing in a short time.

"Many artillerymen show hearing loss, even the two-year men. Some individuals can develop a loss in just one shot if they get too close to the gun.

Dr. Singleton and his associates found the greatest amount of rock 'n' roll noise was picked up in front of the band, as might be expected.

"The significance here is that most of the swingers like to spend most of the evening at the bandstand," he pointed out.

LOWER AT CENTER

From a peak of 120 decibels at the bandstand, the noise level dropped to only 106 decibels at the center of the dance floor. It remained high because the sounds reverberated off the drapes surrounding the dance floor. Amplifiers also serve to boom out the sound to distant points.

As a professional and a father, Singleton hopes to determine what noise level will still be pleasurable but not harmful for rock fans.

"We think that 90 decibels is a safe level," he said, "and even peaks somewhat above that may not be harmful for a short period."

The research has yielded one important measuring rod.

"When the clothing of the chaperones begins to vibrate [at about 100 decibels], you've got too much noise," he said.

[From Environmental Science and Technology, December 1967]

FEATURES OF OTHER NOISE BILLS

As of the latest count some 30 bills, endorsed by different legislators, are being considered by the House Subcommittee on Transportation and Aeronautics, under the chairmanship of Rep. Samuel N. Friedel (D.-Md.). The proposed 30 bills amend 49 U.S.C. 1301 and 49 U.S.C. 1421-30 and are essentially alike. Associated bills include H.R. 13846 (introduced by Rep. Donald M. Fraser (D. Minn.); H.R. 7266 (introduced by Rep. Joseph P. Addabbo (D.-N.Y.)); H.R. 2819 and H.R. 2820 (introduced by Rep. Theodore R. Kupferman (R.-N.Y.)); H.R. 14146 (introduced by Rep. Samuel N. Friedel (D.-Md.)); and others.

Congressmen Fraser's H.R. 13846 and Kupferman's H.R. 2819 would establish an Office of Noise Control in the Office of the Surgeon General. According to Kupferman, "The primary function of the Office of Noise Control would be to act as a national clearing house for general and specific noise information, and could, upon request, disseminate the wealth of its accumulated knowledge to the states and local governments to help them control noise at its point of origin." The proposed legislation is designed to make the Office of Noise Control responsible for controlling other types of noise such as those associated with traffic, subways, and the like.

One title of Congressman Fraser's H.R. 13846 permits certain FAA reimbursements to airlines that conform to proposed federal noise regulations. This includes the following:

As much as a 30% reimbursement of the cost of modifying aircraft to conform with federal noise regulations.

As much as 30% reimbursement to airports making the changes.

A 90% reimbursement for cities acquiring land near the airports or along flight lines in an effort to reduce the effects of noise.

Stephen's substitute bill, endorsed by ATAA, would limit the application of noise measurement standards to aircraft type certification.

[From the New York Times, Mar. 26, 1968]

BRITAIN TO PENALIZE DRIVERS OF VEHICLES THAT ARE TOO NOISY

LONDON, March 25.—The Government moved today to try to reduce noise on the nation's streets and highways by setting up roadside meters for spot checks.

After July 1, if the cars and trucks exceed noise limits set by the Government their drivers will face a fine of up to $120.

There was some question whether the levels set by Mrs. Barbara Castle, the Minister of Transport, were low enough to be of much immediate help. The Noise Abatement Society, a voluntary group, believes that they are much too high.

"We took some tests of our own last week and this week," a spokesman said, "and only one or two cars and trucks got as high as the limits set by Mrs. Castle."

"We think she's giving motorists carte blanche to make as much noise as they want to," he added.

Beginning July 1, when the roadside meters will be set up, noise decibel limits will be 92 for heavy trucks and buses and 87 for passenger cars.

Experts say that a noise measuring 110 decibels is regarded as deafening. They put gunfire, a pneumatic drill and a large machine shop in that category.

They say the ears receive about 90 on a busy street. At the other extreme is 30, which, as one expert here said, is "what you get in a library, on a country road or when somebody is whispering in your ear."

Mrs. Castle agreed that the limits that go into effect in July may allow too much noise. She said the new regulations were experimental and a first step.

She noted that more stringent regulations would go into effect in April, 1970. Talks are under way, she said, with manufacturers and research organizations, to develop quieter vehicles.

[From the New York Post, Mar. 9, 1968]

THE MUSICAL REJECTS

OKLAHOMA CITY.—Loud music listened to by teenagers apparently is a factor in the rejection rate of draftees, says Gen. Lewis Hershey, director of Selective Service.

"I can't support this contention with fact," he said, "but I'm told that some youngsters who listen to loud, noisy music are losing their hearing. And hearing is a major reason for rejection."

[Airport Operators Council International, Inc., special subjects information service, May 10, 1968, S.S.I.S. No. 68–2]

NOISE—AIRCRAFT NOISE BILL ADOPTED BY HOUSE TRANSPORTATION SUBCOMMITTEE

The House Transportation and Aeronautics Subcommittee favorably reported out to the House Interstate And Foreign Commerce Committee on May 8 an amended version of the aircraft noise bill, H.R. 3400. This bill was sponsored by the Department of Transportation, recommended by the White House Interagency/Industry Committee on Aircraft Noise and supported by AOCI.

This is the first major procedural step in the enactment of aircraft noise control legislation. Remaining are: clearance by the full House Commerce Committee, House approval, Senate Aviation Subcommittee and Senate Commerce Committee approval, Senate approval and possibly a Senate-House Conference (should any major differences develop between House and Senate).

The bill would amend the Federal Aviation Act to

1. Require the Federal Aviation Administrator to (a) prescribe standards for the *measurement* of aircraft noise and sonic boom, and (b) prescribe rules and regulations for the *control and abatement* of aircraft noise and sonic boom;

2. Authorize the issuance, modification, or revocation of *any* certificate now authorized for safety purposes to meet these new noise standards, rules or regulations; and

3. Provide for an administrative appeal to the National Transportation Safety Board.

This bill succeeds in accomplishing the following major objectives that AOCI Members have been seeking:

Recognition that the Federal government has a responsibility for the control and abatement of aircraft noise; and

Federal government power to establish and enforce standards, rules and regulations to control and abate aircraft noise, both for *present* and *future* aircraft, through type, airworthiness and operating certificates issued to the manufacturers and air carriers.

CONTINUED MEMBERSHIP SUPPORT NEEDED

It is important *now* for each AOCI Member to keep your Congressional delegation advised of your continued interest in order to secure prompt passage of H.R. 3400. The House Interstate and Foreign Commerce Committee is expected to consider the matter next week (about May 14 or 15).

Under separate cover, we are sending to Official Representatives a copy of the Subcommmittee aircraft noise hearings held last fall and additional information on future action. For further information on these hearings see AOCI's S.S.I.S. No. 67–3, dated November 22, 1967.

Congressional testimony during the hearings evidenced a strong backing for prompt passage of this aircraft noise bill by the following Representatives:

California: J. C. Corman, C. H. Wilson.
Colorado: B. G. Rogers.
Florida: D. B. Fascell, C. Pepper.
Georgia: J. J. Flynt.
Hawaii: D. K. Inouye, S. M. Matsunaga, P. T. Mink.
Illinois: R. C. Pucinski.
Louisiana: H. Boggs.
Massachusetts: H. Keith.
Minnesota: D. M. Fraser, J. E. Karth, D. MacGregor.
New Jersey: J. G. Minish.
New York: J. P. Addabbo, F. J. Brasco, E. Celler, J. J. Delaney, P. A. Fino, J. H. Gilbert, S. Halpern, T. R. Kupferman, R. L Ottinger, O. R. Reid, B. S. Rosenthal, H. Tenzer, L. L. Wolff, J. W. Wydler.

NASA SEES NOISE REDUCTION FOR PRESENT AIRCRAFT

"With the tests we have just recently completed, by modifying nacelles for the DC–8, and 707 aircraft, it looks as though we can reduce the noise level of those existing aircraft down to a level of 100 decibels except for regions very near the airport. So this will be more than a factor of two—(cutting in half the area around the airport subjected to over 100 decibels)."

So said Dr. M. C. Adams, NASA's Associate Administrator for Advanced Research and Technology on March 11, 1968 before a Subcommittee of the House Committee on Appropriations.

In explaining the overall NASA aircraft noise research program, Administrator James E. Webb told the Subcommittee that NASA has completed much theoretical work on noise suppression of engines on current aircraft. Contracts, he noted, have been let with the Boeing and Douglas Companies, "to produce the equipment and modify the nacelles of the engines and do the flying. Now, that information comes back to us for application throughout the industry, so that we can help the FAA set standards, requirements, and regulations."

In his prepared statement presented to the Subcommittee, Mr. Webb stated that, ". . . fiscal year 1968 has involved wind tunnel testing and design and testing of boilerplate nacelle modifications. In fiscal year 1969 the final nacelle configurations will be constructed for flight proof tests on a 707 type aircraft and on a DC–8 type aircraft.

As other parts of its aircraft noise abatement research program, Mr. Webb said, NASA is also conducting research in safe climbout and landing techniques for noise minimization, and development of a "quiet engine" program. Regarding the latter, Administrator Webb explained that,

"In fiscal year 1968 preliminary work will be conducted to define the scope and some of the hardware components of a quiet research engine. The second phase of this proof-of-concept, to be implemented in fiscal year 1969, will include large scale engine component fabrication and full-scale tests of compressors and fans designed for minimum noise."

In further explanation of the "quiet engine" program Dr. Adams told the Subcommittee:

"In fiscal year 1969 we plan to let contracts for detailed designs and initiation of component fabrication for a quiet engine. We will carry out some components tests by 1970. We are working toward the integration of those components into an experimental engine for tests in 3 to 4 years.

FAA NOT READY TO SET NOISE STANDARDS, M'KEE SAYS

F.A.A. Administrator McKee said last week that agency-enforced aircraft noise standards are not eminent. In a trade press interview, he is reported as saying, "We're working with the industry to establish what is practical. We have to know what can be done before we can set any standards—there's no use in making regulations unless you know what's technically practical and feasible."

NASA, he said, is "doing some very interesting work" on means of reducing aircraft noise. General McKee said that NASA and FAA are working closely on determining what can be achieved.

[House Transportation and Aeronautics Subcommittee Print, May 8, 1968]

H.R. 3400

(Mr. Staggers introduced the following bill which was referred to the Committee on Interstate and Foreign Commerce)

A bill to amend the Federal Aviation Act of 1958 to authorize aircraft noise abatement regulation, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That title VI of the Federal Aviation Act of 1958 (49 U.S.C. 1421–1430) is amended by adding at the end thereof the following new section:

"AIRCRAFT NOISE CONTROL AND ABATEMENT

"SEC. 611. (a) The Administrator of the Federal Aviation Administration, after consultation with the Secretary of Transportation, shall prescribe and amend standards for the measurement of aircraft noise and sonic boom and prescribe and amend such rules and regulations as he may find necessary to provide for the control and abatement of aircraft noise and sonic boom, including the application of such standards, rules, and regulations in the issuance, amendment, modification, suspension, or revocation of any certificate authorized by this title.

"(b) In prescribing and amending standards, rules, and regulations under this section, the Administrator shall—

"(1) consider relevant available data relating to aircraft noise and sonic boom, including the results of research, development, testing, and evaluation activities conducted pursuant to this Act and the Department of Transportation Act.

"(2) consult with the Secretary of Transportation and such other Federal, State, and interstate agencies as he deems appropriate;

"(3) consider whether any proposed standard, rule, or regulation is economically reasonable, technologically practicable, and appropriate for the particular type of aircraft, aircraft engine, appliance, or certificate to which it will apply; and

"(4) consider the extent to which such standard, rule, or regulation will contribute to carrying out the purposes of this section.

"(c) In any action to amend, modify, suspend, or revoke a certificate in which violation of aircraft noise or sonic boom standards, rules, or regulations is at issue, the certificate holder shall have the same notice and appeal rights as are contained in section 609, and in any appeal to the National Transportation Safety Board, the Board may amend, modify, or reverse the order of the Administrator if it finds that safety in air commerce or air transportation and the public interest do not require the affirmation of such order."

Sec. 2. That portion of the table of contents contained in the first section of the Federal Aviation Act of 1958 which appears under the center heading "TITLE VI—SAFETY REGULATION OF CIVIL AERONAUTICS" is amended by adding at the end thereof the following:

"SEC. 611. Aircraft noise control and abatement."

Among some of the excellent material available from industrial and governmental sources on noise are "Less Noise,

Better Hearing" prepared under the supervision of Hale Sabine, Celotex Corp. 120 South La Salle Street, Chicago, Ill.; "Industrial Noise," a guide to its evaluation and control, Public Health Service, U.S. Department of Health, Education, and Welfare—1967—publication No. 1572 and Silencing Handbook, by B. G. Golden, 1967 edition published by Burgess-Manning Co., of Dallas, Tex.

POVERTY AND UNEMPLOYMENT

The SPEAKER pro tempore. Under previous order of the House, the gentleman from New Jersey [Mr. HOWARD] is recognized for 15 minutes.

Mr. HOWARD. Mr. Speaker, atop the pressing list of domestic problems, poverty and unemployment remain at once the most urgent and inimical of issues. The distressing contrast of our wealthy Nation—the richest in history—with 30 million of its people below the acknowledged poverty level, illustrates our greatest failure.

We have, indeed, tried to meet the problem. Our welfare program attempts to relieve these poverty-stricken Americans, to help them survive and to find food and shelter. At $8 billion a year it is a very expensive program. But it is also a sorely inadequate program. Only a quarter of the poor receive any help at all.

The welfare system began as assistance for those who could not work. We use it now as our answer to unemployment. The program is by no means successful in this context. What may have been a sensible solution years ago is sensible no longer. Quite the opposite is true; for when a man has no job, giving him charity, even generous charity, cannot save his self-respect or make him a productive citizen.

As an answer to the unemployment problem, the welfare program is not only inadequate but cursed with numerous self-defeating drawbacks. What incentive, for instance, does a welfare recipient have to find a job when he realizes that for every dollar he can earn, he will be penalized by having that much less in assistance? This loss amounts to a 100-percent income tax on the very poorest members of our society. Therefore, we must replace the dole and the handout with jobs.

People on welfare become involved in a cycle that is only broken away from with the greatest difficulty. The rules and regulations for relief are often confusing. They discourage people who actually want to work from doing so. These people raise their families on relief. The children follow in their parents' footsteps so that by now the program which began as temporary aid to those who could not work is serving third generation families on relief.

The original program was not geared to handle general unemployment. Understandably it does not handle it very well. The program is really 50 different State programs, each with its own set of regulations, standards of eligibility, and levels of payment. There are vast nationwide variations in welfare payments. The average child receiving welfare in New York, for example, gets $60 per month; while in Mississippi, the average child receives only $8.35. The lower welfare payments in rural, underdeveloped areas add another incentive for the agricultural poor to move from the country areas to the city ghettos, where they can obtain a greater amount of relief money. And then the dole and the handout cycle begins again with no solution of a job or the possibility of becoming a productive member of the community in sight.

We need Federal standards so that people from the South do not migrate to the North in a desperate but hopeless attempt to better themselves. Along these lines I am now in the process of drawing up legislation which would call for equal payments throughout the country under Federal standards.

Under any circumstances, however, this system of welfare will have only limited success. Handouts cannot cure the ills of unemployment and poverty. Only jobs can do that, useful honest jobs. Welfare as a substitute for a job can produce only bitterness. The taxpayer is justly distressed to see his tax dollars spent so unproductively. Equally distressed is the recipient who becomes immersed in a cycle of dependency and alienation from which it is almost impossible to escape.

The implications of the problem are frightening. Many unemployed fathers must leave their families so that the wife and children can qualify for assistance. The destruction of the family endangers the structure of our society, at a time when we need the strength and unity of the family more than ever before. Instead of a useful, productive job, the husband and father of such a family finds only the disruption of his home and charity for his wife and children.

Some people feel that the best method of dealing with the problem is to tighten the system further, to "get tough" with these "loafers." The idea is that harsher measures will motivate the unemployed to find jobs. These misguided people would even force mothers to leave their children by restricting assistance to families which stay together.

This type of solution will not help. It only perpetuates the basic problem. The hard-core unemployed cannot find jobs on their own. Most of them would if they could and no coercive measures will help them do so. As a result of such measures, the families are destroyed, the children grow up without fathers, and the whole cycle starts all over again. The welfare rolls end up increasing rather than decreasing.

The cycle of bitterness and poverty can be broken. It must be broken if we are to bring these poor into the mainstream of American society. To this end I am cosponsoring H.R. 17567, introduced by the gentleman from Florida [Mr. BENNETT], a bill which would provide tax incentives to private employers to take on the hard-core unemployed, to give them jobs and train them so that they can become productive members of the community, and not drains on the taxpayers. The benefits of such a plan multiply themselves. The burden of welfare will be lifted somewhat from the backs of the taxpayer. These unemployed will stop being a brake on the economy and become an asset. The money they earn will be spent on the open market and they will also join the rest of us as taxpaying citizens.

The husbands of poverty families will be able to support their own wives and children. One-half of those on welfare are just such wives and children. It will be possible to check and even reverse the trend toward increasing the welfare rolls. Families and therefore the very fiber of our Nation will be strengthened if the hard-core unemployed can be given meaningful jobs.

We cannot afford the bitterness and "we-have-nothing-to-lose" attitude that has become part and parcel of the way the poor see themselves in relation to society as a whole. Involving the private sector in finding jobs for the hard-core "permanently unemployed" is an important step toward solving this grave problem. It is essential in realizing the untapped potential of our Nation.

Mr. BENNETT's bill, which I am cosponsoring, is patterned after the very popular act allowing tax credits to businesses which invest in new equipment. It opens the way to a real solution to the problem of the hard-core unemployed. Government alone cannot solve it. The Federal Government cannot employ men on the scale that would be necessary to alleviate the problem. Furthermore, it is far from desirable that they be paid with tax money. The private sector must assume the responsibility and this bill provides an economic tool in persuading it to do so.

The bill can create jobs. The want-ads may be full of job offerings, but they are not meant for those who need them most. With the incentive of a tax credit, employers will be able to take a justifiable chance on these men. They can fill those want-ad jobs because the Federal Government will be providing a cushion for them and reducing their risk. There are provisions that safeguard the program from abuses. The employer must retain these new workers long enough to give them a real chance if he wants the tax credit.

Mr. Speaker, let us move away from the direction of the governmental handout, and toward a program of helping the poor to help themselves.

CRISIS IN HEALTH—A NEED AND PLAN FOR MORE DOCTORS

The SPEAKER pro tempore (Mr. NEDZI). Under a previous order of the House, the gentleman from New Jersey [Mr. CAHILL] is recognized for 20 minutes.

Mr. CAHILL. Mr. Speaker, during the past several years, hospital officials, medical educators, the press, representatives of organized medicine, and the public's representatives in government have spoken of an impending crisis in our Nation's system of health care. However, it has become evident that far from threatening in the remote future, crisis conditions presently exist. As reported by the President's National Advisory Commission on Health Manpower several months ago:

> The indicators of such a crisis are evident to us as Commission members and private citizens: long delays to see a physician for routine care; lengthy periods spent in the

well-named "waiting room" and then hurried and sometimes impersonal attention in a limited appointment time; difficulty in obtaining care on nights and weekends, except through hospital emergency rooms; unavailability of beds in one hospital while some beds are empty in another reduction of hospital services because of a lack of nurses; needless duplication of certain sophisticated services in the same community; uneven distribution of care, as indicated by the health statistics of rural poor, urban ghetto dwellers, migrant workers, and other minority groups, which occasionally resemble the health statistics of a developing country; obsolete hospitals in our major cities; costs rising sharply from levels that already prohibit care for some and create major financial burdens for many more.

However, despite knowledgeable estimates that our Nation is presently short 50,000 doctors, and that by 1970 we will be short 250,000 nurses, the Advisory Commission fails to conclude that these conditions of crisis are primarily the result of a national shortage of health manpower. Rather, it places major emphasis on integrating and coordinating America's medical-care delivery system. A major portion of the Commission's report is devoted to demonstrating the need for reorganizing this delivery system with its present "duplication, high costs, wasted efforts, and overlapping aspects." In my opinion, the Commission has misjudged the nature and causes of what is wrong with the American health-care system. While I recognize that this crisis is not simply one of numbers, I am convinced that it will be impossible to improve our medical-care system without a massive national effort to provide large increases in available physicians, nurses, and allied health personnel. In my judgment, without sufficient health manpower, there can be no integrated system of health care in the United States. I would thus commend the major thrust of H.R. 15757, which has been called the Health Manpower Act of 1968.

This legislation represents a major departure from the thrust of previous legislation directed to training doctors, nurses, and allied health personnel. Largely, the Federal Government's role has been to provide massive grants for research activities. In 1967, for example, the Federal Government expended over $1.5 billion for medical research and development. Largely, this amount was for research efforts conducted by private or State medical schools pursuant to NIH or other Federal Government agency grants. The effect of this massive research support by Government has been to detract from the number of health manpower graduates each year.

There is complete agreement even by representatives of the medical schools and by organized medicine that research has diverted physicians away from the patient and hospital and into laboratories. Medical schools have found it necessary to support education and teaching programs through grants intended for research. Moreover, other results have been serious questions of accountability for funds, wasteful duplication of research projects and equipment, and an academic grantsmanship that has often provided poor research projects and results.

In short, even a special study group of the AMA has concluded:

The adverse effects of Federal research grants on medical schools arise from many sources. Primarily they arise from the imbalance caused by burgeoning financial support for research—in the midst of a relative scarcity of funds for educational programs.

However, the Health Manpower Act of 1968 seeks to provide a balance between the functions of education and research by providing an improved and more intensive program of Federal financial assistance to medical and professional health care education. Under the act, Federal grants for teaching facilities, grants for demonstrating the need for reducing the number of years needed to train health personnel and institutional grants which provide broad support to the educational functions of medical schools are expanded. It is especially encouraging to note that the institutional grants will be allocated to medical schools on the basis of a formula which provides incentive to expanding student enrollments.

However, in my judgment, the Health Manpower Act contains many features which tend to perpetuate inadequacies in the existing system of medical and health education. Primarily, this legislation continues to place undue emphasis on research and specialization. In my judgment, this legislation should be carefully analyzed by the appropriate congressional committees to determine whether it will produce the intended results of providing widespread health care or whether it will merely institutionalize the existing tendencies of medical and health professional graduates to enter into specialties or research and academic oriented careers.

I am convinced that these are the directions that most of the Nation's medical school graduates will take unless something is done. Pursuant to my concern that there are not enough general practitioners or medical graduates entering into general medical practice at a sufficient rate to meet the needs of our population, I directed the following letter to the deans of our Nation's 88 medical schools:

DEAR DEAN———: Pursuant to my continuing interest in Bio-medical education and research, I am presently attempting to compile data which will indicate the broad needs of medical educational institutions. While much secondary information exists, preliminary investigation indicates that medical schools have often been bypassed in determining these needs.

I would thus greatly appreciate an indication from you of the professional trends that recent graduates of your medical school have taken or may be expected to take. While your own convenience and available information may permit a more comprehensive analysis, I would request an estimation of the following for your graduating classes of 1967 and 1968:

(1) The total number of medical graduates;

(2) The percentage of these graduates who will serve or who are serving in the Armed Forces;

(3) The percentage of graduates who will serve with the Armed Forces on a career basis;

(4) The percentage of graduates who will specialize in one particular area of patient-Service oriented medicine;

(5) The percentage of graduates who will enter an academic or research career;

(6) The percentage of graduates who will pursue graduate studies to achieve a specialty or an academic or research career;

(7) The percentage of graduates who may be expected to enter general practice;

(8) The percentage of graduates who will enter miscellaneous careers not mentioned above.

While I recognize that this information cannot be projected with certainty, your best estimations, based on available information and your knowledge and experience, would provide an invaluable contribution. Your cooperation will be appreciated.

With every good wish, I am

Very truly yours,

WILLIAM T. CAHILL.

Over 60 percent of the schools responded, and an analysis of the results has shocking implications for our future health care system. According to the responses I received, it was indicated that graduates from the classes of 1967 and 1968 will follow these career directions:

First. Primarily research or academic oriented careers—11 percent.

Second. General practice—15 percent.

Third. Career military service or administrative medicine—4.5 percent.

Fourth. Specialties—69.5 percent.

In view of these career directions away from the patients bedside, away from the hospital, and away from where physicians are most acutely needed, I would urge that we must undertake a national plan to produce general practitioners in a far shorter time of training than that which is required by the present system of medical education.

This can be accomplished, first, within the resources and funds available at a Federal level by a deemphasis in the amounts that are spent on medical research; and second, by devoting a major and immediate effort to improving and abbreviating medical school curriculum so that general practitioners can be graduated and undertake the treatment of the myriad illnesses and ailments that can be healed without specialization with a period of 4 years.

I would thus like to recommend an exciting and challenging article by Dr. J. Gershon-Cohen, who is director emeritus of the division of Radiology at the Albert Einstein Medical Center in Philadelphia, professor of radiologic research at Temple University School of Medicine, and assistant professor of radiology at the Graduate School of Medicine of the University of Pennsylvania.

Dr. Cohen's article which appeared in the Journal of Medical Economics clearly evidences that there is little sense in requiring a general practitioner to spend over 10 years pursuing an education that is principally oriented toward limited specialization and research. Moreover, the present career trends which I have mentioned indicate that few young men are willing to do so. The arduous demands placed on a general practitioner by his patients and practice, the prestige and financial reward accorded the specialist, the financial and personal sacrifices involved in 10 to 12 years of medical education do not make general practice an attractive career.

Dr. Cohen charts a course by which a

4-year general medical education can become a reality. Dr. Cohen would utilize the existing clinical and research facilities and personnel at our Nation's 50 medical centers. The only cost involved in providing educational and training facilities would be for the establishment and construction of teaching and dormitory space.

I would urge that the appropriate committees, particularly the Subcommittee on Public Health and Welfare, carefully consider amendment of the "Special projects" section of the Health Manpower Act of 1968 to specify that a demonstration 4-year educational center will be established.

We need more doctors. The number of foreign-trained physicians in the United States dramatically illustrates the need and our willingness to accept those not trained to the high standards in effect in the United States of America. We cannot wait. We must push forward now. The Congress has a responsibility to provide this service to the health needs of our country. Dr. Cohen's recommendations should be implemented; other similar plans should be given a fair trial. Our present system of training physicians is antiquated, ineffective, and nonproductive in sufficient numbers to supply the medical needs of our country.

Mr. Speaker, I place Dr. Cohen's article at this point in the RECORD:

WE CAN TRAIN G.P.'S IN HALF THE TIME

(By J. Gershon-Cohen, M.D.)

A decided patient-doctor chill has set in. Everyday conversations abound with complaints about doctors—their unavailability, their exorbitant fees, their indifference. The most frequently heard charge is: "You can't find a family doctor anymore. They're all specialists." The patient who ends up in a hospital emergency room because he can't otherwise find a physician is resentful. The patient whose regular physician keeps him waiting an hour, and then gives him 10 minutes' time, is annoyed. The patient whose physician will not or cannot make a house call is indignant.

All of which leads many patients to believe, "Doctors just don't care anymore." They don't realize that there's an important reason for the seeming change. It's not that a doctor cares less, but that he has less time to care. There are too few of him. He's overworked and spread too thin.

In the U.S. at the turn of the century, there were more than 150 medical schools. They graduated almost three-fourths as many physicians as we graduate today for a population only two-fifths the present size. Small wonder that the physician of that era is recalled with nostalgia and affection. His pace was unhurried, his availability assured, his bedside manner polished. He had time for involvement; he was not swamped with paper work, post-graduate literature, and a slew of phone calls.

Unfortunately, he was as often as not the product of a school that was little more than a diploma mill. As a consequence of the Flexner report in 1910, about 70 medical schools were forced to close their doors, halving the available learning centers. Those allowed to remain open stiffened their standards. Hospitals tightened their requirements for staff appointments and extended the educational process by offering internships and residencies. "Becoming a doctor" became a longer, more arduous, more expensive proposition.

Though Flexner's pruning was necessary and wise, it also caused our current dilemma. Today, many an M.D. is nearly 30 years old before he goes out on his own. His education—through college, medical school, and post-graduate training—has cost an enormous amount of time and money, so he may be heavily in debt. Foreknowledge of these stark realities steers many from the field of medicine.

Many who do complete the exhaustive education eschew general practice for quite understandable reasons. Doctors in training can't help but note the enhanced prestige and the aura of satisfaction that clinical specialists enjoy. They hear of the hectic pace of the generalist, his long working hours, scant time for family life, low status, and relatively small remuneration. They see how the practice of many specialists is hospital-oriented, crowding out the family doctor's participation in patient care. And so about 85 per cent of all medical graduates shun family medicine. The devoted 15 per cent who elect to be G.P.s must bear the brunt of caring for our rapidly expanding, longer-lived population. They do a superb job, in the circumstances, but they can no longer give the patient what he would like the most—more time.

How to ease the doctor shortage? How to give the family doctor more time? The first solution that comes to mind is to erect more medical schools to train more doctors. But is that truly a practical answer? Some 88 medical schools are now in operation, and 16 more are in the planning stage. To build them will cost hundreds of millions of dollars. Yet each four-year school will graduate fewer than 100 doctors per year (average for 1966: 90 per school). By 1975, with every facility operating at capacity, it's hoped that the number of graduates will increase to 10,000. But we could use 20,000 now, and by 1975 the population explosion will have further widened the gap.

Obviously our plans are not commensurate with the needs. Halfway measures won't do. We need a sweeping overhaul of our old concepts of medical education, one that will produce more *family doctors*, capable of handling 90 per cent of the public's ills more quickly.

We should start by shearing off several years of training and by offering several levels of medical education instead of producing all physicians in the same Rolls-Royce mold. Some medical schools, such as Northwestern, Boston University, Johns Hopkins, and Jefferson-Penn State, are already experimenting with shorter curriculums. None of them, however, relaxes the standard course requirements for medical education, which include subjects that no family doctor needs to master. The average American medical student continues to be crammed full of specialized knowledge he'll probably never use.

Our doctor of the future should be allowed to start his medical training immediately on graduation from high school, bypassing completely the four years of premedical study at college. Naturally, this circumvention of college would necessitate changes in high school and medical school curriculums. High school courses would need to emphasize more heavily and at a higher level the necessary sciences, incorporating part of the instruction now given in the premed college courses. Medical school courses would need to be streamlined so as to exclude didactic lectures, research projects, and subjects not immediately germane to the education of a general practitioner. The student's training in clinical medicine should start in his first year when he's studying anatomy and continue for the entire four years of school while he's taking complementary courses in the medical sciences.

On graduation, the young man's experience should be enlarged by an additional year of externship, preferably as a preceptee to a certified internist or to a group of physicians practicing with a peripheral staff of specialists. That extra year of training under the watchful eye of superiors would add greatly to the maturity of our young family doctor and increase his sure-footedness. As a final test of his readiness for general practice, his qualifications as a family doctor would be certified by the same state board of examiners that now judges the abilities of traditionally trained M.D.s. Despite an accelerated medical education, I believe that any bright young man could qualify and, at the age of 22 or 23, be thoroughly prepared to serve the public. And he would be in a position to earn a livelihood comparable to that of his high school classmates who elected to go into the sciences or engineering rather than go through the long training period that medicine entails.

New clinically oriented medical schools offering accelerated courses could be created at greatly reduced expenditure if they utilized the facilities of already existing medical centers. Many great medical schools evolved in exactly that fashion (among them, Guy's and St. Bartholomew's in London). There are more than 50 excellent medical centers in this country that could be readily and economically converted into medical training centers. Properly utilized, they could turn out 5,000 family doctors yearly.

For example, the Albert Einstein Medical Center in Philadelphia has a broader spectrum of physical facilities and teaching personnel than have most medical schools. There's a flourishing basic research department, with more than 20 full-time Ph.D.s of professorial rank, equipped to teach all the preclinical medical sciences. Among the 700 clinicians attending this large hospital complex are doctors with professorial status in all the clinical specialties, including domiciliary and home care, hospital outpatient practice, emergency inpatient and outpatient practice, intensive care, supervision of acute and chronic diseases, psychiatry, preventive medicine, geriatrics, and physical rehabilitation.

TO COMBAT CRIME: MORE, BETTER-PAID POLICE

The SPEAKER pro tempore (Mr. NEDZI). Under previous order of the House, the gentleman from Wisconsin [Mr. REUSS], is recognized for 30 minutes.

Mr. REUSS. Mr. Speaker, I introduce today for appropriate reference, H.R. 17750 the Police Assistance Act of 1968.

It seeks to combat crime by channeling Federal funds to those communities where crime is most out of hand, in order to enable them to hire more policemen and to pay them better. The fundamental weakness of the police departments of large cities is that they are underfunded. Their local source of revenue is the traditional real estate tax on the homeowner. This sets up a vicious circle. If we are to make the homeowner secure in his own home, we can apparently do so only at the price of bankrupting him via the real estate tax.

H.R. 17750 seeks to cut us out of the vicious circle.

The cost of police protection is constantly increasing. For many years we have failed to provide adequate numbers of police in our cities, and the police we do have are shockingly underpaid. The effort to catch up, just begun in recent years, has been extremely costly and burdensome on the local taxpayer, and much higher outlays for police protection will be necessary in future years simply to continue the process of catching up.

As the President's Crime Commission has noted:

There is impressive evidence that in many cities there are too few policemen . . . the number of police has not kept pace with the relocation of the population and the attendant increase in crime and police responsibility. ("The Challenge of Crime In A Free Society," Report of the President's Commission on Law Enforcement and Administration of Justice, pp. 106–107 (1967).)

Further, the Commission has found that—

Police salary scales are now too low to attract the best qualified recruits, or to keep the best qualified policemen. (Crime Commission Report, p. 111.)

The Crime Commission report has also confirmed that crime is most prevalent in large cities, especially those with a population over 100,000—Crime Commission Report, table 8, page 28. It is in these cities also that tax resources are most strained. There has been a continuing movement of the most affluent homeowners out of the central cities ever since World War II. In more recent years, retail stores and industries have followed them to the suburbs. At the same time the demands on local treasuries have continued to rise. The very young and the very poor have come to the cities to replace those who escaped to the suburbs, putting great strains on city schools, public assistance programs, fire and police departments. The cities have tried to meet these demands by raising property taxes, but this simply hastens the flight to the suburbs.

The resources of the Federal Government are necessary to enable cities to break out of this circle. The Federal Government obtains most of its revenue from corporate and personal income taxes, which rise rapidly in response to a growing economy. Thus we can anticipate continually increasing revenue from this source in future years, even if taxes are not raised. The real estate tax, on the other hand, constantly lags behind. It is not progressive, so that it does not keep pace with growth in the economy. Property is not often revalued, so there is a considerable delay in reflecting increases in value.

Well-paid police in sufficient numbers to preserve both order and justice are essential if we are to deal with the problem of crime in this country. A substantial police "presence" in an area is the best way to deter crime that has yet been found. At the same time, this presence must not be oppressive, lest it arouse a bitterness and resentment which can lead to results with which we have become tragically familiar. The solution to this dilemma is to assure that police are not spread so thin that they must take shortcuts to law enforcement. It is easier to search without a warrant, and it certainly takes less time, but I doubt that many of us would be willing to forgo the security of our homes that the fourth amendment seeks to preserve by the warrant requirement. There are other constitutional guarantees which cannot be maintained if we satisfy ourselves with poorly paid policemen in inadequate numbers—arrests may be careless, questioning of "suspicious" persons on the street will be indiscriminate, and persons will be questioned at the police station without counsel present simply to "solve" crimes, foregoing any chance of successful prosecution in order to clear the books.

In addition, the feeling that police protection is inadequate leads too many citizens to purchase guns for their own protection, increasing the chance of death or injury from careless or illegal use of firearms.

It is not only the affluent who desire better police protection. A survey in Washington by the Bureau of Social Science Research showed that anxiety about crime is highest among the poor—Crime Commission report, page 50. This is to be expected, since—

One of the most fully documented facts about crime is that the common serious crimes that worry people most—murder, forcible rape, robbery, aggravated assault, and burglary—happen most often in the slums of large cities. (Crime Commission Report, p. 35.)

A recent study of crime in Milwaukee's proposed model cities area showed, for example, that 42 percent of all adult arrests and 24 percent of juvenile arrests occurred in this section, although it comprised only 4 percent of the total area of the city. In addition, this area reported 34 percent of all murders known to Milwaukee police, 21 percent of all rapes, 28 percent of all robberies, 33 percent of all cases of aggravated assault, 31 percent of all other assaults, and 24 percent of all burglaries.

The present Omnibus Crime Control and Safe Streets Act does not focus directly on the problem. Grants must be channeled through the States rather than going directly to the cities that need them most. Any money received by the cities must be matched with 40 percent local funds. And only one-third of any grant may be used to compensate personnel.

H.R. 17750 would provide $100 million annually in Federal grants to city police departments. Ninety percent of the amount appropriated each year would go to cities over 100,000, on a per capita basis. According to the 1960 census, there are 132 such cities, with a combined population of 51,013,000. This represents 28.5 percent of the total population of the country. Ten percent of the total could be held in reserve by the Attorney General to be given to cities of less than 100,000 population, on a finding that the community has an "unusual need" for the grant. As with the Elementary and Secondary Education Act, the grants would be 100 percent, with no local sharing requirement. The grants would of course be administered in accordance with title VI of the Civil Rights Act of 1964, which prohibits discrimination in federally assisted programs.

The full text of H.R. 17750 follows:

H.R. 17750

A bill to improve law enforcement in cities by making available funds to be used to increase police salaries and to add more police officers

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 "Police Assistance Act of 1968."

SECTION 1. The Attorney General shall make block grants to cities for the improvement of police salaries and for the addition of more men actively engaged in professional police work to the force.

SEC. 2. No less than 90 per centum of the amount appropriated for each fiscal year is to be used for grants to cities with a population in excess of one hundred thousand as determined by the most recent United States Census. The grants are to be apportioned among the cities on a per capita basis. Not more than 10 percentum may be granted to cities with a population of less than one hundred thousand, upon a finding by the Attorney General that the city has an unusual need for the Federal grant.

SEC. 3 For the purpose of carrying out this Act, there is authorized to be appropriated the sum of $100,000,000 for the fiscal year ending June 30, 1969, and such amount as Congress may find necessary for each succeeding year.

WASHINGTON POVERTY CREDIT UNIONS REINFORCE SELF-HELP PHILOSOPHY

Mr. PATMAN. Mr. Speaker, I ask unanimous consent to extend my remarks at this point in the RECORD and include extraneous matter.

The SPEAKER pro tempore. Is there objection to the request of the gentleman from Texas?

There was no objection.

Mr. PATMAN. Mr. Speaker, last week I addressed this body on the outstanding role that credit unions have played in the war on poverty.

The June 7 issue of the Washington Post carries an article that graphically depicts the work that poverty credit unions are performing. According to the article, more than 4,000 loans have been made to residents of low-income Washington areas by nine antipoverty credit unions run in conjunction with the United Planning Organization. These credit unions have 8,338 members and assets of $423,236.88 at the end of the second year of operation of the credit unions.

Most of the 4,000 loans were for small amounts—$50 or less—and went for such items as rent, clothing, loan consolidation, medical, and furniture expenses.

By borrowing from the credit union, which by law can charge only 1 percent a month on the declining balance, low-income families are thus able to avoid the loan sharks that infest poverty areas and extract interest rates that often run as high as 100 percent of the loan.

Not only does the low-income credit union provide a source of loans at low interest rates but it also provides a place for members to save their funds and to encourage members to enter into a thrift program.

According to the Washington Post article, by the end of April of this year the credit union members had savings totaling nearly one-half a million dollars.

Mr. Speaker, it should be pointed out that the money being lent by these credit unions does not come from the Federal Government or from any other governmental agency, but is rather the savings of one member being lent to a borrowing member. Thus, as I have said before, the credit unions in the war on poverty do not extend handouts but rather offer a

helping hand. Of course, as I stated in my remarks last week, it was Sargent Shriver, then Director of the Office of Economic Opportunity, who encouraged and promoted the establishment of these credit unions and his role as one of the early backers of poverty credit unions can never be overlooked.

The results of the helping hand attitude can easily be seen in the report on loan delinquencies for the credit unions. At the end of the first year's operation of the nine credit unions, loan delinquencies were 14.6 percent, while at the end of the second year, it had dropped to 9.4 percent. This does not mean that the loans have been lost but only that members are behind in some of their payments. In many cases, loans which are classified as delinquent will be brought up to date and fully repaid. And, as the credit unions continue to grow and the philosophy of the credit unions is instilled in more residents of low-income areas, the delinquency rate will continue to decline.

As future Congresses debate the merits of the war on poverty and its effectiveness, it is my hope that great significance and bearing will be placed on the role that credit unions have played in helping the poor.

The Washington Post article follows:

FOUR THOUSAND LOANS GO TO POOR, UPO SAYS

Residents of low-income Washington neighborhoods received nearly 4000 low-interest loans from a neighborhood network of credit unions last year, the United Planning Organization has reported.

The nine antipoverty credit unions had 8338 members and assets of $423,236.88 at the end of the year, according to UPO's second annual report of its credit union program.

More than half of the 3857 loans granted—amounting to $630,139.12—were less than $100. The majority of families getting loans had incomes less than $5000. They cited rent, clothing, loan consolidation, medical and furniture expenses as the most frequent reasons for seeking loans.

UPO said the neighborhood credit unions offer "refuge" to inner-city residents who were "once the victims of loan sharks and merchants charging exorbitant interest rates."

Loan deliquency dropped from 14.6 per cent at the end of December, 1966, to 9.4 per cent on Dec. 31, 1967, the report noted.

The members' savings totaled $375,851 at the end of the year. By the end of April, according to supplementary figures, the credit unions had 8960 members with savings of $454,685, UPO reported.

EXCERPTS FROM LETTER OF LT. JOHN P. CULLINAN, U.S. MARINE CORPS

Mr. MONAGAN. Mr. Speaker, I ask unanimous consent to extend my remarks at this point in the RECORD and include extraneous matter.

The SPEAKER pro tempore. Is there objection to the request of the gentleman from Connecticut?

There was no objection.

Mr. MONAGAN. Mr. Speaker, the painful and perplexing question of Vietnam has been debated for years, with confusion, with consternation, and occasionally with clarity. Defenders and critics of our involvement have all been heard. And still the debate and the questions persist.

One of the most moving testimonies of our presence in Vietnam is a letter written on Christmas Eve, 1967, by a constituent of mine, Lt. John P. Cullinan, U.S. Marine Corps, to his fiancee, Miss Anne Critchley. In it he responds to several basic questions about our participation in the Vietnam war and the morality of the draft. It reveals a strong devotion to the service of his country, and a profound understanding of the fundamental nature of patriotism.

The clarity and eloquence of his explanation are compelling. The authority of his statement is particularly forceful since Lieutenant Cullinan was killed in action on January 10, 1968.

I commend this statement to the attention of my colleagues. Excerpts from Lieutenant Cullinan's letter follow:

DEAR ANNE: Trying to look at it objectively, I think it's best to say that no war is good, and every war can cause questions concerning its morality—Both the World Wars showed Americans favoring isolation until enough injustices had been done to turn the tide of public opinion. But this is a different war, Anne—and I personally think it's different because the government (Viet Nam type) has a different opinion of our aid than the Vietnamese people, or at least the majority of them do.

You see, Anne, France was here before we were and they failed and finally had to withdraw—and right or wrong, you can see the average man's reasoning of not wanting to jump in with both feet to support us when he can't be sure the same thing won't happen again—especially with all the discontent at home.

One thing I can assure you of, it's that the average man in the Republic of So. Vietnam hates the Viet Cong. However, this is a civil war—there are people fighting for both sides within the same town. Some people say that because it is a civil war we shouldn't be involved, and they are partly right. As our civil war was fought just between Americans, so also should this one.

However, this civil war has much bigger consequences at stake. And the consequence of having all of Vietnam—the threshold to the Far East—fall under Communist domain, transforms this civil war on one plateau to a confrontation of international importance on a higher plateau.

And by Communism now I'm not referring to Russian type—with whom it now appears we could co-exist peacefully, but the Chinese type that follows Mao's teachings and wants to take over the world.

So, Anne, on the overall picture, it is my personal opinion that we should be here and are here justifiably so. However, I've said before and I'll tell you again that I don't believe we are going about winning this conflict in the correct way.

We are not getting through to the people to convince them that we're here to defeat the Viet Cong and go home. Again it's only a personal opinion, but I think the whole pacification program is sheer crap.

These people are still living in what can be compared to the Dark Ages in some sections of this country. Instead of trying to help and improve the country, which is all well and good in its place, the first and primary objective should be to win the war—not by winning the hearts and minds of the people but by defeating the Viet Cong and all their sympathizers.

The fact that we, and I can use this company as an example, are doing the same thing day in and day out—month upon month, and year after year, indicates to me that our progress is little if any.

It's a different type of war than any we've ever fought before and I don't believe our government has as yet adjusted to it. Our troops are overcommitted and cannot seem to retain territory once they've won it.

But now I'm getting more specific and you wanted the overall picture—so, overall Anne, yes we should be here, but we should change our tactics.

However, there's a second thought you brought up which really irks me—and that's the draft. You asked me if it is morally right. Anne, our country is the strongest in the world and unfortunately the only way she can hope to ever live in complete peace is by being constantly alert to meet any threat which might endanger her. In order to do this we have to have a military organization beyond compare and this military organization must be made up of U.S. Citizens.

Now there are a lot of cases where the draft hits people it shouldn't and misses people it should take—but every system has its faults—and people are constantly trying to come up with ways to perfect the system. But, as of right now, all the great minds have not been able to devise a way to man our militia that is better than the draft.

You asked me Love, if the "boys lose their liberty by being forced to join."

Anne, no one born in the U.S. today has done anything to earn the liberty they are fortunate enough to possess. This was done for them through the sacrifices of their ancestors. And now every eligible male citizen has an obligation—a moral obligation—to do his part to preserve the liberty he has enjoyed for 18–20 years and will enjoy for the rest of his life as long as we are successful.

You told me you can say why college kids protest—well, Anne, college kids are the so-called intelligentsia of our nation—but right now we have a country in which the intelligentsia protests and dissents about a job that they don't want—but a job they are morally obliged to undertake for a short while.

And while they talk about the morality of the war they openly flaunt immorality in all other aspects of life—does that make sense?

In the meantime, while the intelligencia is growing beards, wearing flowers, protesting anything that might cause them to conform in any way, and advocating free love—it's the high school educated and High School dropouts from much poorer backgrounds who are now carrying on the ideals and principles our forefathers passed on to them.

And Anne, these kids are doing one helluva job. Despite the adverse conditions and trying circumstances under which we're fighting this war, they continue to do the tasks assigned to them—simply because they're Americans—and this phase is part of American life. And I can honestly say that I've met some of the greatest people in the world over here—thrown together in a conflict nobody wants—but still performing their job because the President, the American people elected by the biggest majority ever, feels that this is the way to do it.

Anne, it's with these kids that I really feel like an American and actually feel that in some small way I'm fulfilling my obligation to the people who came before me and didn't ask selfish questions of morality when deciding to make this the greatest nation in the world.

And Anne, something none of the intelligencia seems to remember is that this is our country—it'll only be as good and as strong as we make it. And before we can concentrate on domestic issues and individual selfish practices, we must first assure that our country is strong enough to hold her own against any enemy.

Were we fortunate to have enough volunteers to comprise our armed forces, there would be no problem. But everyone wants to lead their own life and rightly so—so the best answer so far devised is the draft, whereby everyone gives a couple of years to main-

tain the strength of the U. S. which in turn assures his ability to lead his own life when he leaves the service.

And Anne, people who burn the flag of our great nation, and burn the draft card which designates them as defenders of our freedom, are not using the intelligence they have the way they should. Rather than realizing the obligation they have to continue the country's prosperity, their lone concern is their own personal happiness—and Anne, we all know that we'll never be perfectly happy in this life—it just doesn't work that way. So everybody should work together to help our country—us—maintain the position we have held—and I hope we will always hold.

So, Anne, the draft is a moral responsibility and it is the best system yet devised, and I personally feel that people who protest the draft, just for protest-sake, and don't try to come up with a better solution, are not normally indignant, but rather—they're scared.

So there it is, Love—a few things to think about. Now I might be the one who's completely wrong but I don't think so and that's the way I feel.

REMARKS ON HON. JOHN S. MONAGAN, OF CONNNECTICUT, PEACEFUL REVOLUTION IN THE GROVES OF ACADEME

Mr. MONAGAN. Mr. Speaker, I ask unanimous consent to extend my remarks at this point in the RECORD and include extraneous matter.

The SPEAKER pro tempore. Is there objection to the request of the gentleman from Connecticut?

There was no objection.

Mr. MONAGAN. Mr. Speaker, violent student revolts are becoming as common as football games and final exams on the college campuses of our Nation, and one of the contributing factors to these uprisings has been the erroneous and dangerous assumption in certain quarters of the academic community that any action can be condoned in the name of "intellectual freedom," and that radical students, even those dedicated to revolution, will listen to reason.

With so many instances of irresponsibility marring the end of this academic year, it is particularly encouraging to note the progress made at Queens College, N.Y., under the enlightened leadership of its distinguished president. President Joseph P. McMurray is well known to us in Washington, and is remembered for his service as administrative assistant to Senator Wagner of New York, as counsel of the Senate Banking and Currency Committee, and as Chairman of the Federal Home Loan Bank Board, from 1961 to 1965.

At this year's commencement, President McMurray reported that the college had undergone a "peaceful revolution" as a result of "responsible student petitioning." As a contrast to the more dramatic and destructive events which have recently occurred on other campuses in this country—and abroad—I commend this example of constructive student power and responsible administrative leadership to the attention of my colleagues, and include an article which appeared in the New York Times on June 5, 1968:

QUEENS COLLEGE STUDENTS' ROLE GROWS IN "PEACEFUL REVOLUTION"

Seven thousand people at the Queens College commencement were told yesterday that the college had undergone a "peaceful revolution" as a result of "responsible student petitioning."

Joseph P. McMurray, president of the municipal college, said that starting next fall students would take part in "evaluating curriculum and professional services" in each academic department and would "be able to express formally their evaluation" of faculty members up for permanent appointment.

Students will also join with the faculty in a new committee to make recommendations on the college's master plan.

Since 1965 they have constituted half the membership—with full voting powers on Faculty Council committees on student activities, student conduct and educational policy.

During the two-hour outdoor ceremony on the 30-acre hilltop campus in Flushing, 18 persons, mainly from Students for a Democratic Society, twice marched silently around the exercises. They were protesting the military draft, to which graduates become liable on expiration of student deferments.

The pickets, carrying a black banner with white lettering that said "Conscription Day," included Wally Rosenthal, a 21-year-old junior and former S.D.S. chapter chairman. Mr. Rosenthal said a Spring Action Committee in which he took part was still pressing 16 demands on Mr. McMurray.

SOME ACTION REPORTED

The college president has reported his action on some of these "recommendations," including a study by next fall on how legal counsel might be made available by the college to students involved in draft and protest problems.

In addition, courses in Negro and African history and culture are to be offered, including one on "the politics of black power," and credit for field work in community affairs is to be expanded.

At the commencement, Mr. McMurray told how the new student participation approved by the Faculty Council would work.

Each academic department is to meet with a new student committee in its department to work out methods for handling such curriculum problems as the way, and how often, courses are offered.

Also, when a faculty member comes up for full-time tenure—how after three years, although the Board of Higher Education is considering extending the preliminary period to five years—the student committee will make a formal recommendation. The committee may appeal to the president on a department decision for or against the faculty member.

HAS 25,088 ENROLLED

The college, which now has 25,000 students, including a full-time day enrollment of 11,500, gave degrees to about 1,700 graduates present at yesterday's commencement—the college's 44th.

Altogether, 3,979 degrees and certificates were awarded for work completed since last June.

Mr. McMurray told the audience—seated among maple trees near buildings dwarfed by a new 12-story classroom structure—that "the Class of 1968 has been one which has led this college through a peaceful revolution."

Wearing a gold inaugural medal hung from a neckband over his robe, he said that the Queens College students had "locked themselves up with administrators in a search for reasonable reform" and that they "honored wisdom before activism." He contrasted this with what he called "the near-destruction at Columbia University."

Kenneth Landau, the class president, evoked applause when he credited class members with helping get rid of dress regulations and a language literature and arts examination that had been required of all graduates.

"PASS-FAIL" PROGRAM

In addition, he said, the college now had "a well-established and improving pass-fail program" that enabled certain courses to be taken without grading.

In the principal commencement address, Senator Frank E. Moss, Utah Democrat, cited advances against poverty and for civil rights and warned against "meaningless protest" and "the fires of demagoguery."

Dr. Margaret Kiely, who retired in 1960 as the college's dean of faculty, received an honorary degree of doctor of laws. It was only the third honorary degree in the college's 31-year history.

INCREASED QUAD-CITIES AIR SERVICE

Mr. SCHWENGEL. Mr. Speaker, I ask unanimous consent to extend my remarks at this point in the RECORD and include extraneous matter.

The SPEAKER pro tempore. Is there objection to the request of the gentleman from Iowa?

There was no objection.

Mr. SCHWENGEL. Mr. Speaker, we live in a changing world, one marked by such rapid change, that it is often difficult to comprehend what is happening.

In few areas has change and technological advancement been as dramatic or as fascinating as in space. We have placed men in orbit and we are preparing to explore the moon. But dramatic advances have also come in aviation closer to earth, especially commercial aviation.

We read in newspapers, in our magazines and in technical publications about advances in the commercial aviation field. We are getting larger, faster, and more comfortable planes.

More and more people travel by air. They travel more quickly and travel better than ever before. They see their loved ones who live at a distance more often. Businessmen save time and money by using their time more efficiently. Servicemen in Vietnam can fly to Hawaii to meet their families for a week of rest and relaxation. By increasing mobility people from all over the world are exposed to differing cultures and experiences through air travel. Man's understanding of man, man's concern for others as people move and as they meet each other face to face.

A "service proposal" has been made by Ozark Airlines to the Civil Aeronautics Board to provide improved service from a number of Iowa, Illinois, Missouri, and South Dakota cities to Washington, D.C., and to New York City. It interests many of my colleagues from those States. The proposal that Ozark makes for serving the Quad-City area interests my constituents.

The proposal would provide direct, single plane jet service to Washington, D.C., and to New York City from the Quad-Cities with a stop in Peoria. This would immeasurably facilitate travel between the Quad-Cities and the east coast. The proposal is listed as CAB docket No. 18577.

This type of improved service would be a real boost to the Quad-City area. There

on the two banks of the Mississippi River is a booming metropolitan area: Davenport and Bettendorf in Iowa; Rock Island, Moline, and East Moline in Illinois; and several smaller adjacent cities. Over a third of a million people live and work in this Quad-City area, and the airline people quietly lay plans for improving service to the community.

The Quad-City area, the farm equipment capital of the world, needs the best possible transportation. The U.S. Army Weapons Command, the weapons center of the Nation, has its headquarters and its Rock Island Arsenal in the heart of the area. Alcoa, Bendix, Oscar Mayer Packing, and many others have plants here to round out a vast and varied industrial and research complex along with Deere & Co., International Harvester, Farmall, and Case farm equipment and industrial equipment plants.

The area leaders have not stood by. They have watched the growth of airline travel in the area and have estimated future travel and have taken action.

A unique and cooperative organization welds together much of the area's broad business planning. There are six chambers of commerce in the area: Davenport and Bettendorf in Iowa, Rock Island, Moline, and East Moline-Silvis and Milan in Illinois. The presidents of these chambers of commerce and their executive directors meet every month on the Rock Island Arsenal as guests of the U.S. Army Weapons Command. They meet as a "Council of Chamber Presidents." The commander meets with them; they call me a one man chamber of commerce. The Arsenal Island is in the middle of the Mississippi River but not in either Illinois or Iowa. Top management takes a vital interest in the community and assumes its role alongside the chambers and other research and industrial type companies as a community leader and community promoter.

These chambers of commerce have studied the transportation patterns and the traffic load from the Quad-City area and in cities west. They have made a strong case and a plea for direct nonstop flights from the Quad-City Airport to Washington, D.C., and from the Quad-City Airport to New York City, originating west of the Quad-Cities.

The Council of Chamber Presidents invited Ozark representatives to meet with them and explain Ozark's proposal. Ozark promptly sent executives from their home office.

The council also invited United Airlines representatives to meet with them and present information about their future plans. Home office managers responded quickly and a special meeting was arranged.

This kind of cooperation makes the Quad-Cities grow. There is a competitive spirit between the cities and between their chambers of commerce, but they join together on the many matters that have areawide impact.

The Civil Aeronautics Board will be told at its hearing, as both airlines have been told, that there is a keen need for direct flight service from the Quad-Cities area to the east and that big business, little business, the Army Weapons Command and the city government officials are anxious to have it provided by either United or Ozark or both, or by American or TWA—who have no authorization into the Quad-Cities—or any airline.

I certainly add my voice to the request for direct flight service. I see the value to the community. I see its value to the individual traveler. I, like the rest of you here on the floor of the House of Representatives, must move back and forth between our home ground and the Halls of Congress with great frequency. I am proud of the First District of Iowa, which I represent, and of the whole Quad-City area. It pleases me to see it grow, serving our Nation in many ways, and providing good homes and a good community for the Quad-City citizens. It pleases me to see so many groups working together to improve air travel, which also is growing steadily.

The same type of thing is happening in other areas, I am told, and will happen soon in many more of them. This pleases me too, for it helps America be great.

Movement of people, movement of mail, movement of goods, and movement of products is essential to the continued growth of a better America. Most important of all is people. If people can move to each other, and see each other, and talk to each other, face-to-face, progress in every phase of American life is bound to come.

At this point in the RECORD I would like to insert a resolution adopted by the Davenport Chamber of Commerce on this matter:

RESOLUTION

Whereas, Ozark Air Lines is requesting the Civil Aeronautics Board to grant non-stop service from Illinois communities to Washington, D.C. and New York City; and

Whereas, the communities from which Ozark is asking to fly non-stop are Peoria, Springfield and Champaign-Urbana; and

Whereas, the Quad-Cities is designated on the Ozark route request as a stop immediately prior to Peoria and thence non-stop to Washington and New York City; and

Whereas, United Air Lines has Civil Aeronautics Board authority to provide service non-stop from the Quad-Cities to Washington, New York City and other coastal points.

Now, therefore, be it resolved that the Davenport Chamber of Commerce, Davenport, Iowa, intervene in the Civil Aeronautics Board hearing scheduled June 12, 1968, in Peoria on the Ozark petition, Docket 18577; and

Be it further resolved, that the intervention be on behalf of the Quad-City community, without reference to a choice of carrier, contending that non-stop service between the Quad-Cities and Washington and New York City is needed; and

Be it further resolved, that communication of this community desire for non-stop service between the Quad-Cities and Washington and New York be made to United Air Lines.

Dated this 28th day of May, 1968.

EDWARD M. LEHNER,
President, Davenport Chamber of Commerce.

JOHN McCORMACK, SPEAKER OF THE HOUSE

Mr. MADDEN. Mr. Speaker, I ask unanimous consent to extend my remarks at this point in the RECORD and include a broadcast by Joseph McCaffrey.

The SPEAKER pro tempore. Is there objection to the request of the gentleman from Indiana?

There was no objection.

Mr. MADDEN. Mr. Speaker, on Wednesday, May 29, 1968, the distinguished news reporter, Joseph McCaffrey, on his program "Meet the Member," commented upon our beloved Speaker. It is a pleasure for me to call this radio broadcast to the attention of the House of Representatives:

John W. McCormack is a thoughtful man, who is loyal to his friends and his political colleagues and expects loyalty in return. Yet despite the number of times during his fifty years in public life when he has found his trust misplaced, John McCormack has never let it discourage or disillusion him. In all his years the Speaker of the House has never been cynical, his faith in his fellow man is as great today as when he trotted off to work at the age of 13 following the death of his father and he was called on to become the family breadwinner.

Young John left high school and began working as a newsboy, then moved up to take a job as errand boy with a brokerage firm at what was, to him at that time, the grand wage of three dollars and fifty cents a week. The chance to increase that amount to four dollars caused him to make what turned out to be one of the most important decisions of his life. He took an errand running job for four dollars a week in the law office of William T. Way.

Taking a liking to the courteous, hard working, young McCormack, Counselor Way suggested that he read law. Studing at night and between errands in the law office, John McCormack was able to pass the bar examinations when he was 21 years old. His law career was interrupted by service during World War I, in the Army, from which he was discharged with the rank of Sergeant Major.

At about the same time he took his first step toward a political career as a delegate to the Massachusetts Constitutional Convention. In 1920 he was elected to the State House of Representatives, and then moved to the State Senate.

By now he had developed a reputation as one of the state's leading trial attorneys as the senior partner in the law firm of McCormack and Hardy. He was elected to Congress in 1928, and today is the second ranking member of the House of Representatives, following New York City's Emanuel Celler who served since November 1923.

Perhaps no one points up the value of making a good impression during the freshman term as does John McCormack. As a first termer, McCormack worked hard. He had the advantage of his years in the state legislature so he was a step ahead of most of the newer members.

He quickly came to the attention of John Nance Garner, and the powerful Sam Rayburn who was then ranking Democrat on the House Commerce Committee. Later John McCormack was picked for membership on the vital Ways and Means Committee, the first Democratic Congressman to win the influential and sought after committee assignment with less than two terms in office.

When Rayburn moved to the Speaker's chair in 1940, McCormack became the natural choice for majority leader, and he has been in the leadership ranks of the House ever since then . . . 28 years ago.

On January 10, 1962, and following the death of Sam Rayburn, John McCormack was elected Speaker, a post which he has held in the 88th, 89th and the current 90th Congress.

He is known as a fair, honest, objective man whose word has always been his bond. He is a party man only in the sense of his loyalty to his Democratic party. He does not attend social functions, preferring to spend his even-

ings with his wife of 48 years, Harriet. The two attend formal state dinners at the White House, but generally the Speaker, as he has done most of his public life, shys away from the social circuit.

Those who know him well doubt if any record has ever been kept of the favors he has done for others, the help he has given those in need, the compassion he has shown to men and women in all walks to life.

Years ago a chaplain of the House of Representatives summed up John McCormack the man when he said, " I think if all of us lived the kind of life John McCormack lives, there wouldn't be any need for a chaplain".

CAPTURE OF JAMES EARL RAY

Mr. ANDREWS of North Dakota. Mr. Speaker, I ask unanimous consent to extend my remarks at this point in the RECORD and include extraneous matter.

The SPEAKER pro tempore. Is there objection to the request of the gentleman from North Dakota?

There was no objection.

Mr. ANDREWS of North Dakota. Mr. Speaker, the events of the past week were not all bleak. The news of the capture of James Earl Ray, the suspected assassin of Martin Luther King, in London on Saturday morning was welcome indeed in the light of current events.

I want to say at this time that I think the Federal Bureau of Investigation did one of its most outstanding jobs in this investigation. There perhaps has been few, if any, investigations into which it has put greater effort. The speed with which it identified the suspected killer, and the exhaustive probe which it continued to make until this man was located are the things which we Americans have come to expect of the FBI.

Thankfully, J. Edgar Hoover and his dedicated associates in the FBI have come through once again for the American people. Let this be fair warning to all would-be assassins—no stone will be left unturned until they are captured and brought to the bar of justice no matter how far they may flee.

LEAVE OF ABSENCE

By unanimous consent, leave of absence was granted to:

Mr. THOMPSON of New Jersey, for the period June 10 through July 3, on account of official business.

Mr. DONOHUE (at the request of Mr. BURKE of Massachusetts), for 4 days, on account of death in family.

Mr. PEPPER (at the request of Mr. ALBERT) for today, on account of official business.

Mr. MCCULLOCH (at the request of Mr. GERALD R. FORD), for today, on account of National Advisory Committee on Civil Disorders.

Mr. CORMAN, for today, on account of official business.

Mr. EVINS of Tennessee (at the request of Mr. EVERETT), for today, on account of illness.

SPECIAL ORDERS GRANTED

By unanimous consent, permission to address the House, following the legislative program and any speical orders heretofore entered, was granted to:

Mr. HOWARD (at the request of Mr. CHARLES H. WILSON), for 15 minutes, today; to revise and extend his remarks and to include extraneous matter.

Mr. CAHILL (at the request of Mr. BLACKBURN) for 20 minutes, today; and to revise and extend his remarks and include extraneous matter.

(The following Members (at the request of Mr. HOWARD) and to revise and extend their remarks and include extraneous matter:)

Mr. REUSS, for 30 minutes, today.

Mr. FUQUA, for 60 minutes, on July 8.

EXTENSIONS OF REMARKS

By unanimous consent, permission to revise and extend remarks was granted to:

Mr. UDALL during his remarks on S. 974 and to include a letter.

Mr. RODINO (at the request of Mr. HOWARD) to include extraneous matter with his remarks made today in the Committee of the Whole on H.R. 3400.

(The following Members (at the request of Mr. REINECKE) and to include extraneous matter:)

Mr. BYRNES of Wisconsin.
Mr. BUSH.
Mr. BROWN of Michigan.
Mr. ASHBROOK in two instances.
Mr. BROYHILL of Virginia.
Mr. BROCK.
Mr. QUILLEN in four instances.
Mr. FULTON of Pennsylvania in five instances.
Mr. BOB WILSON in two instances.
Mr. HOSMER in two instances.
Mr. DOLE.
Mr. POFF.
Mr. SCHERLE.
Mr. KEITH.
Mr. TALCOTT.
Mr. BUCHANAN in two instances.
Mr. SMITH of Oklahoma.
Mr. UTT in three instances.
Mr. MILLER of Ohio.
Mr. WYATT.
Mr. MINSHALL.
Mr. MCCLURE.

(The following Members (at the request of Mr. HOWARD) and to include extraneous matter:)

Mr. ABBITT.
Mr. RESNICK in two instances.
Mr. FRASER in three instances.
Mr. LEGGETT.
Mr. JONES of Alabama.
Mr. EDWARDS of California in five instances.
Mr. FUQUA in two instances.
Mr. HATHAWAY in two instances.
Mr. FISHER in two instances.
Mr. GONZALEZ in three instances.
Mr. BEVILL.
Mr. RARICK in six instances.
Mr. DENT in two instances.
Mr. ROONEY of New York in two instances.
Mr. MURPHY of New York.
Mr. RYAN in two instances.
Mr. HAMILTON.
Mrs. KELLY.
Mr. MONTGOMERY in three instances.
Mr. FASCELL.
Mr. COHELAN in two instances.
Mr. MILLER of California in five instances.
Mr. WILLIAM D. FORD in two instances.
Mr. BLATNIK in five instances.
Mr. PHILBIN in three instances.
Mr. CHARLES H. WILSON.
Mr. FRIEDEL.

ENROLLED BILLS SIGNED

Mr. BURLESON, from the Committee on House Administration, reported that that committee had examined and found truly enrolled bills of the House of the following titles, which were thereupon signed by the Speaker:

On June 7, 1968.

H.R. 5037. An act to assist State and local governments in reducing the incidence of crime, to increase the effectiveness, fairness, and coordination of law enforcement and criminal justice systems at all levels of government, and for other purposes; and

H.R. 16911. An act to provide for U.S. participation in the facility based on special drawing rights in the International Monetary Fund, and for other purposes.

BILLS AND A JOINT RESOLUTION PRESENTED TO THE PRESIDENT

Mr. BURLESON, from the Committee on House Administration, reported that that committee did on the following days present to the President, for his approval, bills and a joint resolution of the House of the following titles:

On June 6, 1968:

H.R. 11308. An act to amend the National Foundation on the Arts and the Humanities Act of 1965; and

H.J. Res. 1292. Joint resolution to authorize the U.S. Secret Service to furnish protection to major presidential or vice presidential candidates.

On June 7, 1968:

H.R. 5037. An act to assist State and local governments in reducing the incidence of crime, to increase the effectiveness, fairness, and coordination of law enforcement and criminal justice systems at all levels of government, and for other purposes; and

H.R. 16911. An act to provide for U.S. participation in the facility based on special drawing rights in the International Monetary Fund, and for other purposes.

ADJOURNMENT

Mr. HOWARD. Mr. Speaker, I move that the House do now adjourn.

The motion was agreed to; accordingly (at 4 o'clock and 6 minutes p.m.), the House adjourned until tomorrow, Tuesday, June 11, 1968, at 12 o'clock noon.

EXECUTIVE COMMUNICATIONS, ETC.

Under clause 2 of rule XXIV, executive communications were taken from the Speaker's table and referred as follows:

1915. A letter from the Secretary of Defense, transmitting a notification of deficiences to be incurred for necessities of the current year in certain appropriations, pursuant to the provisions of subsection (b) of R. S. 3732 (41 U.S.C. 11); to the Committee on Appropriations.

1916. A letter from the Secretary of the Navy, transmitting notification of a proposal to loan surplus property not needed by the Department of the Navy to the Chesapeake Bay Maritime Museum, St. Michaels, Md., pursuant to the provisions of 10 U.S.C. 7545; to the Committee on Armed Services.

1917. A letter from the Secretary of Health, Education, and Welfare, transmitting a report on the method of determining informa-

tion necessary to establish entitlements under title I of the Elementary and Secondary Education Act of 1965, pursuant to the provisions of section 113, Public Law 90–247; to the Committee on Education and Labor.

1918. A letter from the Secretary of State, transmitting the seventh annual report on the activities of the Center for Cultural and Technical Interchange Between East and West in Honolulu, covering the period July 1, 1966, through June 30, 1967, pursuant to the provisions of chapter VII, Public Law 86–472; to the Committee on Foreign Affairs.

1919. A letter from the Acting Comptroller General of the United States, transmitting a report on the need to expand and relocate internal audit function in the Department of Labor; to the Committee on Government Operations.

1920. A letter from the Archivist of the United States, transmitting a report on records proposed for disposal, pursuant to the provisions of the act approved July 7, 1943 (57 Stat. 380), as amended (59 Stat. 434 and 63 Stat. 377); to the Committee on House Administration.

1921. A letter from the Assistant Secretary of the Interior, transmitting a draft of proposed legislation to provide for the disposition of judgment funds on deposit to the credit of the Quechan Tribe of the Fort Yuma Reservation, Calif., in Indian Claims Commission docket No. 319, and for other purposes; to the Committee on Interior and Insular Affairs.

1922. A letter from the Secretary of Health, Education, and Welfare transmitting the first annual report on the progress in the prevention and control of air pollution, pursuant to the provisions of section 306 of the Clean Air Act, as amended; to the Committee on Interstate and Foreign Commerce.

1923. A letter from the Secretary of Health, Education, and Welfare, transmitting a report on the incidence of serious hunger and malnutrition and related health problems, pursuant to the provisions of section 14, Public Law 90–174; to the Committee on Interstate and Foreign Commerce.

1924. A letter from the Attorney General, transmitting a draft of proposed legislation to amend title 18, United States Code, to provide for better control of the interstate traffic in firearms; to the Committee on the Judiciary.

1925. A letter from the Secretary of Commerce, transmitting a draft of proposed legislation to amend section 212(B) of the Merchant Marine Act, 1936, as amended, to provide for the continuation of authority to develop American flag carriers and promote the foreign commerce of the United States through the use of mobile trade fairs; to the Committee on Merchant Marine and Fisheries.

REPORTS OF COMMITTEES ON PUBLIC BILLS AND RESOLUTIONS

Under clause 2 of rule XIII, pursuant to the order of the House of June 5, 1968, the following bill was reported on June 7, 1968:

Mr. MAHON: Committee on Appropriations. H.R. 17734. A bill making supplemental appropriations for the fiscal year ending June 30, 1968, and for other purposes (Rept. No. 1531). Referred to the Committee of the Whole House on the State of the Union.

Under clause 2 of rule XIII, pursuant to the order of the House of June 6, 1968, the following bill was reported on June 7, 1968:

Mr. GRAY: Committee on Public Works. H.R. 6589. A bill to insure that public buildings financed with Federal funds are so designed and constructed as to be accessible to the physically handicapped; with amendment (Rept. No. 1532). Referred to the Committee of the Whole House on the State of the Union.

[*Submitted June 10, 1968*]

Under clause 2 of rule XIII, reports of committees were delivered to the Clerk for printing and reference to the proper calendar, as follows:

Mr. MILLS: Committee of conference. H.R. 15414. An act to continue the existing excise tax rates on communication services and on automobiles and to apply more generally the provisions relating to payments of estimated tax by corporations (Rept. No. 1533). Ordered to be printed.

Mr. GARMATZ: Committee of conference. H.R. 12639. An act to remove certain limitations on ocean cruises (Rept. No. 1534). Ordered to be printed.

Mr. GARMATZ: Committee of conference. H.R. 15190. An act to amend sections 3 and 4 of the act approved September 22, 1964 (78 Stat. 990), providing for an investigation and study to determine a site for the construction of a sea-level canal connecting the Atlantic and Pacific Oceans (Rept. No. 1535). Ordered to be printed.

Mr. STAGGERS: Committee on Interstate and Foreign Commerce. H.R. 15758. A bill to amend the Public Health Service Act so as to extend and improve the provisions relating to regional medical programs, to extend the authorization of grants for health of migratory agricultural workers, to provide for specialized facilities for alcoholics and narcotic addicts, and for other purposes; with amendment (Rept. No. 1536). Referred to the Committee of the Whole House on the State of the Union.

Mr. MILLS: Committee on Ways and Means. H.R. 17325. A bill to amend the Internal Revenue Code of 1954 with respect to advertising in a convention program of a national political convention; with amendment (Rept. No. 1537). Referred to the Committee of the Whole House on the State of the Union.

PUBLIC BILLS AND RESOLUTIONS

Under clause 4 of rule XXII, pursuant to the order of the House of June 6, 1968, the following bill was introduced on June 7, 1968:

By Mr. MAHON:

H.R. 17734. A bill making supplemental appropriations for the fiscal year ending June 30, 1968, and for other purposes.

[*Submitted June 10, 1968*]

Under clause 4 of rule XXII, public bills and resolutions were introduced and severally referred as follows:

By Mr. CELLER:

H.R. 17735. A bill to amend title 18, United States Code, to provide for better control of the interstate traffic in firearms; to the Committee on the Judiciary.

By Mr. CONYERS:

H.R. 17736. A bill to amend the Internal Revenue Code of 1954 to raise needed additional revenues by tax reform; to the Committee on Ways and Means.

By Mr. CORMAN:

H.R. 17737. A bill to amend the Federal Food, Drug, and Cosmetic Act to include a definition of food supplements, and for other purposes; to the Committee on Interstate and Foreign Commerce.

By Mr. GARMATZ:

H.R. 17738. A bill to amend the last sentence of section 201(b) of the Merchant Marine Act, 1936, and for other purposes; to the Committee on Merchant Marine and Fisheries.

By Mr. GATHINGS:

H.R. 17739. A bill to protect the freedom of choice of Federal employees in employee-management relations; to the Committee on Post Office and Civil Service.

By Mr. HELSTOSKI:

H.R. 17740. A bill to establish a Commission on Hunger; to the Committee on Education and Labor.

By Mr. POOL:

H.R. 17741. A bill to amend title 18, United States Code, with respect to the reviewability of admission in evidence of confessions in State cases, admissibility in evidence of eye witness testimony, and procedures in obtaining writs of habeas corpus; to the Committee on the Judiciary.

By Mr. PRICE of Illinois:

H.R. 17742. A bill to provide for the enforcement of support orders in certain State and Federal courts, and to make it a crime to move or travel in interstate and foreign commerce to avoid compliance with such orders; to the Committee on the Judiciary.

By Mr. WALKER:

H.R. 17743. A bill to amend the Social Security Act as related to certain hospitals in the State of New Mexico; to the Committee on Ways and Means.

By Mr. WATSON:

H.R. 17744. A bill to encourage the growth of international trade on a fair and equitable basis; to the Committee on Ways and Means.

By Mr. ADAIR:

H.R. 17745. A bill to provide for the investigative detention and search of persons suspected of involvement in, or knowledge of, Federal crimes; to the Committee on the Judiciary.

By Mr. BYRNE of Pennsylvania:

H.R. 17746. A bill to provide compensation for firemen not employed by the United States killed or injured in the performance of duty during a civil disorder, and for other purposes; to the Committee on the Judiciary.

By Mr. WILLIAM D. FORD:

H.R. 17747. A bill to authorize preschool and early education programs for handicapped children; to the Committee on Education and Labor.

By Mr. HATHAWAY (for himself, Mr. THOMPSON of New Jersey, Mr. HOLLAND, Mr. DANIELS, Mr. BRADEMAS, Mr. CAREY, Mr. HAWKINS, Mr. SCHEUER, Mr. MEEDS, Mr. BURTON of California, Mr. ECKHARDT, and Mr. OLSEN):

H.R. 17748. A bill to authorize the Secretary of Labor to set standards to assure safe and healthful working conditions for working men and women, to assist and encourage the States to participate in efforts to assure such working conditions, to provide for research, information, education, and training in the field of occupational safety and health, and for other purposes; to the Committee on Education and Labor.

By Mrs. HECKLER of Massachusetts:

H.R. 17749. A bill to amend title 13, United States Code, to limit the categories of questions required to be answered under penalty of law in the decennial censuses of population, unemployment, and housing, and for other purposes; to the Committee on Post Office and Civil Service.

By Mr. REUSS:

H.R. 17750. A bill to improve law enforcement in cities by making available funds to be used to increase police salaries and to add more police officers; to the Committee on the Judiciary.

By Mr. TEAGUE of Texas (by the request):

H.R. 17751. A bill to prevent compression of rate ranges by reason of increases in minimum rates of pay under title I of the Federal Salary Reform Act of 1962, to enable the Administrator of Veterans' Affairs to establish higher rates of pay thereunder, to amend title 38 of the United States Code to require pay differentials for nurses in Veterans' Ad-

ministration hospitals who perform evening, night, weekend, holidays, or overtime duty and to authorize payment for standby or on-call time, and for other purposes; to the Committee on Post Office and Civil Service.

By Mr. WHITE (for himself and Mr. PRYOR):

H.R. 17752. A bill to provide indemnity payments to dairy farmers; to the Committee on Agriculture.

By Mr. PATMAN:

H.J. Res. 1295. Joint resolution providing for annual audits of the Federal Reserve System by the General Accounting Office; to the Committee on Banking and Currency.

By Mr. RODINO:

H.J. Res. 1296. Joint resolution creating a Joint Committee To Investigate Crime; to the Committee on Rules.

By Mr. ROUSH:

H.J. Res. 1297. Joint resolution creating a Joint Committee To Investigate Crime; to the Committee on Rules.

By Mr. POOL:

H. Con. Res. 786. Concurrent resolution relating to the pay of the U.S. Capitol Police force for duty performed in emergencies; to the Committee on House Administration.

MEMORIALS

Under clause 4 of rule XXII, memorials were presented and referred as follows:

348. The SPEAKER presented a memorial of the Legislature of the State of South Carolina, relative to a proposed amendment to the Constitution on public school selection rights, which was referred to the Committee on the Judiciary.

PRIVATE BILLS AND RESOLUTIONS

Under clause 1 of rule XXII, private bills and resolutions were introduced and severally referred as follows:

By Mr. ADAMS:

H.R. 17753. A bill for the relief of Eladio Pasamba Amador; to the Committee on the Judiciary.

By Mr. GALLAGHER:

H.R. 17754. A bill for the relief of Amante Catalda; to the Committee on the Judiciary.

By Mr. GRAY:

H.R. 17755. A bill for the relief of Miss Ninfa Evola; to the Committee on the Judiciary.

By Mr. MACGREGOR:

H.R. 17756. A bill for the relief of Iraj Rigi; to the Committee on the Judiciary.

By Mr. MURPHY of Illinois:

H.R. 17757. A bill for the relief of Epaminodas Stavrakis; to the Committee on the Judiciary.

By Mr. TUNNEY:

H.R. 17758. A bill for the relief of Ephy Grace Peshek; to the Committee on the Judiciary.

SENATE—*Monday, June 10, 1968*

The Senate met at 12 o'clock noon and was called to order by the President pro tempore.

The Chaplain, Rev. Frederick Brown Harris, D.D., offered the following prayer:

Almighty God, whose never failing love alone can heal our wounds and in whose keeping are the destinies of men and nations, in this time of grief and sorrow, when an empty desk in this Senate Chamber speaks of our tragic loss, we can but voice our deathless faith:

Jesus, I die to Thee
Whenever death shall come—
To die in Thee, is life to me
In my eternal home.

In life or death, O love divine, O helper ever present, through Thy abounding grace be Thou our strength and stay.

Lord, in this hour of tumult,
Lord, in this night of fears,
Keep open, O keep open
Our eyes, our hearts, our ears.

Not blindly, nor in hatred,
Lord, let us do our part—
Keep open, O keep open
Our eyes, our minds, our hearts.

We ask it in the name of the living Christ who is the resurrection and the life. Amen.

MESSAGE FROM THE HOUSE

A message from the House of Representatives by Mr. Bartlett, one of its reading clerks, communicated to the Senate the resolutions of the House adopted as a tribute to the memory of Hon. Robert F. Kennedy, late a Senator from the State of New York.

The message also announced that the House had disagreed to the amendments of the Senate to the bill (H.R. 4919) to authorize longer term leases of Indian lands on the Hualapai Reservation in Arizona.

The message further announced that the House had passed a bill (H.R. 16027) to amend title 38, United States Code, to provide increases in rates of compensation for disabled veterans, and for other purposes.

HOUSE BILL REFERRED

The bill (H.R. 16027) to amend title 38, United States Code, to provide increases in rates of compensation for disabled veterans, and for other purposes, was read twice by its title and referred to the Committee on Finance.

MESSAGES FROM THE PRESIDENT

Messages in writing from the President of the United States were communicated to the Senate by Mr. Geisler, one of his secretaries.

NOMINATION FOR APPOINTMENT AS A MEMBER OF THE DISTRICT OF COLUMBIA REDEVELOPMENT LAND AGENCY

The PRESIDENT pro tempore laid before the Senate the following nomination, which was referred to the Committee on the District of Columbia:

JUNE 5, 1968.

The Senate of the United States:

Pursuant to the provisions of Section 4(a) of Public Law 592, 79th Congress, approved August 2, 1946, as amended, I, the Commissioner of the District of Columbia nominate the following named person for appointment as a Member of the District of Columbia Redevelopment Land Agency:

Dean Stephen S. Davis, for a term of 5 years, effective on and after May 23, 1968.

WALTER WASHINGTON,
Commissioner of the District of Columbia.

EXECUTIVE MESSAGES REFERRED

As in executive session.

The PRESIDENT pro tempore laid before the Senate messages from the President of the United States submitting sundry nominations and withdrawing the nomination of Edward Klimowich to be postmaster at Montville, N.J., which nominating messages were referred to the appropriate committees.

(For nominations this day received, see the end of Senate proceedings.)

THE JOURNAL

Mr. MANSFIELD. Mr. President, I ask unanimous consent that the reading of the Journal of the proceedings of Thursday, June 6, 1968, be dispensed with.

The PRESIDENT pro tempore. Without objection, it is so ordered.

LIMITATION OF STATEMENTS DURING TRANSACTION OF ROUTINE MORNING BUSINESS

Mr. MANSFIELD. Mr. President, I ask unanimous consent that statements be limited to 3 minutes during the period for the transaction of routine morning business.

The PRESIDENT pro tempore. Without objection, it is so ordered.

WAIVER OF THE CALL OF THE CALENDAR

Mr. MANSFIELD. Mr. President, I ask unanimous consent that the call of the legislative calendar, under rules VII and VIII, be dispensed with.

The PRESIDENT pro tempore. Without objection, it is so ordered.

ORDER FOR ADJOURNMENT

Mr. MANSFIELD. Mr. President, I ask unanimous consent that when the Senate completes its business today, it stand in adjournment until 12 o'clock noon tomorrow.

The PRESIDENT pro tempore. Without objection, it is so ordered.

ORDER FOR ADJOURNMENT FROM TOMORROW UNTIL WEDNESDAY AT 11 A.M.

Mr. MANSFIELD. Mr. President, I ask unanimous consent that when the Senate completes its business tomorrow, it stand in adjournment until 11 a.m. Wednesday next.

The PRESIDENT pro tempore. Without objection, it is so ordered.

ORDER FOR RECOGNITION OF SENATOR TYDINGS ON WEDNESDAY

Mr. MANSFIELD. Mr. President, I ask unanimous consent that after the disposition of the Journal on Wednes-