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ADMINISTRATION OF PESTICIDE LAWS AND REGULATIONS

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HEARING BEFORE THE COMMITTEE ON AGRICULTURE HOUSE OF REPRESENTATIVES

EIGHTY-EIGHTH CONGRESS

SECOND SESSION

MAY 26, 1964

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ADMINISTRATION OF PESTICIDE LAWS AND REGULATIONS

TUESDAY, MAY 26, 1964

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Washington, D.C.

The committee met, pursuant to notice, at 10:10 a.m. in room 1310, Longworth House Office Building, Washington, D.C., Hon. W. R. Poage, presiding.

Present: Representatives Poage (presiding), Abbitt, Jones of Missouri, Matthews, Rosenthal, Duncan, Dague, Short, Latta, Harvey of Indiana, Beermann, and Hutchinson.

Also present: Betty Prezioso, staff; Hyde H. Murray, clerk; John J. Heimburger, general counsel; Robert Bruce, assistant counsel; and Francis M. LeMay, consultant.

Mr. POAGE. The committee will come to order.

We are met this morning to try to get some understanding of the operation of the pesticide and insecticide laws and regulations.

We have representatives present from the Department of Agriculture, and the Department of the Interior, and the Department of Health, Education, and Welfare.

Our first witness is Dr. Clarkson, and if you would like, you may start off and give us an outline of present operations.

We do want some understanding of the relationship between the departments, because I will say, frankly, so that you will understand what we are driving at, and the things that are involved in this, and I think it might be well to point this out, so you people will recognize what we have in our minds. We have understood that the agencies of the Government—and the members of the committee are just like citizens of the country—we have understood that the agencies of the Government have found fish dying at New Orleans in the Mississippi River. They have also discovered that there was a certain manufacturer in Memphis which I believe is something like 800 or 900 miles; that is, river-miles from New Orleans who manufactures an insecticide and they decided that there must be some kind of connection between this insecticide plant and the killed fish at New Orleans. I want to know in that connection, how does it happen that the waste from the insecticide plant in Memphis, Tenn., killed the fish at New Orleans without killing the fish in between.

Maybe we do not understand just what is happening, but I am talking about the reports that we get. And so far as I am concerned, I also want to know something about what happened here in Virginia and Maryland recently when we had publicized the milk situation there, in which instance these people, if I understand it, have been

feeding the alfalfa which has been treated with a pesticide for a great long time to their cows. And they purchased all of that alfalfa in the fall of the year, they did not buy it in January, or February, or March. It was not cut in those months.

They had to buy their alfalfa from the year before for their feed. And all of it got the same treatment, as I understand it. And it was all right during December and January and February—there was not anything wrong with that alfalfa or anything wrong with the milk that was produced. Then, maybe about 2:46, I am not just sure what the time was, these people were told that this whole crop was no good and they could not use it, because somebody had invented a new machine that could test the presence of a poison in much less quantities than had ever been detected before.

We want to know how that alfalfa became poisonous at a later period.

We want to know if there is not some practical way whereby people can attempt to make an honest living in this country and provide the food and fiber for the people of the United States, and attempt to use the scientific developments that have been carried on with some assurance that the thing that is good today will not be declared bad at 3:14 in the morning.

All of this is in the law which requires these regulations. This, I suppose, is based upon the Delaney law. I am rather inclined to think that if there is anything that is dangerous that we ought to find out about it, and the public ought to find out about it.

Certainly, the public should be protected from poisons. No man on this committee, and I do not believe any Member of Congress would suggest that the public should not be protected from things that will hurt the public. I lived out in the country and I think that I did eat a peck of dirt and it did not kill me, and I think that I ate a lot of germs along with it and it did not kill me and it did not kill many other people in this same situation.

Maybe the scientists are doing the human race an injustice in destroying some of our ordinary immunities to normal poisons. Maybe we just should put ourselves in the position where we are subject to more afflictions than we ought to be. Anyway, we ought to know about it. We would like to know from you, Dr. Clarkson, and to have you give us information as to how these regulations do operate. We are, of course, primarily interested in agriculture. Some of these other people are not interested in agriculture. Some of these other people have other responsibilities, but how do you feel that the present laws and the regulations are functioning to help us, rather than to hurt us?

**STATEMENT OF DR. M. R. CLARKSON, ASSOCIATE ADMINISTRATOR;
ACCOMPANIED BY DR. ROBERT J. ANDERSON, DEPUTY ADMINISTRATOR;
AND JUSTUS WARD, PESTICIDES REGULATION DIVISION,
ARS, U.S. DEPARTMENT OF AGRICULTURE**

Dr. CLARKSON. Mr. Chairman and members of the committee, the aim, the purpose, and the day-to-day effort of the several departments in administering the various laws that come to bear upon this problem is to produce a good, wholesome supply of food, and feed, at reasonable cost, which is clean, free of insects and rodent contamination while at

the same time protecting the people, including the farmers and the operators as well as consumers, from any adverse effects from chemicals.

We have a two-sided objective which in many ways tends to be inconsistent. Therefore, it takes a great deal of very hard work and a great deal of very close coordination to bring about the reasonable effect that everyone wants.

I would like with your permission, Mr. Chairman, to present my statement in which I have attempted to give some background on the way in which we in the Department approach this task.

The 50th anniversary of the Insecticide Act of 1910 was 1960. That was "An act for preventing the manufacture, sale, or transportation of adulterated or misbranded paris greens, lead arsenate, and other insecticides, and also fungicides and for regulating traffic therein, and for other purposes."

In the intervening years since those days of paris greens and lead arsenate, many new chemicals have been developed for household, agricultural, and industrial purposes.

In 1947, the original act was replaced by the Federal Insecticide, Fungicide, and Rodenticide Act which included many additional products and provided for the registration of products before they could be moved in interstate commerce.

In 1959 the act was amended to include nematocides, plant regulators, defoliant, and dessicants (Public Law 86-139, 1959) and the scope of activities under the act was further extended with the adoption in 1962 of a regulation declaring certain forms of plant and animal life and viruses to be pests under certain conditions.

Perhaps the most important definition of the act is that of the term "economic poison." An economic poison means (1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, nematodes, fungi, weeds, and other forms of plant or animal life or viruses, except viruses on or in living man or other animals, which the Secretary shall declare to be a pest; and (2) any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. "Economic poison," as used in the language of the act, has been largely replaced in common usage by the term "pesticide."

And we use these two terms as being synonymous.

In the registration of pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act, the Department is specifically charged to protect the public by considering both effectiveness and safety. The two go hand in hand.

The Department is deeply concerned with the avoidance of all hazards, of any kind, in the use of pesticides. Many of them are powerful substances, and some can be extremely dangerous if misused.

Department scientists have always recognized both the immediate and potential long-term dangers of pesticides. There has always been and always will be a deep sense of obligation to see that the Government takes protective measures that individual citizens are not in a position to take for themselves.

This requires the most careful evaluation of safety and effectiveness for a wide range of products. The Department looks far beyond the immediate toxicity of the product and tries to anticipate every hazard

that might ultimately come about from its use. For example: a product might control insects on a crop without leaving a residue on the portion used for human food—but other portions of the crop containing residues might be fed to dairy cattle thus presenting the possibility of illegal residues in milk. Registration is withheld until this question is resolved.

A fungicide might be used for preservation of fruit picking trays or boxes—but there is a possibility of hazard to handlers and also a possibility of illegal residues in milk. Registration is withheld until action. No registration is issued until the question is resolved.

That's just a sample of the possibilities. You can well appreciate that providing protection against such hazards calls for exhaustive data on any new product offered for registration.

Detailed and convincing test results must be furnished by the manufacturer showing that the product will give effective pest control under a variety of conditions. Findings of extensive toxicological studies must be reported to convince us that the precautions on the proposed label will be adequate to safeguard the public. And when the product is used on foods, detailed chemical analyses of residues, if any, must be submitted.

If a compound for food uses passes preliminary tests for acute toxicity, detailed studies are made by feeding variable amounts in the diets of laboratory animals. Microscopic studies are made of the blood, tissues, and internal organs of the test animals to determine what effects the compound may have had. Careful records are kept on growth rates and any gross symptoms.

Tests on larger animals may also be needed. Skin absorption or irritation tests are necessary to determine the effects of absorption of the chemical by that route. Studies are made to learn what happens when the material is inhaled, and when minute amounts of residue are consumed.

When a manufacturer thinks he has enough information to meet the rigid requirements of USDA for safety and effectiveness, he applies to USDA for registration.

The data submitted by the manufacturer is studied by the Pesticides Regulation Division of the Agricultural Research Service, which is manned by a competent staff of scientists, including pharmacologists, entomologists, bacteriologists, chemists, biologists, and plant pathologists.

Safety evaluation of the proposed pesticide is grounded in standard practices in the field of toxicology. Any documented data on human exposure takes precedence over data from laboratory animals.

USDA specialists draw on their long experience and detailed records with similar chemicals and similar types of formulations in making these evaluations.

Reports of USDA laboratory tests on similar products, as well as published research reports are studied.

As a matter of routine procedure, USDA scientists consult on questions of pesticide safety with expert authorities in other scientific institutions, including foundations, universities, and other agencies of the Federal Government. These experts contribute information and experience to supplement that already available.

It is standard practice to contact scientists of the Food and Drug Administration for discussions on critical uses of pesticides on foods. Proposed new household uses of pesticides and other aspects of human exposure are discussed with scientists of the Public Health Service. Questions involving fish, game, wild birds, and their environment are discussed with scientists of the Fish and Wildlife Service. Last month these relationships were formalized through an interdepartmental agreement signed by the Secretaries of USDA, Interior, and HEW. A copy of the agreement is attached.

Under the agreement, each Department undertakes to keep the other two Departments fully informed of developments from research or other sources that may come into its possession.

USDA will furnish Interior and HEW a weekly listing of all applications for registration.

HEW will furnish Interior and USDA a weekly listing of all petitions for pesticide tolerances.

Upon request, USDA and HEW will each furnish to the other two Departments full information about any pending action on registration or the setting of a tolerance.

To implement this agreement, each Department has designated a scientist as its representative. The weekly listings and any additional pertinent information will be directed to these representatives.

Along with the formal coordination outlined by this agreement, we intend to continue the long-established informal working arrangements between the scientists of this Department and those of the other Departments of Government. Such day-to-day consultations by scientists with mutual respect for each other's judgments is indispensable.

An important protection to the public is provided by control over the labels used on pesticides. Labeling requirements are stringent. USDA officials review each proposed label in its entirety. They accept a proposed label only when they are satisfied that the directions and warnings are adequate to protect the public.

Labels that are easy to read and understand are a necessity. Revision of the Department's registration regulations, published in the Federal Register on March 27, 1964, tighten up both the safety and labeling requirements.

Key warning and caution statements must be shown in a prominent place on the front panel of the pesticide label. These must include the statement "Keep Out of Reach of Children" or its equivalent, and a "signal" word—such as "Danger," "Caution," or "Warning"—which draws the user's attention to the need to handle the material carefully. Warning and caution statements must be easy to read.

The Federal Insecticide, Fungicide, and Rodenticide Act provides a good basis for protection against the hazards of pesticides. You may recall, however, that the Department had expressed concern in the past over one feature of the law. If the Department denied registration, an applicant could—and on rare occasions did—demand that the Department register his product "under protest." He could then sell the product to the public until USDA was able to develop legally acceptable proof to justify a court decision to remove it from the market.

This loophole was closed when the President signed Public Law 88-305 on May 12, 1964. This act removes registration under protest,

provides the mechanism for referral of questions in dispute, and provides for authority to the Department to require the display of the registration number on the labels of pesticides.

With the passage of this act all registrations under protest terminated and the Department sent letters of notification to each of the holders of such registrations. Proposed regulations providing for the display of registration numbers on the labels of pesticides were published in the Federal Register on May 20, 1964, with an invitation for comments from all interested persons.

In 1954, the Federal Food, Drug, and Cosmetic Act was amended to empower the Department of Health, Education, and Welfare to establish tolerances or exemptions from the requirement of tolerances in or on raw agricultural commodities. This amendment, known as the Miller amendment or pesticide chemical amendment, assigned two responsibilities to the Department of Agriculture. When a petition for a tolerance or an exemption is submitted to HEW, a copy is furnished this Department. USDA is required to furnish to HEW (1) a statement certifying whether the pesticide chemical is useful for the purposes for which a tolerance or an exemption is sought, and (2) an opinion as to whether the tolerance proposed by the petitioner reasonably reflects the amount of residue likely to result when the pesticide chemical is used in the manner proposed for the purpose for which certification is made.

Tolerances sometimes are set at zero. In other cases the absence of information to demonstrate finite amounts of residue, registration of a pesticide may be given on a "no residue" basis. In both cases, the rapid advance of technology in the development of procedures for the measurement of extremely small amounts of residue is constantly upsetting the determination as to whether or not a residue actually exists in a food or feed.

In recognition of the seriousness of this problem, the Secretaries of Agriculture and Health, Education, and Welfare recently asked the President of the National Academy of Sciences-National Research Council to have the technical questions relating to "zero tolerance" and "no-residue" evaluated by a group of experts with a view to recommending a basis for a solution. This request has been accepted and the Academy is now engaged in convening the group of scientists to undertake this work. The Department is most hopeful that the studies of this group of scientists will point the way toward a resolution of this very problem.

H.R. 11110, recently introduced by Congressman Rosenthal, would further amend the Federal Insecticide, Fungicide, and Rodenticide Act by providing factory inspection, civil penalties, injunctive authority, and waste disposal permits. The Department feels that these provisions will provide more effective tools for the regulation of pesticides. However, evaluation of the bill has not been completed. The Department's report on the bill will go into the merits of the proposals more fully.

In addition to the registration of pesticides, the Department is responsible for the proper handling of pesticides in programs to combat dangerous pests that threaten this country. As with several other departments, this makes USDA in some cases a user of pesticides, and in this, too, safety is a prime consideration.

When not enough is known about an invading insect to eradicate it, control measures are used against the pest. Workers move in with quarantines to confine it to the smallest possible area, and an effort is made to keep down losses until research can develop more effective weapons.

The effect of USDA action is to limit the use of pesticides. For example, keeping four-fifths of the country's productive lands free of the Japanese beetle has saved millions of acres from treatment with chemicals to control this pest.

Operations must be designed to protect workers, people living in the treated areas, crops, livestock, and fish and wildlife, and safe for anyone who might come in contact with residues, if any, of the chemicals used.

The workers who conduct these programs are carefully trained for their jobs. In a real sense, the public has a representative on hand in the officers who oversee all operations. It's their job to make sure that no reasonable precaution is overlooked.

The Federal Pest Control Review Board, established at the request of the Secretary of Agriculture several years ago, considers and approves or disapproves each pest control program proposed by a Government agency. This Board, composed of top administrators from the Departments of Health, Education, and Welfare, Agriculture, Interior, and Defense, has been very effective in coordinating Federal pest control activities, especially with regard to questions of safety.

The Department recently established a pest program evaluation group to review all USDA control programs involving the use of pesticides on a continuing basis to make sure that the safest and most effective materials and procedures are used.

The Department's efforts in registering pesticides and controlling pests depend heavily on work in another major area of responsibility. This is research to find better, safer ways of providing protection against thousands of kinds of insects, diseases, weeds, nematodes, and other pests.

Some of the finest research achievements in USDA's century of service to the people of America have come out of the Department efforts of this kind to improve the health and safety of mankind.

USDA scientists have provided the means to control some of the most devastating and debilitating diseases that man has ever experienced.

Of all the technology that has gone into the making of modern agriculture, one of the most important factors has been the development of pesticides. They have been, for some years now, the main weapon for fighting pests. Often, there was no other weapon available.

That's why the Department has played a leading part over the last three-quarters of a century in developing pesticides. The Department has helped to identify useful chemicals and to devise ways to apply them. As a result, many new pesticides have come into use, particularly during the last two decades.

In this work, the Department has naturally been concerned about the effects of pesticides on animals, plants, fish and wildlife, and beneficial insects. But—even more vital—it has always recognized the importance of protecting consumers against harmful residues in food products.

Because of the many new pesticides being introduced, a major shift of emphasis in research has been pushed since 1955 to study alternate methods of control. There has been a dramatic development of imaginative new approaches, including insect sterility and the use of specific chemicals, such as attractants and repellants. There is a continual probing for the fundamental knowledge needed to make significant progress on all fronts—insofar as budgetary means and personnel permit.

As a matter of fact, these areas at the present time represent two-thirds of USDA's total research effort on insect pests.

The Department is doing a great deal of work on developing control methods that do not require the use of pesticides. But farmers and others will, of course, continue to need chemicals because, in most cases, effective substitutes are not available at the present time.

USDA has done considerable research on the development of treatment schedules to minimize residues on fruits and vegetables—for example, when to treat, how much to use, and how far in advance of harvest to make the last application.

USDA carries on research to develop new and safer forms of insecticides, such as granules, as well as improved methods and equipment for applying all types of materials with greater precision.

USDA scientists have been quite successful in finding specific chemicals that are highly effective against weeds without adversely affecting other organisms in the environment.

The Department has a staff of competent scientists, making decisions based on the best and latest information available. As new information becomes available we use it. I have pointed out the close and constant working relationship with other Departments. Department scientists are acutely aware of health hazards and scrupulously endeavor to minimize or avoid them.

The Department of Agriculture looks upon this task as a great public trust. We are doing—and expect to continue doing—everything humanly possible to discharge this responsibility with the welfare of the American people uppermost in our minds.

That completes my statement, Mr. Chairman, and I appreciate the opportunity to present it and I would like to have the attachment made a part of the record.

Mr. POAGE. That may be done. It will become a part of the record at this point.

(The document entitled "Interdepartmental Coordination of Activities Relating to Pesticides" follows:)

INTERDEPARTMENTAL COORDINATION OF ACTIVITIES RELATING TO PESTICIDES

By the Department of Agriculture, the Department of Health, Education, and Welfare, and the Department of the Interior

PURPOSE

Coordination of activities of the three Departments pertaining to pesticides with special reference to registration and the setting of tolerances to give effect to the pertinent recommendations of the May 15, 1963, report of the President's Science Advisory Committee on "Use of Pesticides."

EXISTING DEPARTMENTAL RESPONSIBILITIES

The following responsibilities of the respective Departments relate to the registration of pesticides and the setting of tolerances for pesticide residues:

Department of the Interior

Fish and Wildlife Service.—Conserving beneficial wild birds, mammals, fish, and their food organisms and habitat, with regard to pesticides.

Department of Health, Education, and Welfare

U.S. Public Health Service.—Protecting and improving the health of man in regard to pesticides.

Food and Drug Administration.—Establishing tolerances for pesticides in or on raw agricultural commodities and processed foods.

Department of Agriculture

Agricultural Research Service.—Providing for the safe and effective use of pesticides, including the registration thereof.

AGREEMENT

1. Information

Each Department undertakes to keep each of the other Departments fully informed of developments in knowledge on this subject from research or other sources which may come into its possession. Additionally, the Department of Agriculture undertakes to furnish to the other two Departments on a weekly basis a listing of all proposals affecting registration and reregistration, and the Department of Health, Education, and Welfare undertakes to furnish to the other two Departments on a weekly basis a listing of all proposals affecting tolerances. Upon request, the Departments of Agriculture, and Health, Education, and Welfare, respectively, will furnish to the other Departments full information about any pending action on registration or the setting of a tolerance.

2. Procedure

(a) Each Department will designate a scientist to act on behalf of such Department in carrying out the terms of this agreement. The weekly listings from the Departments of Agriculture and Health, Education, and Welfare and any additional information relating thereto will be directed to these representatives.

(b) The departmental representative will review the weekly listing of actions pending. If there is reason to question any of the items on that list, this will be communicated to the originating Department within 1 week stating the specific reason for need for further review.

(c) Upon receipt of such request the originating Department will furnish the necessary information and make the necessary arrangements for further review and will withhold final action on the matter for an additional 3 weeks.

(d) If one Department concludes that the proposal should be rejected in whole or in part, this view shall be expressed in writing and shall be supported by appropriate scientific evidence. Upon being notified, the Department responsible for final action will take the initiative to work out a basis for agreement.

(e) In the event agreement is not reached among the Department representatives within 2 weeks of the initial objection, the matter will then be referred directly to the Secretary of the Department responsible for final action with such information, views, and recommendations as the three Departments representatives deem appropriate.

(f) The Secretary of the Department charged with final action may then avail himself of whatever administrative and scientific review procedures seem appropriate under the circumstances. The other two Departments will be notified in advance of the proposed final determination of the issues.

(g) The Department representatives will jointly make a quarterly report concerning their activities to the Secretaries of the three Departments.

(h) The departmental representatives are authorized to review questions involving existing patterns of use of pesticides or tolerances upon which they have reason to believe that critical questions exist.

3. Conference

At least once each year the departmental representatives will arrange a general conference to discuss research needs, research program and policy, and the application of research findings in action programs, including public information relating to pesticides.

4. *Federal Pest Control Review Board*

The Federal Pest Control Review Board may be asked from time to time to consider broad questions on policies relating to pesticides involving the interrelationships of control programs, research, registration, tolerances, and general departmental recommendations to the public.

ORVILLE L. FREEMAN,
Secretary, Department of Agriculture.

Date: April 8, 1964.

STEWART L. UDALL,
Secretary, Department of the Interior.

Date: March 27, 1964.

ANTHONY J. CELEBREZZE,
Secretary, Department of Health, Education, and Welfare.

Date: April 3, 1964.

Mr. POAGE. I gather from your statement that you do not feel that there is any need for any change in the legislation which this committee approved and which you referred to as having been passed this spring in which we did go into some of these questions at that time. That was an effort to cover the placing of any responsible products on the market.

Dr. CLARKSON. Yes, sir.

Mr. POAGE. This committee always wants to try to prevent the placing of dangerous products on the market. Are you satisfied that we have regulations that will take care of that, that we have done so in the recent legislation?

Dr. CLARKSON. Mr. Chairman, the recent bill introduced by Congressman Rosenthal presented some further meritorious proposals. As I mentioned the Department is generally favorable to the proposals but as the evaluation of the bill has not yet been completed, I do not have a final Department position, but I think that they are very much worthy of consideration.

Mr. POAGE. Are you satisfied that we have a workable and practical program that does prevent the use of harmful chemicals?

Dr. CLARKSON. Yes, sir; I do think that we have.

Mr. POAGE. You think we have such?

Dr. CLARKSON. Yes.

Mr. POAGE. Do you think that the whole operation was practical and sound out here in Maryland and Virginia, to take care of this situation, a situation where these gentlemen had a year's feed?

Dr. CLARKSON. Mr. Chairman, the operation of these programs is not without difficulty. In fact, it has been accompanied with difficulty from the very beginning and it will continue to be so long as it is necessary to use powerful chemicals, but the legislative mechanism is adequate.

The situation in Maryland, as with other situations of similar kind that occur from time to time in other areas of the country, illustrates two aspects of this problem.

One, there is always the question of proper use—whether or not a chemical has, in fact, been used strictly in accordance with requirements. The Department and the other agencies of Government, the Extension Service, State Department, the colleges, the industry itself, do a great amount of work to emphasize to all farmers and others using chemicals, that they must follow the label and follow the precautions. This has a very broad and effective impact upon the people using chemicals. Nonetheless, sometimes there is misuse.

The situation in Maryland also illustrates another problem which I touched upon in my statement, and that is, the one of advancing technology in methods of detecting residues in ever smaller amounts. This is a critical problem which has been recognized by both the Department of Health, Education, and Welfare, and the Department of Agriculture. We have not been able to find a suitable resolution to this problem. We have, therefore, asked the National Academy of Sciences to bring the best brains of the country together to help us in solving this problem. They are doing this. We anticipate having a report from them that will show the way to an answer to that most difficult problem.

Mr. POAGE. It would be right helpful if you would give us information today as to the situation that occurred. I doubt if any members of the committee know—the chairman does not know—except just what he reads in the papers. We may have misunderstood the situation. I wonder if you would not tell us exactly what did happen and why it happened.

Dr. CLARKSON. One of the chemicals, heptachlor, had been registered for some time—for soil treatment in the fall after the last cutting of the alfalfa has been removed—for the destruction of soil borne pests that otherwise would attack the alfalfa during the next growing season. This fall treatment was designed to take the place of treatment on the alfalfa during the growing season.

There is, as I am sure the committee knows, no tolerance for residue of heptachlor or any other pesticide in milk. Some of this pesticide is carried with the hay, probably by physical deposition on the leaves and stems—in other words, dust from the fields.

The methods in use sometime back were such that although it could be determined that there were traces of heptachlor in the product and in the milk, they were not of sufficient definiteness to support action by the State or Federal agencies having authority over the milk. However, the newer methods now in hand are useful and reliable down to one one-hundredth of a part per million. Some of the milk from a few of the dairies were found to have residues above that amount.

Mr. POAGE. There was not any tolerance at all, was there?

Dr. CLARKSON. This illustrates the problem, Mr. Chairman, that when we say it shall be zero or when we say there shall be no residue, one must necessarily relate such statement to the ability to detect, the detection method, and the reliability of such method. In this situation it appeared to us that in some cases there may have been a misuse, but with our intensive study of this we also became convinced from some experimental data that had come into our hands only this spring, not yet published, that the proper usage might, in some cases, result in residue in milk. So we canceled the registration of heptachlor for fall use.

Now, of course, as has already been pointed out, the use last fall was perfectly legal. The hay that will be grown this year from fields so treated may, possibly, have enough heptachlor in it, depending upon the weather, drought, and rainfall cycles, and that sort of thing, so that next winter they may produce residues in milk that would be objectionable. This is not very likely, but it is possible.

This is a most difficult situation. It is intolerable to allow it to persist. This is the kind of situation that led the two Secretaries to ask the Academy to help us in the resolution of this problem.

Mr. POAGE. Do you know of any one single case where anybody foresaw the results of this?

Dr. CLARKSON. No, sir; I do not.

Mr. POAGE. Was the purpose of this order to prove some sort of scientific achievement—is that the purpose of this—to show that we can now measure in the future quantities which in the past we have not been able to measure? We measure the existence of an element in the sun. I understand that we can determine that there are certain elements in the sun by looking at the light. But I do not understand that there is anything that we can do about that if it hurts us or hurts the people. But the mere fact that we can find this out seems to be a matter of great importance and a matter of great achievement if we find this.

Nobody was hurt last fall, were they?

Dr. CLARKSON. There is no evidence that anyone was hurt, Mr. Chairman. In the registration process, as in the setting of tolerances, which my friends from the Food and Drug Administration will be commenting on later, it is at all times necessary to have a substantial margin of safety in these matters.

Mr. POAGE. I know that, and find no fault. What I am trying to do is to determine how far we need to go to give protection.

Dr. CLARKSON. I do not know of anyone having been killed from the proper use of any registered pesticide. In fact, in almost every instance of even injury this has come through misuse, carelessness, or accident. I think I would be safe in saying that in every case that was so. Yet these things do happen and we have to take them into account.

In the registrations of pesticides we are obliged to consider the general protection of the public. One of the facets of this consideration is that if the Food and Drug Administration under authority which they must exercise, have set a tolerance for residue of one of these chemicals at zero as in the case of milk, then it is our duty, under the Federal insecticide, fungicide, and rodenticide law, to see to it that our registration of chemicals is not likely to result in a residue that would then be in violation of the Food, Drug, and Cosmetic Act.

Mr. POAGE. Let us not get off on something else. I think that we are all in full agreement that we want to maintain the laws—we want to maintain the regulations that will give adequate protection to the public. I do not think that anyone would disagree with that. I think that we all agree that what we really need to be talking about is whether we are doing a practical thing—are we doing something that is needed to protect the public? I certainly want to continue to do it, no matter how expensive it is in the way of loss of milk or anything else if it is needed to protect people. I want to continue to do anything that is needed to protect the public. If it is not needed, is it really only a display of scientific ability to measure infinity? If that is the case it just seems to me that it is a rather useless display of scientific achievement.

Let me ask you this: This water came from the Potomac River. It came through the Washington waterworks. It has heptachlor in it, has it not?

Dr. CLARKSON. I would assume so.

Mr. POAGE. It must have, because from what you have just told us, they put this on the soil and some of it got into the alfalfa and some

of it washed off into the streams, too, and went down to the Potomac River and it is obvious that there is some in the water right now. I do not think it will kill me.

Dr. CLARKSON. I do not think so.

Mr. POAGE. I do not believe it will. I do not believe that I will suffer any ill results as a result of drinking this. Is there some property in connection with the milk that makes it more poisonous when it is presented in the form of milk than when presented in the form of water?

Dr. CLARKSON. The amount in the milk in question was vastly greater than any amount in that water you just drank. I agree with the chairman and so do both of our departments that these things ought not to be judged merely on the ability of our scientists to develop ever more sophisticated methods of detection. The problem is the determination of the significance of these very, very small amounts which we are now, with increasing competence, able to measure very definitely and precisely. Again, I say that we do recognize this. We do agree with the chairman on his point that we are trying to find a way out of it and we have asked the scientists in this country, the top scientists, to do just that.

Mr. POAGE. Let us nail down one thing here. As long as we have a zero tolerance, then we know that all water except distilled water, all sea water or stream water or rain water that runs on the surface, all water contains some presence of practically every poison known to man, does it not? I do not mean measureable amounts. I am told that the sea contains all these poisons. We have all heard how much gold the sea water contains. It contains some of every element. Water contains some of these things, does it not?

Dr. CLARKSON. Yes, sir.

Mr. POAGE. That is, in infinite amounts. It will not do anybody any harm, but we are developing our ability to measure these infinitesimal amounts so that we have long since made the requirement of zero tolerance an absurdity, have we not?

Dr. CLARKSON. We think so. Our ability to measure trace amounts has outstripped our ability to determine the significance. Improvements in methods of measurement move along rapidly. To determine the significance is a much more difficult problem.

Mr. POAGE. It becomes a question of what we really need, and that is, a measure of significance—a determination of what hurts people. Is that not what we really need to measure?

Dr. CLARKSON. Yes.

Mr. POAGE. Rather than the mere existence of a poison?

Dr. CLARKSON. We need a measure of significance or to turn it around the other way, a measure of the level of insignificance.

Mr. POAGE. Yes. What are we doing to try to get such a measure of significance? I know that we are trying to get absolute measures. What are we doing trying to get a measure of significance?

Dr. CLARKSON. A true measure of the significance of any particular chemical depends upon a study of that chemical. But I have to come back to our request to the Academy of Sciences that we need an overall blueprint for doing this. We have asked them to provide this. I am convinced that within the next few months they will have some guidelines in this area that we in the various departments, and

you in the Congress, if legislation should be necessary, may use in order to come to a solution of this problem.

Mr. POAGE. Then it is your intention if you get guidelines that you think are sound, that would suggest something other than this absolute zero tolerance and that you would probably come to the Congress next year to get some changes in the zero limitation?

Dr. CLARKSON. I am confident that we will find a way to do it administratively or to come back to the Congress for legislation.

Mr. POAGE. You can not do it administratively, as I see it, when the law says there shall be no tolerance. Of course, I recognize when that was passed, Mr. Delaney had in mind, of course, the measurements that were possible at that time, and he thought of what you could measure with the existing methods, with the then existing instruments. I am not trying to say that he was wrong, but I am trying to say that, just as you say, our ability to measure has so outstripped our ability to understand the effect of these infinitesimal quantities that it seems to me that we probably need other criteria. I hope that you folks will be able to give it to us before too long.

Dr. CLARKSON. I hope so. However, I do want to leave open the route to administrative change, leaving full opportunity for this group of scientists to advise in whatever direction is appropriate.

Mr. POAGE. If you can do it administratively, that will be helpful.

I have taken too much time. Do any of the other members want to ask questions?

Mr. Rosenthal. I have some questions.

Mr. POAGE. Certainly, Mr. Rosenthal.

Mr. ROSENTHAL. It is not your position that the action of the Department relating to the milk in Maryland, and so forth, was done for the purpose of scientific bravado of any kind, in other words, you felt that there was a danger, that is why you took that action; is that not so?

Dr. CLARKSON. Congressman Rosenthal, our act tells us to protect the public. This is general language. As a part of that protection we have long taken the position that we will not knowingly register or continue the registration of a product when the registered use is likely to produce a residue in food or feed that would not be in accordance with the Food, Drug, and Cosmetic Act. That is precisely what our situation was here. We found that there was the likelihood that this registered use would contribute to a violation of that act.

Mr. ROSENTHAL. Not merely a violation of the act, but you felt that there was a clear and present danger, a threat to human life; is that not why you took that action?

Dr. CLARKSON. No, sir. We took the action to keep these two acts in tandem. As to the action by the Food and Drug Administration in so acting with regard to heptachlor in milk, I would leave that to them. I would not presume to answer that question for them.

Mr. ROSENTHAL. You do not have any opinion as to the amount of risk that follows from the finding of heptachlor in milk?

Dr. CLARKSON. I do not know of an immediate risk or danger from that amount of heptachlor in milk; neither am I prepared to say that there is none. I just do not know.

Mr. ROSENTHAL. Is it the position of the Department that when you do feel that there is a likelihood of risk that you stop the sale or the use of the chemical and then investigate, or do you investigate first?

Dr. CLARKSON. When we feel that there is an imminent hazard from the use of one of the chemicals that is registered, we suspend or cancel it.

Mr. ROSENTHAL. Going to another subject, if I may, Mr. Chairman, has there been any finding made after the hearings held by the Department on April 9 and 10, and 16 and 17 on the fish kill?

Dr. CLARKSON. We have not issued any statement on it.

Mr. ROSENTHAL. Do you know whether any other department has?

Dr. CLARKSON. Not to my knowledge. Those were USDA hearings. I should not think that any other department would.

Mr. ROSENTHAL. Well, I have in my possession a document entitled "Report on Pollution of the Lower Mississippi River," dated May 5, 1964, issued by the Department of Health, Education, and Welfare, which comes up with certain very clearcut conclusions as to the responsibility for the fish kill. Are you at all familiar with that document?

Dr. CLARKSON. Yes, sir; I am.

Mr. ROSENTHAL. And since that time—do you agree with the findings in that document?

Dr. CLARKSON. I have no basis of disagreement with them.

Mr. ROSENTHAL. In other words, they said in conclusion, No. 1:

The pesticide endrin was responsible for the fish kill observed in the Mississippi and Atchafalaya Rivers in Louisiana during the fall and winter of 1963-64.

You do not doubt that conclusion?

Dr. CLARKSON. We are convinced that there are many other causes of fish kill in the Mississippi. We do not doubt that Endrin causes some fish kill. We do not know how much. This does not presume to say how much.

Mr. ROSENTHAL. And insofar as communication between the two Departments, has there been improvement in the last year or so?

Dr. CLARKSON. The communications between our scientists has always been excellent. There has been an increase of communication at the administrative and secretarial level in the past year. And we have, as I said in my statement, worked out some agreements that we think will tend to formalize and put in more orderly pattern the kinds of coordination that the scientists were already carrying out.

Mr. ROSENTHAL. In other words, if there was any lack of communication it was on the higher executive level rather than on the scientific level?

Dr. CLARKSON. Well, I would put it this way, that with the efforts of this past year, if there have been any faults in these communications through oversight, then by setting up a formalized pattern we will tend to avoid those faults of oversight or carelessness which might otherwise have occurred.

Mr. ROSENTHAL. What I was referring to was a statement from Secretary Freeman made on April 15 wherein he acknowledged that coordination among Government agencies investigating the lower Mississippi River had been very poor—he acknowledged that there

had been very poor communications. I assume from your statement you meant on the departmental, or that he, rather, meant on the departmental level rather than on the scientific level.

Dr. CLARKSON. In that case we in the Department did not know of the study until a few days before the press release went out, which was a bit awkward. We do know, of course, that the Public Health Service regularly carries out studies on pollution in rivers independently or in cooperation with the States. I think they themselves were not aware at the administrative level that the results of these studies would point to agricultural chemicals, as they did, but this was a bit of awkwardness between our Departments.

Mr. ROSENTHAL. I am curious to know how many people you have employed in the division which you refer to on page 4 of your statement on pesticide regulations of the research service.

Dr. CLARKSON. There are 127 all told, including the clerks and the stenographers, as well as the scientists.

Mr. ROSENTHAL. Let me break the question down. How many scientists, including pharmacologists, entomologists, bacteriologists, chemists, biologists, and plantologists?

Dr. CLARKSON. About 56.

Mr. ROSENTHAL. These 56 people are charged with the principal responsibility for investigating pesticides and potential registration and so forth?

Dr. CLARKSON. Yes, sir. I would point out, Congressman Rosenthal, that the President has sent forward for the 1965 budget a substantial increase in this activity in recognition of the substantially increased problems that are put upon this small force.

Mr. ROSENTHAL. When did you recognize that the new additional problems existed?

Dr. CLARKSON. In the budget for fiscal year 1964 which was put together in 1963, we requested additional funds. There were some additional funds voted. And then in the 1965 budget, which was put together last year, additional funds were requested.

Mr. ROSENTHAL. I read in this morning's paper that the State of New Jersey has stopped the use of DDT for various reasons, one being that it is a deadly threat to wildlife and human beings. Do you have any comments on that?

Dr. CLARKSON. I have not seen that article. I do not know what it is about.

Mr. ROSENTHAL. I have no further questions, Mr. Chairman.

Mr. POAGE. Thank you, Mr. Rosenthal.

Are there any other questions?

Mr. SHORT. Mr. Chairman and Dr. Clarkson, has there been any indication from the experience we have had so far of the need for civil penalties as, I think, Mr. Rosenthal's bill provides, for the misuse or the failure to follow the labeled instructions regarding the use of various pesticides and fungicides? It seems to me that this is an area where there is a little weakness. You can put the label on the package but without some penalty on the misuse of the ingredients you do not accomplish very much. You do not accomplish the complete objective of insuring the proper use of the chemical.

Dr. CLARKSON. Congressman Short, the provisions for civil penalties in Mr. Rosenthal's bill would not apply to the users, the farmers, and

the applicators. Rather it would apply to the person who moves the pesticide in interstate commerce in violation of the act; in other words, if he moved in commerce a product which he had not registered, or one for which registration had been refused, or one which although registered had been adulterated or mislabeled after registration. We find in the administration of the act that judges and prosecuting attorneys are rather reluctant to apply a criminal penalty when there are extenuating circumstances. There are many circumstances when the damage has been done, but they are reluctant to apply the criminal penalties. It seemed to us that there should be this choice of either the criminal or the civil penalty for the court to consider. So this would apply to those who are moving the product for distribution to, or sale to, the users.

We have worked with the State departments of agriculture and are now helping the Council of State Governments in the drafting of further legislation for consideration by the States to cover pest control operators so as to make more certain of their proper use of these chemicals. Some States have such laws at the present time.

We do think that the operation of the registration act which gives to the consumer, the farmer, and other users of the pesticides proper information and proper cautions as to misuse, plus the informational campaigns of all State and Federal agencies who have any interest in this, which tend to reach almost every individual in this country, plus the very active interest of many industry groups, such as the Milk Producers Federation, the apple growers, the citrus growers, the American National Cattlemen's Association, the American Meat Institute, the National Wool Growers, and many many others have been effective to prevent misuse. We have worked very, very hard at this, and the general farm organizations, too, so that the consciousness of the ill effects, not only to the general public, but to each individual are borne in on the using public with a very high degree of effectiveness.

Mr. SHORT. Thank you. That is all.

Mr. POAGE. Thank you.

Mr. Beermann.

Mr. BEERMANN. Mr. Chairman and Dr. Clarkson, have there been studies or evaluations made as to the need of pesticides on plants where chemical fertilizers are used to produce optimum production?

Dr. CLARKSON. Mr. Beermann, I do not know that I can answer that directly in the affirmative, but studies that have been made show that strong, healthy plants tend to throw off many insects and diseases better than weak, poorly nourished plants. With some insects this is not so. In some cases some leaf eating, feeding insects prefer the strong, healthy plants. In general one can say that the strong plants can better throw off the insect or the disease or it is strong enough to continue growing in spite of the insect or the disease. But one cannot say that the use of fertilizers in any quantity will make unnecessary the use of control measures against insects and diseases.

Mr. BEERMANN. It just depends upon the kind of crop?

Dr. CLARKSON. In the case of grasshoppers in your State, in the western area, if there is plenty of rain and the grass is lush there may be plenty of grass to sustain the grasshoppers and the cattle, too. But the next year, if there is no rain, that same number of grasshoppers may devastate the range.

Mr. BEERMANN. Is there a difference in the rate of absorption of a pesticide by a healthy or a weak plant?

Dr. CLARKSON. Mr. Ward suggests that there is very little absorption. I would only point this out: That a healthy plant will, generally, have a larger, more active root system, a larger, more active leaf system and if there is a tendency to absorption through either of those systems, then the rate of absorption might be higher with a healthy plant.

Mr. BEERMANN. We are both familiar with the cornroot worms and the webworm in our alfalfa.

Dr. CLARKSON. Yes, sir.

Mr. BEERMANN. I would like to discuss for a minute the effects of using a pesticide on alfalfa. There is a minimum time period of spraying before harvesting, in the case of webworm damage. A decision has to be made whether to put on the insecticide to kill off the webworm or to immediately dehydrate the alfalfa or to stack or bale it to avoid further damage. You have the time element of whether the residue may be on the alfalfa so far as feeding it is concerned. We have never quite figured out which is better. The greater the damage caused, the less protein and more fiber, so that the value is not as high. We have sprayed and waited the proper time as directed before we mowed it and the like. The field looks flat, with waves, like water waves in the fields because of the way the webworm took it.

Dr. CLARKSON. I would be delighted to be able to give you an easy answer to that problem, but there is not any. You have to consider the available pesticides that are registered and labeled for effectiveness against that pest. If you are within the time limits for withdrawal before cutting, then your question is easily resolved. You have no choice, really, if you are not, but to go ahead and cut it without treatment and do whatever you can to let the manufacturers of the chemicals, or the State experiment station and, I suppose, as a last resort, we in the Department, know the intensity of the problem and see if we cannot find some other method of control. This same difficult dilemma is repeated many times over.

Mr. BEERMANN. Thank you, Dr. Clarkson.

Mr. POAGE. Mr. Heimbürger wants to ask you a question.

Mr. HEIMBURGER. I just wondered if you would put some dates to the circumstances surrounding the announcement that was made this spring by the Public Health Service or the Food and Drug Administration regarding the fish killed in Mississippi. Do you remember the date of their press release which brought this to public attention?

Dr. CLARKSON. March 19, Dr. Anderson of the Public Health Service tells me.

Mr. HEIMBURGER. Was this issued by the Food and Drug or the Public Health?

Dr. CLARKSON. Public Health Service.

Mr. HEIMBURGER. How long before the issuance of this press release were you aware that the Public Health was moving in this area?

Dr. CLARKSON. March 13.

Mr. HEIMBURGER. March 13—that was just 6 days before?

Dr. CLARKSON. Yes, sir.

Mr. HEIMBURGER. At that time what was the nature of the information which you obtained from the Public Health?

Dr. CLARKSON. I received a telephone call from Dr. Hundley, who is the Associate Surgeon General, Public Health Service, inviting me to come or to send some of our people to a meeting in his office a couple of days hence. At the same time he sent me a copy of a draft of a press release which was then being considered. The first date was March 13 and the meeting was to be on the following Monday, on the 16th. I did not go, but two or three of our people did attend this meeting. They went over such data as was available there at that time with them.

Mr. HEIMBURGER. Did the data which they saw at that time apparently indicate rather conclusively that endrin was the responsible agent for the fish kill?

Dr. CLARKSON. It seemed to us not to be convincing. There was, certainly, strong indications but it seemed not convincing, and it seemed to us, also, that the source was also a matter still for determination.

Mr. HEIMBURGER. When did this fish kill occur?

Dr. CLARKSON. I believe it was during the months of November, December, January—fall and winter.

Mr. HEIMBURGER. Of last fall and winter?

Dr. CLARKSON. Yes.

Mr. HEIMBURGER. Had the Department received any information from any other source prior to this time that endrin might have been responsible for this?

Dr. CLARKSON. No, sir, not to my knowledge.

Mr. HEIMBURGER. That is all, Mr. Chairman.

Mr. POAGE. Thank you. Thank you very much, Dr. Clarkson.

Dr. CLARKSON. Thank you, Mr. Chairman.

Mr. ROSENTHAL. I have one more question.

Mr. POAGE. Yes, Mr. Rosenthal.

Mr. ROSENTHAL. Do you know what stimulated the Public Health Service to look into the question of endrin as the source of the fish kill?

Dr. CLARKSON. According to my information they were requested to do so by the authorities of the State of Louisiana.

Mr. ROSENTHAL. I have no other questions.

Mr. POAGE. Thank you again, Dr. Clarkson. We will now try to hear from the other departments.

We have with us a representative of the Fish and Wildlife Service. They know more about the fish field than the Department of Agriculture. We will now hear from the Bureau of Sport Fisheries and Wildlife. We will now hear from Mr. Parker of the Bureau of Sport Fisheries and Wildlife.

I wish that you would discuss, Mr. Parker, this fish kill.

STATEMENT OF LANSING A. PARKER, ASSOCIATE DIRECTOR; ACCOMPANIED BY WALTER W. DYKSTRA, STAFF ASSISTANT, BUREAU OF SPORT FISHERIES AND WILDLIFE

Mr. PARKER. Mr. Chairman and members of the committee, we will be happy to explain or to give you our opinions on the situation so far as the fish kill in the Mississippi is concerned, but I am wondering if I might first present a short statement. And then we will be glad to tell you what we know about that situation.

I have with me Walter Dykstra, who is the staff assistant in the wildlife research concerned with pesticides and if we get into any of the technical details, I am going to have to refer those to Mr. Dykstra.

I am Lansing A. Parker, Associate Director of the Bureau of Sport Fisheries and Wildlife. I appreciate the opportunity to appear before this committee to outline the interests and the responsibilities of the Fish and Wildlife Service in the field of chemical pesticides.

I want to emphasize one point. We are not urging a ban on all chemical pesticides. The fish and wildlife managers use substantial amounts of these chemicals to thin out populations of undesirable fish species, to control the lamprey eel in the Great Lakes, to eliminate noxious weeds, and to aid farmers and ranchers in the control of rodents and predators. We do urge greater caution in the use of chemicals, the development of more specific kinds and methods of use, and more studies on the problems of contamination of the soil, water, and living organisms.

Agriculture and fish and wildlife management have much in common. Many of the bird and mammal species are dependent on the farmer for their existence. In fact, if ranching is included, practically all of the animals hunted as game occur in close association with some form of agricultural pursuit. Only the forest-dwelling animals and some waterfowl are less dependent upon how the farmer and rancher manage their lands.

Many food habit studies have demonstrated the importance of birds in the control of insects and weeds. These animals are one of the forms of biological control which is currently being strongly advocated. Were it not for the police action of these creatures the problems of insect and weed control would be much more acute.

I am sure that members of this committee are also aware of the commercial values of fish and wildlife recreation. Although generally an unmanaged byproduct of farming, these resources have given significant economic returns to many landowners.

Hunting and fishing are big business. A 1960 national survey showed that over 25 million persons engage in sport fishing and nearly 15 million hunt game each year. They annually spend nearly \$4 billion for such recreation. The assistance programs you have authorized to encourage shifting croplands to recreational use attest to the soundness of utilizing these resources to supplement the rural income.

Many forms of fish and wildlife are very susceptible to chemical pesticides. Because of their greater sensitivity, fish and wildlife thus present a unique opportunity to discover the effects of these compounds on the food chain of which each animal is a part, and thereby determine pathways through which the chemicals may affect higher forms of life, including man himself. In fact, they may be looked upon as the "miner's canary."

In 1945 the Fish and Wildlife Service began its studies on the effects of DDT and related insecticides. In 1958 the Congress directed the Secretary of the Interior by Public Law 85-852—

to undertake comprehensive continuing studies on the effects of insecticides, herbicides, fungicides, and pesticides upon the fish and wildlife resources * * * for the purpose of determining the amounts, percentages, and formulations of such chemicals that are lethal to or injurious to fish and wildlife and the amounts * * * or formulations that can be used safely, and thereby prevent losses of fish and wildlife from such spraying, dusting, or other treatment.

The findings from the early work revealed that fish were generally highly sensitive while reptiles and amphibians were slightly more resistant, followed by birds and mammals, the latter being most resistant.

This general order of sensitivity has been borne out in the intervening years up to the present time. In addition, we now know that the immediate acute effects, although spectacular, are often less significant than the long-term chronic effects which are not immediately discernible. For example, quail and pheasants raised on diets containing low levels of DDT show no outward effects. However, there is a pronounced decrease in their reproductive potential. Fewer eggs hatch, there is a higher percentage of crippled birds, and fewer chicks survive to maturity.

While it has been reported that only a small percentage of lands are treated with insecticides, this figure should not be construed to mean that an equally small proportion of fish and wildlife is exposed to these toxic agents. Chemicals leaching into water may show up in fishes several hundred miles downstream or in the sea. Likewise, migratory birds often pass through many separately treated areas during their spring and fall migrations. Other unknown factors are: the amount of the chemical which is volatilized, and what part adheres to particles of dust that are carried into the upper atmosphere to be deposited at some future date on land and water many miles away.

There is just cause for concern since we are now finding residues of DDT and its degradation products in approximately three-fourths of fish and wildlife specimens collected from all regions of the continent, even duck eggs and ducklings from breeding grounds in northern Canada that have never been sprayed locally.

Although the amounts of pesticidal residues found in the tissues and organs of fish and wildlife often are only a few parts per million or less, yet several chemicals are known to concentrate at successively increased levels in higher forms of life such as fish-eating birds. This is happening in a number of different parts of the country. During recent years there has been a drastic decline in flocks of grebes and other fish-eating birds in several parts of the West due to what we believe to be reduced reproduction. The same appears to be true in the case of ospreys in the Northeast and possibly in bald eagles, our national emblem.

Residues of DDT and several other chlorinated hydrocarbon insecticides are being found in a number of different species of wildlife and fish harvested as game or utilized commercially for human food. For example, a high percentage of the specimens of woodcock examined by our biologists during recent years have been found to contain residues of heptachlor in their tissues. Since there is a zero tolerance for heptachlor in domestic meats, we are continually being asked the question, "Are these birds safe to eat?" So far, no one has been able to provide a satisfactory answer. Similar questions are now being asked by sportsmen in the State of Maine following recent findings that Sebago Lake landlocked salmon contained amounts of DDT exceeding the 7 parts per million tolerance established for domestic meats. Half of the salmon in the 4- and 5-year-old age class contained more than that amount and a fourth of them had twice that figure.

Evidence of the widespread nature of such occurrences continue to accumulate. For example, measurable residues have been found in

blue grouse in Montana following aerial application rates of only one-half pound per acre of DDT—well under the amounts that have been used in other programs (13 grouse samples ranged from 6 to 85 parts per million and averaged 30 parts per million). Deer and elk also have been found to contain residues of these materials in their tissues.

Adverse effects of pesticides on the reproductive success of birds has been demonstrated under field conditions. In a recent California study, pheasant eggs from untreated land on a refuge and from treated agricultural lands nearby were collected and incubated. Production of 4-week chicks was significantly greater among eggs from the untreated area. DDT residues in eggs from the treated area were much higher than those from the untreated area. Since a recent examination of eggs of wild black ducks showed DDT residues in 36 of 37 clutches taken in 8 States from Maine to Maryland, we are confronted with the strong likelihood of a decrease in the reproduction of this highly prized game bird. The situation is equally critical in the case of some species of fish. A New York State study has demonstrated conclusively that the failure of lake trout to reproduce in many lakes is caused by DDT. Investigations showed that levels of DDT of more than 3 parts per million in lake trout eggs results in virtually complete mortality of the fry. Similar evidence is being accumulated in New Hampshire and Maine.

I cannot overemphasize the magnitude of the problem that has been thrust upon us by the widespread use of certain pesticides. We are confronted with a strong likelihood that many species of fish and wildlife carry residues of these chemicals in their bodies. The manner in which these substances are transported in the environment and the significance of their presence in the tissues and vital organs of fish and wildlife are not fully known. Our biologists believe that the use of highly toxic and persistent insecticides must be drastically curtailed where there is a possibility of contaminating soils, rivers, lakes, coastal estuaries, and ground water supplies. They must be replaced as rapidly as possible by others that are more specific and less persistent. To do otherwise may jeopardize many of our valuable living natural resources and possibly the health and welfare of man himself.

Mr. POAGE. Thank you very much, Mr. Parker.

Tell us about this fish kill. I assume that falls within your jurisdiction?

Mr. PARKER. From my point of view it is simply this: That we have not attempted to monitor any of the streams to determine the effect of pesticides. The lower Mississippi kills have occurred since the fall of 1960. The first year there was about a million salt water fish and about 100,000 fresh water fish that were killed in the lower Mississippi. In addition, there were 2,500,000 fish killed in the Atchafalaya River which lays to the west.

Examinations of another kill in November of 1963 indicated that there were about 5 million fishes that died in the lower Mississippi.

The Louisiana Division of Water Pollution Control asked the U.S. Public Health Service to make surveys to determine the cause of these deaths. And in January and February of 1961, the Louisiana Division of Water Pollution Control sent dead fish specimens to our Eastern Disease Laboratory for analyses and our pathologists there

could find no evidence of the cause of the fish deaths; in other words, they concluded there were no diseases that contributed to the deaths.

In January 1962, additional specimens were sent in, and we had exactly the same results. There was no evidence of pathological organisms causing the death.

In November of 1963, some of our fishery management biologists happened to be in the lower part of the Mississippi and at that time noted a considerable kill of fish. They were able to collect fish dead and in the dying stages and observed water temperatures, oxygen contents, and so on, and there was nothing there to indicate the loss of fishes other than the suspected possibility of a chemical being introduced into the water.

As I have indicated, this has been predominantly a problem handled by the Public Health Service at the request of the State public health authorities.

Our Bureau feels that there is a strong likelihood that chlorinated hydrocarbons from an undemonstrated source is the responsibility for this fish mortality.

Although the loss of fish is important, it is less significant than the fact that the aquatic environment has become unsuitable for the survival of aquatic organisms. We have the view that very few, if any, new and unknown principles of the effect of the toxic chemicals upon fishes will be demonstrated in this Mississippi River kill. The persistence of hydrocarbons in soil and water, the drift over unexpected distances, the runoff of silt particles, the uptake by vegetation, invertebrate organisms, and fishes and their concentration in animal bodies in high amounts have all been demonstrated repeatedly. The lack of evidence until stress or stimulation besets the organisms is also known. All of these things occurred in the lower Mississippi River, but never before on such a large and impressive scale.

We also have stated that there is a certainty of other areas being affected in the same way, perhaps in California or Utah where closed basin drainages exist and this certainly can be reduced only by the most judicial use of the chemical insecticides with due regard to their spread and their broad spectrum effects.

Mr. POAGE. Now, let us get back to the Mississippi River.

We would like to verify this. It may not be your agency, but I do not know just which it is. I think I have read in newspaper accounts and I have heard the various explanations that it was a plant at Memphis, Tenn., and I have heard that it was poison used on the cotton in the delta region that brought this poison into the river. Where do you think the poison came from?

Mr. PARKER. Mr. Chairman, I am not able and I am not sure that anyone will be able to answer you directly as to where those poisons came from, because as I understand it there was a plant or there is a plant on the Mississippi that manufactures endrin, which is used on agricultural crops in some of the States farther to the south. There is a possibility that there could be contamination from the plant itself, from the agricultural crops or both.

Mr. POAGE. Where is this plant?

Mr. PARKER. The one plant I understand is located at Memphis, Tenn.

Mr. POAGE. At Memphis, Tenn.?



Mr. PARKER. Yes.

Mr. POAGE. And Memphis is a good many river-miles above New Orleans, is it not?

Mr. PARKER. That is right.

Mr. POAGE. I do not know just what it is, about 800 or 900 miles, I have that figure in my mind—I may be entirely wrong. Does anybody know the distance in river-miles? In fact, it is a good many river-miles from Vicksburg down to New Orleans, is it not?

Mr. PARKER. I suspect that is right.

Mr. POAGE. And there is no substantial amount of cotton grown below the mouth of the Red River, is there?

Mr. PARKER. I will have to bow to your judgment on that, sir, because I do not know of the cotton situation.

Mr. POAGE. Is it not rather important that before we point the finger of blame that we know where cotton is grown, rather than to blame the cotton?

Our colleague, Mr. Abernethy, who is not here this morning would say and I think there is common knowledge that practically no cotton is grown in the State of Mississippi south of Vicksburg—cotton is grown in the delta and the delta lies between the Mississippi and the Big Sunflower River or whatever it is, north of Vicksburg. That is where the spraying takes place, is it not? No spraying takes place on either the Mississippi or the Atchafalaya, below the Red River, does it?

Mr. PARKER. Two or three winters ago there was a substantial kill in the Atchafalaya River which lies to the west of the Mississippi and received no drainage whatever from the Mississippi.

Mr. POAGE. It carries much of the water of the Mississippi into it—it comes out at the mouth of the Red River and carries three or four times as much water as the Red River. It has to come out of the Mississippi—that is where the water comes from. It is out of the Mississippi. If it did not get water out of the Mississippi, where does it possibly get it? The Red River does not carry that much water. The Denison Dam stabilizes the flow of the Red River.

Mr. PARKER. As I say, there are those two possibilities. I do not think that anyone can say for sure where the contamination actually did come from.

Mr. POAGE. All I am trying to get at is this. There have been some charges made which may be a great injustice to some. They may not be charges. They are rumors. But those rumors seem to have very little scientific foundation. Would you guess that it was possible for a plant in Memphis, Tenn., to so contaminate the Mississippi River that the fish below New Orleans would die and there would be no appreciable loss of fish in the hundreds of miles in between?

Mr. PARKER. Well, I would say this, in the first place the chemical that you are talking about is rather stable and it is entirely possible that it became associated with silt on the bottom, rolled along and

carried down that way. It is entirely possible that there were fish killed all through the years, that no one was entirely aware of. The only explanation that we can offer for the high percentage of endrin occurring in the fish now is that they were able to assimilate much smaller amounts through the years and then when they reached a period of stress in the wintertime when they were drawing on their fat, that suddenly released large amounts of endrin into the bloodstream and killed the fish that way.

Mr. POAGE. Mr. Parker, do you not think that maybe if Castro put poison in the Gulf of Mexico, surreptitiously, that it would come up the Mississippi River and destroy our fish? Is it not just as possible as your suggestion that they are killed from Memphis—is that fact not just as likely a source of poison as Memphis is?

Mr. PARKER. My observation, as I said earlier, is that all that we know is that there is a strong likelihood that there was a chlorinated hydrocarbon that killed the fish, and that is as far as we can go.

Mr. POAGE. Would you not be ashamed of yourself to give circulation to a rumor that there was some plant in Memphis that had something to do with the fish kill below New Orleans but not in between?

Mr. PARKER. The Bureau of Sport Fisheries and Wildlife, or the Department of the Interior had nothing to do with the issuance of that press release.

Mr. POAGE. You had nothing to do with it?

Mr. PARKER. No.

Mr. POAGE. Let us get the people that did, then. [Laughter.]

Mr. PARKER. I have indicated that the State of Louisiana health authorities asked the Public Health Service to conduct this service and they are the ones who ought to be able to answer you much more about it than I can.

Mr. POAGE. I will now call the Public Health Service people and ask them about this.

Mr. ROSENTHAL. I have one question first, please.

Mr. POAGE. Yes.

Mr. ROSENTHAL. Following the Castro suggestion, do you have any thought to refer that to the State Department for action? [Laughter.]

Mr. PARKER. We would take it under advisement, although I would say this, that we have not noted any appreciable loss of shellfish, which are extremely susceptible to any of these chemicals. We have had little or no evidence that there was any great loss of those.

Mr. POAGE. I wonder if we cannot get the health department people here. They seem to be the people who put out this alleged press release.

If you would, Mr. Parker, please stand aside for a moment.

Mr. PARKER. Certainly, I will be happy to do so.

Mr. POAGE. We will hear from the health department people next. Will you please introduce yourselves?

STATEMENT OF DEAN COSTON, DEPUTY ASSISTANT SECRETARY, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE; ACCOMPANIED BY THEODORE ELLENBOGEN, DEPUTY CHIEF, LEGISLATIVE DIVISION, OFFICE OF THE GENERAL COUNSEL; J. KENNETH KIRK, ASSISTANT COMMISSIONER, FOOD AND DRUG ADMINISTRATION; DR. ROBERT J. ANDERSON, CHIEF, BUREAU OF STATE SERVICES, PUBLIC HEALTH SERVICE; JAMES COULTER, WATER PROJECTS SECTION; AND KENNETH BIGLANE, CHIEF, EASTERN OPERATIONS, WATER PROJECTS SECTION, PUBLIC HEALTH SERVICE, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Mr. COSTON. Mr. Chairman and members of the committee, my name is Dean Coston and I am Deputy Assistant Secretary of the Department of Health, Education, and Welfare. And it is with some trepidation that we approach the bench. [Laughter.]

I have with me Mr. Theodore Ellenbogen, of the Office of General Counsel; Mr. J. Kenneth Kirk, who is Assistant Commissioner of the Food and Drug Administration; Dr. Robert J. Anderson, who is Chief of the Bureau of State Services of the U.S. Public Health Service; and Dr. Anderson has with him two of the scientists who participated in the lower Mississippi investigation, Mr. James Coulter and Dr. Kenneth Biglane. Mr. Kirk has a brief prepared statement and Dr. Anderson has a statement, too.

Mr. POAGE. Before we get to any statements, I wonder if we might just clear up this matter, because if we can clear this up then we can go into these other matters, but if we leave it hanging we will not clear it up. I wonder if we cannot get two things fixed up, because, apparently, we have had a lot of discussion about fish. Did you folks issue a news release of any kind in which you attempted to fix the responsibility for this fish kill in the Mississippi River?

Mr. COSTON. Mr. Chairman, I would like to refer that question to Dr. Anderson.

Mr. POAGE. I do not care who answers it. The Public Health Service is a part of your agency?

Mr. COSTON. Yes, sir; and Dr. Anderson and his scientists have the documentation on this for you.

Mr. POAGE. Did you issue any kind of public release trying to fix the responsibility for this fish kill?

Dr. ANDERSON. Mr. Chairman, we did issue a public information release at the time on the progress of our investigations on the fish kill on the lower Mississippi River.

Mr. POAGE. Whom did you blame?

Dr. ANDERSON. The publication itself did not pin or fix the cause of the fish kill on anybody. It was reporting on the work of our researchers and scientists.

Mr. POAGE. Will you tell me how the press got the idea and these other witnesses got the idea that you thought it was a plant in Memphis, Tenn., that had something to do with it?

Dr. ANDERSON. What I am saying is that the press release that was issued on March 19, 1964, cited the findings of the workers in our Department with regard to the phenomena of the fish kill on the lower Mississippi River. This work had been in progress since early Decem-

ber when we, in response to a request for assistance from the Louisiana Division of Water Pollution Control—

Mr. POAGE. We know that they asked for it. Let us get to this question, because the bells are ringing. You say that you did not fix any responsibility there. Do you understand how the press got the idea that you thought that there was a plant in Memphis that had something to do with it?

Mr. ROSENTHAL. Could we have as a part of the record that press release?

Mr. POAGE. Yes, if anybody has it.

Mr. ROSENTHAL. Can we have that incorporated in the record?

Mr. POAGE. Yes.

Mr. ANDERSON. We will do that.

(The press release HEW-A 46 follows:)

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE,
PUBLIC HEALTH SERVICE,
Washington, D.C., March 19, 1964.

The U.S. Public Health Service and the State of Louisiana have announced that water pollution involving toxic synthetic organic materials appears to be the cause of massive and continuing fish kills in the lower Mississippi drainage basin and its estuarine waters in the Gulf of Mexico.

Several chemical compounds have been found in significant quantities in dead and dying fish and in the water environment, including at least two substances so far unidentified and two pesticides, endrin and dieldrin.

The announcement follows 3 months of investigations carried on by a team of engineers and scientists from the Public Health Service's Division of Water Supply and Pollution Control. The studies were made at the request of the State of Louisiana because of a series of fish deaths involving millions of fish which have taken place in the river and the gulf each fall and winter since 1960.

Both the Public Health Service and the Food and Drug Administration within the Department of Health, Education, and Welfare are intensifying their food and water protection surveillance activities in the Mississippi River Basin.

Some trace quantities of organic chemicals are normally present in drinking water supplies; levels found in the lower Mississippi Basin do not present any immediate health problems.

Aquatic life is particularly sensitive to pollution from certain synthetic organic wastes; the presence, in water, of some of these substances in proportions less than one part per billion is lethal to some fish varieties. The intensive studies underway will identify any potential hazards to health from the consumption of fish in which toxic substances may be concentrated.

Examination of dead and dying fish, of mud, and of the river water has shown the presence of a number of synthetic organic materials. Recently developed measuring techniques enabled Public Health Service scientists to detect and measure these substances in quantities as small as parts per trillion. The analyses were made independently by five teams of investigators, four within the Public Health Service and one private research team.

Biologists of the Fish and Wildlife Service of the U.S. Department of the Interior have ruled out parasitic or bacterial disease as the cause of the fish kills. Metals and environmental conditions such as low dissolved oxygen and drastic temperature changes have also been ruled out as causes of these deaths.

In cooperation with several States in the lower Mississippi Basin, the Division of Water Supply and Pollution Control of the Public Health Service is establishing a continuing study to determine the water pollution control measures necessary to protect these waters for all legitimate uses. Scientists and engineers are being assigned to the area and will be supported by several laboratories of the Public Health Service. Other Federal, State, and local agencies are expected to participate in this effort.

The Public Health Service's studies are now being reviewed by other Federal agencies including the Department of Agriculture, and the Department of Interior's Bureau of Sport Fisheries and Wildlife and Bureau of Commercial Fisheries of the Fish and Wildlife Service.

Dr. ANDERSON. The press release itself did not cite the source of the pollution, because at that time—

Mr. POAGE. Will you tell us how you think the press got the idea that you thought that there was a plant in Memphis, Tenn., that had something to do with it?

Dr. ANDERSON. At the time of the press release we were not aware of the possible specific sources for endrin pollution of the Mississippi River. This came out subsequently when the Department of Agriculture and ourselves sent teams of investigators to look at the manufacturing plants and the formulating plants in the Mississippi drainage basin where endrin was used. We felt it was extremely important to identify possible wastes that would get into the river from such activity, because such plants do have a waste disposal problem.

Mr. POAGE. Where did you find those plants?

Dr. ANDERSON. A particular major source of endrin pollution of the river was in Memphis, Tenn., at a manufacturing plant where endrin was manufactured. We found endrin in the mud of the streams into which the waste from that plant was being emptied and we found chlorinated hydrocarbon wastes and dieldrin in some drums that were used by the plant to dispose of some of their waste.

Mr. POAGE. How do you account for that endrin getting down the river? You know the amount, that is, the distance. I do not know.

Dr. ANDERSON. 731 miles, sir.

Mr. POAGE. 731 river miles.

Dr. ANDERSON. That is the river mileage.

Mr. POAGE. All right, 731 river miles from Memphis to New Orleans. Do you know how that could get down to New Orleans without killing fish on the way? Of course, the gentleman before you said that it lays on the bottom and the silt rolls down the river, down to New Orleans. Can you explain how it failed to kill the fish between Memphis and New Orleans?

Dr. ANDERSON. At the time we were conducting the investigation we got in on the tail end of the Mississippi River fish kill. However, in the course of the investigation we learned that there had been reports of fish killed and an absence of fish in some of these drainage areas serving the Memphis area where the plant was located. We did not examine any fish there in this area.

Mr. POAGE. You did not examine any fish between Memphis and New Orleans, so that you do not know anything about what happened between Memphis and New Orleans?

Dr. ANDERSON. We had reports, at the same time that we got in on the first request for assistance, we had reports from individuals related to us by State agency people that there were fish kills occurring as far north as Cape Girardeau and, I believe, even up as far as St. Louis, Mo.

Mr. POAGE. That is way above Memphis.

Dr. ANDERSON. Yes, it is.

Mr. POAGE. How do you explain that—how could that be associated with the Memphis plant?

Dr. ANDERSON. We were not examining the fish kill at that point in time that was occurring in that section of the river. Maybe Mr. Coulter can answer that.

Mr. COULTER. Mr. Chairman, the fish kills that were observed and reported by the State agencies were as far north as the northern boundaries of Louisiana, the State of Louisiana told us that they had information that there were fish killed as far north as Memphis. Our investigators did not see those fish killed in the upper part of the river, because we were not working up there at the time. We were called in by Louisiana.

Mr. POAGE. I want an explanation of how the Memphis plant could kill these fish up at Cape Girardeau and St. Louis.

Dr. ANDERSON. These were only reports that had been made by individuals who were river boat pilots. They did not necessarily have to relate to the Memphis plant, sir. They could not.

Mr. POAGE. You got the same kind of report about the fish down the river, down at New Orleans?

Dr. ANDERSON. In the instance of the Memphis plant we did identify considerable volumes of waste containing endrin in the drainage of that plant. These chemicals are not very soluble. They are persistent and they have a tendency to adhere to surfaces like mud silt; as a matter of fact, they even adhere to glassware and they also have the tendency to adhere to the surfaces of naturally occurring fishfood in the streams and may be picked up by them. They also have a tendency to be much more soluble in fats and oil substances than they do in water. Consequently, as they are picked up by organisms the chemicals lodge in the fat phase or the oil phase of the organisms and are transmitted successively to the organisms that live upon the lower organisms and ultimately end up in fish.

Mr. POAGE. To me, it seems a remarkable thing that there have been fish kills all along the river below Memphis without people becoming aware of it. I remember we had a fish kill down here and we became immediately aware of it, it seems to be something in which there was a great deal of interest by everybody, not alone by the scientists. How do you explain the fish kill down on the Potomac—when was it, 2 years ago this summer, I believe—it was comparable to that on the Mississippi River, was it not?

Mr. COULTER. Mr. Chairman, my answer would be "No," that it was not comparable.

Mr. POAGE. Of course the Potomac is not as large a river, obviously, as the Mississippi and does not have as many fish in it, but I believe that somebody said there were 2 million fish killed in the Mississippi—how many were killed down here?

Mr. COULTER. I do not know. My comparison was not in numbers or size of the system, rather in the type of kill that was observed. In the Chesapeake and Potomac it was largely one species of fish. There was considerable evidence that the fish kill was caused by a fish disease in the Potomac and the Chesapeake.

Mr. POAGE. Yes.

Mr. KIRK. At that time the Food and Drug Administration considered the possibility of pesticide residues. We got fish that were dying and dead fish on the Potomac and ran them in to our laboratories and did not find a pesticide problem.

Mr. POAGE. It occurs to me that I would just like to ask you this question.

If you were running a plant at Memphis, Tenn., an endrin plant and someone sued you for any loss that occurred down in the lower Mississippi for destroying a business down there, would you pay if you could work out a reasonable compromise—would you pay or would you fight?

Mr. KIRK. I would turn to my lawyer first.

Mr. POAGE. Do you not think that your lawyer would advise you to fight?

Mr. KIRK. That is pretty much out of my line, Mr. Chairman.

Mr. POAGE. I cannot conceive of any intelligent human being accepting the responsibility on such terms as you have outlined.

Mr. ROSENTHAL. Will you yield there? Is there such a case pending?

Mr. POAGE. I do not know. Do you?

Mr. ROSENTHAL. I do not know, but if there was it seemed to me that it would be out of order to put anything in the record that might be used as expert testimony in that case.

Mr. POAGE. They do not have to testify. We are not forcing anybody to testify here. This is a discussion. We are just trying to find out if there is any reasonable ground to say that we know enough about these matters to pin the responsibility on certain plants and certain activities at this time. I am sure that there are instances where such pollutions of streams cause difficulties. I do not think there is the slightest doubt about that. But to my mind it is a little preposterous to assume that a plant in Memphis, Tenn., killed fish down below New Orleans. That is the kind of guesstimate that I do not think we ought to indulge in. If we have something that jumps 731 miles and kills people and fish at that distance it would be a rather remarkable achievement and it would be a weapon that we should develop, probably. I just do not believe that we have reached that stage in our scientific development. I do not believe that we have reached the stage where we can keep that chemical inert for 700 miles and suddenly have it break out as a death-dealing instrument that will kill all fish in the river. If you folks have that kind of information, if science has reached that point, I think that we ought to know it.

Dr. ANDERSON. I think that you are accepting the fact that endrin was responsible for the fish kill.

Mr. POAGE. You said so.

Dr. ANDERSON. I did. We have accepted it because we are convinced that it was. I think, too, that if you consider the properties of this kind of a chemical, that does attach itself to small particles suspended in the water and when we recognize that the Mississippi River does flow down into the New Orleans area, and that the velocity of the flow in the lower stretches of the river is probably much less, you can see how these particles or you can imagine how these particles would move down and settle out in that stretch of the river. We did find endrin in the river in the vicinity of Memphis, we found it from that point on down into the New Orleans stretch. In the lower flatter section of the country where the water moves more slowly we found more endrin there than we did up above.

You referred to the Atchafalaya River taking water out of the Mississippi and it does. Along that stretch of the Mississippi, in Louisiana, as I understand it, there is very little tributary or, very few tributaries from that side, because there are levees and so forth that prevent this, so that we have an almost closed system from the

upper stretches of the river in Louisiana, below Memphis, down to New Orleans area. These particles can move in that fashion, attached to silt.

We do not know all of the possible sources of endrin. We would hope that we would not find that the endrin manufacturing process was not responsible for any of this pollution and that it all related to the agricultural recommended uses. Our object here is to locate the source of endrin, to identify the sources, find out whether or not any of them are related to field uses or whether they are related to some other use which is not recommended or to some slip-up in the manufacturing process or the formulating process and to try to close off and reduce the endrin loading of the Mississippi River.

Mr. POAGE. Did you find any on the Yazoo River? Did any fish die in the Yazoo River?

Mr. COULTER. There have been reports of fish kills in the Yazoo. We did not observe this.

Mr. POAGE. I suppose that everybody has reports of fish kills in every stream in the United States—I mean even back before we knew of these chemicals, we have had fish die in great quantities. We have had that from time immemorial.

Dr. ANDERSON. That is so. Fish kills have been reported in other parts of the United States, and they all require investigations, and the type of investigation that is being undertaken by Agriculture and ourselves in relationship to the Mississippi pesticide problem in that important agricultural and river drainage basin.

Mr. POAGE. The agricultural drainage is very little except in the delta. Most all of the drainage of the Yazoo is the so-called delta with a little along the hills on the east side, but I would suppose that the drainage which comes out on the Mississippi Delta, from the great cotton-growing section, where the great bulk of this poison is used, would show the greatest concentration. And would not the Yazoo River, with its concentration of this poison in that area and the washoff from the ground into the streams, would not the Yazoo have a much greater concentration than the Mississippi River would have, because, certainly, it has far less water, a much smaller fraction of the volume of the Mississippi, and yet it covers, I would suppose, a very substantial part of the area in which this poison is used.

Dr. ANDERSON. I think you are making a very good suggestion that the Yazoo River, also, ought to be brought under these kinds of investigation relating to the movement of pesticides in the water system.

Mr. POAGE. It would certainly seem to me that before we issue a blanket indictment and feel that we have solved the problem that we ought to go a little further and we ought to know something about that. All I am trying to say is that we know that the fish died and we know something caused that, and we know that we would like to find out what caused it, and we know that endrin could cause it if it entered in such quantities and so could carbolic acid and so could a good many other things cause this, and we know that there is an endrin plant in Memphis, Tenn.

I suppose that we know of endrin plants in some other places. Probably there are some in Chicago but the fish did not die in the Great Lakes. And maybe in the Illinois River you probably have the same condition. They die in both those places from time to time

as I understand it. All I am trying to say is that there has been an awful lot of wild charges made about who was responsible for some of this loss of wildlife. But as I see we do not have adequate evidence to prove them out. I know that you cannot just go down there and run a computer and find out just exactly what happened. It takes a lot of time and it takes a lot of study and work.

All I want is to get from you gentlemen this information. It seems to me that you have been issuing statements before you had enough evidence to justify giving out opinions which can do a great deal of economic harm.

Mr. COSTON. It might be helpful to the committee if I would read to you the conclusions that were made by the Public Health Service as the result of the study of the fish kill in the lower Mississippi.

Mr. POAGE. We would like to have them.

Mr. COSTON. I do not think we suggest these are indictments of any individual or person or anything else. I think they do show the things we do know and the things we need to find out.

The first conclusion that we reached was this:

The pesticide endrin was responsible for the fish kill observed in the Mississippi and Atchafalaya Rivers in Louisiana during the fall and winter of 1963-64.

That conclusion, as I understand it, was accepted by the conferees who met in New Orleans under the provisions of the Federal Water Pollution Control Act, by the representatives of the four States and the Federal Government.

The second conclusion that was reached was this:

Industrial wastes and drainage from contaminated areas in and near Memphis, Tenn., are sources of endrin pollution in the Mississippi River.

And that conclusion, again, was accepted by the four States and the Federal Government conferees.

The third conclusion is that:

The available data demonstrate that other sources than the Memphis area, not yet identified, contribute to the endrin found in the lower Mississippi drainage area. These other sources must be identified through further study.

The fourth conclusion was that:

Discharges of sewage and industrial wastes may cause pollution of an interstate nature and will require further studies.

The fifth conclusion:

The presence of minute concentrations of endrin in the treated water of the Vicksburg, Miss., and New Orleans, La., water supplies is a matter of concern. While acute effects on humans of this pesticide in water have not been detected, the effects of continued ingestion of even these minute quantities must be evaluated.

And the final conclusion, No. 6:

It is obvious that discharges of endrin in the Memphis, Tenn., area, together with other unidentified discharges endanger health and welfare of persons in a State or States other than that or those in which such discharges originate. Such discharges are subject to abatement under the provisions of the Federal Water Pollution Control Act.

These were the six conclusions that were reached by the Public Health Service after their investigation of the Mississippi fish kill incident. I do not think any of them are inflammatory. I think they are very factual and they were all accepted in substance by these

members of the conference who participated with us in trying to get at the existence of the problem, the magnitude of the problem, and the possible solutions that might be reached to that problem. We have not been interested in trying to take all pesticides off the market. We recognize the necessity for the use of these chemical compounds if we are to have in this country and adequate supply of food and fibers. I think that we can all be proud that we live in the best-fed nation in history and we, certainly, do not want to take any action that would adversely affect the quality or the quantity of that food supply.

On the other hand, we do have a positive obligation to be sure that the activities which we are engaging in are not going to result in possibly endangering our health or welfare, either now or in the future, and this is our concern in this study of pollution of the lower Mississippi River.

Mr. POAGE. I certainly agree with you as to your responsibility. There is no question about that. I would question your responsibility of making statements mentioning Memphis, Tenn., in connection with this kill of fish in New Orleans. Of course, I spoke somewhat facetiously in speaking about the supposed Castro event, but it seems to me that your connection of the domestic plants with the tragedy at New Orleans is about as remote as the situation that I was describing.

I cannot see the connection between the Memphis plant and the New Orleans fish kill. I see the desirability of abating any pollution of the rivers but I just am not ready to accept the statement that you pour it in the river 731 miles upstream and have no report of killed fish for over 700 miles and then find out the fish kill you had at New Orleans happened as the result of what happened 731 miles upstream.

Mr. COSTON. I would like to offer for the record, if I may, the study of the lower Mississippi fish kill that was produced by the Public Health Service. I think it may be helpful to the committee. It is a very extensive document.

Mr. POAGE. We cannot put that in the record. It would cost a great deal of money.

Mr. COSTON. I will be glad to give it to you for the committee's files and for what use you may have for it.

Mr. POAGE. We will be glad to have it for the committee files.

(The document referred to, entitled "Report on Pollution of the Lower Mississippi River" will be found in the files of the committee.)

Mr. POAGE. I think that the whole thing boils down to the proposition that, at least, you have shown no causal relationship between the plant mentioned and the fish killed in New Orleans and I frankly say that I do doubt it, and if we doubt it to the extent that we doubt that, then, of course, there is your whole problem and we lose confidence in the whole thing and wonder if other conclusions and activities are as far-fetched as this conclusion.

It seems to me that there is the matter of the hay in Maryland, where you had a rather extreme application of this rule that you applied. As I take it from you in your applying of the rule, if you found something at St. Paul that entered into the Mississippi River you would feel that it endangered the fish down below New Orleans. That would be likely, would it not?

Mr. COSTON. It is certainly possible. I would not rule out the possibility that it could happen.

Mr. POAGE. It could happen up at Sioux City and it would be possible if it happened up there. I do not know whether they use endrin up in the corn belt or not, do they?

Mr. BEERMANN. I would like to say they do use endrin in the corn belt and dieldrin.

Mr. POAGE. It may be that some of it came down from there to St. Louis and on down the river and then went down to New Orleans. In other words, you have sources over two-thirds of the continent. It would cause traces from those points. But you think that it caused the contamination at this time, at least, for New Orleans. That is what seems to me to be the weakness in your suggestion. I just do not see the connection between the two.

Dr. ANDERSON. On that particular point we do have information from river water samples taken between August and this winter which we have examined for endrin. It was not until we got into the Vicksburg area that we got the finding of endrin in those river samples. So there was apparently no indication of its coming from north of that area.

Mr. POAGE. So, apparently, it did not come from Vicksburg, is that what you mean?

Dr. ANDERSON. I said Vicksburg? I meant Memphis, if I said Vicksburg. It was in the Memphis area where the endrin began showing up.

Mr. POAGE. Did you make any studies as to where endrin is produced other than this plant at Memphis?

Dr. ANDERSON. Yes.

Mr. POAGE. Is that the only plant in the United States?

Dr. ANDERSON. No; Mr. Coulter, would you answer that?

Mr. COULTER. There are two plants to our knowledge that manufacture endrin, the Shell Chemical Co. in Denver and —

Mr. POAGE. In Denver, Colo.?

Mr. COULTER. In Denver, Colo. And the plant in Memphis, Tenn. We have visited the plants, we have sent sanitary engineers and other people out to the plant in Denver, Colo., and they went over their waste disposal practices.

Mr. POAGE. In other words, you do not think there is any waste from the plant in Denver getting into the Platte River?

Mr. COULTER. Mr. Chairman, I did not say that. They have very extensive waste treatment works and a lot of investment has been made for waste treatment at the Shell plant. Most of their waste is injected into the ground. Some figures come to my mind, I believe about 12,000 feet into the ground. There is a possibility that a problem concerned with the solid material does exist. We are working on this with the scientists.

Mr. ROSENTHAL. They do not use that system in Memphis of injecting it into the ground—it flows out into the river?

Mr. COULTER. No; they do not inject the waste underground at Memphis. Apparently, for the last 6 years, they have been discharging their waste quite promiscuously. The Department of Agriculture investigators and our investigators who visited the plant estimate that some 5,000 tons of chemical waste from that plant have been deposited in steel drums subject to corrosion in the flood plains of the Wolf River, and—

Mr. ROSENTHAL. Have they attempted to abate that?

Mr. COULTER. Yes, Congressman Rosenthal; they are at the present time doing everything possible to bring the sources of endrin under control in Memphis.

Mr. POAGE. I do not want to indicate the slightest criticism of any of you. I want to commend you for trying to prevent the dumping of that or any other harmful waste into the Mississippi. I agree that is ought not to be dumped into that river or any river. No waste should be dumped.

The only point you have left me up in the air on is the connection between the plant at Memphis and the fish kill at New Orleans, because while some people seem to think that because they are deleterious that they must be in the same neighborhood, but there is a long distance between New Orleans and Memphis. I think that there would be an awful lot of fish killed in between if it could kill fish at New Orleans.

Mr. ROSENTHAL. I just want to say that there is not a unanimity of scientific opinion on this committee. I can reasonably well understand how the fish were killed. I want to commend the Public Health Service for being very vigorous in pursuing what I think is a very serious problem. I know the chairman agrees with me.

Mr. POAGE. I do.

Mr. ROSENTHAL. And that you should do everything possible. This plant in Memphis, if it is polluting the river, either the local authorities or the State or Federal authorities should act precisely to prevent it in the interest of the public welfare and I commend the Public Health Service and the Department for doing that and getting on top of the situation.

Mr. POAGE. Thank you, Mr. Rosenthal.

Mr. COSTON. If I can add one more thing: I do not want to leave the committee with the impression that we are maintaining that the Memphis pollution is the sole source and cause of the New Orleans fish kill. There are other unidentified sources that we are now working on trying to establish this matter.

I just want to make that quite clear before we leave.

Mr. BEERMANN. If there are other unidentified sources, why is so much made of this particular source?

Mr. ROSENTHAL. Do we have those figures, or could we have those figures again of the number of barrels or the amount of that item that you pointed out—whatever it is, tons or barrels or whatever you used.

Mr. COULTER. Yes; reading from the report presented by the Department of Agriculture at a water pollution control conference—

Mr. ROSENTHAL. I do not believe that Mr. Beermann is hearing you.

Mr. COULTER. The Department of Agriculture investigators reported that they had learned that drums of this waste had been coming to the dump for approximately 6 years at the rate of 12 drums a day.

Mr. POAGE. You specified 5,000 tons all told.

Mr. COULTER. Each of these drums has an estimated capacity of 400 pounds, in other words, it appears that approximately 5,000 tons of chemical waste could have been placed on the dump over the 6-year period.

Mr. POAGE. Thank you very much, gentlemen. We could use an hour in which to discuss these matters. I think it has been a very good meeting.

Again we want to say that nobody on this committee wants you to let up on scientific work. I think that you have made out a very good case of water pollution.

Mr. COSTON. With your permission we should like to file our statements for the record.

Mr. POAGE. Certainly.

(The prepared statements of Dr. Robert J. Anderson, and J. Kenneth Kirk follow:)

STATEMENT BY DR. ROBERT J. ANDERSON, CHIEF, BUREAU OF STATE SERVICES, PUBLIC HEALTH SERVICE, U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Mr. Chairman and members of the committee, the Public Health Service, in the Public Health Service Act, and under delegation from the Secretary of the Department of Health, Education, and Welfare, has certain responsibilities which do pertain to pesticides. The statutory responsibilities are not those specifically categorized as pesticide laws but are those that develop—

(1) From Public Health Service Act authorities to:

(a) support research and training on the causes, control, and prevention of diseases (sec. 301) and impairments of man,

(b) collect and make available information as to, and the practical application of, such research (sec. 301),

(2) and from the Federal Water Pollution Control Act (Public Law 660, as amended) to preserve water quality for all legitimate uses, including enforcement actions to abate pollution, and

(3) under the Clean Air Act (Public Law 88-206) to protect the Nation's air resources including enforcement actions under certain requirements when air pollution endangers the health and welfare of any persons.

It is precisely the toxic and physiologic properties of pesticides that make them useful in the control of diseases of plants, animals, and man that give cause for concern about their effects upon nontarget plants, animals, and man in the environment related to their manufacture and use. This concern has led to regulatory and educational approaches which are all aimed at providing the greatest possible degree of safety in the manufacture, distribution, and use of pesticides. There is much laboratory animal experimental evidence and some evidence from accidental, or homicidal or suicidal poisonings of people about the immediate effects of exposures to pesticides. People who have been accidentally poisoned have probably not been following recommended practices. However, research results about the long-term effects of repeated and chronic exposures to immediately tolerable, low level exposures of people are not as complete. Such research is increasing. There are indications, however, that there may be undesirable consequences, particularly if large numbers of people are exposed and the abnormalities resulting are evidenced by a nonspecific body response, be it behavioral or organic.

Under such circumstances, it is urgent that facts be sought through research and investigation. Moreover, it is important to know what our exposures are and how they take place. And it is prudent to try all possible ways to reduce them. This is the philosophy guiding us in our activities for control and regulation.

Next, I shall describe briefly those activities that I believe pertain to your interest today.

To assure a safe milk supply on interstate carriers, only milk that is produced under circumstances of the Public Health Service Standard Milk Ordinance and Code is approved for such carriers.

To facilitate and encourage the interstate movement of sanitary milk, we have developed a program for the certification of interstate milk shippers. It uses the provisions of the Public Health Service Standard Milk Ordinance and Code as the basis for certification. This code employs the same standards as the Food and Drug Administration uses for milk and thereby deals with pesticides uniformly.

To assure the sanitary quality of shellfish eaten raw, we have developed a cooperative certification program with the States for interstate shipments to inspect and approve the sanitary quality of the waters in which such shellfish are produced and harvested. This includes chemical as well as microbiological examination.

These activities have served to guide States in shaping their activities for prevention and control of water, milk, and shellfish borne disease agents.

To abate interstate water pollution which is endangering the health and welfare of people, the Secretary of Health, Education, and Welfare, on his own initiative or at the request of either State, may initiate proceedings leading to the enforcement of such water pollution abatement. The May 5 conference in Baton Rouge was such an action. The purpose of that conference was to bring together the State water pollution control agencies, the representatives of Health, Education, and Welfare and other interested parties to review the situation, the progress that had been made and to lay a basis for future action by all parties concerned and to give the States, localities, and industries an opportunity to take any remedial action which may be indicated. Furthermore, a State may request such action on an intrastate pollution problem.

The Clean Air Act places similar responsibilities on the Secretary of Health, Education, and Welfare for abatement of air pollution which is endangering the health and welfare of any persons. This legislation was recently enacted.

In all of these activities there is appropriate collaboration and endeavor with other Federal departments, and State agencies. There is participation by private citizens and groups, and by industry and industrial organizations.

The Department of Health, Education, and Welfare, is represented through the Food and Drug Administration and the Public Health Service on the Federal Pest Control Review Board, established in September 1961, by the Secretaries of Interior, Defense, Agriculture, and Health, Education, and Welfare, at the suggestion of the Secretary of Agriculture. I have been Chairman of this Board since its organization. This Board has been advisory to the departments who conduct pest control activities on the hazards present in such programs that might be minimized. Very recently an interdepartmental coordination agreement between the Departments of Agriculture, Interior, and Health, Education, and Welfare has been signed by the Secretaries of these Departments providing for coordination of activities relating to registrations and tolerances. The Public Health Service will participate with the Food and Drug Administration in shaping the Departments' views on registrations and tolerances through the mechanisms set up to implement this agreement.

STATEMENT BY J. KENNETH KIRK, ASSISTANT COMMISSIONER, FOOD AND DRUG ADMINISTRATION, U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Mr. Chairman and members of the committee, the terms of the Federal Food Drug, and Cosmetic Act do not deal with the marketing or labeling of pesticides. However, the pesticide chemicals amendment, as enacted in 1954 and subsequently amended, represents an important part of this statute. Under this amendment any interstate shipment of a raw agricultural commodity is deemed to be adulterated, and thus contraband, if it bears or contains a residue of a pesticide chemical which is not within a safe legal tolerance as established by the Secretary of Health, Education, and Welfare, or which has not been exempted from the requirement of a tolerance by regulation.

The law provides a very good system whereby tolerances may be established on petition of interested parties or on the initiative of the Secretary. The procedure calls for the submission of a petition which contains full information, including the chemical, pharmacological, nutritional, microbiological, and other data about the pesticide and such residues as may remain from the use of the pesticide. These residues may be the chemical itself or may be other compounds which are formed after the pesticide has been used. When such a petition is received it is first considered by the Department of Agriculture and no action is taken by the FDA until the Secretary of Agriculture has certified that the pesticide is useful in agriculture and that the residues shown to be present as a result of the proposed use of the pesticide would be within the requested tolerance.

Once this certification is received, and assuming the petition appears to be complete, a notice of the proposal is published in the Federal Register, along with a reference to the method of analysis which the petitioner proposes be used for enforcement of the tolerance proposed.

The next step is for the scientists of FDA to review all facets of the petition and usually to conduct trials of the analytical method submitted to determine whether it is a practical and accurate one. Assuming the provisions of the statute are met and a determination of safety of the proposed residue tolerance

is established, the next step is for the publication in the Federal Register of the order establishing the tolerance which is based on the results of feeding studies on at least two species of animals, with a very substantial safety factor, usually at least 100 to 1. Research is continuing to try to find even better ways to do this testing work. The tolerance may not be set higher than is needed. The law provides that if a finite tolerance cannot be established as safe, a tolerance of zero shall be set.

There is a provision whereby objections to these tolerances, whether they be zero or higher, may be filed and safeguards are set up for the consideration of our decisions in public hearings, by special scientific committees nominated by the National Academy of Sciences and, ultimately, appeal to the courts.

Once a tolerance is established it is not considered as a closed matter. but rather is subject to continued reevaluation as science progresses. There are procedures in the law whereby we can revise tolerances, even to zero, where we believe the facts justify such a course. Additionally, we conduct studies on the residues present in or on foods as prepared for the table. These "total diet" studies have shown very small residues of pesticides. These studies, which are most reassuring, are being continued and expanded.

So far, of the several hundred pesticide chemicals used in agriculture, we have established tolerances or exemptions from tolerances for over 125 of these covering some 2,500 crop items.

Where a pesticide is used on the basis that there will be no residue in or on a crop, there is no requirement that any tolerance be established, but in the absence of a finite tolerance, there is an automatic zero tolerance. For example, no finite tolerances for pesticides have been established in milk. Thus, the tolerance for residues in milk is zero.

This concept of a zero tolerance presents a real problem in that proof that no residue is present depends upon the sensitivity of the method used by the chemist. As science progresses, methods are improved and there is always the concern that a product showing no residue today may be found to contain a residue by a new method. Because of the problem here, the Secretary of Health, Education, and Welfare and the Secretary of Agriculture have joined in a request to the National Academy of Sciences that a committee of distinguished scientists be established to review this whole "zero" and "no residue" problem. The Academy has agreed to undertake this study and has indicated that we should have the recommendations of the committee by the end of 1964.

Additionally, this year the Secretaries of Health, Education, and Welfare, Agriculture and Interior have signed an agreement to deal, among other things, with the pesticides proposed for marketing on the basis that their use will result in no residue. Briefly, this provides, as far as FDA is concerned, for us to be sure that the other two Departments are fully informed about any proposed tolerance or exemption from tolerance, and we have an opportunity to determine whether our scientists believe that there is sufficient data submitted to the Department of Agriculture to conclude that the reasonably expected use of the pesticide will not result in the production of crops which would be in conflict with the Food, Drug, and Cosmetic Act.

Essentially this agreement formalizes a procedure which has been followed in some, but not all, cases in the past, and has the added advantage of being sure that up-to-date methodology is taken into account at all times.

The pesticide chemicals amendment does not apply directly to processed foods, but the Food Additives Amendment of 1958 takes over to deal with those items. The procedures here are very much the same as in the case of the pesticide chemicals amendment. Tolerances may be established and published as regulations.

We spend a great deal of time and effort in publicizing the need for using pesticides so that no illegal residues will be encountered. We have worked successfully with many industry groups designed to achieve this objective.

Our enforcement activities with respect to pesticide residues are conducted by our 18 field district offices and laboratories. The first step is to examine spraying and dusting practices in the area to determine whether there may be situations where, either through carelessness or as a result of unusual growing conditions, it appears that pesticides may be used in quantities greater than called for or at times closer to harvest than they should be. We collect and examine many samples, both before and after shipment in interstate commerce, to determine whether illegal residues are present. Taking into account those samples which are collected because of some suspicion of misuse of the pesticide,

and those which are collected on a survey basis, our goal for the last 2 years has been to examine not less than 25,000 samples of raw agricultural commodities each year.

Several years ago, we inaugurated a program whereby the results of these samples are reported to the grower, to the State regulatory officials, and to any other person who may have a legitimate interest in the particular lot sampled. Obviously where such a report shows a violative residue before the crop has been harvested this will often give the grower the opportunity to avoid shipping illegal products. He may be able to correct the situation by letting the crop weather further or, in the case of such an item as lettuce, he may be able to trim the article to get rid of the excess residue.

We have encouraged State officials and industry groups to conduct this type of preharvest testing, and in some areas this has worked extremely well in preventing the marketing of illegal crops.

Where we find interstate shipments which are over the tolerance or which contain residues of pesticides for which no finite tolerances have been established, the law provides for removal of the shipments from the market by seizure. Such actions are taken through the Federal district courts. There is provision in the law also for the institution of criminal proceedings against those responsible for shipment of illegal products and additionally an injunction may be invoked to prevent shipments of known violative materials.

For fiscal year 1963, we examined 29,244 domestic and 832 import samples for the presence of pesticide residues, and found illegal residues in 2.1 percent of the domestic and 0.1 percent of the import samples. Forty-two seizure actions were instituted.

For the first 6 months of fiscal year 1964, we examined 17,123 domestic and 360 import samples; 2.9 percent of the domestic and 1.9 percent of the import samples contained illegal residues. So far in fiscal year 1964 we have instituted 32 seizure actions.

We regard this pesticide program as one of our most important operations designed to protect the public health. With only tolerances which are safe, plus a firm checking and enforcement program, we are convinced that pesticides can be used safely without resulting in a hazardous food supply.

Mr. POAGE. The committee stands adjourned.

(Whereupon, at 12 :25 p.m., the committee adjourned.)



