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WASHINGTON, D.C.

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The 37th meeting of the Interdepartmental Committee on Pest Control was held on Thursday, 13 June 1961, at 0930 in Room 5160 (Secretary's Conference Room), Department of the Interior, C Street, N. W., Washington 25, D.C.

Dr. J. B. Devitt, BSFAW, USDI
Mr. S. C. Dowe, B/A, OCE
Mr. W. W. Dykstra, BSFAW, USDI
Mr. W. B. Eavis, Jr., ARI, USDA
Mr. S. A. Hall, USDA, ARI
Dr. W. J. Hayes, Jr., USFWS
Col. W. B. Hall, HMC, USN, BUNED, B/M
Col. H. V. Krombein, Hdqtrs, USAF
Capt. J. M. LeVan, USPMF, US Coast Guard
Mr. F. J. McFarland, FNA, HEW
Mr. A. D. Ried, B/A, OCE
Mr. A. Vincent, Hdqtrs, USAF
Mr. J. C. Ward, Pesticide Regulations, ARI, USDA
Col. J. E. Webb, Jr., OTSG, B/A

Capt. B. T. Holway, MSC, USN, Exec. Sec'y. AFSA
Capt. J. H. Hirst, MSC, USN, Exec. Department, MRS, KRCZ,
Berkeley
Lt. Col. M. J. Ferguson, Army Med. ASD Command

Mr. A. P. Alaman, GS/C, D/A
Capt. J. J. Alamo, MA, USN, USNMA, Edgewood Arsenal, Md.
Mr. D. S. Eilert, LSDB, Denver Laboratory, Denver, Col.
Mr. A. B. Eckhouse, Thomas, JPS, JADA, Silverdale, Md.
Mr. G. C. Burke, Jr., Water Pollution, USFWS
Lt. Col. S. G. Daniels, MA, USA, Congressional Dir., et.
Ft. Le. Md. Dir., GS/C, D/A

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GUESTS - Cont'd

Capt. J. B. DeCoursey, OLC, NEIS, AFPCB
Maj. D. J. Hernandez, USAFA, Edgewood Arsenal, Md.
Mr. B. F. Kitch, OCS, D/A
Dr. H. Linn, Plant Biologist, National Park Services
Col. H. G. McCall, MEC, USA, USAFA, Edgewood Arsenal, Md.
Mr. M. O. Nelson, Jr., FAALS, USDI
Dr. J. C. Selyow, Staff Specialist, Div. of Wildlife, USDI
Capt. H. L. Walter, MC, USN, DASD (Manpower - Rich & Mad)
Dr. D. E. Woelker, Research Biologist, FAALS, USDI
Amherst, Mass.

MINUTES

1. Minutes of the 34th meeting were approved without change.
2. The members and guests introduced themselves.
3. Chairman Hall stated that Item 4(b), Subcommittee on Pest Control Legislation, will be discussed next. Justice C. Ward was called on to speak.

Mr. Ward: I'd like to call to your attention to only 3 legislative actions of perhaps a fairly large number which have been proposed, which will be of basic interest to the Committee. The first two of these are carry-over actions from the last session of Congress, and they are referring specifically to proposals made by Congressman Dingell which will have an effect on both fish and wildlife functions and on the registration of labels. The first bill is one dealing with the requirement that pest control programs which are carried out by Federal agencies should first be cleared with the Fish and Wildlife Service and with the local game and fish commissions in the areas where the programs will be undertaken. That would have an impact on not only the projects of the Fish and Wildlife Service, and Interior people themselves, such as their rodent control, but also on very large area pest control projects of the Forest Service and in a few cases the National Park Service. It will also have a bearing on programs of the USDA, Plant Pest Control Div., to which this committee has been introduced at past meetings and so the scope of this bill is well understood. We feel it is somewhat less likely to get favorable comment from governmental agencies than perhaps Congressman Dingell would prefer to have it receive.

The 2nd bill he proposed was that pesticide-wildlife research studies of the Fish and Wildlife Service be materially strengthened. That bill up to now is in both House 4487 and Senate 1251, with the Senate bill being sponsored by Senators Newburger, Long, and McIntyre, so that bill has considerable congressional interest. One feature of the bills will be giving the Secretary of Interior the responsibility of notifying the

Secretary of Agriculture as to Wildlife hazards in the use of all pesticides registered under the Federal Insecticide, Fungicide and Rodenticide Act. There is some uncertainty in the interpretation which has been given to the bill by various attorneys. That is whether it means Fish and Wildlife should dictate the type of warning statement which should appear on registered labels or whether it should merely give to Agriculture the information as the responsible officials in Agriculture would dictate to industry the warning statements which will be needed. As a consequence, I am uncertain as to what the comments on this bill will be from the various agencies involved, and these will be DEW, USDA, and Interior. Those bills are likely to have very serious consideration, and congressional study is undoubtedly going to be quite intense. The Newburger bill, that is, the Senate bill, is already under hearing. Senator Magnuson's committee is hearing on that bill, and further testimony is anticipated.

USDA is preparing its testimony and it will be presented on request. All of you may know that at the outset of the Ribicoff Committee hearings, a question was raised very specifically on one point in the President's Committee Report, that was the reference to the Federal Insecticide, Fungicide, and Rodenticide Act provision in the bill which provides for registration under protest. Senator Ribicoff took the occasion at the start of the hearing to ask questions as to what had happened to the recommendations which had been made by the USDA to the Bureau of the Budget that this particular feature of our law be studied and perhaps modified. The Senator took the occasion to say categorically he felt this provision was a loop hole in the law and it should be plugged. Since Agriculture had agreed to that being a desirable move, the question of how to do it most expeditiously was the only question to answer, and Senator Ribicoff, because of his personal interest in this particular point dropped into the hopper, Senate Bill 1603 which does 2 things: It removes registration under protest and it gives to us the authorization to require under regulation that registration numbers appear on labels. That bill has had a comparable House bill H.R. 6828, submitted by Congressman Rosenthal, which is fundamentally identical. It means basically that as far as legislation on pesticides is concerned, in this session of Congress we have more interest than has been evidenced since the passage of the Miller Pesticide Chemicals Amendment in 1954 which you know is an amendment to the Food, Drug, and Cosmetic Act. I think with that introduction, there is no way of forecasting the outcome of any of these bills, but I will file with the Secretary copies of these particular statutes, and we will all await with some interest what the Congress does later.

Mr. Hall: We should mention what I call the White House Report, properly referred to as the President's Science Advisory Committee Report on Use of Pesticides, and I presume that most of you have read this document. It seems to me it's going to be a best seller; we tried to get extra copies which we haven't obtained yet. It has been printed in other journals; the Chemical and Engineering News has reprinted this in full and it is sending

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out copies. I'd like to ask Mr. Ward what he thinks about this in relation to the various bills and committees. Is this going to be referred to as a basis document?

Mr. Ward: I think there is no question that this will be a basis document, from various viewpoints. Senator Ribicoff has used it in preparing almost all the questions to all the witnesses which have already appeared before his committee. Most certainly he will use it as a basis guideline to all the rest of them.

There is no question but that the document will have a fundamental impact on the future of pesticide management because the President has directed the Secretaries of the various Departments to put into effect as rapidly as is possible the recommendations of the Life Sciences Panel. Whether or not the Congress will go along with some of the changed laws or new laws which will be necessary to make all of these recommendations realistic, is the only thing which is the question at the moment. This particular document recognized the fact that we need more background information and that is almost across the board. The pesticide phase is only one facet, and so strong recommendations for increased research funds are likely to be made. I think all of us will favor that particular move, because there isn't a regulatory official who is not faced with the fact that scientists disagree because of partial knowledge. One man believes one thing, and perfectly conscientiously he believes that thing to be true, whereas another man perhaps in the same committee will say, "No, I don't think that is true; my data does not lean in that direction."

So, the regulatory official is inclined to ask for a definition of "how much scientific is enough" to justify a legal decision. This document doesn't tell us that: It merely says we don't know enough. The document does criticize both Agriculture and HEW, saying we don't have the background knowledge to judge the propriety of using pesticide chemicals in environmental situations. It says Food and Drug doesn't know enough to justify setting tolerances. To many of us that is an illustration of the "ivory tower" scientist who is in fact justified in his belief, that we should know more about everything we use, but who is removed from the immediate responsibility of making decisions on the information presently available.

Once again, the only thing I can say is that to activate many of the facts proposed will require not only new laws but vastly increased research support. If Congress chooses to move in either direction those of us who enforce law will do our very best to apply any new standards which are set up. But once again, the Life Sciences Panel Report is a basic document which is likely to be used for many years, in guiding our thinking, as to what more data we need to ask for and perhaps in giving Congress and to the President support for making strong recommendations for enlarged programs.

Dr. DeWitt: For the benefit of the committee, additional copies of this report could be obtained through Mr. Dykstra's office or through mine in reasonable number. We could not supply everybody in USDA, but certainly could supply 2 or 3 copies for each member of the Committee.

Mr. Hall: I believe anyone in any phase of pest control should read this. It specifically mentions this Committee and the Federal Pest Control Review Board. One of the points that I recall as a criticism is that we don't make enough use of outside consultants, and whether this is more pointed at the Federal Pest Control Review Board, or at ILPC, I don't know, but in this committee we do attempt to use outside consultants in bringing forth any material of interest. This is not in my mind spelled out in any clear way but I'm going to take a few minutes to read from the report -- just a paragraph:

"The Federal Pest Control Review Board was established in 1961 through joint actions of the Secretaries of Agriculture and Interior, Defense and HEW, and composed of representatives from each of these Departments. Technical matters are referred to staffs within the agencies for consideration and advice and occasionally to the ILPC. The Board has not used consultants from outside the government (I guess it's more pointed at the Board). The basic responsibility for federal pest control operations is placed by statutes on various departments and agencies. The fact that these same agencies constitute the Federal Pest Control Review Board restricts the Board's effectiveness in reviewing the programs of member agencies. The Board carefully considers programs before giving clearance and, when appropriate, offers recommendations for alternate proposed procedures. Although many programs have been modified as a result of such reviews, particularly by the incorporation of additional safeguards, the discontinuation of a program has not been recommended."

Well, it's much more pointed to the Board, but I would say one of the functions of this Committee, and an important one, is to advise the Board and to call on outside consultants, so indirectly I believe that we do serve the purpose of trying to get a reading from all concerned and whether this is sufficient or not, I suppose, may become a point of considerable discussion. I don't know if there will be any comment on that, it's a rather difficult area, but you can see we are pointed out not in an entirely favorable light and I hope that this Committee can dig into important matters and really advise in the pest control operations and problems as they come up.

Mr. Ward: Let me make only one comment, with regard to that: I think the President's Committee had in mind the bill which I commented on last year; that is the Dodd bill, which was aimed at setting up a Chemical Council in Government. Such a Council would have authority and would actually dictate either the way in which the chemical should be used or whether it should be used at all. It was the feeling at that time that the Review Board authority was limited in scope because it applied only to federal programs or programs with which the federal government had a financial or administrative liaison and the big problem was not restricted to those programs. The problem was felt to be in the widespread general use of pesticides so the particular point that Mr. Hall brought out is a point well taken, but it should be viewed in context with the thinking which was expressed by the Life Sciences Panel itself, and by Congressman Dodd in the last session of Congress. Whether or not we in Government will look forward with hope or with apprehension to such

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a Council will depend in part on just how concerned we are about what we are doing now, and how well we are controlling pesticides and other chemicals presently. At any rate, there are dramatic ideas being bandied around the nation and this is just an illustration of it.

Captain Holway: Another aspect of this is becoming more and more important. Everyone recognizes the need for more research; there is no question about that. But in connection with the functions of various boards and committees, there is the question of information itself. Most everyone knows that Senator Humphrey is doing a tremendous amount of stimulation on this point and there is a lot of concern about the mechanisms for handling and screening out the tremendous amount of information, which is being referred to now as the information explosion. This is very likely the real root of the whole problem; it's just impossible to gather the facts that are already there, and it may be that both the pesticide problem and the information problem will eventually need to be tied together in some form.

Mr. Reed: Do we need more recording or adequate reporting of work that is done?

Capt. Holway: This is one factor, but the real problem is in getting information that is available to the people who need to use it. So often at these board and committee meetings people, with the best of the facilities of all departments are asked to come in and answer questions but you still don't get all the answers; frequently a few days or a week later somebody comes up with some information right on a very important point that wasn't known to be available, at that time.

Mr. Hall: I think this is true, and certainly on a large scale pest control program. I can think of one that came up before the Federal Pest Control Review Board on hemlock looper control where they proposed to use DDT and the question of whether there was any DDT present in the oysters out of Willapa Bay, where they are going to do spraying, was the big question mark, no one had any information, and that is a crucial point in that program. This is what you are speaking of, this type of information from so many different angles, residues and effects on wildlife, and so on that we need every bit of information we can get and I think this is important to have this at your fingertips or know exactly where to go. I don't know whether we have facilities sufficient for this to properly coordinate in the best way. I'm sure there is a lot everyone could discuss on this big problem, and at least pest control is recognized as a very important thing and I personally think that we'll be a lot better off as we get better organized in these

In order to introduce the program, there was a discussion which some of you may recall and I have a note here that it was the 44th meeting of this Committee in December 1959, and the title of that program was "Stability Producing Agents in Pest Control." The discussion leader was Dr. E.T. Knutling

who is the pioneer in this revolutionary means of controlling pests which reproduce sexually, by sterilization whether through radiation or chemosterilants, and I think it has a tremendous future. At that time we were exploring folic acid antagonists, such as aminopterin and methotrexate, and also we had some results on some of the nitrogen mustard. Now since that time, December 1959, very considerable progress has been made in the field of chemosterilants and this will be outlined by our first discussion leader. We know we can sexually sterilize many insect species very successfully and the beginning is being made in the realm of pest birds. I think we will see some progress in rats and mice and pests of this sort. It's the purpose of this program to explore this a little bit more because of the increasing interest in this way of managing (we use the word Mr. Dykstra prefers) these populations so they do not overburden us. So we will get on with our first discussion leader, Dr. Berkeves.

3. Program. Management of Bird and Mammal Populations by Use of Chemosterilants.

(a) Dr. A. B. Berkeves, Chemist, Agricultural Research Service, USDA, Beltsville, Md.

Summary: The maturation of sperm and ova are not autonomous processes. Sterilization (failure to reproduce) can be accomplished by:

- (a) Mechanical means.
- (b) Interference with regulatory activities governing the maturation, maturation, and release of germ cells.
- (c) Interference with the activity of the gonads.
- (d) Deactivation of individual germ cells.

Insect chemosterilants act most probably according to one or both of the last two processes.

The chemicals which can sterilize insects are divided into three main

1. Alkylating Agents
2. Antimetabolites
3. Miscellaneous Agents

Only the first group consists of compounds clearly defined by their chemical characteristics and structural features. Alkylating agents include the derivatives of aziridine, the most effective and from a practical point of view most promising chemosterilants.

As far as pest control is concerned the sterile male method is of primary importance and most of our work is directed toward the discovery of compounds which could be employed in that method. In this respect an ideal chemosterilant will have the following properties:

- (a) It will permanently sterilize males in small quantities and it will not interfere with the male's longevity, sexual vigor, and biological competitiveness.
- (b) It will be sufficiently stable to allow for suitable formulation.
- (c) It will be either harmless to the environment or it can be administered in a safe manner.

In a limited number of instances we can approach rather closely all three criteria.

In the Entomology Research Division, our main interests are insects and related animals. Nevertheless, we have given some thought to other animals. In theory any population of sexually reproducing, more or less mobile animals can be controlled by sterilants. Laboratory data are available on chemosterilization of several species of mammals and a few publications on birds appeared. Considering the often immense numbers of insects, their high concentration in small areas, and their universality many other animals would actually appear to be a better subject of the sterile male method than insects themselves. Evaluation of these possibilities will of course require considerable research effort.

Mr. Hall: We may just proceed and have questions directed later to any three in this program so we will proceed with Dr. David A. Wetherbee. Dr. Wetherbee will cover the bird part of the discussion.

(b) Inhibition of Reproduction of Birds, Dr. David A. Wetherbee, Branch Wildlife Research, Bur. Sport Fisheries and Wildlife, University of Mass., Amherst, Mass.

My report outlines the research activity in avian sterility conducted at the Massachusetts Cooperative Wildlife Research at the University of Massachusetts.

Laboratory screening is conducted with the Coturnix Quail of a pilot animal. Candidate chemosterilants include chemicals that have suspected biological activity in inhibiting spermatogenesis, oogenesis, and/or embryogenesis.

Experiments are conducted in immunization of birds by physiological induction of spermatozoal antibodies. Birds actively or passively immunized are artificially inseminated and the effects upon reproductive capacity tested.

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Physiological chemo-tagging has been developed to identify wild birds that consume candidate chemosterilants. Egg yolks of birds so tagged show the presence of oil soluble dyes. Further through screening dyes, stains, and pigments, clues to which chemical structures pass the ovarian barrier are detected.

Exposure of birds and their embryonated eggs to radio-activity is in progress to determine lethal doses and doses sufficient for reproductive sterilization.

The ecology of target organisms is studied to enable field implementation of chemosterilants proved in the laboratory. Target species — include Herring Gull, Red-winged Blackbird, Rock Dove and House Sparrow.

Responses of wild populations are appraised as they relate to field treatments of chemosterilants.

Mr. Hall then introduced Mr. Balser.

(c) Management of Predator Populations with Antifertility Agents, Donald S. Balser, Research Biologist, Denver Wildlife Research Center, Denver, Colorado.

Summary: There is an urgent need for development of new, safe, and effective control techniques in management of predator populations. The potential for the use of antifertility agents appears to be a most promising approach. Investigation of antifertility agents now in use and in the research phase indicates that the most practical method at this time is to upset the normal endocrine balance, by oral administration of a bait containing a synthetic estrogen, diethylstilbestrol, thereby blocking successful reproduction.

Tests on penned coyotes at the Denver Wildlife Research Center indicated that reproduction was blocked during and for several weeks following estrus. These tests also indicate the proper timing of a field application should be immediately after the peak of breeding.

A subsequent field trial was carried out in New Mexico on 17 townships on March 3-15. Results obtained from this field trial were determined by collection of females from the treated area and a reference area some distance away. Approximately 92% of the breeding females on the reference area would have produced pups, while on the treated area approximately 17% of the breeding females would have produced pups. This was based on a sample of 37 females taken on the treated area and 21 reference specimens.

Further field trials will be conducted with stilbestrol to develop application techniques and results, while further tests will be run to determine effects on other species. Penned tests on a new series of alkylating agents are planned for this fall in the search for an agent that will cause sterility in males.

Mr. Hall: The subject is now open for discussion. Mr. Balser, Dr. Rockover, and Dr. Wetherbee will be prepared to answer any questions anyone may ask.

Dr. Davis: I would like to ask Dr. Wetherbee what pest birds in addition to gulls are concerned in this program?

Dr. Wetherbee: Starling, red-wing black bird. Although we have no active program pertaining to sparrows and pigeons, I suppose this will eventually have application.

Mr. Hall: I would like to make the comment that in thinking of chemosterilants for insects, we make a very clear distinction between male and female chemosterilants and here our object is mainly to get male chemosterilants because the male seeks out the female and here you are utilizing the reproductive urge, the sex urge to put it in reverse so to speak, I mean here you are taking full advantage of this means of pest control. I presume this would apply in the case of birds and mammals, would it not, Dr. Wetherbee, or am I wrong there?

Dr. Wetherbee: We're concentrating on females; I don't know how it works with insects, I should think you could sterilize half the male population and the other half would settle all the females.

Mr. Hall: Dr. Rockover, do you have any comment on that?

Dr. Rockover: No, I think the genuine idea is this: If you use a chemosterilant which will not interfere with the mating urge of the animal, and if you sterilize half the population then about 50% of the matings will be sterile matings. Now since the female doesn't know about the male being sterile or fertile, and since in many cases the female will mate only once, then the female will be satisfied and not mate anymore and at the same time will not produce progeny while the male will go on and mate with some other female in cases where there is multiple mating, but the point is that's what maintains the normal aggressiveness of the sterilized male as compared to the normal male and that the male can go on and in fact sterilize several females. You sterilize only one while this sterilized one goes around and sterilizes biologically maybe 10 others, so if you treat one you get 10 times the effect; this is the power of the method.

Mr. Hall: Of course, our aim in insect control is to achieve eradication; this may not be true in the case of your coyotes, or birds. Maybe this is not your aim, but one way of doing this is to reduce the population by the use of insecticides and other means and then come in and release sterile males, which go seek out the remaining females which you couldn't get by other means, then eradication can be achieved. Incidentally, this is working out in insects now other than the screw-worm. I'm not talking now of the chemosterilants but of the gamma irradiated insects. Out on the Island of Rota in the Pacific, the

beef-fly has been eradicated experimentally by the release of sterilized males. In some of these other problems you may just want to control or manage as we put in the title here, to keep below a nuisance level. Are there any comments?

Mr. Baker: Yes, our objective is population regulation. We are also not necessarily looking for a permanent sterilizing effect but a temporary one, one that can be applied when it is necessary and when released still have a population that could maintain itself, and there are also differences in reproduction physiology in these animals where the sterile male technique would not have that magnification effect in certain of these mammals. Whether you treat male or female when they pair won't have too much of an advantage one way or the other, except that we think interference with spermatogenesis or blocking ovulation is much needed in trying to determine the pregnancy or blocking of later stages.

Mr. Reed: Is this true that you cannot release sterile males or sterile females in populations such as coyotes? I can see where it might pay you to go after the females instead if you wanted only an advantage of regulating, whereas the same rule will not apply with insects.

Dr. Retherbee: Does an insect only breed once? Mammals and birds have promiscuity or at least multiple copulations, so male sterilization techniques wouldn't apply.

Mr. Hall: Well, there must be many insects that have multiple matings, too, but this across-board is nonoptimum. Any comment?

Dr. Hayes: I think I understand the mathematics of the insect control idea both from the standpoint of mathematical models and the actual proven work in the field. But these models and field proof shows you accomplish something by sterilization of a large number of males or females, since this can't be accomplished by killing. The question I'd like to ask in this sterilization at one stage or another or in one sex or another of mammals or birds: What is the real difference between that and killing?

Mr. Baker: Both of us have an advantage here in using agents that are safer for one thing. In killing the animals it is frequently quite difficult; it requires toxic agents in some cases and a lot of labor and power in others, and if we can develop something that is relatively safe to other forms of wildlife environments, we can effect a savings in time and safety.

Dr. Hayes: That the value is in the other forms of wildlife will eventually recover from this material. Is there any proof that nitrogen is better for desirable forms of wildlife than it is for coyotes?

Mr. Baker: No, we can make this selective for coyotes by placement of the baits, by time of bait applications. Some of the reproductive features of various species are out of phase with coyotes. Also, the dispersal

of our baits will prevent us from affecting the other species.

Dr. Hayes: The same thing of course, so far as dispersal and selectivity, occurs with any chemical you put out, 1080 or what else. 1080 never gets out of phase for mammals.

Mr. Hall: Dr. Betherbee, do you wish to comment?

Dr. Betherbee: The limiting factor in carrying adult populations is food supplies, so that existence of sterile organisms in the populations exerts pressure on the population and that would sterilize and kill them.

Mr. Hall: Are there any further comments?

Mr. Balser: I'm sure Dr. Hayes will agree with this that if he could see the volume of mail we get when we kill something compared to other methods, he would know one reason we are conceiving this, that would prescribe something other than killing.

Dr. Hayes: That though is a part even I don't believe can be caught.

Mr. Balser: In the second instance, we are destroying the populations of forest ferns rather than having to go out and kill animals after they are already established in their environment; this should be the simpler approach.

Mr. Hall: It is more of a birth control approach in other words. Are there any more questions on this subject?

Dr. Harris: I want to ask a question on insects. How many species of insects do you think this technique would apply to? I assume it would apply to some, or do you think it would apply to all of them?

Dr. Betherbee: There might be some species to which it would not apply, for example some insects reproduce parthenogenetically or some insects simply stay in one place and don't move around; these are cases in which this technique would not be of too much use, but in most other cases, at least in theory, it would apply.

Dr. Harris: Japanese beetle, it should apply?

Dr. Betherbee: Yes, in the Japanese beetle, it should apply very well.

Mr. Hall: I would only comment that I believe we will find that there are more efficient materials to work with. Speaking of diethylstilbestrol, what is the dosage that was used for that material?

Mr. Balser: 100 milligrams in a one shot dose per animal of about 10 lbs.

Mr. Hall: These are the beginnings. I feel sure that this more sophisticated method will become very important. We will proceed to item 3.

Unfinished Business, and for the first report, Subcommittee Report on Continuous Automatic Dispensers of Pyrethrum Insecticides, I will call on the Chairman of the Subcommittee, Dr. Wayland Hayes.

4. Unfinished Business

(a) Subcommittee Report on Continuous Automatic Dispensers of Pyrethrum Insecticides, Dr. Wayland J. Hayes, Jr., Chairman.

You have received the report through the mail.

The report itself as you know is quite brief. It points out in essence that the registration of pyrethrum formulations for the purpose of using automatic dispensers is fully justified under the law, that the question of residues resulting from such applicators for ruling is before the FDA. Finally reference is made to a very extensive review of the literature on toxicology of pyrethrins. We find that the conclusion is reached that there may be a place for use of these materials, and at the same time the philosophy of certain people in public health that any food handling establishment should be so sanitary that you shouldn't need any such devices. It would appear the group who sent us this question in the first place want to have an excuse for eliminating the registration of the formulations designed for use in continuous dispensers, and we have straddled the fence in what I hope is a way that will be acceptable to all parties. There are two philosophies involved, and the Committee is committed to publish both of them so that the report is before you and I trust the Committee may reach some decision on it. I think the only action necessary, if possible, is to approve and transmit it to the people who sent the question; Mr. Rupert, Chief of Milk and Food Branch, USDA.

Mr. Ball: Secretary Ball, for the record, transmit a copy of the report to Mr. Rupert and any other interested parties. Dr. Hayes, can you think of any others outside the Committee that would want to get a copy of this report?

Dr. Hayes: No, but I have additional reports. I wonder since this is a subcommittee report, would it be appropriate for the whole Committee to accept it, if possible?

Mr. Reed: I think it would, Mr. Chairman, and in order to put it before the Committee, I move the acceptance of this report. I found it extremely interesting and I think it's a fair statement of the case. I think it would be very sound for the Committee to accept.

Mr. Ball: Before we vote, I'd like to see if there is any discussion on this. Perhaps we should back up a little bit; automatic dispensers. I think many will recall, was quite a hot potato subject when lindane came out for use in automatic dispensers in various establishments, particularly food establishments. Here we have an automatic dispenser of pyrethrum insecticide, and in addition to pyrethrum, you have piperonyl butoxide. It is not a simple question and while I think the subcommittee which I appointed has done very

well in defining the problem, it doesn't entirely solve the problem. Will you agree to that, Dr. Hayes?

Dr. Hayes: Well, I don't think the problem is going to be solved. There are two philosophies involved here, but all members of the subcommittee were apparently quite easily able to agree to this final conclusion, that is: there might be situations in which insects would come in from the outside, insects that weren't under the control of the owner of a food handling establishment. Suppose if you had a restaurant nicely situated on the edge of the city dump, you see. Well, here you are.... It isn't necessarily justified to say he cannot control the insects, and yet the owner isn't financially or otherwise able to go out and eliminate a dump, although some efforts are being made at certain levels these days. On the other hand, everyone was willing to agree that most food handling establishments or all food handling establishments should be so clean inside that you shouldn't need to squirt the pyrethrum about generally every few seconds; this is just an unnecessary and undesirable thing. Going back to this lindane reference. In the first place the toxicology of pyrethrum is better known from practical experience if nothing else, than the toxicology of lindane; that is true even now.

It is my impression that the only real danger from these things, if there is any, concerns allergy and one peculiar point about pyrethrum as an allergen is that under practical conditions as well as under experimental conditions, sensitivity to it has frequently been delayed, sometimes even as long as 2 or 3 years. This is most unusual, most allergies receive doses, and in 10 days or two weeks you've got sensitivity. This thing will be delayed in workers who are intermittently exposed in the course of their work, and once it appears, however, it can be quite severe and incapacitating. Now, I just don't think there is enough information to say how often this is going to occur with the more or less purified pyrethrins used in modern insecticides, if they are dispersed in the air in a continuous fashion.

Mr. McFarland: We agree of course there is a very low toxicity involved with pyrethrum and piperonyl butoxide, but still they are classified as poisonous substances and needless exposure to them on that basis should be avoided. From terms of the law any residues of pyrethrum or piperonyl butoxide, or any other pesticide in food, make that food illegal under the law unless covered by tolerances or exemptions. Pyrethrum or piperonyl butoxide in processed foods does not presently have any clearance under the Food and Drug Law from such applications as contemplated here, and use of this device in such a way that food would be contaminated with the pyrethrum-piperonyl butoxide would render that food actionable under our law, if the food were in interstate commerce. We do have a petition pending under the Food Additives which seeks sanction for the use of the dispersants, but the decision has not yet been reached as to whether this sanction should be granted.

Mr. Hall: Are there any other points anyone wants to bring up with regard to this subcommittee report? There are some calculations in the

Col. McCall: We were invited to appear today, and maybe this is a good time to bring up the question of the use of herbicides in drinking water. Would this be appropriate now?

Mr. Hall: I think it would, and I would like to say I was not clear whether we were going to try to discuss this as a full agenda item when I was getting up the program, because it had been my information this was taken up by the group concerned at a meeting at which I was not present. I think it is something we want to look into and we have the time. The use of herbicides in drinking water started with a draft of a circular from the OSG; this circular has not been issued. This was circulated for comment and I received a copy, but I did not have comments; others have been commented, but I guess I should read this circular just as it was put out in draft form without any circular number, dated 15 March 1963, entitled "Use of Chemicals as Herbicides."

(1) The purpose of this circular is to provide guidance to commanders on the use of herbicides in water supply reservoirs and on water sheds. It establishes procedures to be followed to assure protection of health.

(2) Background. In recent years, many chemicals, both organic and inorganic, have been introduced for the control of undesirable plant growth. In many instances these have been rapidly adopted for use because of their proven efficiency as herbicides. However, the mode of action, translocation characteristics uptake and residue time in plants and soils, and human toxicity of many of these chemicals and their resultant products have not been adequately investigated and defined. Research is being conducted to evaluate the acceptability of these chemicals for use in potable

attached to the report regarding business likely to result and I would say considerable thought is given to every angle. Mr. Mayo brought out the allyer aspects, Mr. McFarland the public aspects, and satisfaction aspects have been brought out, so I think a very useful purpose was served by this subcommittee, and I certainly thank them for getting this together and making it available for the nation here. A motion has been made by Mr. Reed that the whole Committee accept this report and has been seconded. All were in favor and the Committee accepted the report.

Mr. Hall stated that Item 4(b) had already been submitted by Mr. Reed. Item 4(c) follows.

(c) Unfinished business. None

5. New Business.

Mr. Hall asked if anyone wished to bring up any new item or other new business.

water sources. Studies on some herbicides have already established their acceptability or nonacceptability.

(3) Exemption.

(a) Personnel responsible for the operation of water supplies shall not use any chemical herbicide until such time as sufficient data is available to permit their safe utilization except for chemicals listed in paragraph 2b; no herbicide shall be used unless approved by the Forfeitor General. Such approval shall be granted by subsequent publication or after review of pertinent data submitted through channels.

(b) Copper sulfate and Dalapon sodium, which is sodium 2, 2-dichloropropionate, are the only chemicals presently acceptable for use in and around water sources and reservoirs, and even these must be used in a prescribed manner with appropriate safeguards. Copper sulfate may be used in water reservoirs in concentrations up to 12 ppm as CuSO₄ to control algae. Dalapon sodium may be used as a herbicide utilizing dosage concentrations and frequency of application recommended by the manufacturer. Water samples will be collected after treatment with any herbicide and analysis will be determined whether tolerance levels are exceeded. Sampling schedules will be determined by the post surgeon. There are standard methods for the determination of copper which can be done locally. However, Dalapon sodium can only be estimated at present by colorimetric methods used for the estimation of pyruvic acid.

(c) As additional information becomes available regarding other herbicides, it will be disseminated. This will include information relative to permissible concentration, collection, and analytical procedures and other instructions necessary for the proper use of these herbicides.

Mr. Ball read a comment on this draft dated 15 April 1963, from the Corps of Engineers, Army:

(1) The following are comments on the proposed circular subject as above:

(a) Reference paragraph (1). The expression "water sheds" is vague in the context used. The treatment of soil or vegetation near water supplies is to be prohibited a distance factor from the water edge. It is more appropriate.

(b) Reference paragraph 2b. The approval of Dalapon only as pesticide by control points plants is questioned. Dalapon may only be used for weeds in water supplies.

(2) The Army may be subject to criticism for approving only one firm's pesticide for control of rooted plants. This would be the For Chemical Company. According to representatives of the DDA, some formulations of 2, 4-D have been widely tested for toxicology and cleared for general use. Tolerances of

to our personnel in the field with respect to the use of herbicides in waters intended for domestic use. Therefore, our Agency drew up a proposed circular and submitted it to GIDC with a recommendation that it be sent to the field as guidance. In this circular, we specified that copper sulfate or dalapon sodium could be used, and specified the levels and methods of use. We also provided a reference for the analytical determination of dalapon sodium. With the preparation of this draft, a number of questions were raised and we were then provided information regarding a proposed manual drawn up by the Department of Agriculture for the Corps of Engineers relative to the use of herbicides. Needless to say, GIDC was vitally interested in the contents of this document and close coordination was felt desirable between the Corps of Engineers and GIDC to assure that the document would be prepared in a manner satisfactory to both. This is presently underway.

Certainly it can be realized that the military problem with respect to herbicide use in reservoirs is no different than that which might be encountered by any municipality in the country, which utilizes surface water. Therefore it is not our desire to separate ourselves from civilian communities with respect to this problem. We feel that certainly these chemicals which can be used with safety by our civilian counterparts can also be used with the same safety in and around military installations. The problem as we see it is generally well summarized in comments which were made by GIDC during a recent study which they carried out. They are:

Among the considerations to be kept in mind in rendering an opinion as to whether a pesticide or herbicide residue arising from the application of formulations of synthetic chemicals proposed for use in or on any agricultural commodities and in sources of potable water supplies would be likely to present a health hazard are:

1. Proof concerning adequate evidence of safety of the material. This step entails evaluation of data obtained in animals during long-term (chronic toxicity) studies, biochemical and nutritional studies of the material or its metabolic products, suitable chemical methods for analyses of the material or its products in body tissues and fluids, reproduction and lactation studies, and establishment of tolerances, etc.

2. Establishment of accepted techniques for the application of the material at the lowest dosage and times of application to obtain the desired effect.

3. Development of sensitive analytical methods to determine pesticide or herbicide residues in or on the product at the time of consumption.

4. Tolerances for pesticide residues are not permitted for milk lactating animals; likewise in meat animals, proof has to be available that pesticide residues in meat resulting from the feeding of treated forage should be within established tolerances (not applicable to our specific problem).

other herbicides have also been studied and cleared for use according to this source. It is recommended that the publication of the proposed circular be deferred until research described in paragraph 2 of the proposed circular has identified one or more widely useful chemicals as acceptable for use. A copy of research results is requested for each herbicide cleared for Army use. This is signed by Col. G. S. Lyle, Corps of Engineers, Chief, Repairs and Utilities Division.

Mr. Hall: Before we open the discussion, I must say that we did not schedule this for full discussion, so let's try to bring out as briefly as we can the points that we want to look into and see if we can't lead to some action of this Committee without getting into too protracted a discussion.

Major Hernandez: If I may, I would like to say a few words as far as background is concerned, just how we became active at this particular time. The subject pertaining to the use of herbicides in water, and on the land area adjacent to water which is intended for potable use, has been a topic of interest for some time in the Office of The Surgeon General and at the United States Army Environmental Hygiene Agency. This was primarily instigated over the past several years due to the fact that a number of inquiries have arisen in the field pertaining to their use. Some of these inquiries were relative to the use of herbicides on land, in areas where the chance of water contamination was rather remote. These were handled in and of themselves in so far as recommendations were concerned. However, more recently we have received several specific queries pertaining to the use of herbicides in water reservoirs which were intended for the storage of water to be used for general domestic purposes. At this time, it was felt necessary to obtain specific information pertaining to the toxicity of the materials which were proposed for use. Of specific interest were Silvex, Aquathol, and 2,4-D. In one case, Silvex had already been used in the reservoir and in the other case, it was proposed to use Aquathol or 2,4-D in a reservoir. We began a literature search, and in addition, attempted to find out whether any responsible health agency had investigated or approved the use of these materials for this purpose. During the course of our investigation, we sent a letter to the United States Public Health Service in order to determine whether or not they had ever approved the use of these materials in water supplies. We received in reply certain information which was based upon investigations they had carried out. This information indicated that they had not officially approved the use of any specific herbicide. However, it appeared that dalapon sodium and copper sulfate were probably the herbicides which could presently be considered for that use. Their use, however, should be properly controlled and the levels of copper in the water to be utilized should not exceed that which is presently established in the WHO Drinking Water Standards 1962 (1.0). The concentrations of dalapon sodium should not exceed 0.1 ppm as dalapon sodium. Based upon our investigations and the information received from WHO, we forwarded answers to the two installations in question. However, at that time we realized that the use of herbicides could reach monumental proportions in so far as our installations were concerned and felt we should attempt to provide some guidance

5. The application of pesticides, herbicides, and related chemicals, when deemed necessary from an economic or public health viewpoint, should involve the basic principles that as little of the additive be used to obtain the desired effect and that as little as possible be present in the water at time when it is consumed.

These basically are the problems with which we are faced and at this time we feel that many of these questions still cannot be answered and much of the information is still not available. Therefore, we must proceed with caution. Needless to say, there probably are a number of herbicides which may be safe, if properly utilized. However, we cannot go on record as approving them for our use until such time as we can obtain the answers to the questions and problems posed. This, of course, was the thinking which initiated the proposed circular which I mentioned earlier. This, more or less, summarizes the present position of our work and it might be appropriate at this time for the discussion to be carried on by the represented agencies.

Mr. Burke: I should like to support the points made by Major Hernandez regarding the consultation of the DEPHS. We have worked with the Environmental Health Agency and furnished them info that the Public Health Service has in regard to the use of some of these chemicals in water supply reservoirs. This information indicated that the three chemicals mentioned should not be approved because there wasn't sufficient information to decide that they would be safe for use in water supply reservoirs.

In the past half dozen years, we have had numerous requests for advice on whether or not to use 2,4-D in water supply reservoirs. Responses have always been negative, discouraging the use of 2,4-D in water supply reservoirs. This did not mean you could not use it at some points in water sheds; it has been brought out that water sheds can be very large. I think if you were using it in the immediate vicinity of water sheds which were principally to collect water for the municipal water supply, there might be some doubt as to its advisability, particularly if it reached the water body and stayed in the water supply system. You might want to refer to Public Health Service Drinking Water Standards issued in 1962. It is pointed out in there that numerous pesticides were considered and the Committee decided that it did not attempt to set limits in water at the time. There were a number of reasons - most of the observations had been such that the concentrations of pesticides in water were very low and there is no evidence to show that the low concentrations would constitute a known health hazard. Five to 20 parts per billion was about as high as we had observed at that time. We are finding them more frequently now, however, but they run in parts per million, and parts per billion in water supplies draining areas where pesticides have been applied. Until we can find what is enough to constitute a hazard, I think we cannot be setting safe tolerances in water. It is also set in the chemical limits of the Drinking Water Standards that substances, which might have a physiological effect on the consumer, or when their effects are not known, should not be added to the water supply. I believe this should be considered when you are deciding what pesticide or herbicide to use in the reservoir itself, because this certainly might reach the consumer, and unless we know something about the effect, it would be

desirable to use something else. Surely, copper sulfate is one we've known much about for many years, and if we can use Dalspon, I think this would be the desirable one to use until we can determine another one, notwithstanding we may be accused of approving a pesticide that is manufactured by only one company.

Dr. Emis: First...The problem with Dalspon, it doesn't control the weeds you are interested in.

Mr. Burke: This is a point, it does control some, but it might not control them all.

Dr. Emis: Second...I'd like to ask, on what basis did you say 2,4-D would not be used - because it has been proven to be toxic or because you just don't have any information?

Mr. Burke: We have some information, but the information is not sufficient to decide if it is all right.

Dr. Emis: Do you have any indications from the information available that it is toxic?

Mr. Burke: I'm not a toxicologist, but a sanitary engineer, but our toxicologist, as a precaution, would not recommend its use because of the toxicology. We have that, and that information was furnished to the ARHA. It can be furnished to this committee if it chooses to have it.

Mr. Hall: I might say right at this point, that there are enough questions raised here that I am sure we will have to appoint a working group to represent all sides of this to get at this. Doctor Hayes had a question.

Dr. Hayes: I don't want to propose this as adequate evidence of the toxicity of 2,4-D, but I thought you might be interested in rather dramatic bits of information. We have a record of a case in which a physician treated a man with a systemic fungus disease which was found to prove fatal if not treated, and he reasoned that 2,4-D killed some kinds of plants and perhaps have some effect on the fungus. This was a few years ago. He dosed the patient intravenously with 2,4-D at various doses and got up to 2 grams without having any harmful side effects on the patient and in fact the disease did improve. The patient improved a little bit during this period, but he wasn't cured. He finally went up to even a higher dosage. Typical effects of the poisoning, from which the patient recovered. That, he decided the drug wasn't going to cure the fungus disease and discontinued it, and the man in due course went on to die of the fungus disease, but I submit there are only a certain number of pesticides that you can inject intravenously.

Mr. Burke: I wonder if Doctor Hayes would want to comment on the fact that pyrethrum may have an effect several years later. I wonder if the 2,4-D really killed him or if the fungus disease did kill him.

Dr. Hayes: Well, animals treated the same way continue their life uninterrupted, whereas no one has ever survived this fungus disease in any of your medical journals.

Mr. Ball: Doctor Ennis, I think you had something.

Dr. Ennis: I did want to mention that we had a meeting with these gentlemen regarding this whole matter and it was agreed they needed information that we might have available in Agriculture. The Surgeon General's Office directed a letter to ARS, asking for certain specific information. It has taken time to get this together and Mr. Ward tells us these scientists were here yesterday to receive it. But this has gone back to the SG's Office and responses were given to specific questions such as what herbicides are registered for use on military bases, what pharmacology data do we have, etc. After this information is studied, we thought we could get together again if necessary to iron out any further questions the SG's Office might have.

Mr. Ball: I think it is quite clear that this is not just a problem that affects the military, although it started out as a draft of a circular from one of the branches of the government, it certainly gets into the civilian applications and I believe it's certainly appropriate for DHEC to look into this and to get the information together and I would also say this, that I notice a strong trend now to suddenly discover that we lack information--a tremendous amount of information---and it's not always clear where the burden of proof is on lack of information, but I certainly think where there is an indication of hazard, there is definitely need to get more information. What the actual amounts of 2,4-D would be in reservoirs under recommended conditions of use, I don't know; was data obtained, Doctor Ennis, on this point?

Dr. Ennis: Well, there is some, but there is need for a great deal of additional information. Of course a reservoir could be several miles long and there might be a few cattails or other aquatic weeds in the upper reaches of it, and this could be treated without fear of contaminating the water taken out at the other end; it is almost inconceivable that there would be even detectable amounts when you consider the small total amount used to treat small areas in a large reservoir. If one treated a whole reservoir, then this is another matter. In the final analysis, I think this is a judgment factor of what you can do and what you cannot do. I question the wisdom of a blanket statement that 2,4-D will not be used at all. It can be used safely, I'm convinced.

Mr. Ball: Doctor Hayes mentioned this drastic dosage of 2,4-D. I wonder if there is any data on chronic toxicity of 2,4-D.

Dr. Ennis: This is what I assume Justice Ward was going to put together and send to these men.

Mr. Ball: You wouldn't have any comment on that, Mr. McFarland, from the standpoint of FDA?

Mr. McFarland: Well, we have tolerances for 2,4-D in certain fruits, apples, pears, citrus fruits, and peaches, of 5 parts per million, which originated on the basis of testimony taken at the 1950 spray-residue hearing, but I believe the amount of data presented gave cause for some reservation. FDA has, during the past couple of years, started some toxicity studies of our own. I think they are now complete and what they show led to the evidence that adequate criteria to establish the safety of residues in food is under some question and what we formerly considered sufficient may not today be considered sufficient. Reproduction studies, human feeding studies, that sort of thing, are currently under consideration, in addition to the chronic studies on rats and dogs which heretofore have been considered sufficient, but there is a lot of evidence on the chronic toxicity of 2,4-D available.

Mr. Burke: Is there a tolerance for residues of 2,4-D in milk?

Mr. McFarland: No.

Mr. Burke: In other words, it would be none?

Mr. McFarland: Well, there is no tolerance for any pesticide in milk.

Mr. Burke: That is right, and why should we have one in water?

Mr. McFarland: Well, it would be desirable to have no pesticide in water the same as it is desirable to have no pesticide in milk, but here you are for singling out 2,4-D as against Dalacon and copper sulfate.

Mr. Burke: We consider when we put it in water though, how fast it can go out. Copper sulfate probably goes out pretty fast, whereas some of these organic chemicals don't go out very well; they go right on through. We have tests to show organic chemicals going all the way through the water treatment plant.

Mr. McFarland: We certainly will not contend that because there are tolerances for a certain pesticide on a certain food or a certain group of foods that this means these should be tolerated in water. This is an entirely different consideration.

Dr. Umis: I think there are some possibilities of using these materials where you will not have any residues.

Col. McCall: The purpose of the Army circular is to provide advice to the field on the health hazards involved in the use of herbicides in drinking water reservoirs and to provide a mechanism whereby the commander has a means to obtain medical clearances for those herbicides not covered by the circular. I think that one of our biggest problems in respect to the use of aquatic herbicides is that the Presidential Committee overlooked or ignored the problems in water supplies. To my knowledge, I do not believe there is actually a

regulatory Agency that has the responsibility for registering herbicides for use in water supplies. There is a mechanism in respect to food, wooded areas, irrigation ditches, and other herbicide uses. The lack of a program for clearances on water supply herbicides is a matter of considerable concern.

Dr. Davis: You asked about aquatic herbicides for use in irrigation water?

Col. McCall: Of course, they now register algicides for swimming pools. I don't think they have registered any herbicides specifically to use in reservoirs that you're going to drink out of.

Mr. Hall: I'd just like to get away from herbicides for a moment; this basic question of whether there is any mechanism for this matter of contaminants of water. Could I get some comments directly on the point? From the standpoint of FDA you are not in it, is that right, Mr. McFarland?

Mr. McFarland: We don't feel we have the responsibility here that Public Health has regarding water supplies.

Mr. Hall: This is your jurisdiction, then, Mr. Burke?

Mr. Burke: We don't set them, as the FDA or USDA does, and send out a published list of tolerances. The drinking water standard is the only thing we are using now, but it has open-ended clauses which require a special consideration. Now if we were to find that the water supply is being contaminated, of course we would have to evaluate that whole situation, and make recommendation with regard to how to correct it or whether or not it could be permitted as is. We have numerous inquiries on the use of particular chemicals and it became such a big problem in regard to these new coagulant aids that came out after World War II that we had to set up a special technical advisory committee to look into them. In that case we have published a list of those coagulant aids that could be used in water treatment; that is those which would be safe and acceptable. You can see that list published periodically in American Water Works Association Journal, or you can receive it by inquiring of the Public Health Service. This is the only one we have set up formally, by Committee, or by publishing lists and it is limited to coagulant aids. We have been requested by the Association of State and Territory Health Officers to do something like that in regard to the use of herbicides, but we have not been able to set up anything on that yet.

Capt. LeVan: That was done, the one you mentioned first, because it was for water treatment.

Mr. Burke: That is the reason it was done, coagulant aids are needed in water treatment. Herbicide is used in water treatment, too, for the general control of pests that are harmful to the water supply.

Capt. LeVan: You mean this was in the actual treatment of plants, more so than in soil?

Mr. Burke: Both

Mr. Hall: In the case of detergents, would anyone have authority to limit their use? Would the Public Health Service?

Mr. Burke: We have recommended a limit on detergents that is measured by the alkyl benzene sulfonate (ABS) test. There is a limit of a half a milligram per liter in the Drinking Water Standards.

Mr. Hall: I see, so this, in effect, is a tolerance.

Capt. Halsey: One of the recommendations of the President's Science Advisory Committee is that the National Research Council be requested to look into this question of "safe tolerance" and "no residue". With the refinement of analytical methods, we hear more and more reference to parts per billion and parts per trillion, as you pointed out about copper sulfate and Dalaena. However, there seems to be very little information as to the significance of these minute amounts.

Mr. Hall: Could I ask the tolerance of chlorine in water? Has one been set?

Mr. Burke: There isn't any for chlorine as such. There is for chloride; it is recommended at 250, but this is based on aesthetics. In 1925 there was a limit prescribed for residual chlorine at about a tenth of a milligram per liter. This was because of objection to taste of the chlorine.

Col. McCall: The Army Surgeon General, some years ago, went to the National Research Council on this. Their recommendation, generally speaking, was that there was no requirement for a limit on chlorine residuals, but experience has demonstrated that fairly high residuals are tolerated, and taste was probably the bigger factor than toxicity.

Mr. Hall: The question of water pollution is one for very serious attention and I understand the Ribicoff committee leans in this direction. As far as this committee goes, dealing with pesticides, that 2,4-D is only a pesticide and whether there be any hazard in its use, or in other use, would be something I think is well worth looking into and so I want a subcommittee. I feel, as I indicated before, that this is not solely a military problem, although it started this way, and perhaps be best to have as its Chairman Mr. Justus Ward, since he signed a letter on this and is looking into its uses as regards herbicides; and as the other full members of the committee, I would like to have Mr. Jahann serve regarding toxicology, and Mr. Rumie, who is a specialist in herbicides, USDA, and Mr. Doyle Reed, from the same point of the Army regarding use of herbicides; and then I would like Mr. George Burke of the ARS to join with this committee, and also a representative from the ARS. It is basically important to know what you can recommend or register for use as pesticides. This will have to be confined to pesticides, and specifically herbicides here, with regard to what shows up in water. So Mr. Ward will be

alerted to get the Subcommittee together and I hope we will have a report for the next meeting in September. The next item is date and place of next meeting. We will set, unless we hear otherwise, September 19, Thursday, at the same time, in the same place, for the next meeting; and now before we reach item 7, I want to thank all of you for coming, the program people, and you people of the AERA, FHS, concerned with this last problem we so briefly discussed.

7. Adjournment: at 12:30

W. B. Hill

W. B. HILL
Secretary
Interdepartmental Committee
on Pest Control