Monsanto

St. Louis

May 6, 1968

cc:

AROCLOR RESIDUES IN FISH AND FOWL

TO : C. E. Anagnostopoulos - CANAG
E. S. Robson - EROBS

The attached letter should be of interest to both of you, inasmuch as I believe Aroclors are split between your two groups.

It is another example of the widespread interest in what appears to be a rather insignificant phenomenon; namely, the persistence of polychlorinated biphenyl in some species. As far as the Stanford Research Institute's proposition is concerned, I would be against our doing anything at this time. I think it would be wiser for us to find out what the Government is doing and see where we go from there.

We will continue to follow this matter with any contacts we can establish.

R. Emmet Kelly, M. D.

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att.

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STANFORD RESEARCH INSTITUTE

MENLO PARK, CALIFORNIA 94025

May 3, 1968

Dr. William H. Hunt
Medical Department
Monsanto Chemical Company
800 North Lindberg Street
St. Louis, Missouri 63166

Dear Dr. Hunt:

During a visit with the staff of the Manufacturing Chemists Association in Washington a few months ago, the issue of polychlorinated biphenyl compounds confusing pesticide residue analyses of fish and game came up for discussion. The problems that these compounds can create in the analysis of chlorinated hydrocarbon pesticide residues is well known to you, I am sure We were stimulated to investigate the biological activity of PCB's because of the possible role they might play in environmental health matters. The paper by Holmes, et al., published in Nature [216, No. 5112, page 227 (1967)] presented data on the levels of PCB's found in British fish and wildlife.

Mr. Hicks of your Organic Chemicals Division in Santa Clara, California, was kind enough to supply us with Aroclors 122, 1248, and 1254 a few weeks ago. We also requested a supply of Aroclor 5460 which we assume will arrive in the near future.

We have studied Aroclor 1242 and found it to have an LD_{50} of 58 ppm (34-99 ppm) to goldfish at 15°C in a 96-hour exposure period. At higher water temperatures, this Aroclor is considerably more toxic. Other studies are in progress at present.

In studies with Japanese quail, Aroclor 1242 was included in a practical diet for nine days, but caused no toxic signs at levels we had expected to be lethal. At the end of the feeding period, control and treated birds were studied to determine if there was a difference in barbituate sleeping times. To our surprise, there was a marked decrease in the sleeping time of treated birds as compared to controls. This suggests to us that Aroclor may

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have stimulated enzyme induction in the dietetically treated birds and that the Aroclors are not biologically inert as may have been previously assumed.

We are suggesting for your consideration, that this work be expanded along the following lines:

1. Determine the LD_{50} of Aroclor 1242 to fish at several temperatures to find the extent of its acute toxicity variability.

2. Obtain LD_{50}'s (96-hour exposure) with goldfish at 15°C for other Aroclors, namely 1248, 1254, and 5460.

3. Obtain dietary LD_{50} values (7-day exposure) on Japanese quail for these four compounds. Investigate the enzyme induction activity of Aroclors 1248, 1254, and 5460 by the barbituate sleeptime technique and compare their relative effect with that of 1242.

We would prefer to undertake the type of work suggested here in cooperation with Monsanto rather than seek government support. Since government agencies are already concerned with Aroclors and investigating them with regard to fish and wildlife hazards, we could offer you comparative data.

You are undoubtedly familiar with the publications from our laboratory involving the use of Japanese quail in pesticide studies. Our experience with this bird goes back quite a few years. We feel competent to conduct not only growth, but reproduction and tissue analyses with these birds, if you so desire. We are currently expanding the facilities of our fish toxin research laboratory so that it may be of benefit to both government and industry in the establishment of hazard information.

Last week I spent a day with Dr. Donald I. Mount, Director of the new FWPCA Fresh Water Quality Laboratory in Duluth. This is an active research center. Mount is directing studies which I am sure will produce important information for industry, determining the quality criteria not only of effluent water which comes from plants into public streams and rivers, but also the quality of inflowing industrial water.

I will be on the East Coast May 23rd and 24th, but could stop by to see you and Dr. Emmett Kelley if you desire to discuss our work and suggestions. Otherwise, we await with interest your reactions to the suggested investigations outlined here.

With kind personal regards,

Sincerely,

Gordon W. Newell, Chairman
Department of Agricultural and
Environmental Toxicology

cc: J. Glenn Hicks

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