Monsanto

MAY 7 - 1969

FROM (NAME & LOCATION) P. G. Benignus - General Office

DATE May 6, 1969

SUBJECT AROCLOR--WILD LIFE STUDIES
UNIVERSITY OF DENVER

REFERENCE

TO Dr. R. Emmett Kelly - RKELL
Medical Director

cc H. S. Bergen/D. A. Olson- HBERG
W. R. Richard - WRICH
E. P. Wheeler - EWHEE

Mr. E. L. Raab
General Electric Company
Pittsfield, Massachusetts

Mr. E. L. Raab, Manager of Insulation Systems, General Electric Company, Pittsfield, Massachusetts, through knowledge about the biological reports pertaining to Aroclor found in wild life, induced his acquaintances at the Denver Research Institute to present to us their facilities for studies in these areas.

As you well know, General Electric are the largest user of Aroclor dielectrics.

Enclosed is a letter from the Denver Research Institute and their brochure describing their organization and facilities.

Please respond to Dr. John A. Young. Thank you.

P. G. Benignus

/ecd
Enclosure

University of Denver
COLORADO SEMINARY

DENVER RESEARCH INSTITUTE UNIVERSITY PARK, DENVER, COLORADO 80210

2 May 1969

Mr. Paul G. Benignus
Monsanto Chemical Co.
800 N. Lindbergh Blvd.
St. Louis, Missouri 63166

Dear Mr. Benignus,

I have recently learned from Mr. Edward L. Raab that Monsanto is becoming concerned about possible harmful effects of Aroclors on wild life, and that a research program to investigate this danger is being initiated by your firm. If this is so, the Denver Research Institute would like to offer its services in performing the work, and I am writing to acquaint you with our capabilities. Since at this time we have no knowledge of the precise directions which you intend to follow, I have taken the liberty of outlining very briefly some phases of such a program in which our services might be helpful. I have also included some professional data on the personnel who might be involved, and have enclosed a brochure describing the Institute in general.

The program might be divided into three parts: (a) development of accurate, reproducible, and sensitive analytical methods for trace amounts of chlorinated materials, capable of discrimination between Aroclors and other highly chlorinated residues derived from pesticides, (b) determination of toxicity and/or concentration effects in animals, to be carried out concurrently with (a), and (c) elucidation of transport mechanisms, both physical (dissemination of Aroclors in the environment) and biological (transmission along natural food chains). This last part would be necessary only if both the presence of Aroclors in the environment and the harmfulness of such presence were firmly established.

The Denver Research Institute would be quite competent to develop analytical methods for Aroclors in the ppb. range. We feel that present methods could be substantially improved by use of mass spectroscopy in conjunction with chromatography, as the latter discriminates only indirectly (by appearance times, compared with standards) between various halogenated molecules, whereas the former allows unequivocal assignment of structure. The Institute has operated for the last year a very sophisticated v.p.c./m.s. train and has acquired considerable expertise in its use for separating and identifying components in shale oil. Chlorinated aromatics should be excellent subjects both for detection by electron capture, following chromatographic separation, and for identification by mass spectroscopy.

The Institute itself has no facilities for animal feeding, which would be necessary in the second part, but we have in the past cooperated with Colorado State University in setting up programs of this type. The feeding would be done at CSU and the post-autopsy analyses at DRI.

Assuming that experiment demonstrated clearly that Aroclors rather than other highly chlorinated residues were indeed responsible for harmful biological effects, it would be necessary to determine possible transport mechanisms. In the biological aspect of this problem, isotope labelling would be very useful in tracing the passage of chemicals through an organism and possible concentration in individual organs. DRI has an isotope laboratory fully equipped for the particle counting involved in such tracer studies. We also have some ideas on possible biological vectors in transmission of Aroclors down the food chain. The problem of physical dissemination of Aroclors in the environment would be first attacked by analysis of air and water samples taken in the vicinity of installations using such materials.

Personnel who might be employed on this program include the following.

Dr. Josef J. Schmidt-Collerus. Dr. Schmidt-Collerus heads the Chemical Section of DRI and holds a joint appointment as Senior Research Chemist at DRI and Professor of Chemistry at Denver University, teaching graduate courses in infrared, nuclear magnetic resonance, and mass spectroscopy, and in biochemistry. He was educated in Europe at Universitie of Vienna, Prague and Frankfort/M and has a Ph.D. degree from University of Frankfort and Prague. He was a Research Fellow at the Paul Ehrlich Institute for Experimental and Chemo-therapy in Frankfort/M, Germany. He directs the Center for Oil Shale Research at DRI, is a member of an international committee on oil shale research, and has done recent work on the geochemical origin of uranium deposits.

Dr. John A. Young. Dr. Young, who holds B.A. and M.A. degrees from Wesleyan University and a Ph.D. from the University of Florida, is presently Senior Research Chemist at DRI and Associate Professor of Chemistry at Denver University. He has published over thirty papers on organic fluorine chemistry and has taught courses in infrared spectroscopy, organic analysis, organic synthesis, and fluorine chemistry. He is chairman of a divisional ACS committee, a member of a national ACS committee, and was one of the organizers of the 4th International Symposium on Fluorine Chemistry. He has recently worked in the areas of high-energy compounds, high temperature polymers, and herbicides, and has had research support from most of the national research agencies, as well as from industry. He is familiar with chlorinated aromatics, having had five years' experience with the General Electric Co. at their Pittsfield laboratory.

Mr. George E. Bohner. Mr. Bohner (M.S., Texas Technological Institute) is a specialist in gas chromatography. Over the past year, he helped develop the v.p.c./m.s. interface system which is now being used very successfully in DRI's mass spectroscopy laboratory for analysis of samples in the nanogram range.

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With the facilities and personnel described, we feel that the Denver Research Institute could make a substantial contribution in settling the question of environmental pollution by Aroclors. If there is a possibility of collaboration, we would be glad to submit a formal budgeted proposal, and would like to meet with Monsanto personnel to discuss the problem in more detail. You would be very welcome to examine our facilities and meet our staff, should such a meeting be arranged in Denver.

Yours sincerely,

John A. Young

JAY:mcl