COLLEGE OF ARTS & SCIENCES

NEW YORK STATE COLLEGE OF AGRICULTURE
A Statutory College of the State University

CORNELL UNIVERSITY
DIVISION OF BIOLOGICAL SCIENCES
ITHACA, N. Y. 14850

SECTION OF ECOLOGY & SYSTEMATICS

December 18, 1969

Dr. William H. Bromley,
Vice-President, Plastic Products,
Monsanto Chemical Company,
800 N. Lindbergh Blvd.,
St. Louis, Missouri
63166.

Dear Dr. Bromley,

Our group at Cornell has been working for some time on the biological effects of sub-lethal doses of DDT and dieldrin. We have also carried out some preliminary work on the polychlorinated biphenyls. It seems to me that facts about the effects of PCB's on biological systems are of interest not only to the ecologist but also to the manufacturer since, with the wide-spread concern over environmental changes, he is liable to be held responsible. I wondered if you would consider it worthwhile to sponser some research along these lines. Two possible advantages would be that we are already working along these lines and second that research from an independent institution might carry more weight.

We are interested in looking at some or all of the following systems which have been shown to be affected by DDT at environmental levels:-

(1). Hepatic enzyme induction. We have already demonstrated that PCB's induce hydroxylating enzymes in the pigeon and kestrel. However we are interested in studying the results of these effects in the intact animal as we have for DDT.

(2). Inhibition of carbonic anhydrase. This enzyme is involved in the hydration of carbon dioxide and is found in red blood cells, the kidney, the eye, and the cerebrospinal fluid of most vertebrates, it is also present in a number of marine organisms. We have recently demonstrated the inhibition of this enzyme by DDE in the avian oviduct and that this is accompanied by the formation of thin egg shells. Dieldrin does not have this effect.

(3). Inhibition of ATPase. Recent studies have shown that DDT inhibits ATPase in the cockroach, honey bee and in the brains of rabbits and rats. Research in this area appears to be limited to the DDT group, lindane, and chlordane.

(4). Glucose-6-phosphate dehydrogenase. This enzyme catalyses the oxidation of glucose-6-phosphate by TPN and this pathway is important in glucose metabolism and in the generation of TPNH. Decreased activity of this enzyme has been demonstrated following treatment with DDT. The physiological importance, if any, of this effect has not been examined, nor has the effect of other chlorinated hydrocarbons.

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W. H. BROMLEY

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The major equipment necessary for this work is available in our section. This includes a Varian Aerograph Gas Chromatographic Unit(Model 2100) for residue analysis, high speed centrifuge, and multi-channel scintillation counter. The cost of research would largely be that of technican's salary and supplies, roughly $8000 per year per technican.

If you are interested we could discuss specifics; however I feel that I should point out that while we would supply progress reports and drafts of articles we would insist on complete freedom of publication.

Looking forward to hearing from you,

Sincerely yours,

David B. Peakall, Ph.D.
Senior Research Associate

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