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SCHOOL OF MEDICINE
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Mount Sinai School of Medicine • The Mount Sinai Hospital



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John F. Brown, Jr., Ph.D., Manager
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Dear Dr. Brown:

Thank you for sending me a copy of your letter to NIEHS. The studies surely add to our information concerning this complex problem, and gives us initial hard data on a question which, as you know, we have considered essential to the PCB problem.

However, several questions remain unanswered which I hope will not be neglected. Our concerns with the problem of PCB contaminating biologically active residues has, in fact, been further complicated by these findings and by other recent reports: we must consider not only dibenzofurans, but polychlorinated terpenyls and quaterphenyls, and now, clearly, the diphenyl ethers and chlorinated benzenes. The admixed chlorinated benzenes are inherently biologically active; the tetra- penta- and hexa-isomers are biologically persistent; and they apparently serve as chemical precursors to diphenyl ethers, and thus inevitably to dioxins and dibenzofurans. The latter seems likely, since chemical precedents for such oxidative coupling exist, and since the diphenyl ether concentrations are probably higher than can be accounted for by their presence in the original mixture.

It is important that we now know that Aroclor 1260 itself, albeit with different additives and stabilizers than that in the used Aroclor analyzed, had low (if any) PCDF concentrations. However, it would be premature to dismiss the likelihood of PCDF in the used transformer oil, since the concentration of diphenyl ethers seems high enough to obscure low level PCDF analysis.

Of course, this situation cannot necessarily be extrapolated to "unused" 1242-1254's, where PCDF's, especially the more toxic tetra- and penta-isomers, are more likely to form and have indeed been detected at significant levels by the Japanese.

It could be that the presence of chlorinated benzenes might well serve an antioxidant function in transformer fluid, with formation of phenyl ethers to the exclusion of intermolecular or intramolecular oxidative coupling of the biphenyls, by scavenging the available oxygen. In heat-exchange fluids, the formation of PCDF's and PCQ's

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would be more likely. So the question of PCDF's in used Aroclors needs further clarification.

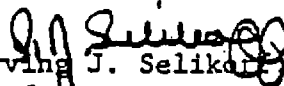
Again, the material you made available to NIEHS was very helpful in allowing the additional studies to be done, and further progress thus made. With regard to the other analyses that are necessary, it would surely be a tedious analytical problem. Dr. Mary Wolff suspects that Dr. Rappe's group might be able to approach it, since they have done such work before, although possibly not with such high levels of diphenyl ethers. It is because of that possibility that Dr. Wolff and Dr. Fischbein have looked to exploring with you the possibility of obtaining used oil from transformers and heat-exchange fluids, with similar quality control batch lots of unused fluids, available to you. Do you think this latter is feasible?

Finally, since the biological effects of PCB's have generally been investigated without such admixtures, we need as much information as possible that would sort out potential interactions.

Again, my thanks for making your thoughts available to us.

With all best wishes for the Holiday Season and the New Year!

Sincerely yours,


Irving J. Selikoff M.D.
Professor

IJS:jm

cc: Dr. Mary S. Wolff
Dr. John Welch
Dr. Thomas Casey

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