CONFIDENTIAL

TO: DR. J.W. BARRETT.

19th August 1955.

DVNH/MEB

AROCLORS -
TOXICOLOGICAL EXAMINATION

c.c. Dr. J.A. Gardner.
Dr. W.McG. Morgan.
Mr. W.E. Hamer
Mr. C.G. Wickham
Dr. H.R. Newman.
Dr. D.S.P. Rosebuck.
Mr. J.S. Hunter
Mr. E.L. Pixton.
Mr. N.G.H. Thomas.
Mr. J.A. Brindle.

Further to my memo of 9th August, I propose to summarise the present position on Aroclor vapour toxicity as an essential background to our policy and to our consideration of the Battelle proposal for a programme of toxicological work.

I have indicated in my summary of the two reports by The Kettering Laboratory that prolonged exposure (7 hours a day for 150 days) to Aroclor 1254 vapour at 1.5 mgrm./$m^3$ caused slight but positive signs of injury in test animals and that similar experiments with Aroclor 1242 gave negative results at 1.9 mgrm./$m^3$. As I see it this positive result with 1254 would be construed by Public Health Authorities as an indictment of Aroclors as a class, and the negative result with 1242 would not rank as a clearance for that particular chlorinated diphenyl. To upset the one positive result with 1254 would require much more than a simple re-investigation, since it would be necessary to demonstrate by an even more exhaustive and searching investigation that the Kettering observations were mistaken. Even then, the work would probably not be decisive until confirmed by an independent authority.

During the near future, at any rate, our consideration of the suitability of Aroclors for specific applications must be governed by this finding that prolonged exposure to Aroclor vapour at 1.5 mgrm./$m^3$ can produce damage to the liver and kidneys of test animals. In translating this finding to the human being it is the recognised practice to employ a safety factor of 10; in other words when the maximum, safe concentrations for test animals has been located, the corresponding value for the human being is taken as one tenth of it. With 1254 we now know that 1.5 mgrm./$m^3$ is <u>above</u> the maximum permissible concentration for

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test animals so that the maximum for human beings must be placed below 0.15 mgrm./$m^3$, and must be regarded as applying to all Aroclors, on account of their similar chemical constitution.

Our own analytical work with a room painted with Aroclor 1248 plasticised Lustrex Latex paint affords evidence that Aroclor concentrations of the order of 0.5 mgrm./$m^3$ can prevail for a month; we have not so far attempted to develop the more refined analytical technique necessary to determine with reasonable precision concentrations in the range of 0.1-0.5 mgrm./$m^3$. This development would be a difficult assignment and when available it would only permit us to determine the time to reach 0.15 mgrm./$m^3$ and hence the time during which a person could be exposed to concentrations greater than what must now be regarded as the maximum permissible.

Previously on the basis of published work the value has been taken variously at 0.5 or 1 mgrm./$m^3$ and Monsanto has normally used the higher figure. On that basis it could be argued that exposure to a concentration at or above the maximum permissible would be of short duration and that any hazard was of marginal significance.

However, we now have to reckon with a fairly long exposure to concentrations above the new maximum, and hence the hazard must be rated much greater. There is yet a further consideration that is always taken into account by Health Authorities, and this relates to the idiosyncrasy factor. So far we have considered the <u>average</u> human being, but there will always be a minor proportion more susceptible than the rest. This may be due to the natural variability of resistance or predisposition existing among healthy individuals, or to functional disability, and in assessing a human hazard consideration is always given to those individuals who are more likely to suffer injury; in this case presumably those possessing impaired livers and kidneys would be most likely to suffer first.

If the argument I have presented above is accepted then we must now line up with M.C.C. in withdrawing our recommendation that Aroclors be used as plasticisers in Lustrex Latex paints. As regards the use of Aroclors in P.V.A. paints, we have so far made no measurements of Aroclor concentrations in painted rooms, but I see no reason for believing that materially reduced concentrations would be found.

We have still to examine the position of Aroclors in ordinary paints. Here I have argued that the rate of volatilisation will be greatly reduced and probably governed by the rate of migration within the dry paint. It now seems possible that a hazardous concentration could



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be attained in a room in which a large area is painted with Arcolor-containing paint. Certainly we must say that these paints must not be used on hot surfaces such as radiators and hot-water pipes.

D.V.N. HARDY.

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