AROCLOR TOXICITY INVESTIGATION

AT KETTERING LABORATORIES

In two experiments (No. 1 and No. 2) exposures have been completed in which animals were subjected to the vapor of Aroclor 1242 in concentrations that approached saturation and which were much greater than any that would normally be anticipated in operations. A similar experiment has been conducted with Aroclor 1254 (No. 1). The Aroclors were volatilized from a heated well as described in "The Physiological Response of Animals to Cyclohexane, Methylcyclohexane, and Certain Derivatives of These Compounds. II Inhalation", (by Treon, Crutchfield and Kitzmiller. J. Indust. Hyg. and Toxicol. 25:323, 1943). Another group of control animals (No. 1) were simultaneously placed in a chamber for 7 hours per day. These chambers were all conditioned with the respect to dust, humidity and moisture, but no Aroclor was metered into the third chamber. The duration of exposure, the concentration of Aroclor found in the chamber and the temperature to which the Aroclor was heated are given in Table 1. Conditions of operation of other experiments now in process, and in which the concentrations of Aroclor are at somewhat lower levels, are given in Table 1a.

Those completed experiments in which the vapor approached saturation will be discussed first. The mortality among the animals has been summarized in Table 2 and their growth has been given in Table 3. The ratio of the weight of the organs to the body weight of the survivors (Aroclor 1242, Experiment No. 2, and Aroclor 1254, Experiment No. 1) has been compared statistically (Table 4) with the comparable findings on the controls (Experiment No. 1). The effects upon the apparent prothrombin content for the experimental and control animals are presented in Table 5. The effects upon the numbers of erythrocytes and leucocytes and hemoglobin content of the peripheral blood are shown in Tables 6 and 7.

The findings obtained upon the experiments in which the vapor approached saturation may be summarized as follows:

1. No signs of intoxication appeared among a group of animals, all of which survived throughout a period of 24 days, during which they were subjected to the inhalation of air bearing 8.6 micrograms of Aroclor 1242 per liter (0.83 p.p.m.) for 7 hours on each of 17 days. Microscopic examination of the tissues revealed no alterations.

2. The incidence of mortality among all but rabbits in 2 groups of animals exposed for 7 hours on each of 82 or 83 days over a period of 120 or 121 days to air bearing, respectively, Aroclor 1242 in the concentration of 6.83 micrograms per liter (0.66 p.p.m.) and Aroclor 1254 in that of 5.40 micrograms per liter (0.41 p.p.m.) was no greater than that among a similarly constituted control group. The survivors with the exception of the guinea-pigs, grew equally as well as did the controls. The average weights of their livers and kidneys relative to the body weight of the animals exposed to Aroclor 1242 did not differ significantly from the values found in the unexposed group, but the livers of the rats in the groups subjected to Aroclor 1254 were enlarged. The prothrombin content of the blood of the animals exposed to either Aroclor as measured by the method of Kato remained within normal limits. Changes in a few blood determinations were believed unrelated to the exposure because they were small and irregular. Upon microscopic examination of the tissues the only significant visceral lesion found was degeneration of the liver. The pathologist commented that at these conditions these materials do not appear very toxic. It should be noted that in these experiments the concentrations approached saturation and were greater than any likely to be encountered in practice.

Because of the few positive effects in the experiments which approached saturation other experiments at lower concentrations are in progress (Table 1a). In these experiments the mortality has not been much different than that encountered among the controls (Table 8). Gross examination of the tissues of the mice that have died in the second experiment with Aroclor 1254 indicate their deaths were due to incidental causes that were unrelated to the exposure. Except for the guinea-pigs the experimental animals have grown as well or better than the controls (Table 9).

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