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December 17, 1974

Dr. Donovan Gordon  
Industrial BIO-TEST Laboratories  
1810 Frontage Road  
Northbrook, Illinois 60062

Dear Don:

As a follow-up to our phone conversation yesterday, I am sending you copies of the information on Aroclor 1260 study which was sent to me by Dr. Kimbrough. You may find this informative in preparing for your subsequent discussion with them.

When you have had a chance to review your schedule, would you kindly let me know what days may be convenient for a meeting. This probably will be in the Washington area and I anticipate that you, Renate Kimbrough, Bob Squires and I will attend.

Sincerely,

George J. Levinskas, PhD  
Mgr., Environmental Assessment  
and Toxicology

/bkp  
att.

cc: Dr. J. C. Calandra

bcc: W. B. Papageorge (+ att.)

DSW 037312

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DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
PUBLIC HEALTH SERVICE  
CENTER FOR DISEASE CONTROL  
ATLANTA, GEORGIA 30333  
TELEPHONE (404) 633-1311

December 6, 1974

Dr. George Levinskas  
Monsanto Industrial Chemicals Company  
800 N. Lindbergh Boulevard  
St. Louis, Missouri 63166

Dear George:

I am enclosing a brief outline of the experiment Aroclor 12-72-A  
for your information. A copy of Bob Squires letter is also enclosed.

Sincerely yours,

*Renate*

Renate D. Kimbrough, M.D.  
Toxicology Branch

Enclosure

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Aroclor 12-72-A

Animals

Random bred female Sherman strain rats reared under specific pathogen-free conditions were obtained from the NCDC animal farm at Lawrenceville, Ga.

Aroclor 1260

Aroclor 1260 (Lot number AK-3) was supplied by Monsanto Industrial Chemicals Co., St. Louis, Mo.

Statistics

The students t-test was used for comparing body weights and weight gain.

Methods

Four hundred 21-26 day-old weanling female rats, weighing 48-97 g, were distributed into 2 groups of 200 animals each according to a table of random numbers. Each animal was weighed and given an individual ear tag number. The animals were housed 10 rats per cage. Food and water were provided ad libitum. Two hundred animals were fed the control diet of ground Purina laboratory chow; the test animals were fed the same diet fortified with 100 ppm Aroclor 1260.

Aroclor 1260 was incorporated into the diet by dissolving 5.2 g in ethyl ether then adding this to 100 g corn starch and allowing the ether to evaporate. The PCB-cornstarch mixture was blended with 345 g ground chow, then pulverized in a mortar and diluted with additional ground chow in a bakers mixer to give a 1000 ppm concentrate. The concentrate was further diluted to obtain 50 kg of 100 ppm diet. The diet was prepared every 10-14 days. Random samples from the final mixes along with samples of control chow were taken at regular intervals to determine PCB levels in the control chow and to verify the 100 ppm fortification level. Ground laboratory chow was also checked at intervals for aflatoxin at the district office of the Food and Drug Administration in New Orleans.

The combined body weight of rats in each cage was recorded weekly until the rats were 6 months old, bi-weekly until 12 months old, and monthly thereafter. Individual weights were recorded only at the onset of the experiment and at death or sacrifice. The animals were observed

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briefly each day and animals exhibiting debilitating signs or large tumors were removed from the group cage and housed individually. At each weighing the animals were examined individually and abnormalities noted. Food consumption was measured on all rats during the first two weeks of the experiment, then during weeks 5, 8, 11 and 20 and every 12 weeks thereafter. Autopsies were performed on all rats that died. Rats that were sacrificed were killed under ether anesthesia by severing the vena cava. Tissues were fixed in buffered formalin and stained with hematoxylin and eosin. Additional special stains will be conducted.

### Results

During the course of the study 4 animals in the test group and 8 controls were sacrificed prior to the final kill. These animals had either large tumors which had ulcerated or hindered movement, or the animal appeared moribund. In all, 14 animals in the test group died; 17 animals in the control group died. One animal was accidentally killed in each group early in the study.

No definite dose related signs of toxicity were observed in the test animals throughout the study. Comparative curves of body weight gain and food consumption on the basis of body weight, as well as PCB intake of the test group are given in Figure 1. A slight decline in the rate of weight gain of the test group compared to the control group began about 3 months after onset of the experiment. Mean final body weights were 420 g (S.D. 72, S.E. 5.4) for the control group and 392 g (S.D. 62, S.E. 4.6) in the test group; the difference was statistically significant ( $p < 0.001$ ). Food consumption (gm/rat/day) was comparable in both groups throughout the study. Mean weight gain was 350 g (S.D. 70, S.E. 5.3) and 323 g (S.D. 60, S.E. 4.5) for the control and test groups, respectively; the difference in weight gain was also statistically significant ( $p < 0.001$ ). PCB intake declined from 11.6 mg/kg/day during the first week of exposure to 6.1 mg/kg/day at 3 months of exposure and to 4.3 mg/kg/day at 20 months. A 6 g mean weight loss occurred in both control and test groups during the 6 weeks prior to the final kill.

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Preliminary List of Microscopic Findings (Kimbrough)  
Please Note: Sections of All Tissues Listed  
Were Not Available for All Animals

| <u>Tumor Type</u>                                                   | <u>Controls</u>    | (Tissue of one rat autolyzed)<br><u>Experimental Rats</u> |
|---------------------------------------------------------------------|--------------------|-----------------------------------------------------------|
| Mammary Gland:                                                      |                    |                                                           |
| Fibroadenoma                                                        | 19                 | 14                                                        |
| Adenocarcinoma                                                      | 7                  | 0                                                         |
| Pituitary:                                                          |                    |                                                           |
| Chromophobe Adenoma                                                 | 38                 | 30                                                        |
| Carcinoma Pituitary                                                 | 0                  | 1                                                         |
| Uterus:                                                             |                    |                                                           |
| Endometrial Polyp                                                   | 20                 | 23                                                        |
| Endometrial Sarcoma                                                 | 2                  | 3 and 1 adenocarcinoma                                    |
| Thyroid:                                                            |                    |                                                           |
| Medullary Cell Tumors<br>(parafollicular)                           | 26                 | 18                                                        |
| Liver:                                                              |                    |                                                           |
| Nodular Hyperplasia                                                 | 3 (8188,8192,8232) | 7                                                         |
| Nodular Hyperplasia<br>and Hepatomas                                | 1 (8231)           | 154                                                       |
| Nodular Hyperplasia,<br>Hepatomas, and Hepatocellular<br>carcinomas | 0                  | 14                                                        |
| Adenofibrosis                                                       | 0                  | 4                                                         |
| Bladder:                                                            |                    |                                                           |
| Papilloma                                                           | 1 (8317)           | 0                                                         |

In addition, a number of other occasional tumors were found.

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Preliminary List of Microscopic Findings - Page 2

Out of this group, 4 control rats and 4 rats in the experimental group were sacrificed early because they were sick. All tumors of these animals, outside of the liver lesions, are included in the preceeding list. The liver lesions need to be added. The animals are as follows:

Controls

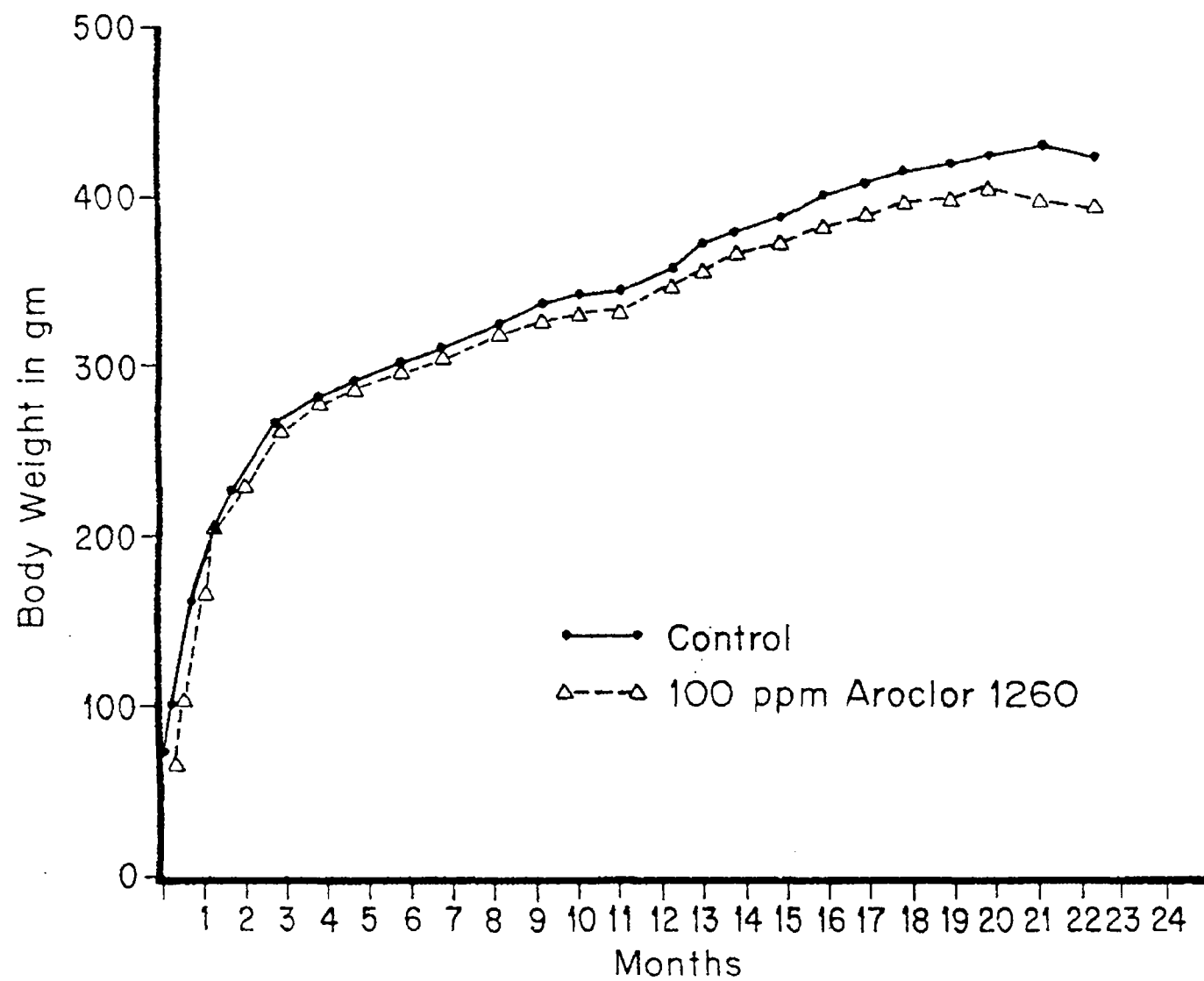
8194  
8151  
8121  
8254

Experimental

8331  
8347  
8413  
8517

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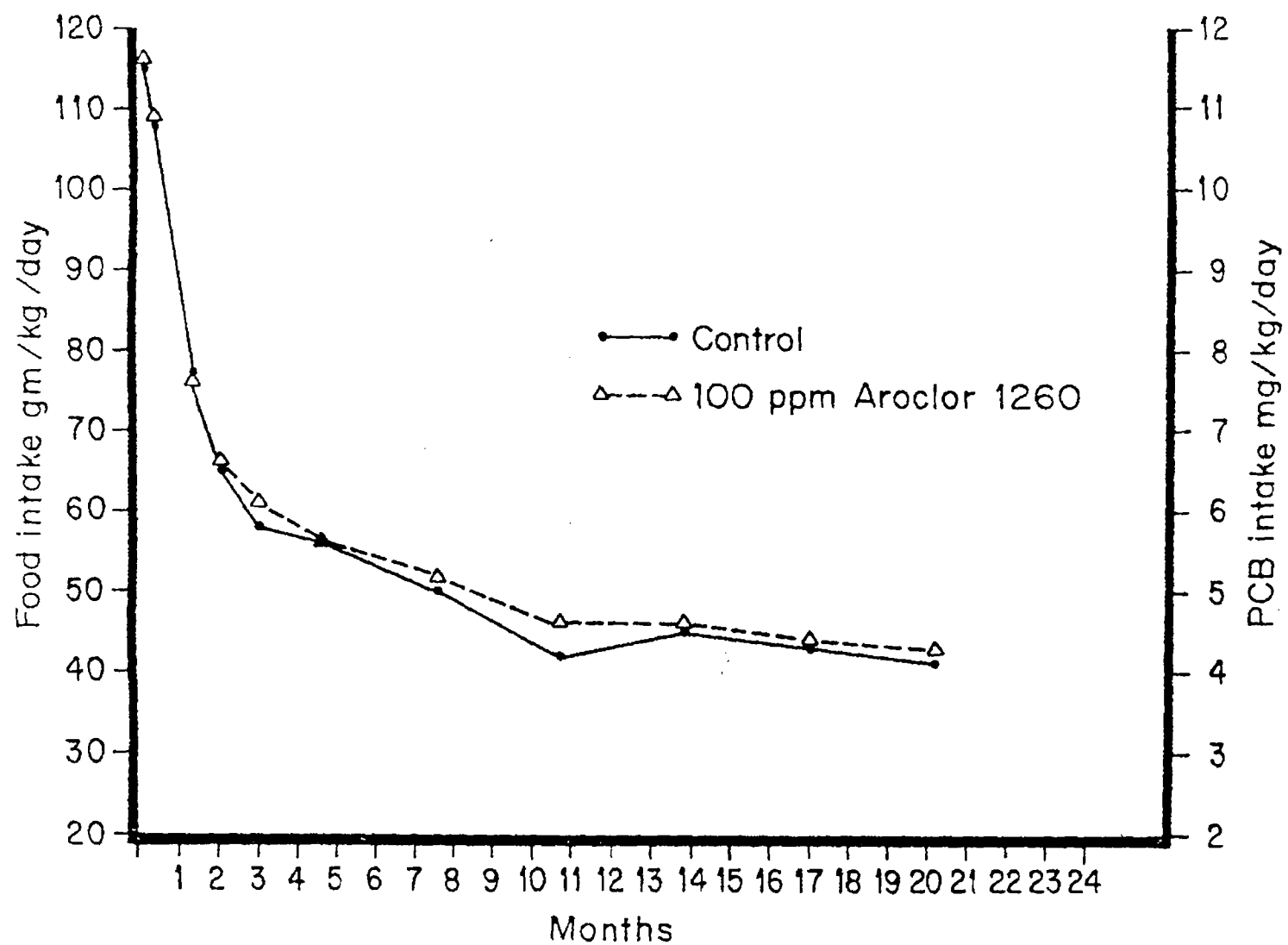
Figure 1 BODY WEIGHT



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Figure 2 FOOD INTAKE AND PCB CONSUMPTION



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