DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
ATLANTA, GEORGIA 30333
TELEPHONE [illegible]

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

MONS 092700

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 aflotoxin 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

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 accidently 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

Tumor Type	Controls	(Tissue of one rat autolyzed) Experimental Rats
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 (parafollicular)	26	18
Liver:		
Nodular Hyperplasia	3 (8188,8192,8232)	7
Nodular Hyperplasia and Hepatomas	1 (8231)	154
Nodular Hyperplasia, Hepatomas, and Hepatocellular 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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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	Experimental
8194	8331
8151	8347
8121	8413
8254	8517

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Figure 1 BODY WEIGHT

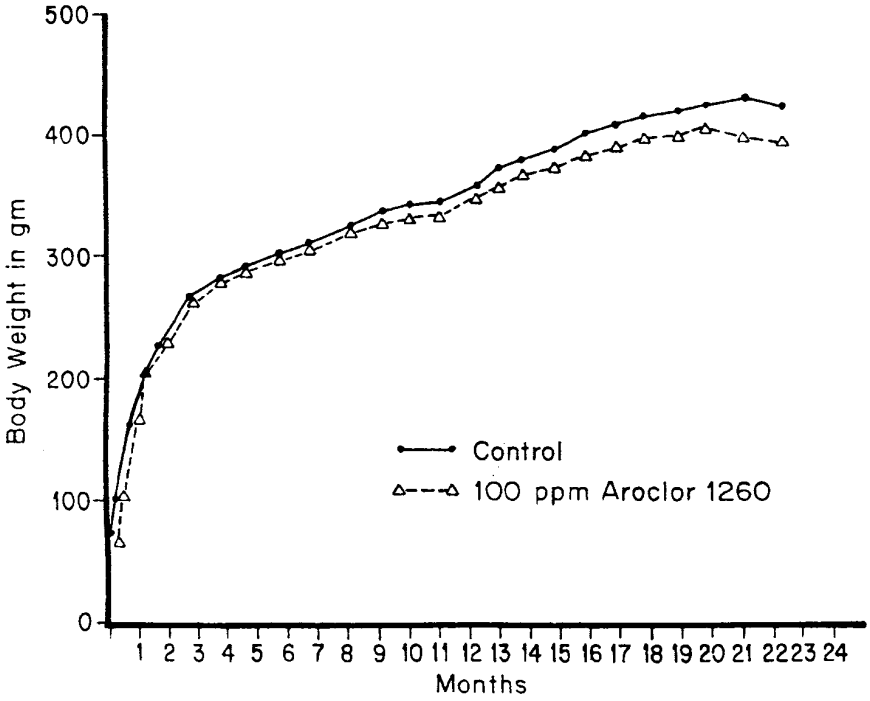

Figure 2 FOOD INTAKE AND PCB CONSUMPTION

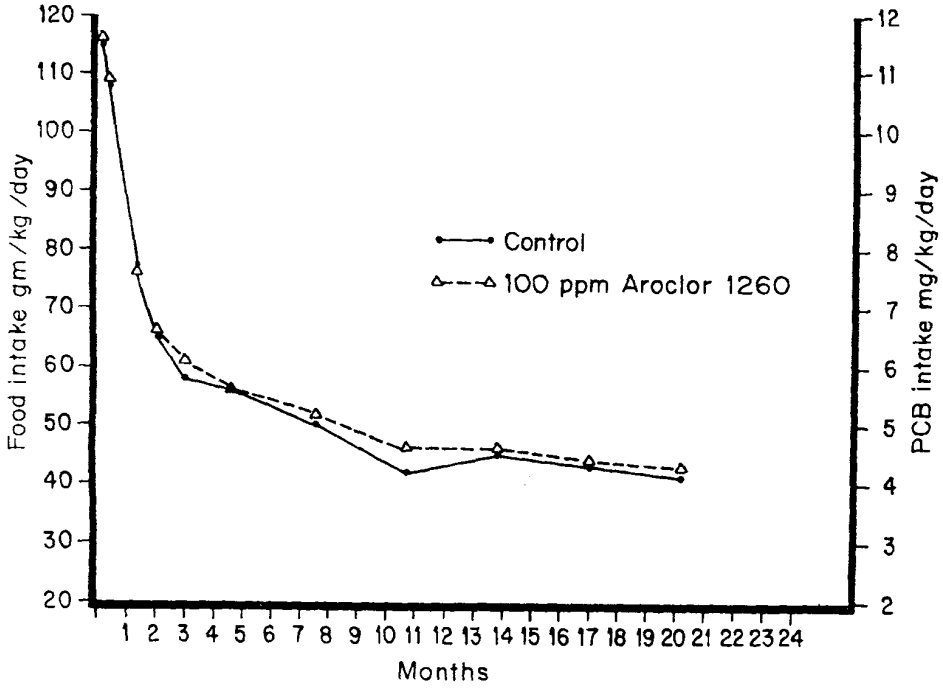

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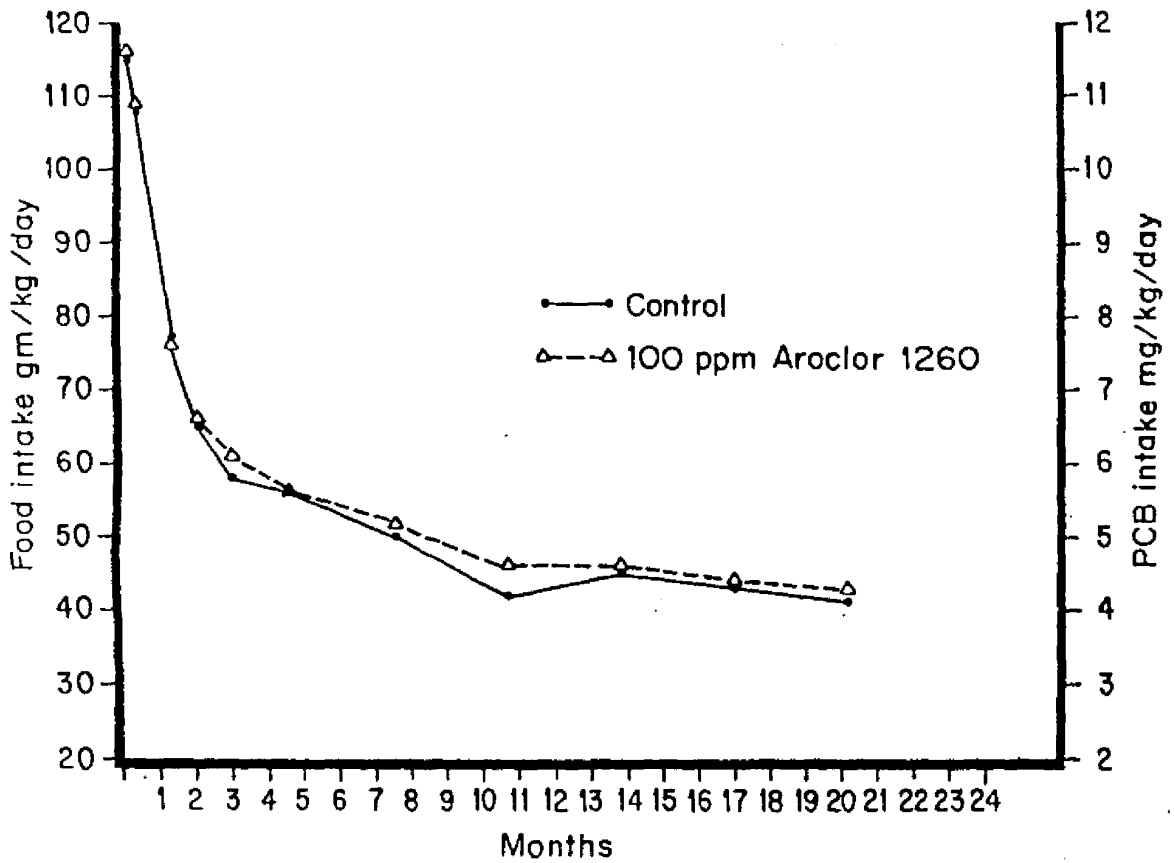
Figure 2 FOOD INTAKE AND PCB CONSUMPTION



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