

Monica

Carroll

FROM (NAME & LOCATION)

D.S. CAMEL J - Brussels

DATE

2nd October 1970

cc:

P.J.A. MARSH - Brussels

SUBJECT

PCB Conference at Stockholm

H.A. VODDEN - Ruabon

REFERENCE

DSC/jab

TO

:

W.B. PAPAGEORGE - St. Louis

Attached is a list of all the delegates to the Stockholm Conference and copies of the various papers that were presented.

The proceedings of the entire conference including what was said in the Discussion Period, will eventually be circulated to all participants, I have asked for two copies so one should be available for you.

The paper we prepared for this event failed to reach Stockholm in time for prior circulation and it was not read during the Conference. I do not know whether or not it will be included in the official proceedings but I would imagine this is quite likely.

Bayer made a very modest contribution on the plasticizer applications of PCBs and this should be included as will the Prodelec paper. Incidentally, one or two alterations were made to the Prodelec paper before it was presented - all reference to quantities were eliminated so as to remove any opportunity for the participants to question us about Sales volumes, market participation.

I found this conference something of an anti-climax since most of the papers seemed to be largely a repetition of information that had already been published. Nothing that was really controversial came up and unfortunately, nothing that was said is likely to bring any pressure to bear on the other manufacturers for swift action. I had been hoping that this public exposure of Bayer and Prodelec would have been beneficial from this point of view.

The speaker from Finland indicated there was some pressure being brought upon the Government for regulation on PCBs. He was also the only one to complain about the lack of sales statistics as an inhibiting factor.

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Dr. Westoo made her expected comments upon the level of PCBs in many food stuffs in Sweden and in human milk and a speaker from the Swedish Poison Board also commented rather emotionally upon the rapid destruction of their environment but in general there was not too much emotion.

Dr. Berlin commented upon the lack of toxicity data on PCBs so we took the opportunity to describe the nine month results of our studies with rats and dogs. The later data, refers to your memo 22nd September, has not yet been received. You will notice that Dr. Berlin also commented upon the Biphenyl incident at Nokia in Finland. Since Press people were present I did not think this was a suitable forum to dispute his statement that this was a case of Biphenyl intoxication but it may well be that Dr. Kelly might like to correspond with Dr. Berlin on this matter. Alternatively, he may feel it better to let it rest.

My understanding is that Biphenyl poisoning was never proved, and all that was known is that the man died of some poisoning and he had been working with Biphenyl for eleven years. He had also been working for the same period of time with all the other ingredients in the coating formulation.

Finally, Dr. Eric Eranius from Stockholm University, suggested we should get in touch with Dr. Douglas Warf of the Department of Health, Education and Welfare in Rockville if you are not already in contact with him. Dr. Eranius suggested that Dr. Warf would be interested in carrying out very detailed studies using sophisticated techniques on the livers, (and possibly other organs) taken from the animals that are sacrificed during the feeding trials. He felt we might be wasting an opportunity by merely carrying out rather superficial examinations of the liver instead of using the latest techniques apparently available to Dr. Warf. These would include a study of individual cell behaviour following PCB ingestion.



D.S. CAMERON

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ENVIRONMENTAL PROTECTION BOARD
Research Secretariat

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C a s e s

H. Danielson, Ut

September 9, 1970

Dnr 5160-7-70

P R O G R A M
for
P C B Conference

September 29, 1970

in the "Werner Gren Center" (session hall, annex building)
Sveavägen 166, STOCKHOLM

Chairman: KARL FRIMMER, Prof., M.D., Natl. Inst. of Public Health, STOCKHOLM

0900-0910 Introduction

RICHARD HENRIKZ, Ph.D., Natl. Environment Protection Board, SOLNA

0910-0930 PCB as contaminant of the environment - history

ROBERT SUNDIN, Ph.D., Natl. Environment Protection Board, SOLNA

0930-0940 Discussion

0940-0955 PCB - uses in industry

PIERRE JAY, Ph.D., P E O D E R H A C, BOCHERS (France)

0955-1015 PCB - experiences in Finland

WILHELM KEMMELI, Ph.D., State Game Research Inst., HELSINKI (Finland)

1015-1025 Discussion

C o f f e e b r e a k

1045-1105 PCB - occurrence in Swedish wildlife

ALF C. JOHANSSON, Prof., Ph.D., Sw. Museum of Natural History, STOCKHOLM

1105-1115 PCB - effects on mammals

LENNART BERGMAN, Prof., M.D., Univ. of Lund, LUND

1115-1125 PCB - effects on birds

JURGEN BECKMANN, D.V.M., Natl. Poisons and Pesticides Board, STOCKHOLM

1125-1135 PCB - indications of effects on fishes

KERST JOHANSSON, Ph.D., Salmon Research Inst., ÅRVÄRMBY

1135-1145 Discussion

L u n c h

1300-1310 PCB - synthesis and radioactive labelling (≤ 4 Cl-atoms)

LENNART BERGMAN, Ph.D., Univ. of Lund, LUND

1310-1320 PCB - synthesis and radioactive labelling (≥ 4 Cl-atoms)

CARL ALBIN LARSENBERGER, Ph.D., Univ. of Stockholm, STOCKHOLM

1320-1330 PCB - possibilities of destruction

LENNART BERGMAN, Ph.D., Univ. of Lund, LUND

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STATENS NATURVÅRDSVERK
 Box
 171 20 SOLNA 1
 TR 08-98 18 00
 Forskningssekretariatet

P C B Conference

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DSW 229488

STLCOPCB4053698

PCB Conference, Stockholm, September 29, 1970.

PCB - effects on mammals.

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Already in 1899 Herxheimer described a condition that he called chloracne, which was caused by chlorinated biphenyls or chlorinated naphthalenes. Chloracne is a type of follicular pyodermitis, e.g. pyogenic inflammation in the sebaceous glands of the skin. Clinical experience indicates that the capacity to produce this condition increases with chlorination of the biphenyls. Around 10 cases of fatal intoxication with chlorinated biphenyls or naphthalenes have since been described (ref. 2, 3, 4). They all showed liver atrophy and necroses. Histological examination revealed fatty degeneration, necroses and cirrhosis. All cases involved persons who handled or were exposed to these compounds in their occupations.

Animal experimentation has confirmed that chlorinated biphenyls and naphthalenes can produce liver damage of this kind. Chlorinated biphenyls and naphthalenes can be absorbed by the skin, by inhalation or by ingestion. In tables 1-3 Dr. Ulf Ahlborg (ref. 5) has summarized the published toxicological investigations in mammals involving chlorinated biphenyls and naphthalenes. The results shown on the tables indicate that the toxicity of these compounds is proportional to their degree of chlorination.

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A comparison between the chlorinated naphthalenes and the biphenyls based on existing studies indicates that the biphenyls are more toxic. However, it must be emphasized that all the experiments done have been screening experiments involving technical preparations with an undefined purity, - usually mixtures of compounds having different degrees of chlorination - and that these investigations have generally focused on liver damage. Investigations of the effect on the brain for example seem to be lacking. So, in general, the present material

permits only very limited conclusions.

It has been shown that the chlorinated biphenyls stimulate the liver microsomes as revealed by an increased metabolism of oestrogens in the pigeon liver (ref. 9). The biphenyls seem to be about 5 times more potent in this respect than either DDT or dieldrin (ref. 9). Drinker (ref. 4) has observed a synergistic effect on the liver of carbon tetra-chloride and chlorinated biphenyls - i.e. animals exposed to chlorinated biphenyls show severe liver injury with considerable lower doses of carbon tetra-chloride.

In this connection it could be mentioned that a fatal case of biphenyl intoxication recently occurred in Finland (ref. 10). A 31-year-old man was working in an industry that used biphenyl - not chlorinated - for impregnation. The exposure level was around 100 mg/m^3 , 10 times the MAC. He had been working in this industry for 11 years and suddenly developed liver insufficiency which appeared histologically as necroses, atrophy and cirrhosis. A general atrophy of the brain cortex was also found. Medical examination of the about 120 persons working in this industry revealed 3 additional cases with liver injury (biopsy) and 2 cases with pathological EEG and impaired peripheral nerve function.

In order to make a toxicological evaluation of the risks involved in exposure to chlorinated biphenyls, it is necessary to have knowledge about 1) the distribution of these compounds in the body, 2) their metabolism, retention and elimination in different organs and 3) the toxicity of these substances for different cell systems and their metabolites.

With respect to the distribution, we know that there is a tendency to accumulate in body fat and in the lipid-containing tissues of the brain. That is about all we know. Our knowledge about the metabolism of these compounds is minute. From a theoretical point of view and on the basis of existing experimental data, there is reason to believe that the compounds with a low degree of chlorination should be more easily metabolised and broken down in the body than those with a high degree of chlorination. The turnover of the discrete compounds and their metabolism in different kinds of organs is unknown. The toxicity to different cell systems is also unknown.

except for the fact that liver cells can be interfered with at those concentration levels which occur in man due to industrial exposure. Liver injury also occurs early in animal intoxication experiments. However, quantitative data regarding the concentration in the liver cells at which disturbances occur is lacking at present.

Conclusion.

There is a strong suspicion that chlorinated biphenyls can be retained and accumulated in the body with chronic exposure. Present data do not permit evaluation of the risk of organ damage in the body at different doses of defined chlorinated biphenyls. There is a strong need for studies of the metabolism of chlorinated biphenyls in the body, as well as the mechanism of the toxic effect due to these substances.

R E F E R E N C E S

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DSW 229492

STLCOPCB4053702