

Cancer Institute liaison member of the Commission. The spontaneous offer by the Institute's liaison member of the commission to supply the Biometrics data on teratology was declined by a member of the staff of the Commission.

*July September, 1969:* Members of the staff of the National Cancer Institute and the National Institute of Environmental Health Sciences actively engaged in the work of the technical panel on carcinogenicity and teratology. Further analyses of the teratogenicity data were performed.

*August 15, 1969:* Request made by the Teratology Panel for the Biometrics data on teratogenicity.

*September 11, 1969:* Data on teratogenicity provided to the Teratology Panel. Delay in part related to procedures involved in clearing permission for the data and in part related to putting the data into a condition suitable for examination by those who had not participated in their development.

*Fall 1969:* FDA studies on embryotoxicity, and teratogenicity of 2,4,5-T and dioxins reinitiated, as described in Dr. Verrell's testimony.

*November 25, 1969:* Meeting of National Institutes of Health scientists with those from FDA and Dow Chemical Co. to plan further studies to clarify roles of 2,4,5-T and dioxin impurities in the production of teratological abnormalities.

*November and December 1969:* Secretary's Commission report published.

*January 1970:* New teratological studies initiated at National Institute of Environmental Health Sciences using materials provided especially for the purpose by Dow Chemical Co.

*April 10, 1970:* Above teratological studies completed.

*April 12, 1970:* Analysis of the above data completed.

*April 13 and 14, 1970:* Interpretations of the above-mentioned findings by representatives of the regulatory agencies and parties to the interagency agreement for protection of the public health and the quality of the environment in relation to pesticides, and presentation of conclusions and proposed actions to members of the Cabinet.

That is a long chronology. I am sorry. I thought it would be shorter.

Senator Hart. You have taken the words from me, it is a long time after that first bell was sounded before we got this morning's action. I am sure it is always easier to play it from the 20-20 vision of the grandstand up here than from the vantage point of the summer of 1969 when the first bell rang. But that is still a long time.

Dr. STRICKLAND. The studies were initiated at a time when this sort of thing was not ordinarily done. As we have more and more chemicals and materials put into our environment we must be more and more careful about the effects they produce.

Senator Hart. How can we compare the period between June of 1969 and April 14, 1970, in the future? What mechanism do you now visualize which will avoid this sort of lag from recurring?

Dr. STRICKLAND. If the procedure for registration of materials for use as food crops required teratogenicity studies as well as other

long term chronic toxicity studies, as it is my understanding that they now do, we may be able to avoid this in the future.

The idea would be to prevent the introduction rather than react some years later, after the material was used, not only ubiquitously but in large quantities. I think this is the direction we must go, to prevent the introduction of materials rather than to react after they are used.

Senator Hart. Wouldn't this require the burden of proof to be on those who want a market?

Dr. STRICKLAND. Yes.

Senator Hart. To make the affirmative case that it is not dangerous. That is correct, isn't it?

Dr. STRICKLAND. Yes. I think the thing we really need are good predicting systems for man. I think it would be ideal if we had some in vitro systems which would tell whether a compound is going to be toxic. This is what we need, a lot more research and correlation of animal data with human epidemiologic data. I hope we never do experiments on man but we can collect data in retrospect epidemiologically in individuals who may have been exposed to chemicals or certain diseases and so forth.

Senator Hart. Mr. Bickwit?

Mr. BICKWIT. You obviously have done some thinking about how to patch up the system and I don't want to cry unduly over spilled milk, but do you have any idea why, when NCI received this first progress report, that it did not immediately pressure Biometrics to go into an all out effort to acquire further data quickly instead of allowing them approximately 2 1/2 years to complete their tests?

Dr. COURTNEY. The first statement NCI made was "Rejoice the study and make sure it is right," and that is just what we did. We went to a different strain of mouse, then we went to a rat. By the time we did all of these studies, it took a bit of time.

Dr. STRICKLAND. We were also studying similar chemical pesticide structures, so we could see if it was a larger problem than just this one. This was all going on at the same time.

Mr. BICKWIT. Did the other pesticides that you were studying exhibit the same kind of alarming data?

Dr. COURTNEY. I don't know how you describe it as alarming.

Mr. BICKWIT. Would you not describe it as alarming?

Dr. COURTNEY. Yes. We had some other pesticides that we were concerned with at the time and, of course, without repeated studies we could not make a judgment. So some pesticides were not as alarming and some were more and as we repeated the tests we got our results. This pesticide seemed to give us a positive response every time we studied it.

Dr. STRICKLAND. I would say we are not particularly pleased with the fact that it took so long to get all the data out. The first time around in one of these situations always takes longer and hopefully in the future we will be able to move much more rapidly.

Senator Hart. I was just thinking of all the things that have happened since that first alarm bell. We have elected two-thirds of the Senate, a new President, gotten further into Vietnam.

Mr. BICKWIT. According to your chronology, if I read it correctly, the data from Biometrics were first made available to FDA on October 14, 1969.