

Monsanto

JAMES H. SENTER
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October 1, 1990

Mr. Donald Clay
Assistant Administrator for Solid Waste
and Emergency Response
Office of Solid Waste and Emergency Response
U. S. Environmental Protection Agency
Waterside Mall
401 M Street, SW
Washington, DC 20460

RE: Monsanto Company Sponsored Health Studies

Dear Mr. Clay:

Earlier this year, an EPA employee on your staff, acting in her private capacity but utilizing the format of an intra-agency memorandum, forwarded to the EPA's Science Advisory Board accusations raised in an appellate brief filed in a private lawsuit involving Monsanto Company. The untrue allegations repeated in that memorandum referenced to two health studies sponsored by Monsanto to examine any impact of possible exposure to dioxin in employees involved in the production of herbicides at Monsanto's Nitro, West Virginia plant. The allegations charged that the study results had deliberately under-reported cancer mortality. The gross inaccuracies of these charges have been the subject of prior correspondence to the Agency by myself and by Monsanto's Chairman, Richard Mahoney. Notwithstanding our efforts to correct the record, these baseless charges have been widely repeated in newspaper accounts and even before a Congressional Subcommittee where the charges were portrayed as fact, thus giving the incorrect impression that it is the government's view that the studies are misleading. Monsanto recognizes that the Agency did issue a corrective statement indicating that the employee was acting in her individual capacity, not as an Agency employee in preparing the memorandum, and that her memorandum does not reflect the Agency's official position. However, that statement has not remedied the problems caused by continual references to the accusations repeated in the memorandum which was prepared on Agency stationery.

In view of the inability of Monsanto to halt or correct the many erroneous reports with respect to these two studies and in view of the extreme prejudice being suffered by Monsanto and the individual scientists associated with the studies, Monsanto is compelled to request, in the strongest sense possible, that the United States Environmental Protection Agency, through the auspices of NIOSH, perform a complete audit on the two mortality studies (authored by Zack/Suskind and Zack/Gaffey) referenced within the memorandum. Monsanto is confident that the audit will confirm the conclusions reached by the original scientists. The impartial action urged herein would serve to put an end to this false controversy. Absent such government action, Monsanto will continue to suffer damage to its reputation.

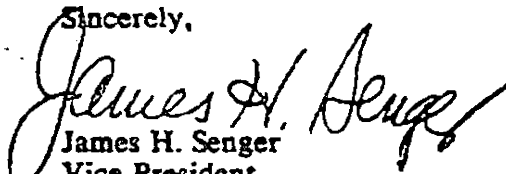
Given the Company's science-based focus, preservation of Monsanto's reputation for performing accurate world-class research is of critical importance to our business and research operations. Furthermore, since NIOSH is in the process of issuing study results based, in part, upon the same



population involved in the two studies sponsored by Monsanto, it should be important for the government to remove any stigma improperly attached to NIOSH's work as a result of the earlier charges raised against the predecessor studies. In connection with NIOSH's Dioxin Registry Program, Monsanto has previously furnished NIOSH with complete data sets regarding the mortality experience of the Company's Nitro, West Virginia work force. It is believed that Dr. Marilyn Fingerhut at NIOSH has all the data necessary to perform an impartial, independent audit. If Monsanto can provide further assistance to facilitate completion of an audit, via furnishing any additional data, it would be happy to do so.

I wish to stress that Monsanto believes the charges raised against the two studies are utterly without merit, but that Monsanto's own ability to counter these charges has been impaired by the incorrect impression created in the media that your Agency has challenged the validity of these studies. This erroneous impression is perhaps best resolved via direct government involvement in performing an independent audit of the two studies followed with a publication by the government in a peer-reviewed journal of the results of that audit. If you have other alternatives besides the suggested audit to respond to this situation, please feel free to contact my office. We look forward to receiving the commitment of the government to proceed with this work.

Sincerely,


James H. Senger
Vice President
Environmental Policy Staff

DFS:ddo/13

cc: Raymond C. Loehr, Ph.D.
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excitement on the last day of the meeting. Instead of direct measures of receptor binding, they used a handy surrogate: the increased activity of the cytochrome P450 enzyme system, widely considered the most sensitive response to dioxin in all species. No toxic effects are known to occur at levels below those required for enzyme induction.

After reviewing data on the necessary dose for enzyme induction in all species, Gallo, Birnbaum, Scheuplein, and others took turns at the blackboard, trying to calculate what the "safe" level in humans might be. Their rough, back-of-the-envelope calculation: 1 to 3 picograms per kilogram per day—several hundred times higher than current U.S. standards and in the same ballpark as those set by some European countries, which arrived there by an entirely different method.

Not so fast, says Maryland's Silbergeld, who cautions against "replacing one stupid model with another." For one, a receptor-based model does not necessarily predict a

"hockey stick" curve, nor does receptor binding necessarily imply a "safe" dose, says Silbergeld, who thinks her colleagues are underestimating the intricacies of receptor theory. Nor is she convinced "that the result [of the new model] will be that different from EPA's current figure. As a scientist, I object to the EPA model. But [its predictions] may be very, very close, for totally irrelevant reasons."

Working with EPA scientists, Gallo is now setting out to refine the risk number for dioxin. George Lucier and his colleagues at NIEHS are doing the same. The idea is to build a conceptual model of cellular responses to dioxin and then turn that over to mathematicians to develop a predictive tool to estimate dioxin's risks—not just for cancer but for any toxic endpoint. William Farland, who runs the dioxin risk assessment effort at EPA, expects a "straw man" model to be complete in about a year. The next step would be to see if it passes muster with the

scientific community—and if it in fact offers an advantage over the status quo. "This is an improvement, not a cure-all," warns Lucier.

Once the model is complete, perhaps the biggest question, in terms of dioxin's danger, is the background exposure of the general population, which comes chiefly from diet but also from environmental sources. If background exposure is comfortably below the practical "threshold" needed for receptor activation (point B in the figure), then there may indeed be a safe dose. But if background exposure is higher, near the "threshold" (point A), "then there is no margin for additional exposure," says Moore. Background exposure is now estimated to be about 1 picogram per kilogram per day—slightly below the rough "safe" number the Banbury group came up with—which may not leave much room for additional exposure.

At this juncture, EPA officials are enthusiastically embracing the new scientific approach. Don Barnes, a dioxin expert and executive director of EPA's Scientific Advisory Board, talks of "a real breakthrough, a sea change in our view of dioxin." In fact, the topic is deemed important enough that a special briefing is planned for EPA administrator William Reilly and top agency officials.

But how far is EPA likely to go if the modeling exercise does reveal that dioxin is less risky than the agencies now calculate? Gough of OTA, for one, thinks that the answer is not very far: "Dioxin is the most potent carcinogen ever tested. If they back off this one, they will open the door to every chemical manufacturer in the world" whose chemical acts in the same way. "That is a door they will reluctantly open." Gallo contends that the door will open just a crack, as there are less than a dozen carcinogens known to work the way dioxin does. And he predicts that the new receptor-based risk model will cut both ways: some carcinogens will turn out to be far riskier than now predicted; others, like dioxin, less risky.

Moore agrees that change will not be easy. "For issues this emotional, you have to be purer than Caesar's wife anytime you propose to change the status quo. There would have to be a fair degree of support within the scientific community for it to come to pass, especially if the potential change is a 'relaxing' of the number."

Eric Bretthauer, EPA's assistant administrator for research and development, concedes that "the agency hasn't traditionally relaxed numbers." But, he says, "I think there is a willingness at the policy level to take it on. My view is we have to be open to changes in science, whatever their effect on regulatory policy." He adds, however, that "the science has to be very clear."

■ LESLIE ROBERTS

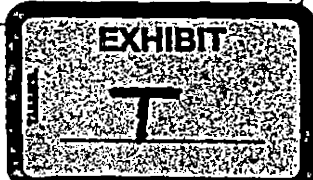
Monsanto Studies Under Fire

The Environmental Protection Agency has launched a criminal investigation to determine whether Monsanto Corp. of St. Louis falsified three epidemiologic studies of its workers, which showed no increased health risks from dioxin other than the skin disease chloracne. The investigation, which EPA is mandated to conduct in response to a petition requesting it from the activist group Greenpeace USA, should resolve, once and for all, the allegations that have been swirling around these studies for almost a year. EPA officials would not confirm or deny the existence of the investigation, but *Science* obtained internal agency memos discussing it.

The EPA has not notified Monsanto that it is under investigation, but says Dan Bishop, the company's director of communications, "We hope there is one, we welcome it. It is the only way to put this matter to rest." In fact, the company wrote to EPA twice over the past few months, begging the agency to perform a scientific audit of the studies. Bishop calls the fraud allegations "bald-faced lies."

The main charges are that Monsanto epidemiologists misclassified exposed workers as unexposed in their control group and that they omitted workers who had died of two cancers that have been linked to dioxin exposure in other epidemiologic studies. The charges first came to light last February when a plaintiff's lawyer in *Kemner v. Monsanto*, a case involving a tank-car accident, reviewed the studies, decided they were fraudulent, and alerted the press to the alleged cover-up. That brought in Greenpeace, and also Cate Jenkins, a chemist in EPA's regulatory branch. She has since made the Monsanto studies something of a personal crusade, petitioning EPA's Science Advisory Board to audit these and other studies, and meanwhile sending numerous copies of her memos to various environmental groups, Vietnam veterans organizations, and her friends on Capitol Hill. Jenkins maintains that Monsanto's studies have directly affected how EPA regulates dioxin. Other agency officials deny that, saying that EPA's current—and very stringent—standard for dioxin exposure is based on animal studies.

Everyone *Science* spoke with who is familiar with the Monsanto studies agrees that they are flawed, but probably not as the result of criminal intent. The scientific questions about the studies may now be moot, however, as all but six of the Monsanto workers in the three studies have been carefully reexamined as part of a larger federal study just published, which suggests that high dioxin doses can cause human cancer (see box on page 625). The other questions may be tougher to resolve. When EPA completes its investigation, the agency will report to the Justice Department and recommend either that they prosecute or close the case. ■ L.R.



Nitro Plant Update (2,4,5-T dioxins)

To provide perspective, Monsanto initiated in mid-1978 a joint epidemiology study of employees and former employees of our Nitro plant in conjunction with Dr. Raymond Suskind, Institute of Environmental Health, University of Cincinnati. This study involves workers exposed to dioxins (unknown at the time) released in a 1949 trichlorophenol accident at the plant, and subsequently in 2,4,5-T associated departments up to 1969 when Monsanto ceased production. Over 120 people involved with the 1949 accident, and over 150 people in the subsequent 1949-69 period developed chlor-acne (including some with additional symptoms). In most cases, with treatment, symptoms disappeared over time.

Dr. Suskind, a consulting dermatologist who had treated over 35 of our more severe Nitro cases in the 1949-55 period, subsequently became involved as consultant to the World Health Organization in the investigation of other dioxin accidents, including the major 1976 Hoffman-LaRoche release in Seveso, Italy, involving over 1200 people. Additional controversy has occurred over the Agent Orange (containing dioxin impurities) exposures of veterans and civilians in Viet Nam, and the recent banning of 2,4,5-T following the alleged excess abortions from forest spraying in Oregon.

In the interim, animal toxicology has implicated minute concentrations of dioxins (2,3,7,8-Tetrachlor) in severe toxic effects, both acute and chronic (reproduction, cancer, etc.) in several species. Thus, the Monsanto population exposed up to 30 years previously to dioxins became of significant worldwide interest in attempting to answer questions about the long-term health effects, if any, of dioxin exposure.

While implementing our study of mortality experience at Nitro as an initial step in identifying involved employees and potential health problems, the Steel Workers Union announced a health study to be conducted by Dr. Selikoff of Mt. Sinai Hospital, New York, on April 6-8, 1979. In response to the potential allegations which could result from the Selikoff volunteer health examinations, we moved forward as rapidly as Dr. Suskind's schedule permitted with a hands-on Monsanto-funded health study which was carried out successfully at Nitro, June 11-18. A total of 437 people were examined by Dr. Suskind's staff which represents an increase of 70% over the number (260) examined by Dr. Selikoff in April. We believe that Dr. Selikoff's study results may be completed for reporting in late July, while Suskind's results (we believe to be more complete and thorough) will not be available until Fall. In the meantime, we are vulnerable to Selikoff announcements and/or allegations of potential health problems, which he may relate to dioxins or to other products such as rubber chemicals, PAB, etc. which are/have been produced at the Nitro plant.

Currently, DMEH has major effort in analyzing the mortality data from the 1949 accident group and the 1976-78 medical data (clinical and medical histories) for active hourly employees, to determine if any significant relationships exist between abnormal past findings and 2,4,5-T (dioxin) associated exposure. We expect the results from this computerized analysis will help us anticipate potential



health problems, and be responsive in evaluating results of Selikoff's study which may appear as allegations or announcements, prior to the Suskind results later in the year. The first mortality results of our 1949 accident group do not indicate any statistically significant changes from U.S. mortality experience. While this negative preliminary result is encouraging and may help allay anxiety of employees, we cannot be confident of overall health conditions until both the complete mortality experience and current health studies are completed.

F C M
F.C. Meyer

/bks

Monsanto

FROM: William J. McCarville - A3NC - 4-3257

DATE: August 11, 1978

TO: Mr. P. S. Park
Dr. George Roush
Mr. J. R. Sayers

TO: Mr. R. W. Duesenberg
Mr. J. R. Eck
Mr. F. J. Fitzgerald
Dr. S. A. Heining
Mr. J. T. Nolan
Mr. W. L. Reding
Mr. T. K. Smith Jr.
Mr. M. C. Throdahl

1. Action Section

A. Problem/Issue/Situation

In 1949 a process accident in a trichlorophenol autoclave at Nitro exposed a number of our employees to the chemical tetrachlorodibenzodioxin, commonly known as TCDD or "dioxin". The immediate effect was a skin disorder, chloracne. Two hundred twenty-eight employees were treated by four Charleston, W. Va., dermatologists. Thirty-seven of these employees were subsequently referred over the period 1949-53 to Dr. Raymond Susskind, a consulting dermatologist at the University of Cincinnati.

"Dioxin" has been alleged to have caused a whole spectrum of health effects as a result of its being a contaminant in the herbicide 2,4,5-T widely used in Viet Nam as part of a defoliant mixture called Agent Orange. It also received further adverse publicity as a result of an accident, similar to our Nitro experience, at Seveso, Italy, in 1976 where more than 5000 persons are known to have been exposed.

Dr. Susskind has approached Monsanto with a request to do a retrospective epidemiologic study on the 37 employees he examined in order to predict whether those people who were exposed at Seveso face chronic health risks in the future.

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EX 76



B. Recommendations

It is recommended that we do an epidemiologic study of exposed Nitro personnel in cooperation with Dr. Susskind. The group studied should involve as many of the 228 exposed employees as we can locate, since the 37 identified by Dr. Susskind would be too small a group from which to obtain meaningful results and could have a large inherent bias as the referral to Dr. Susskind might imply that the 37 were among the more serious cases of exposure.

A substantial effort will be required to accomplish this study. We further recommend that we engage outside consultants to avoid dilution of ongoing studies directed to determining the possible risk to our employees of current exposures to substances such as acrylonitrile, styrene monomer and benzene. The study would remain in the overall control of Monsanto; Dr. Susskind, while he may be part of the consulting team, would not be in charge of the effort.

2. Background Section

The Law Department has advised us that there is no legal requirement to carry out this study. Further they have advised that we should recognize that any effort to obtain information concerning the health status of employees exposed in the 1949 incident may tend to relate the exposure to present health problems. The West Virginia statute of limitations requires that action for injury or damage be brought within two years of the exposure, but claims for wrongful death can be brought within two years of death regardless of when the causal event took place. In West Virginia there is no limitation on the amount of recovery which might be obtained in such a lawsuit.

Nevertheless, a voluntary, Monsanto-sponsored follow-up study is consistent with our policy of social responsibility and could contribute significantly to beneficial or even life protecting measures and treatment for our own involved employees and for the people involved at Seveso in the event long-term effects are discovered, or if none are discovered, the population at Seveso could be reassured.


William J. McCarville

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