DRAFT 3
Talk by John P. McCullough
to wives of R&E managers
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W. E. Ashley
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Good morning, and welcome to this session on environment and toxicology.

SLIDE 1 Let's begin where we left off last time. Some of you may remember this slide on acid rain. Well, it's still a topical subject. You may have heard recently that the Canadian government made a movie about it, and our government insisted that the movie couldn't be shown here unless it were labeled as a foreign propaganda film -- which shows how political an issue this is.

SLIDE 2 Toxicology, of course, is a very topical subject right now. Consider a few of the things that have happened fairly recently.

-- "Dioxin" became a household word, joining DDT, PCBs, and thalidomide.

-- "Times Beach" became a well-known place name, along with Love Canal and Three Mile Island.

-- Everybody found out that there was something called EPA -- the Environmental Protection Agency -- when it became the focus of a major political crisis.

-- The Tylenol scare again focussed attention on companies' product safety measures.

After thinking about these new developments, I decided that I would try to take you behind the newspaper headlines and the

TV news pictures, and highlight a few points that I think are important.

SLIDE 3 Acid rain, as it happens, is a good place to start. Begin with the facts -- what do we know?

We know that sulfur dioxide and nitrogen oxide emissions react in the air, producing acidic sulfates and nitrates. These then appear in fog, rain, or snow, and can then be deposited in lakes or on the ground.

We don't know how much of this pollution is man-made, and how much is of natural origin. Volcanoes and marshlands emit sulfur dioxide. Forest fires and lightning are significant sources of nitrogen oxides.

We don't know how far these pollutants travel. Some scientists say industrial emissions from the Ohio River Valley cause acid rain in Canada and the Northeastern United States. Others say the Northeast makes most of its own acid rain by using oil-fired burners in homes and industry.

Now look at public opinion, which is a potent force whether it's right or wrong. And the public believes, from seeing television and reading the newspapers, that acid rain damages lakes, fish, forests, and buildings and may even affect human health.

SLIDE 4 Politicians have reacted to this concern by introducing a lot of bills in Congress. One, for example, wants to cut sulfur dioxide emissions in the 31 states bordering on and east of the Mississippi River by 8 million tons, or 40%. Why

40%? No good scientific reason, but it does something the public can understand.

So there's an admitted problem, there's public concern, and there's the chance of a so-called "solution" which will be based on emotion, not evidence. And any such "solution" will be expensive. It will force companies to invest millions of dollars in pollution-control devices which may not be needed. Who will pay? In the long run, you, the consumer, will pay in higher prices.

Acid rain, in fact, is a serious, but a limited problem. What we need most of all is good science, which means calm research to define the problem and find cost-effective solutions. The answers will only come through patience and well designed research.

SLIDE 5

The same questions apply to the dioxin problem.

Let's start the same way. What do we know?

We know there is a powerful chemical called 2, 3, 7, 8-tetrachlorodibenzodioxin -- 2, 3, 7, 8 TCDD or dioxin for short. A single oral dose of a millionth of a gram can kill a 14-ounce guinea pig. Dioxin at higher levels has been linked to the skin condition chloracne, a severe form of acne which may be disfiguring. It is suspected of causing kidney and liver malfunctions, and possibly cancer in humans.

The dirt roads of Times Beach were sprayed with oil containing dioxins early in the 1970s, and these could still be dangerous to animals which find food in drainage ditches and yards in the area. We do not know if dioxins at Times

Beach will be dangerous to residents in the long term. We do know that, seven years after a chemical plant explosion spread dioxin dust at Seveso, in Italy, fears of cancer and birth defects have never materialized, even though direct exposure to dioxins was significantly higher than at Times Beach. These facts should certainly be weighed in any assessment of the Times Beach situation.

SLIDE 6 Now look at the public reaction, based largely on the media stories. You recall that the TV reports featured men in plastic suits scraping up samples of supposedly deadly soil. You remember that the children stood around watching, without any similar protection, and no doubt thinking about the scary men in space suits in the movie ET. Then the EPA made a spectacular offer to buy all the town's homes. Finally, the politicians reacted to public concern by forcing the resignation of the head of EPA and other top officials. These events underscore the power of emotion to force action when it may not be justified by the facts.

What do we need to do? Once again, we need to commit ourselves to good science to solve this and other hazardous waste problems. We may have to take action sometimes before all the facts are in, but we must do our best not to be stampeded into actions that aren't necessary.

SLIDE 7 Hazardous waste is a factor in another issue which you are going to hear more about -- the groundwater problem. About half of all Americans rely on groundwater for drinking.

Groundwater supplies a quarter of the fresh water used for all purposes in the nation. It is present in layers of permeable soil, gravel, or stone called aquifers.

A small amount of groundwater has been spoiled by so-called "traditional" pollutants -- nitrates from fertilizers, highway de-icing salts, or bacteria from septic tanks or leaky pipes. More recently, man-made chemicals have been found in community and private drinking-water wells.

For example, several wells in New Jersey, New York, and Pennsylvania were closed after they were found to contain more than one part per million of trichloroethylene, or TCE, which is an industrial solvent known to cause cancer in laboratory mice, although only at much higher concentrations.

SLIDE 8

In addition, groundwater can become contaminated through gasoline leaks in tanks at service stations. Mobil's tanks are made of fiber glass, and don't leak. But this is certainly a problem.

In 1978, Congress asked EPA to investigate the extent of groundwater contamination, and two years later EPA proposed a "groundwater protection strategy" to serve as a framework for all programs affecting groundwater quality. EPA is now developing a policy which would recognize the states' primary role in this field -- an approach which the oil industry favors because of the differences in the problems to be solved from one area to another. But look for more arguments on this topic, and we'll still need <u>good science</u> to devise solutions which don't go beyond the problem.

SLIDE 9 Let me take a minute to talk about a problem that is common to all the issues we have talked about so far. This is the question of risk. Zero risk, as we know, is impossible in this world.

This table shows some of the odds that we face. Notice that we accept calmly many personal risks which are far greater than the danger of toxic exposure. So the question when we're dealing with risk is not how to eliminate it entirely -- since this is impossible -- but rather: What kind of risk are we talking about? Are we talking about the ordinary kind of risk we face every day? Are we talking about significant risks that merit thoughtful warnings? Are we talking about serious risks that require action by government?

SLIDE 10 These are basic questions which depend on good science for their solution. And Mobil not only works with the rest of industry, but conducts its own environment and toxicology program. It's a subject we take very seriously. We set up our Environmental Affairs and Toxicology department in 1978, and we have expanded our staff from seven to about 80. We've expanded our work with approval and encouragement from Excom, whose concern was reflected in their approval of two major policy statements in 1981.

This is our updated Environmental Protection Policy. (Read some of policy provisions on slide.)

SLIDE 11 This is our Product Safety Stewardship Policy, which indicated top management's concern that we should insure the

safety of our workers, our customers, and the public generally. (Read some of policy provisions on slide.)

SLIDE 12 Let's talk about some of our achievements -- our policies in action.

Take refinery effluents. Although refineries used to contribute to both air and water pollution, tremendous improvements have been made. Mobil, like other oil companies, has trained refinery personnel to respond rapidly when an oil spill occurs, we have designed refineries to contain spills, and we have perfected techniques for cleaning up spills quickly.

This picture was taken at our Joliet, Illinois, refinery. The waste water is "rinsed" five times before it's returned to the Des Plains River. The refinery won the state EPA Industrial Achievement Award. And we've been just as careful at our other refineries. We spent $50 million on a "state of the art" water treatement plant at Paulsboro, New Jersey. At Ferndale, in Washington state, treated waste water flows into a Lummi Indian fishery where oysters and salmon thrive, and bald eagles "fish" for salmon right off the oil-loading pier.

SLIDE 13 We also have our own industrial waste disposal program. We're concerned not only about the sites at or near our chemical plants and refineries, but about facilities operated by our contractors, and by companies we've acquired. We want to know if a problem exists, what caused it, and what we can do to clean it up.

In 1979, we released a comprehensive "Protocol," to which Environmental Affairs and Toxicology contributed. It set out a sequence of steps to be applied at any waste site:

-- Catalog background information.

-- Establish a groundwater and surface water monitoring program.

-- Gather information for a risk assessment.

-- Evaluate need for action, which may include control measures -- such as additional monitoring and segregation of water and buried chemicals -- to more complex actions, such as soil decontamination or even total relocation of a waste site.

We have now field-tested this Protocol at a Mobil plant site at Charleston, South Carolina, where phosphorus-based chemicals and fertilizers have been produced for over 100 years. This study has established methods for screening groundwater aquifers and conducting hydrologic tests for water flow rate and direction. We now have the expertise to evaluate conditions at waste disposal and manufacturing sites, so that we can take appropriate action if necessary.

SLIDE 14 The work we did at Charleston told us several other things. It showed that the surface groundwater beneath the site is well separated from a lower drinking water aquifer by a clay stratum about 150 feet thick. So we don't see the very small concentrations of chemicals that we measured in the surface groundwater wells as having any hazardous effect.

We found no indication of plant-produced chemicals in the Ashley River, but we did find a small seepage of dichlorofenthion (DCFT) from the plant site when we examined the river sediment. We believe that we have effectively eliminated the seepage and are carrying out further testing to confirm that belief. Finally, we have performed toxicological studies on the marine life in the river to be sure that the DCFT in the sediment posed no acute or subacute health hazard to man.

,IDE 15 One way of insuring the safety of Mobil products is through MSDB program -- Material Safety Data Bulletins. In this program, every new or revised Mobil product undergoes a health and safety review, and a toxicology test if necessary, before commercialization. Information is entered into our computerized product safety information system, from which a four-page MSDB is produced. These MSDBs are distributed worldwide in manual form, with semiannual updates. These manuals presently cover about 6,000 of our highest-volume products and raw materials, out of a total of 10,000. We're developing them now at a rate of about 2,000 a year.

LIDE 16 One very new Mobil material is para-methylstyrene (PMS) which may have a bright future as a specialty plastic. We've undertaken a $2.8 million toxicology testing program, designed to comply with government regulations for materials that may come into contact with food. Results to date indicate no toxicology problems, and we have received approval to use PMS

with non-fatty foods. We hope to have full approval for PMS from the Food & Drug Administration by 1984.

SLIDE 17 Finally, Mobil is very serious about helping improve toxicological research and training people in this field. We provide about half a million dollars annually to academic and other institutions for these purposes through the Mobil Foundation. Environmental Affairs & Toxicology manages Mobil's assistance to cancer research organizations like the American Business Cancer Research Foundation and the Salk Institute. We have assisted organizations like the Nature Conservancy, and research institutions like the Woods Hole Oceanographic Institute, which studies ways in which the oil industry can operate most safely in ocean environments.

(LIGHTS ON)

I hope you'll agree with me that Mobil is doing a great deal to prevent its products from harming the environment and public health. I think we're doing our part towards developing the good science we've talked about.

What else must we do?

It's clear that we must do a better job of explaining to the public what risks are involved in the use of chemicals, and what risks are acceptable and what are not. In an atmosphere like that of Times Beach or Love Canal, what has been generally missing is the voice of the calm, responsible, reasonable scientist.