

E. V. John - BLND

October 15, 1973

Mr. K. W. Easley - 1920  
Dr. I. D. Hill - NLA

File

Mr. A. B. Marvin - C2SA

Attached is your first draft of Mr. Throdahl's speech. My marginal notes and underlinings indicate where I have questions or where I think the copy should be changed.

Since mid-Friday afternoon to Monday morning at 8:45 is not, in my opinion, a reasonable time limit for proper checking of this copy, I am carboning in K. Warren Easley in Washington, and Dr. Ira Hill so that they -- too -- may comment on the text. I would ask the carbonees to reply to you directly.

E. V. John

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Attachment

WEP reviewed  
10-16-73

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Thank you, Dr. Sarett. I hope I can add to the content of this segment of our meeting.

In studying the present and future impact of EPA on industrial R&D, I have a natural tendency to concentrate on Monsanto Company, its experience to date and its prospects. Further qualifying myself as a witness here today, I should add that Monsanto and EPA have some rather close ties as well as some rather sharp differences. (I will get to the differences later in my presentation.)

As for the close ties, Monsanto is a contractor for EPA, a supplier, and even a landlord. Through our research subsidiary, Monsanto Research Corporation, we perform analytical research for EPA and we produce instruments such as microwave-induced emission spectrographs. In North Carolina's Research Triangle Park our Chemstrand Research Center, Inc., has leased a wing of its laboratory space to EPA's nearby research facility which did not have laboratories of comparable design.

So I find myself in a delicate ambivalency in discussing EPA.

In common with the general public, we of the Monsanto family (in which I include employees, shareowners and customers) are beneficiaries of EPA activities; still, as technological

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sophisticates, we detect bureaucratic trends in EPA to which we object.

In broad generalities, the enabling legislation passed by the Congress to establish EPA, as an ongoing, viable function is good. It reflects, through the political process, the desire of the general public. There are parts to which industry takes exception; there are parts to which EPA itself takes exception. The laments are a good sign. I have always held the belief that if everyone is supremely happy and superbly confident the S.S. Titanic effect is about to be experienced.

EPA, as designed by Congress, is charged with controlling evil effects of human activity by regulation of these activities. Its work is in the area of technology. Its regulations presume an up to date working knowledge of scientific vocabulary and concepts.

EPA must deal, in its regulations, with the interrelation of qualities and this interrelation is extremely difficult to understand in many cases. Bigger, for example, is not always better than small; but neither is smaller guaranteed to yield improved results. Faster is not always a route to progress; but slower is not necessarily a virtue in every case. There are times in the cycle of laundering clothes where a part of the system is supposed to collect the dirt; in effect it gets dirtier, and this is good, even though cleanliness is next to you-know-what and is one of the constant ambitions of humanity.

The interrelation of qualities is difficult for a morally responsible manufacturer of a new product to anticipate, and who can be expected to know more about a new product at the outset than its originator?

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I am going to leave unanswered the rhetorical question I have just asked, but this (as I see it) is the largest effect on industrial R&D that EPA is going to have. In order to satisfy EPA regulations, industry is going to become more and more involved in second and third order effects. How does the product behave in use? What becomes of it when it is declared refuse and joins the world's waste? How does it hold up under abuse and how does it behave under a maximum credible accident when six or eight contingencies are encountered simultaneously, - that is when things which should not go wrong do go wrong, not one at a time but all together.

These are difficult questions and they are going to challenge industrial R&D expertise in new ways in the future. They are already challenging the engineering portion of this industrial capability as air, water, solid waste and noise regulations close in on production plants in the various industries.

We at Monsanto feel we are very close to the crest of a breaking tidal wave in the marketplace. We advertise ourselves as Monsanto: the Science Company. Evidently, our customers read this advertising and when an environmental regulation impinges on their activities, they have a way of picking up the phone and calling us. From week to week these calls increase in number as well as in complexity.

If there were one set of regulations, life would be a lot simpler for us in helping these customers (as well as ourselves), but the multiplicity of Federal, State and local requirements is presenting us with daily problems.

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Take such an elementary item as the definition of the hydrocarbons which are not supposed to be released in effluents of various categories. You will find one definition in Rule 66 of Los Angeles County, another in Regulation 3 of the San Francisco Bay Area. Los Angeles says it's a molecule with eight or more carbon atoms in it; the Bay Area says it is a substituted aromatic molecule. And so it goes: differently in Rule 5.07 of the State of Ohio and again in Regulation 5 of the Commonwealth of Virginia.

The Federal definition hasn't quite reached the point where a hydrocarbon is defined as any liquid which floats on water, but it seems to be headed in that direction.

To state that this leads to confusion is putting the case quite mildly.

Let me shift for a moment to chlorinated hydrocarbons.

Once upon a time, and a very good time it was back in the 1920's, General Electric had a problem as did the other manufacturers of large liquid-cooled electrical transformers. They were all using a flammable petroleum derivative to carry out the cooling process and when there was a short circuit there was generally an explosion followed by a fire. More than once, people were hurt.

General Electric investigated various alternatives and found that, due to peculiar characteristics inherent in the molecule, certain chlorinated biphenyls would do the cooling job without the explosion and fire risk. Swan Chemical, now a part of Monsanto began making the compound for this application, and polychlorinated biphenyls (or PCBs as they became known to the headline writers) became an article of commerce.

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G.E.  
name  
E.g.

Among its unique properties, the PCB molecule exhibits a wonderful stickiness. It adheres to anything in its vicinity, wood, metal, paper, stone. It naturally trickled into paints, printing inks and other applications where stickiness was one of the criteria. It also extended its applications in heat transfer from transformers to large sterilizers and cooking vats.

Until the gas chromatograph was invented and put to perceptive use, PCBs could only be described as a boon to mankind.

*check legal?*

The gas chromatograph undid this reputation. When it was used to check for DDT residues in the environment, some strange peaks showed up on the charts. Other instrumentation identified these recurring peaks as PCBs. And, we at Monsanto came to the (sudden) conclusion that PCB was no boon at all when it got loose in the world. Because of its stickiness it adhered to particles as small as passing dust, <sup>2</sup> as was swept into the atmosphere only to fall again as precipitation. The molecule has been found in polar bear fat as well as in the fauna of tropical rain forests.

Monsanto decided unilaterally to withdraw the product from sales <sup>into applications where the material contained</sup> which could not be controlled. It was decided that the askarel application in power transformers and in condensers presented no ecological threat and <sup>should</sup> could be continued, at least until a substitute fluid might be found. But the product would no longer be sold for use in paint, in inks, in food processing, etc.

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I am sure many of you have had the chilling experience of walking into a purchasing agent's office with a sample and a spiel about how all the prospective customer's problems can be solved if only he will put his name at the bottom of the purchase order.

But, how many of you have walked into a valued customer's office with a technical report in one hand and a spiel that starts out: "Harry, I know you make the stickiest printing ink in the trade and we're glad we've been able to help you get that reputation but you're not going to be able to buy PCB from us any more."?

If you think the initial sales call met with a cold and glassy-eyed reception, you should try the second variety. Good old Harry can't believe you're saying it so he literally cannot understand you. It takes multiple repetitions to get the message across, - and in some cases it takes the threat of police action to enforce a supplier's decision to cut off the supply.

To help us close off our non-conforming market applications, therefore, we welcomed and even solicited regulatory action to restrict release of PCBs into the environment. While we were the sole suppliers in the U.S., there were other manufacturers in Germany, Spain, <sup>France</sup> ~~Sweden~~, Italy and Japan. It took additional regulatory action to close down these sources of supply for applications in which PCBs were likely to be released to add to global contamination. { maybe not be true }

But we did it, thanks to the cooperation of all concerned. And, in this case, with the scientific evidence clear-cut, we welcomed the regulatory action.

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In the case of nitriloacetic acid, better known perhaps as NTA, we have a different problem entirely.

Monsanto had started the manufacture of sodium nitrilotriacetate as a replacement for phosphates in detergent formulations. ~~Our form of~~ NTA did a good job of chelating or joinging with impurities such as metal ions in the dirty water mix and sequestering them or removing them from the solution. Our tests indicated that NTA was degraded by biological activity in rivers and lakes and left no nutrient moieties after its degradation. At the time, detergent phosphates were under attack as contributors to eutrophication of bodies of water.

Then a laboratory performed a mouse and rat test in which it was determined that the presence of NTA increased the rate of transmission of metals across the placentas of the laboratory animals into the fetuses where the metals increased fetal toxicity and resulted in growth abnormalities.

The doses employed in the test were considerably higher than those which would ordinarily be encountered by the human population. Nevertheless ~~ERA~~ Surgeon General and EPA concurred in recommending the voluntary discontinuation of the use of NTA in detergent formulations and the formulators agreed. As suppliers of raw materials to this industry, we of Monsanto returned to our laboratories to search for a new compound.

In retrospect, I am not at all sure this was a wise move on EPA's part. The scientific issue is still a moot one, with a growing body of evidence supporting the original claims of easy biodegradation.

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Let me try to be objective about this controversy. My

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plant is  
shot down.

feelings are naturally hurt that all our careful work showing the biodegradability of the compound was sent down the drain without consideration when a single set of experiments showed potential danger. Monsanto had an operating plant with an annual capacity of 100 million pounds a year of the product at the time of the cessation decision and I am suffering normal managerial agony over this idled facility.

Plant in  
operation  
& profitable

At the same time, as a manager myself, I recognize fully that some actions are taken for reasons other than the obvious. I have not studied the record to see what outside pressures were being placed on the Surgeon General's office or the EPA at the time they decided to suggest a halt in the use of NTA. I can guess there were some pressure<sup>s</sup>/if only because there are always ~~many~~ pressures on managers who merit the title.

Pressures of  
deformed  
babies!?

Pending the ultimate resolution of this question by the continuing research, or the cancellation of the issue by the discovery of an even better phosphate substitute, another avenue which is being pursued actively, I really do not know what I will ultimately believe.

Right now, though, I do feel the Surgeon General and EPA reacted unscientifically to a situation which is basically a matter of logical science. If I am correct, this possibility holds within it the seeds which may lead to a real problem for society as a whole, something which goes far beyond rings around the collars and becomes too rapidly collars around the public's collective neck.

I mention this only as a possibility. Let me emphasize that point: not as a present fact at all, merely as a long-range possibility, but one of which we should never lose sight.

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So now I have described a case in which we found the regulatory power of government agencies, backed by the police power of the State, a vitally needed part of our corporate strategy. And I have outlined a case in which we could have managed very well, I believe, without government interference of any kind. Let me move on into some futurology, if you will, some spots in technology where industry may help EPA in the discharge of its public obligations.

A year ago, industry's general reaction to zero plant discharge requirements was one of hilarity and ridicule. We have made considerable progress in the past year, so that now industry's reaction is more along the lines of "When zero discharge regulations take effect in 1985, we will have to be ...." and the end of these sentences is filled with the appropriate words to show that the message is getting through.

Now there is no way that human activity can be carried on with absolute zero discharge. At Miamisburg, Ohio, Monsanto operates Mound Laboratory for the Atomic Energy Commission. Due to <sup>their</sup> ~~its~~ <sup>certain</sup> radioactive nature, /emissions from this laboratory have no counterparts in the surrounding air, water and land behind which they can hide. Our instrumentation can find the atoms in concentrations so small that it boggles the mind.

Again because of its nature, Mound Laboratory is very close to zero discharge right now. It is a clean facility, with an outstanding safety record. My point is that it does discharge something in addition to the cigarette smoke from unreconstructed employees on their way home at night. It is not a hazardous leakage in any sense of the word. The amounts are incredibly small and if they were not radioactive they

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could never be found in the background of atoms normally in the environment.

But they can be found and we have found them and we report regularly to the appropriate authorities and to the local press and community leaders on what our tests show, And it leads us to think about plants which are stackless and sewerless and produce no solid waste.

Such a plant will be a product of creative engineering and it will have to have just the right product line and just the right raw materials. But would you be surprised to know that engineers in industry right now are thinking about this as a possibility?

Such creativity will be found downstream from the sacred halls of the U.S. Congress. This is not something that could ever be legislated into existence. But if it does happen, someday, I will <sup>wager</sup> ~~guess~~ that the original creative thrust comes from industry and from an engineer trained in systems analysis. I would hope that this individual will turn out to be a Monsanto Company employe, but the contest is difficult and there are many runners in the race.

Now how does this affect the EPA/industry interaction? It does, because the possibility of such a plant requires some understanding on the part of EPA. If the agency should degenerate from its present posture into a sort of traffic cop for garbage, measuring effluents and comparing these readings against prescribed standards and hauling offenders into court, why then we will lose the momentum we presently have. The individual engineer at his desk, the <sup>individual</sup> chemist at his bench, each sees in EPA something more than a regulatory agency. Each sees a sort

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of stamp of approval, a motivation, a reason for doing what he wants to do in the first place. Everyone wants to feel useful and scientists are no exception. No-one wants to create havoc merely for havoc's sake and scientists are no exception. The basic spirit of technology is the spirit of service. To this end, the charter of EPA is a valid rallying point for individual desires and it becomes the responsibility of EPA leadership to stay with the charter.

This is not going to be as simple as it sounds.

For one thing, there is going to be an increasing amount of drudgery in EPA work and in industry work as well. Setting guidelines and objectives and working out regulations can be a stimulating task. Policing these can be somewhat less challenging.

My reaction to the overall theme of this meeting is that government regulation will require industrial R&D to invest more manhours in each project and program in order to satisfy legal requirements and get the numbers to put into the appropriate columns on the prescribed forms. It follows that we will either have to increase total R&D expenditures or settle for fewer projects.

Since many of the required tests established by regulations will be tedious, repetitive and non-challenging, it is easy to predict that industrial R&D will be working harder and enjoying it less.

I foresee that this will continue as a trend in the United States at least until that nearly indefinable element we refer to as "the quality of life" returns to its levels of a few decades ago.

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Should "the quality of life" decline any further than it already has, government regulation will increase geometrically, at least until the rate of decline levels off. The public has no other way of imposing its desires on industry.

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