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Government

File

Risk assessment's role in regulation debated

The difficulty of determining what health or environmental risks, if any, arise from use of a new chemical has become a real gremlin in the work of federal regulators, chemical companies, scientists, and even judges. Aside from the troublesome mechanics of risk assessment, however, there are questions, serious ones, about evaluation of risks when experts disagree, or when the public's perception of risk is at odds with the apparent facts. Also, once it is determined there is a risk, there is the question of which branch of government has the final responsibility for deciding how much of that risk society should bear. Should it be Congress or the courts?

At the Sixth Symposium on Statistics & the Environment, held by the National Research Council of the National Academy of Sciences, a

number of people actively involved in risk assessment tried to come to grips with these issues.

The program began with an overview of the state of the art of risk assessment. In an attempt to put everything down on paper, the Committee on Risk & Decision Making of NAS is preparing a report on methods for risk assessment, and a status report was presented by Howard Raiffa, Frank P. Ramsey professor of managerial economics at Harvard. The report is expected to be presented to the academy in January.

From Raiffa's presentation, it is clear that most of the problems with risk assessment are not with assembling data, but with interpretation. Raiffa says obtaining value-free reports from "synthesized" data is very difficult. There is a tendency to pre-judge the data, coloring it with the



C&EN staff photo

Raiffa: Independent assessment groups

analysts' own perceptions. Raiffa's committee sees the need for "independent, credible assessment groups," to do analysis.

The problem with individuals' own risk values sneaking into assessments is that people often have very subjective perceptions about risks that may bear little or no resemblance to the actual relative risk. This is the subject of studies by psychologist Baruch Fischhoff at Decision Research in Eugene, Ore. He cites several studies indicating that people's risk perceptions are colored by their own prejudices and even the way the risks are presented.

But Fischhoff warns that the public cannot be ignored just because it doesn't accept the risk evaluations of a dispassionate "credible assessment group." It becomes an issue of whether a public institution, such as a regulatory agency, should respond to the public's fears or to expert's facts. Fischhoff reminded the audience that the public may act this way because it knows something the experts do not. Even if nonexperts do not know anything special, but have a deep emotional investment in their beliefs, the stress that would be caused by ignoring those beliefs may have to be a factor in forming policy.

But even the experts are by no means in agreement on many issues. Panel discussions of several contro-

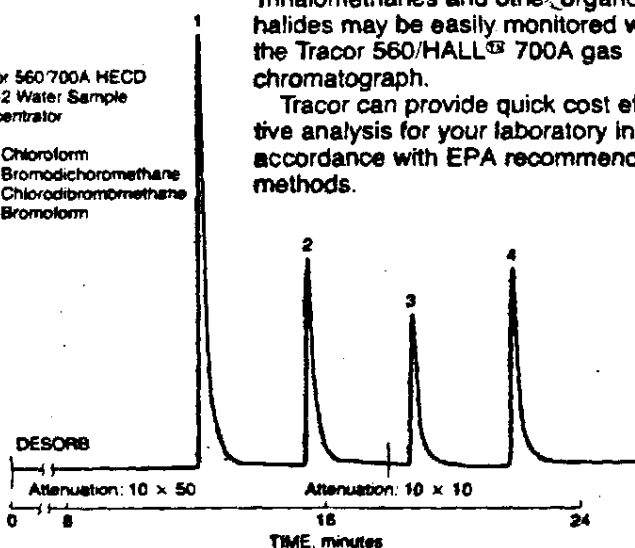
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Markey: Congress should decide

versial issues found room for considerable debate. Topics covered were the benzene regulations, banning of diethylstilbestrol (DES), the use of herbicide 2,4,5-trichlorophenol, and chlorofluorocarbons.

Although much of these discussions was a rehash of the facts that led to regulatory decisions as they stand now, it was clear these decisions and the data on which they are based are not the final word. What they showed mostly was that without very clear answers to the question, "Does this chemical cause unacceptable risks in the way it is used?", regulatory agencies face a tough time making decisions.

But people are searching desperately for someone to make these tough decisions, says Paul Markey, Chief Judge of the U.S. Court of Customs & Patent Appeals. He does not want that someone to be the courts. "I am not sure that federal judges, immune from the political process, should ever be involved, in any circumstances, as arbiters of the degree of risk acceptable to the public," Markey says.

He maintains that letting the courts decide would preempt the people's right to govern themselves. Markey favors throwing the entire matter back into the lap of Congress. What Markey suggests as a "trial balloon" is that technological problems be reviewed by a beefed-up Office of Technology Assessment. According to Markey's plan, OTA could assess any new evidence regulatory agencies consider in making a decision and the correctness of the agencies' conclusions regarding risk. If errors are found, OTA could hand the issue back to the agency. If an impasse resulted, the matter could then be settled by the people's representatives in Congress. □

F. J. Donnell

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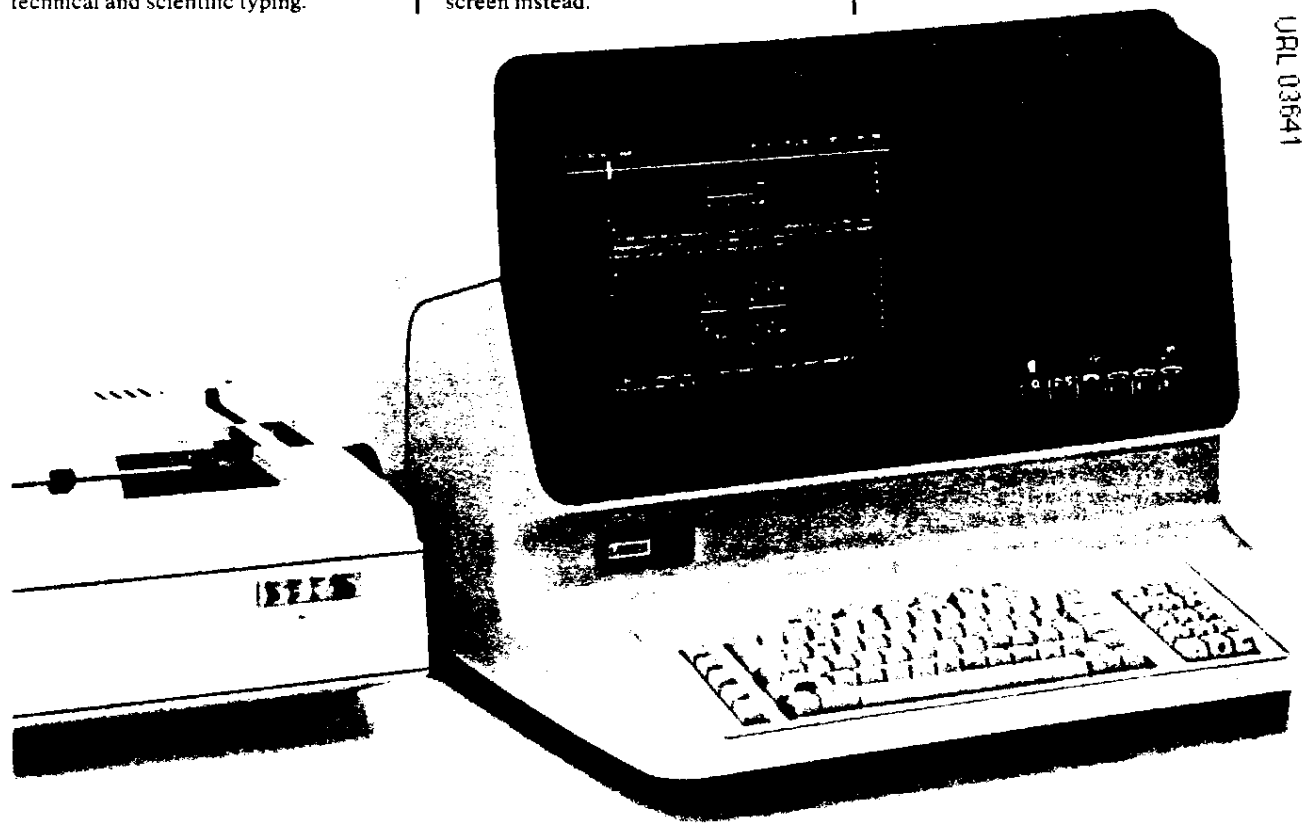
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J'accuse

"EVERY GENERATION of Americans has surpassed its parents in education, literacy, and economic attainment—except the present one."

—Paul Copperman, President of the Institute of Reading Development in California.

THIS REFLECTS a lack of leadership in the administrative, legislative, and judicial branches at all levels of government, and exposes an atavistic trend in the age in which we're living. Over the last 20 years, at least, we've created a generation of feral children who have grown up in the wilds of our civilized canyons, who somehow have not benefited from the learning experience. And yet our teachers, by definition, were the *crème de la crème*. I accuse them all, for failing to provide effective leadership as well as the abrogation of responsibility.

There is something even more insidious here than the case of any single individual, or that of a sizeable segment of society. It mirrors underlying causes that affect an entire generation and along with it the course of world history. It is for this reason that I chose the title of this Notebook entry, borrowed from the French writer and journalist of the late 19th century, Emile Zola (1840-1902).

It was in 1894 that Capt. Alfred Dreyfus of the French Army was deliberately and wrongfully accused, and convicted, at a court-martial of passing military secrets to a German attaché in Paris. This brought about a wave of political upheaval over matters of national security, of which our own Watergate is reminiscent, along with a storm of anti-Semitism, because of Dreyfus's heritage. In 1898 Zola entered the fray with his editorial series, "*J'accuse*" (I accuse), pointing his finger at the cover-up in the upper echelons of the French War Office. Zola himself was forced to flee to England for his own safety, where he continued his

accusations. This ultimately led to the downfall of several high military careers and the final exoneration of Dreyfus in 1906, four years after Zola's death. The real spy, Ferdinand Esterhazy, escaped to London, but Dreyfus's attorney had been found murdered under strange circumstances, while Zola died after a gas-jet had inexplicably been left on in his apartment.

But such heroism and integrity by any one man is not going to help us to escape from the dilemma in which we find ourselves today. The insidiousness to which I referred is not helped much by the environmentalists, with whom I disagree in principle, although there are points of imbricate

The capacity for genocide is not limited to acknowledged historical monsters.

agreement. Our ecological systems are generally somewhat resilient, able to recover after even a major upset, such as the Mt. St. Helens eruptions. Yet while there's kicking and screaming about the development and use of nuclear power to alleviate some of our energy problems, there's laughing and shouting over subtle poisoning of millions by fluoridation. Mankind may be resilient collectively, but there are limits. For example, the San Francisco Bay Area is almost entirely on fluoridated water supplies, and whether or not there's a connection, it also has the highest cancer rate in the world among Blacks and Chinese. In fact, the carcinomatous asbestos-like fibers of serpentine, a hydrous magnesium silicate, were found existing naturally in Crystal Springs reservoir, supplying back-up water to San Francisco. Serpentine is the California State rock. *J'accuse*.

Then there was the ill-fated war on malaria. The World Health

Organization (WHO) began an anti-malaria program some 30 years ago, using DDT to spearhead the effort, centering the attack on the hotbeds of India, Pakistan, and Sri Lanka (Ceylon), where nearly 80 million cases per year were reported, which resulted in some 7 million deaths, mostly children. On Sri Lanka alone one-quarter of the 8 million people had the disease.

Three years after the DDT program was initiated on Sri Lanka to combat the anopheles mosquito carrier, the incidence of malaria dwindled to 12 cases per year and remained there for over a decade. When political caprice in the United States, under the leadership of then HEW Under Secretary Wm. S. Ruckelshaus, banned DDT and other organo-chlorine pesticides as potential health hazards, we stopped manufacturing and exporting these chemicals. And, the Asian countries had little choice but to follow our lead.

Within three years Sri Lanka had 1.5 million cases of malaria, and India, Pakistan, and the newly emergent Bangladesh reported a total of more than 6 million cases, with fatalities totaling about ten percent in all instances.

The capacity for genocide thus is not limited to acknowledged historical monsters and maniacs. And, the fire of fever becomes a surrogate holocaust as another sacrifice is made on the altar of the voracious goddess. *J'accuse*.

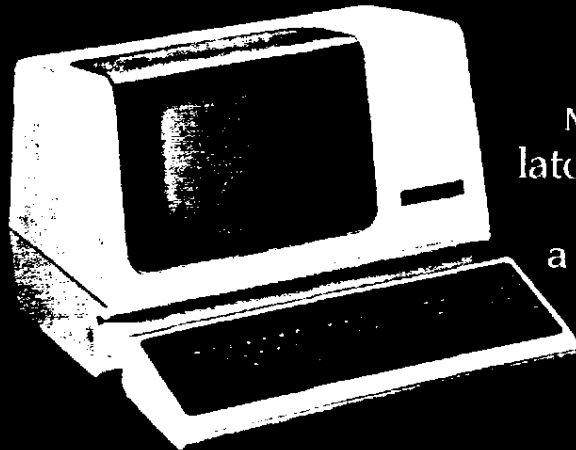
More than a century ago Charles Mackay published his book (1841): *Extraordinary Popular Delusions and the Madness of Crowds* (London: Noonday Press, 1974 pb), with commentary that holds just as true today as it did then. Indeed, this work describes with sharp clarity how incorporeal ideas can initiate and control the reality of actions and events, from witch hunts to massed Crusades, from fear of the familiar to terror of the unknown, and from two-bit hucksters to the selling of a world. Those who condemn the past, forget in repeating it. Again, *J'accuse*.

Frederic B. Jueneman, director
Hydrogen Research Institute

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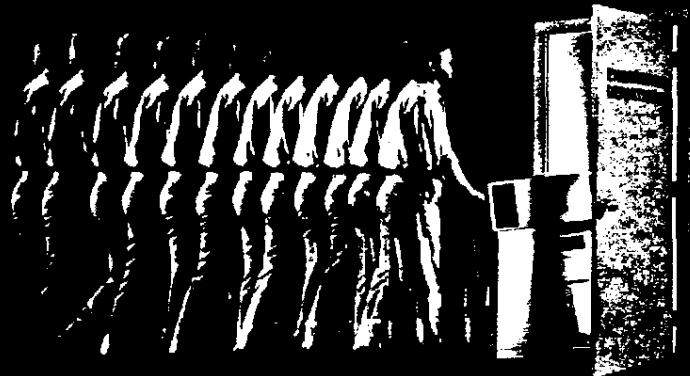
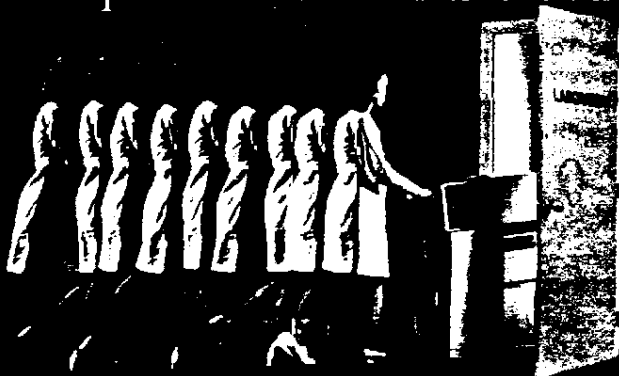


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a little bit of intelligence

YOU MUST GET involved, says Dr. James Martin, chemist and U.S. Congressman (R-NC). In his keynote address at the meeting of the Institute of Food Technologists in Dallas recently, he warned of the dangers in the "concept of Absolute Zero Tolerance." It is, he said, "based not so much on science as on political response to unknown fears."

Calling Absolute Zero Tolerance "an absolute absurdity" in a world where chemists can detect concentrations of 3 to 5×10^{-11} , he warned of the tendency of federal agencies to adopt it as their guiding principle. He said:

"I am concerned that the approach of OSHA, EPA, The Consumer Product Safety Commission, and others to this policy response will be dominated *not* by scientists, *not* by experts who understand the meaning of evidence; but by those trained in law and public administration. I am afraid that, if left to themselves, their lack of scientific understanding will be conveniently replaced by their penchant for organizational orderliness. The essentials of technology will be obscured behind a facade of legal technicality."

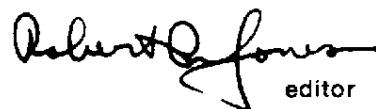
The agencies need help. Just as the public should not look to scientists alone to reflect the wishes of the public, Dr. Martin said, "... we must look to no one else to interpret the meaning of science. You must, therefore, get involved. If you do not, it will be left to others to bend the meaning of science so as to fit their advocacy agenda."

You can organize expert panels and be available to give testimony in agency and Congressional hearings. You can point out that Absolute Zero Tolerance, rigorously applied, would ban our total food supply. You can remind the policy makers that many carcinogens have thresholds below which they are not carcinogenic. You can help to put things into perspective.

Recent newspaper headlines have decried a technological sea of poisons pervading all of Earth. Critics seem especially panicky about compounds popularly identified by letters and numbers: PCB, PBB, DDT, 2,4,5-T, etc. Yet rarely do they know more than surface details. Rarely do they consider the trade-offs, e.g., nitrites in pork vs. botulism, when nitrites are prevalent in leafy vegetables and generously abundant in human saliva.

When you get involved in the Absolute Zero Tolerance absurdity, Dr. Martin warns, you can expect to be challenged as someone who favors "a little bit of cancer." To this he replies, "No, I am not really in favor of a little bit of cancer. I am only in favor of *at least* a little bit of intelligence."

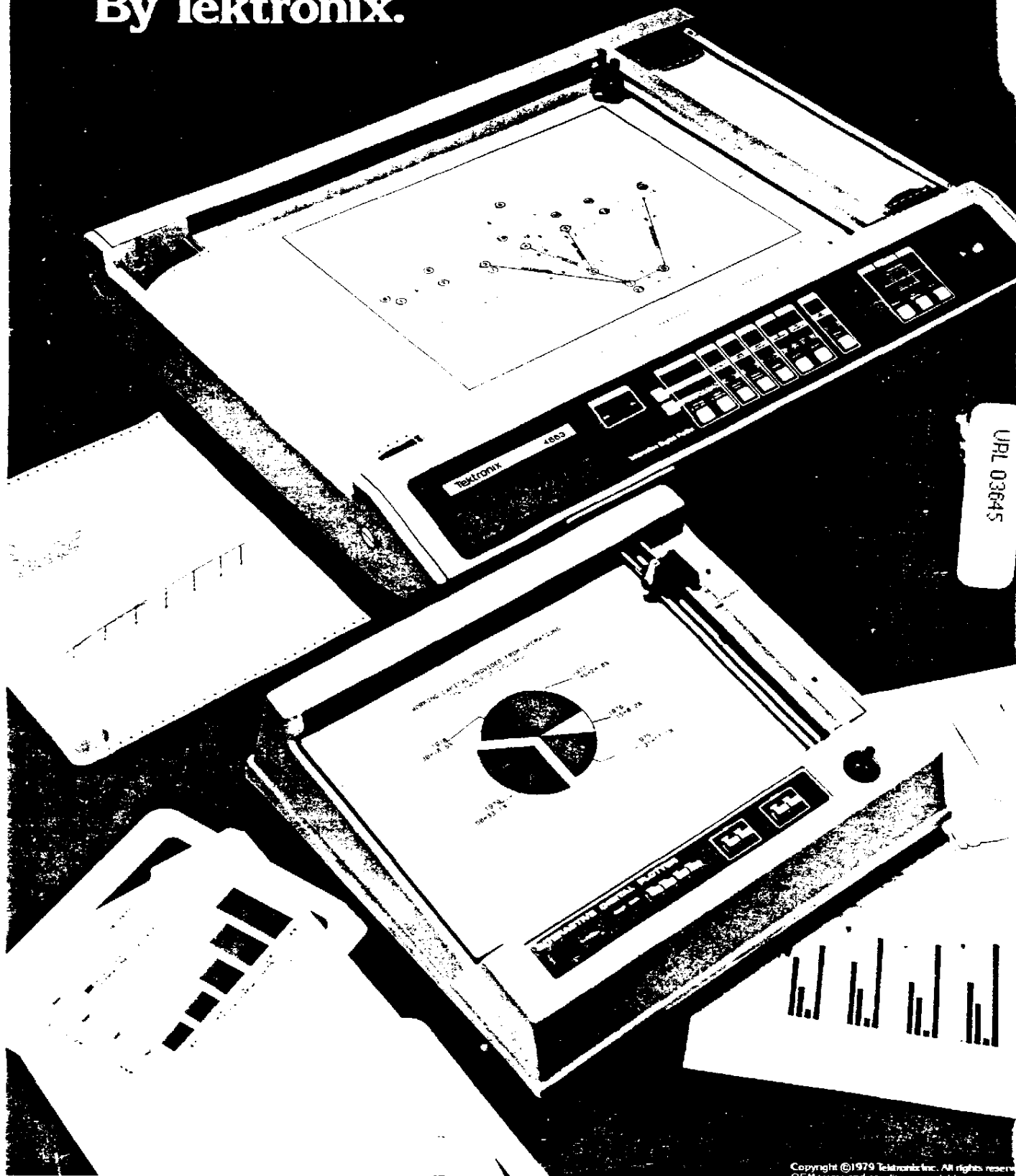
Dr. Martin is right. It is time, for those of us who care, to get involved.


editor

URL 03644

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THOUGHTS *on product development*

Risk, reward, and change . . . and Three Mile Island — IV

IT IS INTERESTING to analyze how our perception of risk has changed in the 372 years since the colonists first set foot on North American soil in 1607. The colonists came over to this land at great personal risk to themselves and with little hope for any reward at all. Two hundred years ago, the leaders of this country embarked on a risky experiment for which there was no precedent, namely to revolt against their mother country and establish a democratic form of government. They were willing, in the words of Thomas Jefferson, to "pledge . . . our lives, our fortunes, and our sacred honor."

Since the founding of our republic, countless people have risked everything to explore this country and settle the unknown wilderness. Others risked their economic well being to develop new businesses. Most of these risks were taken with little reward in sight. From this auspicious beginning, we have evolved into a nation which does not want to risk having its children eat a non-nutritious breakfast and wants to pass regulations to ensure that this catastrophe does not befall us.

Every day of our lives we face all types of risks, be they physiological, psychological, or social. Many of these risks carry no reward at all, and, in fact, the reward for most of the risks we take is that we live another day. We can say then, that to live is to risk. Only in death does risk become zero.

One of the major problems confronting our society today is that it does not want to risk accepting a new

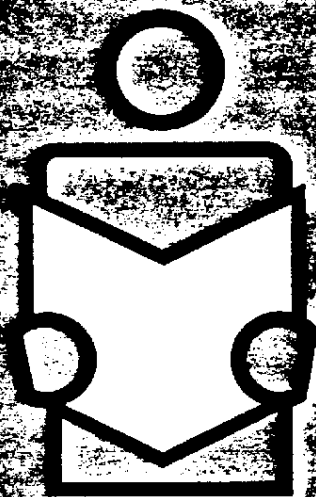
technology for some future reward. It appears that we are willing to forego tomorrow's reward in return for not having any risk today. Because we want our risks to approach zero, we are, in a sense, committing sociological suicide. We would rather not have electricity or more-efficient cars or bigger and better airplanes because we do not want to accept the risks of evaluating these new products. We want advance guarantees that these products are perfect.

This unwillingness to accept risk is the major threat to product development and innovation. Developing new technologies and products is, in reality, creating change. Change of any sort means risk. If our society does not appear to want to accept any risk, then technology is in deep trouble. This unwillingness to both encourage and accept risk is what is causing the United States to lose its position as the technology leader of the world. It is also the underlying reason why it has become so easy to politicize any new technology and sidetrack it into endless legal confrontations.

To paraphrase a current commercial, no product is 100% safe all the time, but without new products and new technologies, our society will slowly grind to a halt. If we want our society, our country, and the world to change and to be a better place than it is today, we must accept some of the risks of new technologies, even if there does not appear to be an immediate reward.

Erwin A. Frand

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Height in 1" heels	Elbow Breadth
Men	
5'2"-5'3"	2½"-2¾"
5'4"-5'7"	2¾"-2½"
5'8"-5'11"	2¾"-3"
6'0"-6'3"	2¾"-3½"
6'4"	2¾"-3¼"
Women	
4'10"-4'11"	2¼"-2½"
5'0"-5'3"	2¼"-2½"
5'4"-5'7"	2¾"-2½"
5'8"-5'11"	2¾"-2½"
6'0"	2½"-2¾"

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1983 Metropolitan Height & Weight Tables

Weights at ages 25-59 based on lowest mortality. Weight in pounds according to frame (in indoor clothing weighing 5 lbs. for men and 3 lbs. for women; shoes with 1" heels).



Metropolitan Life Insurance Company
Health and Safety Education Division

1983 METROPOLITAN HEIGHT AND WEIGHT TABLES

MEN					WOMEN				
Height		Small	Medium	Large	Height	Small	Medium	Large	
Feet	Inches	Frame	Frame	Frame	Feet	Frame	Frame	Frame	
5	2	128-134	131-141	138-150	4	10	102-111	109-121	118-131
5	3	130-136	133-143	140-153	4	11	103-113	111-123	120-134
5	4	132-138	135-145	142-156	5	0	104-115	113-126	122-137
5	5	134-140	137-148	144-160	5	1	106-118	115-129	125-140
5	6	136-142	139-151	146-164	5	2	108-121	118-132	128-143
5	7	138-145	142-154	149-168	5	3	111-124	121-135	131-147
5	8	140-148	145-157	152-172	5	4	114-127	124-138	134-151
5	9	142-151	148-160	155-178	5	5	117-130	127-141	137-155
5	10	144-154	151-163	158-180	5	6	120-133	130-144	140-159
5	11	146-157	154-166	161-184	5	7	123-136	133-147	143-163
6	0	149-160	157-170	164-188	5	8	126-139	136-150	146-167
6	1	152-164	160-174	168-192	5	9	129-142	139-153	149-170
6	2	155-168	164-178	172-197	5	10	132-145	142-156	152-173
6	3	158-172	167-182	176-202	5	11	135-148	145-159	155-176
6	4	162-176	171-187	181-207	6	0	138-151	148-162	158-179

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Source of basic data: 1979 Build Study: Society of Actuaries and Association of Life Insurance Medical Directors of America, 1980

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