KEYNOTE ADDRESS --- "THE YEAR OF ECOLOGY"

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In the Orient, this is "The Year of the Dog."

In the United States, it is "The Year of Ecology."

Many people are using the word "ecology" with great assurance. But I am sure that many of them don't really know what it means. Others, who may not be comfortable with the word ecology, talk about "environmental quality," "quality of life," "the right to breathe," and so on, almost to the point of nausea.

A member of the Hawaii State Senate recently proposed that the constitution be amended to guarantee every citizen of the state the right to clean air, clean water, and freedom from noise. (He didn't say how he proposed to prevent our volcano from puting smoke and dust into the atmosphere!)

Now, much of this is understandable, for this is an election year in Hawaii and, because of reapportionment, every house and senate seat, as well as the office of governor, is up for grabs. Given the temper of the times, no candidate for public office--local, state or national--can overlook the issue of pollution. It is a "motherhood" issue. If your are a candidate, you have to be for pollution control.

If you sense that I am mildly cynical, you are correct. This cynicism has two roots. One is that many of us have known about some of these problems and have been trying to find constructive solutions for years. The other is that many of the loudest critics have seized the new rhetoric (and here I use the word in its definition as "insincere or grandiloquent language") without doing their homework.

As one example, a woman asked me not long ago why there was such a shortage of people trained in the new science of ecology. I said I wasn't sure there was a shortage and, as for its being new, take a look at me. I told her I had studied ecology back in the thirties and that I still treasure my 1929 edition of Weaver and Clements' Plant Ecology.

As another example, a "new" conservationist stated, during hearings on water pollution regulations, that farmers and land owners should be made to prevent soil erosion and water runoff. Apparently he had never heard of the U.S. Soil Conservation Service. Nor of geologic erosion.

But I am more than cynical. I am deeply concerned, and I find that some of my colleagues share this concern.

It seems to me that there are at least two things we should be concerned about. First, I believe there is a real possibility that the environmental quality bandwagon will get to playing so loud and to rolling so fast that there can be some unfavorable consequences in food production and processing--the job I work at and that some of you work at. Second, I believe there are signs that we could lose our balance--that we could be making decisions on emotional instead of rational grounds. Reason seems to be in danger from an epidemic of emotion. And we need to remember that scientists and academicians are not immune to emotionalism.

Let me emphasize here that we all know there are pollution problems, that some changes have to be made, and that our governments have been inattentive or complacent for too long. I am not suggesting that such complacency be allowed to continue or that we not try to solve the serious problems we have. What I propose is that we need to consider our environment questions with what George Fahnestock (writing to Science) called "greater philosophical accuracy," and with a concern for the total environment.

What does all this have to do with vertebrate pest control?

Well, for one thing, control of any pest means a change of some kind in the environment--either through the means used to achieve the control or simply through a change in population of the pest being controlled.

For another, vertebrate pest control, like any other pest control, has some sort of goal, or purpose. In our ecosystem, these purposes invariably are human oriented. We want the mosquitoes killed because they are a nuisance or because they are a vector of human disease. We want to control prairie dogs because they damage pastures and thereby reduce productivity. We want to control rats in cane fields for the same reason. So whether he will admit it or not, man has always been making value judgments about the other organisms that share his world and, in the end, he always decides in favor of himself. I don't see anything wrong in this but I think people are hypocritical when they cry about the bald eagle or the redwoods, because they are really crying about their own selfish interests.

Over the past thirty years there has been truly remarkable development of chemical pesticides. These are useful tools in the control of vertebrate and other kinds of pests. But those of us working at any kind of pest control should be concerned because we will almost certainly lose some more of the useful chemical tools we now have as a result of the emotional concern about pollution. And it has already become increasingly difficult to get registration and residue tolerance for new pesticides.

As you know, DDT has been of decreasing importance for some years, mainly because of the development of superior alternatives for many uses. The transition was proceeding in an orderly manner, until emotion took over. The use of DDT in the United States was doomed from the day Rachel Carson's Silent Spring was published. And I believe it has been condemned more on the basis of emotion than on fact.

Literally countless people have decried the use of DDT because it was found in Antarctic penguins. But how many of them know that out of ten penguins DDT was found in only four? Or that in these four the DDT was found only in fatty tissue? Or that the average for these four tissues was five one-hundredths of one part per million? Or that 38 tissue samples were negative?

How many such people ask, "What is a tolerable level of DDT?" Healthy Lake Michigan herring gulls were found to have 390 parts per million DDT in their body fat. If herring gulls can tolerate this much, how much is bad for a penguin? Or for a human?

Thomas H. Jukes, Professor of Medical Physics, Space Science Laboratory, University of California, has encouraged me by his appeals for reason instead of emotion. (BioScience 19:640-641. 1969. and Science Pg. 44, Oct. 3, 1969). He notes that, "No authentic cases of death or serious injury to human beings from the routine use of DDT have been reported, although there have been a few industrial accidents, or freak incidents such as using DDT by mistake for pancake flour."

He also points out that DDT can be the culprit either way. If a desired species of wildlife declines in numbers, it is being poisoned by DDT; if an undesirable species increases in numbers, this is because its natural enemy is being destroyed by DDT. As an example of the latter phenomenon, the coral-eating starfish has grown to damaging numbers around Guam and is of concern in Hawaii. DDT has been blamed because it is supposed to have killed some unidentified predator.

As further examples of threatened loss of useful pesticides, the President's Science Adviser announced last October 29, 1969, that it was proposed to cancel the registration for the herbicide, 2,4,5-T, by the end of the year. The related compound, 2,4-D, was also suspect and, by implication, was a candidate for the same fate. Why? On what basis? These two materials have been useful herbicides for 20 years and, so far as I know, there are no authenticated cases of human death or injury.

Well, one laboratory reported some "Thalidomide-like" birth defects in experimental animals injected with 2,4,5-T. Also, there were reports of birth defects among people in Viet Nam where 2,4,5-T had been used to kill jungle vegetation. Apparently the 2,4,5-T was applied neat--full strength--by aircraft, over villages and crops, and maybe it could have some harmful effects used in that way. And this leads me to another fact that is so often not known or, if known, is disregarded.

Almost 500 years ago, Paracelsus said, "All things are poisonous, yet nothing is poisonous." More recently, Fred Stare, of Harvard, has put it, "There are no safe chemicals, there are only safe ways of using chemicals." But this message doesn't seem to get across. And our mass media don't help a bit.

Not long ago, in Honolulu, two or three children suddenly got sick. A sibling didn't. The children who got sick had eaten some oatmeal; the other one hadn't. An analysis found

diazinon in the box of oatmeal. How did it get there?

Well, someone had told the householder, "Hey, you know da kine medicine, Spectracide? Real good, you know! You paint em in kitchen, you kill da cockaroach!" So, the guy got a can of Spectracide and slopped it around the kitchen and some splashed onto the box of oatmeal.

When this was reported in the press I think the emphasis was wrong. The emphasis was on how dangerous this material is; not on how stupid the user was. I use Spectracide but I read the label and I follow the directions. The label says, "Lawn and Garden Insect Control" (nothing here about kitchens). "Warning: Keep out of reach of children. May be fatal if swallowed. Avoid contamination of foodstuffs." It seems to me that is pretty plain language. It would have been nice if the media could have said, "The manufacturer is very explicit about use and precautions. We are sorry the kids got sick. But for Heaven's sake, read the label!"

Because this is "The Year of Ecology" all pest control measures are going to continue to be under attack. What can we do? As I said earlier, nobody can be against pollution control or improved environmental quality.

I believe all we can do is what we have been doing--but maybe more and better.

I believe we must continue to depend upon the scientific method. We must experiment and test and test and test. We must have facts. And they must have a solid foundation. In our own work, I'm afraid we have too often depended on results of empirical field tests, without having done enough basic research to know and understand why we were getting the results we did.

If I have learned anything from nearly 35 years in agricultural research, it is this--five years of basic research can save you twenty years in the field. Oh, you have to do the field work, to adapt, extend and demonstrate, but you can do it so much faster and with so much greater confidence if you have a solid base under it.

I believe we must leave our emotions out of our decisions. Emotions are fine but if we are to have a society based on reason, we must make our decisions on facts.

Finally, we must speak out. Get on committees, task forces, boards, commissions, or what have you. Sure, it takes time. Time that you would rather spend in the field or laboratory or office. Such public service is not only onerous and time-consuming--it is sometimes downright unpleasant. But if we don't make our points and put our case forward, no one will do it for us.

Sometimes, in my pessimistic moments, I have said that the pendulum can swing too far. That the appeals for pollution control and environmental quality can go so far as to take away some of the tools of production to the point where we could experience actual decreases in output. That the emotional approach can discourage the very research and development needed to improve the use of pesticides we have now and to find new and better ones.

In my optimistic moments, I know this cannot happen. That reason will prevail. A meeting such as this gives me optimism for, as I have tried to say, our goal is in finding the facts, making them known and using them. This meeting can help us achieve that goal.