LUNCHEON ADDRESS

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I would like to share with you my observations and some personal philosophy on water and water research, and how they might apply to New Mexico. It might be helpful to put my comments into perspective by telling you how I got involved with water in the first place.

In 1960, I was attending college at the University of Idaho, studying to be a forester. For some reason I wanted to work in the woods. In those days and even today, all students that were between their sophomore and junior year in college had to attend forestry summer camp. Some of you probably know what forestry camp is all about but for those of you that don't, it's a place where you get an opportunity to sample the kinds of activities that professional foresters eventually get into sometime during their career. These include such things as timber cruising, log scaling, learning forest ecology, fire fighting, log rolling, axe throwing, and tobacco spitting. Our summer camp was located in Central Idaho near McCall and it was a particularly dry summer that year. We had just spent a week fighting a fire and were then scheduled to spend the next few days on a high dusty mountain studying a new high-line technique for getting logs to the bottom of the mountain. Well, like I say it was hot, dry and dusty and all of us wanted to get back to McCall because it was next to a beautiful and wet lake. We finished our work on the dusty dry mountain, returned to McCall and the next day we found out that we were to spend the next two weeks on a subject called limnology. I thought that had something to do with the science of taking limbs off of trees and I pictured a return to that hot-dusty-dry mountain again.

As it turned out, limnology was not the study of limbs but the study of freshwater lakes and streams. We went to the banks of the beautiful Salmon River and spent two weeks measuring water flows, sampling water for chemical analysis, examining the stream bottom for aquatic insects and studying different fish management techniques. To make a long story short, I liked the idea of working in and around water and decided to become a limnologist.

My fixation to water took me to the state of Michigan because of its vast opportunity to work in the water field. I completed my graduate work there and returned to the west and spent a few years at Colorado State University as a young Assistant Professor teaching Limnology. I returned to Michigan to spend the next eight years in the water resources field.

It was there that I got my most comprehensive exposure to water management and the role of research in helping to solve water problems. The emphasis there was on water quality. Large numbers of people along with industry had put enormous demands on water resources of that state.

Although the water was not depleted in the sense that supplies had dried up, much of the water became so grossly polluted that it was no longer suitable for many uses. Toxic chemicals contaminated thousands of tons of fish, beaches had to be closed because of pollution by municipal sewage and many other beneficial water uses were threatened, even navigation. For example, on one of the tributaries to Lake Erie a paper mill was discharging its effluent into the stream. Paper fibers would settle to the bottom and lie there and become compacted. Two or three times during a summer, gases would form under this compacted layer of paper fibers and produce a raft two to three feet thick that would eventually float to the surface of the water. They were so thick you could actually walk on them! There was quite a bit of boat traffic up and down that river and many had to wait until these paper rafts floated out of the way down to Lake Erie. That's a water quality problem!

Many of you may not be aware of this but there was a significant demand for groundwater in the state and in some areas groundwater depletion was a very serious problem. There were also important institutional and legal problems over the jurisdiction of water and it's management and these had to be addressed before any progress could be made.

To make a long story short, I learned that there were no simple solutions to water problems and furthermore, no single water user group, be they industrial users, agricultural users, recreation users or municipal users, had all the answers. What would benefit one group in many cases was to the detriment of another group. At that time I said to myself "self" as a research administrator should you get involved in deciding which management scheme is the best. The answer was "NO". I said to myself "self" is that a cop out and am I avoiding responsibility? Myself took a long time in answering that last question, but eventually the answer took shape, it goes something like this:

It's probably not very productive for a trained scientist to question whether one should or should not modify his environment to suit the needs of a particular group of water users. The very nature of the human species is to modify his environment and as long as there are people, there will be change! I've accepted this. I think, though, from the standpoint of a scientist and a research administrator, what <u>is</u> productive is that the role of research in water resources management should be to assure that results of our actions are foreseen; that they're predictable, and that they are laid out in such a way that the public can look at the options and determine whether or not they're acceptable. Through research we can help predict what the consequences of various alternative management schemes are going to be. Through extension and other outreach programs of the university results of research can be put out on the table for scrutiny by the public. It is the public that is going to make the final decisions. It is incumbent on the scientist to provide answers to what the future will be like under different scenarios.

Getting back to my point there are no simple solutions to water problems. Let me stress that the research needs related to these problems are also not very simple. This takes me to the topic of what is going to be the future direction of the Water Resources Research Institute and the programs what we administer. First of all, let me say that I will probably not be charging out in some radically new direction. I said probably. If I were to outline

to you right now a very detailed research plan I would not only be kidding you, I'd be kidding myself. I do, though, have some thoughts on the general boundaries within which I would like to see research proceed.

* Develop a comprehensive plan that will take into consideration the water problems of the state and region as well as the availability of the scientific talent required to complete the research. This plan will be developed in close coordination with water users and managers. In this respect it is particularly important for you people to make your views known especially as they relate to the kinds of research you think need be done before a problem can be solved or an issue resolved. This conference is an excellent forum in this respect.

* Stick to the plan!! I don't mean to say that a plan has to be rigid and closed to new ideas. On the contrary, I think it should be receptive to new ideas. By saying stick to the plan, I mean that we should be aggressive in recruiting the resources and promoting the topics of the plan. This is opposed to being passive in research; simply jumping from topic to topic as funding becomes available. Put another way, I am saying be a carnivore and select and pursue your prey. Don't be an omnivore and simply take what passes by.

  In Michigan we had a research plan for water quality management. At that time portions of this plan were not very popular with the lead funding agency (EPA) and funds simply were not available. None-the-less we felt strongly that the research simply had to be done. We spent over four years trying to fund the project. We stuck to the plan and eventually raised $2.5 million. The topic of the research soon became very popular with EPA but the problem then was already upon us. In many ways I believe that research designed to meet the needs of today's problems will often be too late for input to the solution of the problem when the results are in. We need some real crystal ball gazers in this respect.

* Write down the plan in black and white and subject it to scrutiny. I think if one is to have an adaptable plan, researchers should have the opportunity to see the plan in order to see how they might fit in. The same holds true for the users. They should see it in order to input their ideas and assure themselves that the right questions are being asked.

These are broad boundaries in which we will proceed into the future As the plan is coming into sharper focus for me, I see a few areas that are sure to demand attention. I'll list some of these that we are getting into now or are sure to get into the next year - not listed in any order of priority:

* Water use efficiency in agriculture - Research will continue in developing irrigation techniques and plant varieties that use less water.

* Water quality management research - This is research whose goal is to minimize water quality degradation as it is used. Be it agriculture, energy development, or other industrial and urban use.

* Developing acceptable schemes to integrate recreational uses of water with other demands on this scarce resource. I believe that there are many areas where recreational uses of water are compatible with other uses.

* Research on saline water.

  Desalting itself, it is not a panacea. Although we have vast amounts of saline water in this state, it is not an unlimited resource. The technology of desalting is improving but it is not going to be the total solution to the economic development of the state.

  Saline water development is a high priority topic. This would include research on using saline or brackish water directly for such things as irrigation of salt tolerant plants. Use of saline or brackish water for aquaculture shows great potential. There is a lot of aquaculture research going on in coastal regions of our country that shows great promise in the growing of such items as shrimp, shellfish and finfish. I am confident that through research we can do the same with our brackish groundwaters.

  I should mention that the Institute has just signed an agreement with OWRT on the use of the Roswell Test Facility to do a vast array of research in saline water development. I see a bright future with many exciting opportunities in this area.

* Comprehensive economic and legal assessments of water management have to be done. We should be taking a total, "holistic" approach to water development, weighing all the costs and benefits.

* Technology transfer - We will be putting more effort into this area in the future as we get the resources to do it.

These are just a few elements of what I am sure will be in such a plan. Let me close by sharing with you a quote I heard sometime back and I forgot who said it...but it goes like this: <u>"Logic is the Loudest Voice Spoken First"</u>. Let me encourage all of you to be logical this afternoon in your workshops. Speak up. This is your chance for input into the important vital water issues that are facing us here in New Mexico.

Thank you.