

SECRETARY STEWART L. UDALL

Dr. Corbett's Introductory Remarks:

It is not everyday that New Mexico can have a member of the Cabinet in our State. It is a very great pleasure for me to have the opportunity to introduce Secretary Udall, the Secretary of the Interior. Before I ask him to step up to the microphone, there are several things that should be said.

He is the first and only man from Arizona to be in the Cabinet. He is one of the youngest men who has ever served in the Cabinet of the United States. I say with some feeling, being associated with New Mexico State University, that he was a great basketball player. New Mexico State University learned this in competition with him. He played for the University of Arizona and was an "All Conference" player. We were in the Conference at that time. I imagine that athletic prowess stands him in good stead in these strenuous days where he is going day and night as Secretary of the Interior.

Secretary Udall has become one of the great conservation leaders in the short time that he has been in the House of Representatives and the Cabinet. I think it is extremely important to you men and women of this Conference who, for years, have attempted to bring together all of the available knowledge on water problems, that we have as Secretary of the Interior a man from the Southwest. He is familiar with our problems and knows what to do about them, and he is the leader in saline water work. This is important to us. And so, we are extremely fortunate to have as our Secretary of the Interior, Secretary Udall. He is going to speak to us on "The Interests of the United States in Saline Water Conservation." Secretary Udall.

Secretary Udall:

I think this Conference has captured the excitement of the Saline Water program. Over 10 years ago, people like Senator Anderson not only saw the need for a program of reducing the salinity of saline waters--brackish waters and ocean waters--but also had the vision to recognize that this was one of the great and challenging scientific projects our country faced. They undertook to enact a program that has moved ahead steadily for 10 years. In fact, two years ago, a bill by Senator Anderson and Congressman Aspinall from Colorado nearly trebled the scope of the program. Consequently, our efforts are on a much higher level now than they ever were, and this progress is in one sense "The New Frontier" of the whole water field.

Until just a few years ago we were still living, so we thought, in the lap of plenty. We believed we had sufficient supplies, and that there wasn't too much to worry about. Yet, events have moved so rapidly that we can already see that we were very foolish in some of the practices we adopted. We are still today a Nation of water wasters. The quantities of water we are wasting in many of the Eastern parts of this country, such as through the polluting of our rivers, is one of the National scandals in the conservation field.

The problem we face is applying science and scientific technology to all of our water problems. But this application is not what we thought a few years ago. Then we thought we could do an adequate job if we simply built the necessary dams and reservoirs on all of our major rivers so we could have hold-over storage and smooth out the water cycle. Of course, this is very essential, and we are moving ahead on this work. In fact, we did some really significant things last year.

In Congress, authorization was given for two vital water projects which involved transmountain diversion--water from the Pacific watershed to the Atlantic watershed. The San Juan-Chama project on the Rio Grande is one, and the Frying Pan-Arkansas project on up the spine of the Rocky Mountains is the other. Here we are, through the techniques of engineering, taking water from one watershed and moving it over to another. This is an example of the long range planning we have to do. But, the necessity for this type of planning is more and more apparent to us in the arid areas of the country, such as this, where you have less than 12 or 15 inches of rainfall a year and where water is so precious. Long range planning is vital to this area's growth potential which is so closely related to the water supplies.

There are many steps that we can take in approaching our water problems properly. We can at least reduce our evaporation losses, and cut the consumption of water by phreatophytes, those water-using plants along our water courses. The entire field of better water management and better water conservation is part of the challenge we face. We must learn to recycle and reuse water; we waste tremendous quantities simply by not understanding what we are doing or by using water extravagantly and wastefully. We must advance on the entire water conservation front.

I think we will live to see many of our major cities such as Albuquerque, Phoenix, and Los Angeles taking their sewage effluent, purifying it, and reusing the water; in other words making maximum use of the water available. Some cities are doing this already. In addition we are going to have to do a better job of controlling evaporation losses. At the Roswell Saline Water Plant the effluent is taken off to pond, spread out, and nature evaporates it. This,

of course, makes sense. This is part of the problem, part of the scientific experiment we are all engaged in. Assistant Secretary John Kelly, who is a geologist, tells me that if the effluent were taken out further, that it probably could and should be injected back into the earth. Ultimately, it may be that science will devise ways and means of recovering the minerals and salts from these saline waters.

This is old ground that I am covering, but I mention these factors to set the stage for one of the points I want to make here today. The problem is to understand water, because we cannot manage it or conserve it properly unless we understand it. We can't control the quality of water, we can't determine how to use it best or how to get maximum use from it, unless we understand the behavior of water.

I think one of the most important water measures is pending before the Congress of the United States today. It is Senator Anderson's S.2 Bill which is another example of conservation pioneering on the part of the Senator. The bill sets up at Land-Grant Colleges and Universities in all of our states, Water Resource Research Institutes. Setting up the Federal government and states in partnership, entering into a new bold program in water research is, I think, one of the most significant proposals that has been put forward in many years in the water field.

Senator Anderson in his usual creative way borrowed a concept from another field--this is the way you produce new ideas. You take an idea that has worked over here, and you say, "why not apply it over here?" There has been no more successful scientific program over the last 50 or 75 years in my opinion than the cooperative program between the Federal government and the Land-Grant Colleges with regard to agricultural science, with regard to the programs that the Land-Grant Colleges have had in their Agricultural Experiment Stations, in their effort to determine ways and means of making our farms more productive, of raising better crops, and of doing a better job in managing all of our resources which relate to the land and its products. As a matter of fact, my science advisors have suggested to me that this has been one of the great successful scientific ventures in our country's history. For a long period of years, we have spent more money as a people, more Federal money, in the field of agricultural research than any other place. The results of this research account for the tremendous success today in the agricultural field where our land yields are so high, our crops so bountious. This is one of the great American success stories.

Senator Anderson served as Secretary of Agriculture, and you have heard him discuss this whole problem. But today, we think

of our agricultural surplus as a problem--actually it is a great boon to our country since it enables us to help other peoples around the world not only with surplus crops, but with the know-how we have gained over the years of using science to help us understand the land and the proper use of our soils. Based on the success of this program, that has enabled our country to become so prosperous that we are almost embarrassed in terms of agriculture, we have every reason to expect success in water research.

Senator Anderson has suggested to the Congress of the United States, and the Senate has already taken up this suggestion and has passed his bill, that we use the method that worked so well in Agricultural Experiment Stations and apply it to our water problem. The idea is that the Federal government appropriate monies for a joint program with the states to set up more aggressive action in terms of water research in all of the 50 states. Of course, many of our Land-Grant Colleges in many of our states already do have water research programs. Your Water Conference here is evidence of that.

It was obvious to Senator Anderson, and to those of us who studied the national picture with him, that many of our states are not making any effort. In fact, some of them are making a very inadequate effort, considering the problems confronting us. If the projections of water use are sound, twenty years from now we in this country are going to need twice as much water as we are using today to take care of our industrial, municipal, and farming needs.

There are many areas where we have water surpluses in this country, but you can see what a tremendous challenge we face. As any of the Geological Survey people here will tell you, as any of our experts at your institutions such as Dr. Corbett will tell you--there are a lot of basic things that we do not understand about water, about its nature and about its behavior. This is the reason that I have been working closely with Senator Anderson on his legislation so that all of our states become involved in a larger effort--coordinated as the Bill provides with a national effort.

We have got to produce more water scientists in our universities. If we are to do a proper job of water conservation in this country, then we must have more experts. The National Academy of Science has made a study for President Kennedy on water. One of their major conclusions was that we face a very serious shortage of water experts, and people who are knowledgeable in the hydro sciences. The Academy stated that we must make

a planned effort or we are going to find ourselves using our geologists and other water experts as emergency squads who run around trying to solve problems when people get into trouble, instead of properly planning our water future and thus eliminating most of the problems.

I think that all of us here and all of the people in the country have a stake in Senator Anderson's bill because it concerns our universities, it concerns all of you here, it concerns, I think, a very vital aspect of our whole water conservation program in this country.

As far as the Saline Water Program itself is concerned, what interested me the most in coming here today was to see this fine new plant, and to survey the progress, problems and opportunities we have here. I have been told that there are tremendous water resources in these arid areas. This is an area where you have a very limited amount of rainfall a year. It means that you have to husband what you have. It means that as far as the growth of your area is concerned, water is now and always will be your most serious problem.

Yet, you have underneath the soil here a great aquifer of water. As you look at the Geological Survey maps, you find that there are tremendous underground aquifers in the Midwest and in parts of the Southwest. Some of this water is usable, some is near the surface. Some of this water, often in enormous quantities as in your case, is saline in character and unusable for farming or other purposes. When I tasted the sample of the water pumped out of your deep saline aquifer here today, I couldn't believe how saline it was. It is half as saline as the waters of the ocean itself. And yet, this is part of the water resource of this region. At present, it is unusable. Until we perfect the means of conserving it, of creating, one might say, a water product that is usable, it will remain merely a potential.

One of the reasons we selected the New Mexico area for this plant is that this is the most interesting of our saline plants. Other plants, one on the Gulf Coast, one on the Atlantic Coast, and one on the Pacific Coast, are working on problems of desalinating ocean water, and the problems of all are quite similar. But here we have a very special problem involving a great underground resource. We have here waters that are highly mineralized, have different types of minerals, and a very high degree of salinity and mineralization. This presents a real challenge to the engineers and water experts who are trying to perfect the saline water technology.

This plant has subtle problems that will not be solved overnight. This is an experiment; it was intended that way by the Congress. We are going to find out a lot of answers relating to your own area with regard to reducing the salinity of soils. We will find out how to take care of an effluent that comes out of a plant of this kind, and what is the best way of handling these very saline, highly mineralized waters. It is this type of engineering and scientific venturing that will provide the answers not only for your state or for this locality but for all of the states that have similar underground brackish aquifers. There are, too, many places in the Middle East and elsewhere that have problems that are quite similar in terms of water potential. Therefore, this project, its operation, its developments, and the solutions it gets, will be watched with much interest all over the world.

It is apparent to me that we are making real progress toward our objective. From antiquity men have been able in one way or another to produce fresh waters from the seas or from brackish waters through various simple but very limited methods. Our basic problem is perfecting techniques whereby we can produce the water in great quantities at minimum cost. We are already strongly convinced that we are nearing the point where we can see this big break-through where in many parts of our country the price will really break down sharply to the point where, for municipal and industrial purposes, the water that can be produced from large saline water plants will be competitive with water that is available from other means. It is obvious to us that the main vehicle for this break-through is to move out of these relatively small plants into very large plants--plants that are 50-100-500 times as large as the plant constructed here.

These will be great water factories, once we have perfected the techniques. Our engineers and others have been working with the Atomic Energy Commission people; and industry people are also rising to the challenge. The combination of a large plant which would produce simultaneously electric power, through thermoturbines, and usable water offers a very inviting prospect. For such a plant the largest cost requirement is the energy, and of course, part of the requirement for any desalinization plant is the energy to either heat or cool the water; energy is one of the big components.

Most saline water plants are based on the heating principle, using low pressure steam. The turbine is turned in our latest thermogeneration of electricity devices through high pressure steam. Thus, if a plant is producing steam, the high pressure steam could produce electricity and the low pressure steam could be bled off and used for a desalinating plant. The result would

be a versatile plant where all of the energy would be used to produce electricity at the peak load and peak time in the evening. At night, the plant would operate at full capacity producing water, which, of course, is stored for use at the proper time. This is something that we see very clearly now as a potential.

We didn't see this too well two and a half years ago, when I first came into the program. So it is not only a matter of perfecting the machinery, perfecting the technology of the desalinization; but it is a matter of putting engineers together to look at the larger aspect so that we can see how a program of this kind can serve the people both in terms of water and perhaps electric power simultaneously. I am very hopeful that, perhaps this year or not long thereafter, we will be ready to discuss with Senator Anderson and others in the Congress various types of alternate proposals for moving into large plants.

I think, and I am being conservative, we are going to see within the next five years a move into the construction of large saline water plants. If we can perfect techniques and perfect the equipment that is needed, this great underground saline aquifer that you have here now practically useless, may have the potential of being converted into a tremendous asset that will help the long-term growth of your area.

You have launched here in New Mexico a very interesting experiment. It is an experiment which holds a great potential for your future and the future of the country. Your Conference will aid everyone to understand better the problems and opportunities available to all. As for us, we are delighted to have another activity in the State of New Mexico. The Department of the Interior has a tradition of fine relations with your state and state officials. I am sure that we all are going to be very excited and interested in this plant as it operates in the months ahead. Thank you very much.