WATER'S CHALLENGE TO OUR FUTURE

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In the foyer of the Department of Commerce building in Washington, there is a big clock to which is attached a counter turning big numbers ahead at the rate of 330 per hour. The register is recording our national population which is presently increasing at that rate.

On October 16, that counter turned 175 million. Tonight, as I am speaking to you 21 days and nine hours later, it has gone up another 182,652. By 1967, according to the demographers whose business it is to keep track of population trends, the count will exceed the 200 million mark.

Within the next 20 years, according to Census Bureau projections, we will have a population of 260 million and 2010, fifty years from now, our population will have more than doubled, probably ranging around 370 million people.

That population gain will be felt by every one of our states which by that time should surely include not only Alaska but also Hawaii, and by our territories as well. If the present trends continue, the impact will be greatest in the West as it has been in the last two decades.

Since 1940, the population of the western states has increased 55 per cent--from 27 to 42 million people. This is nearly twice the national rate of increase. I am indebted to U. S. News and World Report for other growth statistics which are relevant to our discussion here tonight.

Between 1940 and today, employment in the western states has increased 108 per cent, which is nearly double the rate of population increase. Personal income is up 455 per cent, bank assets are up 379 per cent, capital spending for plant and equipment is up 930 per cent and the value of manufacturing output is up 770 per cent.

All of these rates of increase are sharply above the national average. Project these rates of increase in business statistics along with the indicated rates of population increase and it leaves one more than a little breathless about the future of the West.

But there is another rate of increase which should give pause in our optimistic outlook concerning the West's economic development. If we had a register recording the rate of water usage to correspond with the rate of population increase, it would be pushing ciphers clear out

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of the end of the four-block-long Commerce Building by now.

Back at the turn of the century when we took our baths on Saturday night in an old tin tub by the Kitchen stove, our daily per capita consumption of water was 530 gallons. There were no air conditioners, no garbage disposals, few great industrial plants, and less than a fourth as much irrigated land as we have today.

By 1930 our per capita consumption of water had climbed to 900 gallons per day. Today, we are requiring a per capita supply for all purposes, domestic, industrial, and agricultural, of 1600 gallons daily, nearly three times our average individual need a half century ago. In terms of total use the figures are more startling. We are using 280 billion gallons daily compared with 40 billion gallons in 1900.

It is a little more difficult to anticipate future per capita water requirements than to project population trends, but some forecasts have been made placing the per capita requirements as high as 2200 gallons by 1975. Our water needs are increasing at a much more rapid and remorselessly geometric rate of progression than is our population.

This is one of the great challenges facing the United States today. Even more than nationally, it is a challenge to the West. The 85 million gain we may anticipate in population during the next 20 years is more than the nation absorbed in the entire nineteenth century. During that period of westward expansion, virtually everthing west of the Appalachians was virgin territory and there was elbow room for everyone.

There is still lots of elbow room in the West but it will require foresight and imagination if it is to be made capable of supporting the vast population of the future.

Dr. Walter Prescott Webb, the eminent western historian, is quoted as saying that the West, within foreseeable times, will never be as congested with population as are some other parts of the country. I am in complete agreement with him that it will always have plenty of wide open spaces.

Many areas are simply not adaptable to carrying a concentrated population. Then there are those magnificent areas of our national parks and some forest and public land areas which must be protected and retained in as much their natural state as possible even though they are already the Mecca of vacationing millions.

But there are many other areas, rich in natural resources and potential expansion in industry, agriculture and population, that await development. They need only the pressure of an onrushing civilization, the catalyst of an increasing population, to bring to fruition the process that has been slowly evelving since the first settlers pushed their way west across the Mississippi.

I use the term, slowly, advisedly. Actually, it is amazing what has been accomplished in the western states in the last century or even the last half century when the pace has been even swifter. And always the pace has been geared to the availability and use of water.

Back in the middle of the nineteenth century, the new territory of New Mexico was probably best known for the criss-crossing of the Santa Fe trail and the Goodnight trail up the Pecos, where the cowboys herded the longhorns from the winter grass in Texas to the summer ranges in the Rockies.

Then, as now, water was one of the territory's principal problems. I am indebted to a clipping from the El Paso Times for a story concerning the investigations along the Pecos River by Captain John Polk in the 1850's.

On the instructions of the War Department, which was seeking a rail route west, Captain Polk spent several years drilling for water at various places in the Pecos River basin. He was unsuccessful, not because of the lack of artesian water, which he found repeatedly, but because of improper equipment. Wooden boring rods and casings, and soft, wrought iron pipe, were simply not up to the task.

Nevertheless, there was a portent of things to come in a report to Secretary of War Jefferson Davis in 1855. Here is what Captain Humphreys of the Topographical Engineers wrote: "If a demonstration of the practicability of constructing artesian wells at moderate cost on the interior plains and table lands can be joined by the discovery of coal beds, fertility, industry and wealth may be made to take the place of sterility and solitude over extensive areas of those arid, naked and treeless districts."

A method of construction of artesian wells at moderate cost was developed and coal beds were discovered and mined in New Mexico. While the two were not as closely related in development as Captain Humphreys had hoped, nevertheless they have both been of major significance in the growth and prosperity of this state.

I have no doubt that New Mexico will face up to the future challenge of an adequate water supply because it has always been a leader in this field. The Rio Grande and Pecos are the principal sources of surface water in the state and there were irrigation projects on both streams long before the Federal Government entered the picture.

Irrigation is reported to have flourished on the Pecos River under the Spanish land grant colonization system early in the nineteenth century and the early American settlers had extensive systems in operation in the 1850's. From these early beginnings came the Rio Grande and Carlsbad projects which were among the first undertaken by the Federal Government after passage of the Reclamation Act of 1902.

Since that time, the Federal Government has been a copartner with the people of New Mexico in development of the State's water resources and has invested approximately $90 million in Reclamation development in the state.

This cooperation is inherent in your state constitution which reserves for the United States, and I quote, "with full acquiescence of the people of this state" all of the rights and powers of the Reclamation Act of 1902.

As early as 1931, New Mexico enacted legislation declaring that ground water occurring in underground basins having boundaries that are reasonably ascertainable is public water and subject to the doctrine of prior appropriation. In 1953, this law was strengthened to declare that all underground waters of the state are public waters and that permits to appropriate are required when declared by the state engineer. Your state is far, far ahead of most of the West in this important field of ground water regulation.

I can say from personal knowledge that there has been a close and cooperative working arrangement between the Department of the Interior and the State of New Mexico in the last several years. This is due in no small part to State Engineer Reynolds and his predecessor, John Bliss, Governor Mechem, and your congressional delegation.

In 1956, as an example, the state engineer declared the entire Rio Grande basin area adjoining the river a closed ground-water basin because of the inter-relationship between surface and ground water which was affecting the river flow. His action, in effect, protects the holders of surface-water rights and permits the planning of further orderly water conservation measures along the Rio Grande.

This groundwork of close cooperation between the State and Federal Government permits high optimism in viewing New Mexico's acceptance of the challenge of the future.

The Navajo and San Juan Indian irrigation projects have been sensibly planned as the result of remarkable cooperation on the part of the state, the Navajo Tribal Council, and the Department of the Interior, represented particularly in this instance by the Bureau of Reclamation and the Bureau of Indian Affairs.

In this case the policies were established by the state, and the technical studies and services in general were made by the Federal agencies. The state, however, assumed the leadership in ironing out the conflicts between different interested groups and achieving agreement on a coordinated plan.

Navajo Dam is now under construction on the San Juan River, and I feel confident the San Juan-Chama and Navajo Indian irrigation projects will follow in the orderly process of Reclamation authorization and construction.

At the state's request, the Navajo Dam is being made large enough to assure use of all of the state's share of Colorado River water if this is found practicable and desirable. Similarly, the tunnels of the San Juan-Chama diversion, which are the limiting factor in that project, are being planned with sufficient capacity to divert 235,000 acre-feet of water annually in the event the state desires such diversion for use in the Rio Grande basin.

It is part of the state's responsibility in the development of its water resources to determine how the water is to be used. This principle is inherent in the 1902 Reclamation Act itself.

There are a number of opportunities within the state to enlarge its water supply by salvage of moisture now consumed by nonbeneficial plants along the various streams. The Middle Rio Grande Project has accomplished a major savings by channelization and the drainage of lakes and swamps.

Similar close coordination with state agencies is being maintained in the studies on the Pecos River. Here the Bureau of Reclamation and the Geological Survey of the Department of the Interior, and the Corps of Engineers are working closely with the engineering advisers to the Pecos River Commission on plans for improvement of the Pecos River Basin.

Congress only recently authorized a water savings improvement for the McMillan Reservoir on the Pecos River above Carlsbad and an initial appropriation for completion of a planning report was made this year. However, some limitations in the authorization and the fact that the Carlsbad people desire a delay in clearing the floodway may defer actual construction of these improvements for some time.

Another means of meeting the future water needs of New Mexico is by small projects. A project does not necessarily have to be large to be successful. However, conservation of water has become a tremendously

complicated affair. There are very few projects like the early ones by which our grandfathers diverted a simple stream of water out of a stream or spring into a ditch.

But there is no reason why small projects cannot be developed which fit into the total basin and state-wide concept of maximum water use.

Your state has its own program being carried out by the Interstate Streams Commission, and Federal participation is possible through the Small Reclamation Projects Act of 1956. The State Commission and the Bureau of Reclamation are already conferring on the possibility of one such small project.

Two other technical developments give promise of future water savings which will be of importance in New Mexico's future. One is the purification of salty and brackish water. Your Senator Anderson and Senator Case of South Dakota have been particularly active in supporting the Department's investigations in water purification.

Desalinization processes are already very near a point where a domestic water supply can be developed economically, but we have quite a way to go yet in bringing down the costs to a point where present processes are practicable for making brackish and saline water suitable in the large amounts necessary for irrigation purposes. However, I have no doubt that that day will come.

We would have been labeled dreamers of the wildest variety a half or even a quarter century ago for some of the measures which are being taken today to develop a water supply.

The other major water conservation measure of promise is the use of the chemical, hexadecanol, for use in curtailing reservoir evaporation. This is particularly important here in the Southwest where you have long, cloudless days and large, relatively shallow reservoirs at a low elevation.

The Bureau of Reclamation and the Geological Survey are well along on investigations which, from all preliminary reports, indicate very favorable results on small reservoirs.

The results of wind action in breaking the protective chemical film on larger reservoirs are now being studied.

Thus, in summary, water's challenge to our future is premised on two principal factors--an exploding rate of population increase and an even greater rate of increase in per capita water use.

It is a national challenge but one that is particularly important to the West and to states such as New Mexico, which are enjoying the greatest rate of population increase and conversely have the greatest water supply problems.

It seems clear that there are new possibilities of water supply, new possibilities of conservation which can be developed by the same pattern of cooperative effort that has proven so successful in the past.

Planning must be on a comprehensive basis, that is, to construct and operate projects in such a manner that the greatest possible good will be realized. This means, in most cases, that they must incorporate many purposes. More often than not the water may be used over and over again.

Such multiple benefits can be realized only by close coordination. This in turn, can be accomplished only by full participation and a positive approach by all beneficiaries as well as those water users who already have firmly established rights and who may not benefit particularly from construction of additional facilities.

I emphasize a positive approach because negative thinking, a dog-in-the-manger attitude, will get us nowhere.

Water is wasting away to the ocean in many parts of the world today simply because individuals, groups, states and nations have been unable to get together on development plans.

With the needs I have mentioned looming up larger and larger every day, we no longer have time to indulge in bitter end disputes. There is an urgency to the situation that requires constant and orderly progress in all phases of water development if future generations are to be protected. We must not let them say we have failed.