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REMARKS OF GILBERT G. STAMM

ACTING COMMISSIONER, BUREAU OF RECLAMATION

U.S. DEPARTMENT OF THE INTERIOR

AT THE CONFERENCE ON COLORADO WATER POLICY

SPONSORED BY THE LEAGUE OF WOMEN VOTERS OF COLORADO

DENVER, COLORADO

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WATER RESOURCES AND FEDERAL RECLAMATION

We of the Bureau of Reclamation are honored to participate in this excellent and timely conference. The high caliber of the program is the type we have come to expect of the League of Women Voters. Your in-depth, objective study of many areas of concern is well recognized.

Similarly, ROMCOE is well respected as an organization of dedicated, conscientious citizens.

Land use planning and water policies relating to land use are matters of wide concern in our Nation today. You have an especially important job of decisionmaking before you. Your state—Colorado—(and mine) has the potential for a quality of life attainable in but few other places in the world. The climate, the mountains, the plains—all combine to make Colorado outstandingly beautiful and one of the most richly endowed areas in the Nation and the world. Yours is a precious heritage. You are justified in your concern for it.
Moreover, there is no question that now is the time for assessing and establishing water and land use policies, before undesirable growth patterns become intractible.

We of the Bureau of Reclamation have a strong interest in the proper development of Colorado, for Colorado is one of the 17 Western States in which we administer the Federal reclamation program.

While the League of Women Voters is well known for its in-depth studies on matters with which its members concern themselves, you may not be familiar with the Bureau of Reclamation. I would therefore like to discuss the scope and work of the Federal reclamation program.

The purpose of Reclamation in the west is to develop water resources for the maximum benefit of people—locally, regionally, and nationally. Authority for the program generally, and for the numerous projects specifically, comes from a succession of congressional enactments.

In administering the program, Bureau people since 1902 have planned, designed, constructed, operated and maintained numerous dams, canals, pipelines, tunnels, pumping plants, hydroelectric powerplants, and power transmission lines.

The numbers and types of facilities are impressive, and include such well known structures as Hoover Dam and Powerplant, Grand Coulee Dam and Powerplant, and Glen Canyon Dam and Powerplant, but the facilities themselves are not the end objective. They are merely the means to the end. What they do for people is the significant thing.

The total Bureau of Reclamation water resources management system: Delivers 27 million acre-feet of water annually; which is used in the 17 Western States consumptively and otherwise to
benefit people, fish and wildlife;

Provides water service to 16 million people, or 30 percent of the total population of the 17 Western States;

Provides 56 million visitor days of public recreation use annually;

Provides average annual flood control benefits of $40 million;

Provides annual electrical energy generation of 50 billion kilowatt hours and revenues of $161 million; the powerplants have capacity to serve the energy needs of over 5 million residential customers, equivalent to 16 million people;

Produces 53 million tons of food and fiber annually at a gross crop value of over $2 billion; and

Generates over $4 billion annually in increased business activity throughout the national economy, above what would have been generated in the absence of the projects.

Closer to home, the Colorado-Big Thompson was built to serve eastern slope users in the broad area of Longmont, Fort Collins, Greeley, and on down the South Platte River to Fort Morgan, Sterling, and Julesburg. Some features of that project are Lake Granby and Shadow Mountain Lake near Grand Lake on the West Slope, and Marys Lake, Lake Estes, and Carter Lake on the East Slope.

And to name some other of Colorado's Reclamation projects, you have Fryingpan-Arkansas, with its increasing emphasis on municipal and industrial
water service; Uncompahgre, which dates back to 1904; Grand Valley, Collbran, Participating Projects of the Colorado River Storage Project and units of the Pick-Sloan Missouri Basin Program.

So you can see, that the Federal reclamation program is a substantial undertaking. Furthermore, I am sure you see that the program has had a substantial influence on the development of the western states, including Colorado.

These projects, predictably, have not been without opposition. We find that many people do not like us, even among those that like the luxury crops grown on irrigated land, or expect to find water in the tap when they want a drink of water, or like to troll on a mountain lake, or want their homes protected from floods, or depend on electricity to lighten life's chores. Water in the arid west has always been a precious commodity. Transmountain diversions such as the Colorado-Big Thompson Project and the Fryingpan-Arkansas Project have been opposed by some western slope interests who rightly sought to preserve their water for use in the areas of origin. In order to protect those interests, Reclamation projects have included storage reservoirs and other means of providing replacement supplies to meet prior water rights and allow for future expansion.

Concerns for the environment have had a major influence on the reclamation program. While concern for the environment has heightened in recent years, the influence of that concern has been with Reclamation planners and designers for many years. The 1930's are remembered primarily for the economic misery of the Great Depression. But that period also generated
consciousness of the need for national resources conservation. Federal legislation during that period included the Conservation of Fish, Wildlife, and Game Act of 1934 and the Flood Control Act of 1936. Both of these acts had provisions applicable to Federal reclamation projects.

Legislations in the 1940's and 1950's dealt further with flood control, fish and wildlife preservation, and with water pollution.

Federal water policy in the 1940's and 1950's was affected by various commissions and committees which studied ways of improving water resource utilization.


Throughout the more than 70-years of its history and the recently accelerated evolution of environmental legislation and policy associated with water resources, Reclamation has taken a positive, responsive position with respect to each legislative addition to its authorities and responsibilities. This is evidenced by numerous facilities for fish migration and propagation, by the many water fowl areas set aside on Reclamation projects and by numerous wildlife mitigation measures embodied in project development, and more recently by careful borrow area selection, and scarred area restoration. Recreation areas at Reclamation reservoirs are attracting millions of visitors annually to environmentally improved and protected areas.

Notwithstanding that which has been done previously, the concern for the environment which has risen in the past few years has brought significant and worthwhile additional changes to the planning, design, and construction
of Reclamation projects and, in fact to the very organization of the
Bureau of Reclamation.

Our organizational structure has been changed to include environ-
mental specialists both in the Washington Office and in the regional and
engineering center offices. Mr. Eggen, on our panel today, is one of those
environmental specialists. We have increased our architectural staff so
that more emphasis can be given to the aesthetic aspects of structures. Our
research staff includes a fish biologist who, with other members of the
research staff, is studying the effects that our structures and water
impoundments have on fish and the aquatic environment.

Our interdisciplinary input is not limited to that of our own staff. In
designing a new powerplant presently being built at Grand Coulee Dam in
Washington, an advisory Board of Environmental Consultants was retained to
assist in preliminary planning. In addition, a private architect was given
the job of developing plans for environmental upgrading of the overall area
around Grand Coulee Dam. Another architectural firm was retained to provide
architectural concepts for the new powerplant and for visitor facilities.

Here in Colorado, Mt. Elbert Powerplant illustrates the considerations
being given to the environment in the design and construction of Reclamation
projects. Mt. Elbert Powerplant is a feature of the Fryingpan-Arkansas
Project. It is located on Twin Lakes above Buena Vista. It is a pumped-storage
powerplant. That is, water is pumped through the plant to an upper reservoir
during the night when the value of electricity is low and then released back
down through the powerplant, turning its turbines and generating electricity
during those times of the day when the electricity rates are higher. This
results in a net or surplus revenue which helps pay for Fryingpan-Arkansas
Project costs.
As the Mt. Elbert Powerplant site is in a major recreational area, considerable effort has been expended to assure that the plant will be in harmony with its surroundings and that the impact of construction activities on the environment is closely controlled. The specifications for construction of the powerplant include provisions for the contractor to carry out his activities in a manner that will prevent all unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of his work.

The plant's construction specifications also include provisions for the contractor to control air pollution resulting from his construction work. Burning of woody vegetation is not allowed. Waste water from aggregate processing, concrete batching, or other construction activities is not permitted to enter streams, water courses, or other surface waters without appropriate control methods. Sanitary wastes are to be disposed of by burial at approved sites or by other approved methods.

Bureau engineers have called for the powerplant penstocks to be buried, as an aesthetic consideration; this is also compatible with engineering and economic analyses. The heavy insulated cables carrying electric power from the powerplant to an adjacent switchyard will be placed under ground as another contribution to environmental concern for the powerplant site. The switchyard itself, which includes various towers and other electrical apparatus, incorporates the Bureau's latest designs to render the facility functional yet aesthetically pleasing. Switchyard structures will have rigid structural steel configurations, rather than the older multimember latticed frame-type design.

All completed structures within the powerplant's environs, as well as the plant itself, will be fully landscaped. The landscaping will be in harmony
with the mountain scenery and the structures.

Studies have been conducted to determine whether the fluctuations in the water levels of Twin Lakes caused by the pumping-generating cycle of the powerplant would disrupt the ecosystem of the lakes. The conclusion was reached that disruption could be avoided by proper operation of the powerplant.

Reclamation project planning has undergone change in response to changing priorities. You are perhaps familiar with the U.S. Water Resources Council's proposed Principals and Standards for water and land resources planning. That document, while imperfect and yet to be approved, does have many good, sound recommendations. One of those recommendations is multi-objective planning in water resource development. The multiple objectives against which planners must weigh their alternative plans are National Economic Development, Regional Development, and Environmental Quality. While the Water Resources Council's report has not yet been accepted by the administration, Reclamation planners are convinced of the soundness of the multiobjective approach to planning and have already implemented a modified form of it.

Despite what we are doing in Federal reclamation work to improve the quality of life both economically and environmentally, there is nonetheless a question as to the basic concept of water resource development as it is perceived today. The affluence of Americans generally which is attributable in no small measure to past development of water resources, both westwide and nationwide, has given us the freedom to question the virtues of further development along traditional lines. Many believe that the time is at hand for breaking the spiral of water development, economic growth, then more water development. This is evidenced by the action of Denver area voters who have just recently voted down a bond issue which would have provided for
future growth in this area of the state. The basic question, and perhaps the crux of this conference, is what must our water policies be for the obtainment of an optimum quality of life now and in the future?

How can such development be sacrificed or reoriented without jeopardizing our economic and social well-being? How should water resource projects be evaluated? Should we pursue water augmentation plans such as weather modification? Should further development of hydroelectric plants even though they pollute neither air nor water, be curtailed or encouraged?

I would not presume to answer these questions for you. Having been associated with water and land development in the west for many years I would be suspected of bias. I can suggest, however, that water resources can be developed to improve the quality of life. But development requires close and continuous cooperation between local, state, and Federal agencies. Citizens input is essential. The National Environmental Policy Act recognizes these needs and so do we.

Also I should remind you that the program is a dynamic one, its cause has been altered periodically to meet changing national objectives, and it currently is under systematic review to determine the extent to which reorientation is again appropriate.

Regardless of the extent of reorientation, people will need water. The complexity of water resource development requires many talents. Some of the best talent around is on our panel today. These men are recognized experts in their fields. Without men such as these, water resource development could not function in the sophisticated manner in which it does.

The first of these gentlemen is Mr. Wallace Christensen. Wally graduated
from Utah State University at Logan with a bachelor of science degree in civil engineering. He has been in water resources planning for over 29 years. He is presently the head of the Western U.S. Water Plan staff and in that capacity has overall responsibility for an extensive study of western water resources.

The second member of the panel is Dr. Archie Kahan. Archie is presently in charge of the Bureau of Reclamation's Atmospheric Water Resources Management program and for my money is one of the most eminent men in his field.

He has received degrees from the University of Denver, the California Institute of Technology, and his Ph.D. in Meteorological Oceanography from Texas A. and M.

He is/internationally recognized expert in meteorology and has authored numerous publications and papers.

The third panel member is John Maletic, who is in charge of the Land Resources Branch of our planning staff here in Denver. John has a bachelor of science degree in Soil Science from Pennsylvania State University. His entire career with the Bureau of Reclamation has been devoted to land use planning. He is recognized worldwide for his contributions to classification of soils for irrigated agriculture. He is also at present involved in conducting the Colorado River Water Quality Improvement Program. The objective of that study is to find a solution to the salinity problem of the Colorado River.

The fourth member of the panel is Richard Eggen. As I mentioned earlier, Dick is an environmental specialist. He is assigned to our Lower Missouri Region with headquarters here in Denver, which administers an area covering
parts of Wyoming, Nebraska, Kansas, and Colorado.

Dick graduated from Kansas State University. Following graduation he accepted a position with the Kansas Forestry, Fish and Game Commission as a biologist. He served 15 years with that agency in several capacities. He joined the Bureau of Reclamation in 1964. He has held positions as Agriculturist, Natural Resources Specialist, and is now Regional Environmentalist.

It has been a pleasure to meet with this highly respected group to review the broader aspects of the Federal reclamation program.
The Colorado River from its headwaters in the Rocky Mountains of Colorado and Wyoming to its delta in the Republic of Mexico, is 1,300 miles long. The Colorado River Basin includes parts of seven States--Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, totalling 242,000 square miles or one-twelfth the area of continental United States, as well as 2,000 square miles in Mexico.

Thirty years ago the Colorado was a wild untamed river. The runoff from its arid basin, which averages only 1.3 inches, occurred largely as devastating spring floods from the thawing mountain snow pack. Sixty percent of the total flow was wasted unused into the Gulf of California.

Historically, the development of the river progressed more rapidly in the Lower Basin. In the early 1920's the maximum utilization possible without extensive reservoir storage had been reached. Additional demands for water led to the Colorado River Compact of 1922. This agreement divided the water between the Upper and Lower Basin areas but did not apportion it among the individual States. The Upper Basin States agreed by compact in 1948 to an apportionment of their share of the water.

These agreements led to the planning and authorization in 1956 of the Colorado River Storage Project. Taking advantage of the canyons of the Colorado and its principal tributaries, the plan provided large storage units such as Flaming Gorge Dam and Reservoir
to regulate the widely fluctuating flows of the river. That regulation provided by these storage units will make it possible for the Upper Basin States to meet their commitments under the compacts and yet beneficially utilize their share of this most vital water resource.

Today, development of the river is proceeding rapidly in the Upper Basin. The Colorado is almost entirely controlled by the works of man. About 80 percent of its average flow is being used consumptively.

In the Lower Basin, the Boulder Canyon Project Act and the subsequent construction of Hoover Dam in 1935 made further developments technically possible. Now that water litigation among the Lower Basin States has been ended by the Supreme Court Decree in the case of Arizona v. California, the way is clear for the initiation of projects for the Lower Basin States to utilize the river to their legal limits. Under the pressure of imminent serious shortages, the greatest possible development of the river must soon be realized. We expect that ten years from now over 96 percent of the yield of the river will be utilized for consumptive use purposes. Only portions of the rare extreme flood flows which occur when all reservoirs are full will escape unused to the Gulf of California.

Even then, there will remain areas of serious water shortage and excessive mining of ground water within the Colorado River Basin. After 1975 as populations and economies expand, both the Upper and
Lower Basin water demands will exceed the available supplies, and the natural flows of the river will ultimately have to be augmented by imports from other basins or by techniques such as desalination of sea water and weather modification.
April 10, 1970

To: G. G. Stamm
Assistant Commissioner

From: Regional Information Officer

Subject: Draft of your speech - April 22, 1970

Here is a suggested draft of that portion of your speech in Fresno April 22 which deals with the environment. It contains no flowery phases praising the environment or promising that we will never, never disturb the delicate balance of the ecology which surrounds each grain of sand. It does state a position which I think is defensible and with which we can live. Also, one which should prove to be popular with your audience in Fresno.

Joe Carson, from our Napa Field Office, who arranged for your appearance before the Eel River Water Council, has been at a Grid meeting all week. He is preparing the local portion of your talk at Berryessa. He promised me today he would have it ready Monday. In the interest of saving time, I have asked him to send it directly to you, with a copy to me. I asked him also to edit the enclosed draft to fit the change in audience. I am suggesting to Joe that, if possible, he write his local message to fit in starting at the bottom of page 8 where we have you talking about the Peripheral Canal in Fresno. The Canal doesn't mean much to the Eel River group one way or the other.

Enclosure
The Bureau of Reclamation has a long history of responding to the
pleas of state and local organizations to help meet specific environmental
problems. It was in fact created to meet such a problem.

In the late 1800's, following the Civil War, the first great mass
movement of Americans westward beyond the Mississippi River began.
Congress passed the Homestead Act and the Desert Land Act, opening vast
acres of land to anyone willing to farm it. But most of this land was
arid or semi-arid and it became obvious that it must be irrigated if
it were to support the flood of settlers.

Congress first tried to solve this problem at the State level by
offering each public land state up to a million acres of land; in return,
the States were to see that these lands were settled and irrigated,
using the proceeds from the sale of land for irrigation projects.

It was a good idea. But it didn't work. The states did not have
the necessary engineering experience nor were they willing or able to
provide the funds necessary to convert these arid lands into truly
productive acreage.

Consequently, in 1901, President Theodore Roosevelt went before
Congress with this message: "Great storage works are necessary to
equalize the flows of streams and to save the floodwaters. Their
construction has been an undertaking too vast for private effort. Nor
can it be accomplished by the individual states acting alone. It is as
right for the National Government to make the streams of the arid region useful by engineering works for water storage as to make useful the rivers and harbors of the humid region by engineering works of other kinds."

Spurred on by President Roosevelt, Congress in 1902 enacted the Reclamation Act. During the first quarter of this century the Bureau of Reclamation helped meet the needs of the West for irrigation water through the construction of the Salt River Project in Arizona, the Orland Project in California, the Newlands Project in Nevada and other similar projects throughout the western states.

These first projects were built primarily to produce irrigation water, with some incidental power for use mainly at Bureau pumping plants. But by the start of the second quarter of this century, the needs of the West had become more varied and sophisticated. Large communities had grown in the river valleys and along the coast. These communities needed power and water and flood protection and year-round navigable streams. In response to these newly recognized needs, the Bureau of Reclamation entered into the multiple-purpose era of river development.

During this era mighty Hoover Dam, one of the seven engineering wonders of the modern world, was built, and the All-American Canal. And, of course, the first units of the Central Valley Project.

While California's State Engineer was in Washington seeking federal help to begin construction of the Central Valley Project, he
was asked whether he thought the Project should be constructed by the State or the Federal Government. His answer is, I believe, significant. He said:

"That is a matter of secondary interest in California. California wants the project constructed and if the Federal Government desires to take charge of it, I am sure the people of California will say well and good. They are desperate."

The Bureau of Reclamation responded to this desperate plea for help by building Shasta Dam, Friant Dam, Tracy Pumping Plant, the Delta-Mendota Canal, Friant-Kern and Madera Canals, and those other facilities needed to effect one of the greatest water storage and distribution systems in the history of the world.

In recent years, as man in the West has become more affluent and more leisure conscious, the Bureau has responded to his new demands that we devote more specific attention to certain water resource development benefits which we had previously considered only casually, as being of only secondary importance. Laws had to be passed and regulations changed to allow us to do some of those things, even though many of us had wanted to do them for quite some time. But those laws were passed and those regulations were changed and in recent years we have been able to mitigate and enhance fish and wildlife values, increase recreational opportunities and improve the quality of water through many of our projects.

We have entered into management and funding agreements which
allow the development of recreational facilities such as those at Folsom Lake where three and four million people a year fish, water ski, swim, boat, picnic and just plain enjoy themselves.

As part of the construction of the Tehama-Colusa Canal we are building a simulated natural fish hatchery in the bottom of the first reach of the canal where 40,000 fish can spawn annually. Lest any one think this might be of only casual or secondary importance to us, let me tell you the cost of including these fish enhancement facilities in our canal--between $17 and $18 million dollars, hardly a token commitment by anyone's standards.

We have been responding as well to the need for clean water for people and even have one project--the Canadian River Project in Texas--which delivers nothing but water for municipal and industrial use.

I cite these accomplishments of the Bureau of Reclamation over years past neither boastfully nor apologetically. While I am proud of what we have accomplished, I wish we had been able to do more. But the point I want to make is that over the years the Bureau of Reclamation has responded to the needs and demands of the people. As those needs and demands have changed, laws and regulations have been changed to allow the Bureau to meet new and different challenges. And the Bureau has met those challenges.

Today, as you all know, protection of our environment has suddenly become a matter of national concern. In case there is any doubt in anyone's mind, let me state flatly that the Bureau of Reclamation shares and welcomes this concern. As a matter of fact, I don't know of any
organization, public or private, which is better qualified to solve so many of the environmental problems we are faced with today. We have the experience and the engineering knowhow, the ability and the will. Some changes in legislation and regulations may be necessary to make us "able" as well as "ready and willing," but those changes can and will be made if the people want what we can give them bad enough.

We can build fish hatcheries as readily as we can diversion dams; we can build desalination plants as well as dams and hydropower plants; we are already studying the possibility of building offshore pipelines instead of canals; and we are perfectly capable of building waste treatment and disposal facilities as well as water supply facilities.

However, despite our very real and very deep concern for the environment, the Bureau of Reclamation cannot--it must not--abdicate its responsibilities to meet the Nation's continuing and growing need for food and water. This need will continue to grow as our population grows, even though the rate of growth may be less than once expected. Even if nationwide a zero population growth might be achieved, it is highly doubtful that immigration into California would end. And I can't buy the argument that if water wasn't available people would just stop heading this way. Despite the most justified screams of outrage now arising against the desecration of the environment in California, this state still offers one of the most pleasing environments in the nation and I expect it will continue to grow much more rapidly than other states and will keep growing even should other states start declining in population. One reason for this conviction
is the example set in Arizona. For the past quarter of a century the Nation has known--through a well-publicized and lengthy lawsuit which I am sure most of you are familiar with--that Arizona does not have enough water to support its present economy. And during that period Arizona has become the Nation's fastest growing state in terms of percentage of increased growth.

When those people get out here, they expect water to flow from their taps and power to be made available at the flick of a switch. We have a responsibility to make certain their demands as well as those of the environmentalists can be met.

Even assuming for the moment that population growth in the United States and California will somehow, someday, reach zero, there is another problem we should consider.

I quote from a speech I heard a few months ago:

"Unless we are to face a global catastrophe, we must be able to help meet the problems of food and shelter caused by the population increase all around the world."

A quote from some fuzzy-thinking, wild-eyed radical do-gooder? Guess again. A quote from a speech given to the National Reclamation Association by Robert A. Sandberg, vice-president of Kaiser Aluminum and Chemical Corporation. Mr. Sandberg went on to cite a projection by Dr. Raymond Ewell of New York State University that there will be a serious famine in India, Pakistan and Communist China in five or six years. There will be serious famine in Indonesia, Iran, Turkey, Egypt and Brazil within the next decade. Most of the other countries of Asia, Africa and Latin America will be in famine condition by
1980—just 10 years from now. These famines will effect hundreds of millions of people—and no pill or zero population growth program not yet implemented is going to prevent them. Even if those who claim there is a surplus of food in the United States today are correct, even if there should be no population growth in the United States within the next decade, there are still going to be millions and more millions of hungry people in the world and this nation—this state—this valley—may be called upon to serve as the breadbasket for most of the people on earth.

We who are charged with the responsibility of providing food and water when it is needed cannot abdicate our responsibilities. But we can and must do everything we can do to mitigate any bad effects our projects might have on the environment. We already have the responsibility for mitigation and the means to accomplish it in many areas.

In some cases we have been able, through Congressional action, to spend money to enhance the environment through our programs. We must continue to do this wherever possible.

But inevitably, I feel, there are going to be conflicts between what is the most economic way of providing water which is needed and the effects of providing that water on the environment.

Someone is going to have to choose between building a dam and not building a dam. The question must then be, who shall make that decision. That decision, I believe, should be made by a well informed public through its elected representatives. But that decision can be made wisely only if the people making the decision have been able to consider all of the factors involved.
A decision not to build a dam or a canal should not be made because someone—or a thousand someones—says "all dams are bad." A decision not to build a dam should not be made simply because someone—or a thousand someones—says "we should let all rivers run wild." Those decisions should be made by weighing the relative merits of building the dam or the canal or of letting the river run wild. All of the benefits and all of the disadvantages that would result from either decision should be discussed and considered. I believe the Bureau of Reclamation should have the obligation of exploring and presenting several different alternatives to specific problems. I don't believe the Bureau should recommend one alternative simply because it is the least expensive. I believe the decision as to which alternative should be chosen should be made by the public through its elected representatives. Let them decide how much it's worth to save a view or a wild stream. After all, they are the ones who will have to pay the costs of protecting and enhancing the environment in which they live.

I have no desire to tell the public, "this is what you should do." On the other hand, I do not believe that the environmentalist has the right to impose his values on the public. To present them, yes; to impose them, no. Let the people decide.

But I caution once again that the public can reach the right decision only if it has access to the facts. It cannot make a wise decision based on emotion-packed charges and countercharges. A typical example of how such charges can obscure the real issue is seen in the
projects. Let the public decide. We can present the facts, but the
decision should be up to them. Once the public makes its decision, the
Bureau will be there, ready to build a diversion dam or a fish ladder—or
both; an offshore pipeline or an aqueduct—or both; a nuclear powerplant
or a hydropowerplant—or both.

As I mentioned earlier, some of these things we would like to do
will require changes in legislation and regulations—and new legislation.
These changes undoubtedly will be a while in coming, but I feel they
will come. I am sure Congress will not insist that water users and power
users pay for the cost of upgrading the quality of water in our streams
or for enhancing the fisheries any more than they should pay for flood
protection and recreation. New benefit-cost evaluations will have to
be agreed upon that will allow us to build projects that today might
have a less than 1 to 1 b-c ratio. These changes will probably come
in time.

But in the meantime we in the Bureau of Reclamation are determined
to seek out ways in which we can under present laws and regulations
protect and enhance the environment. At the same time we are determined
to meet our obligations to help provide the basic supplies of food and
water our Nation needs to survive.
There is still another area which merits careful consideration in our search for common ground. It is that encompassed by the acreage limitation provisions of Reclamation law. Now some of you may question the relevancy of my reference to this as an environmental subject.

To place it in its proper perspective, we must reflect for a moment on the basic concepts which led to the original enunciation of acreage limitations more than 60 years ago. At that time we, as a nation, were still in the midst of a tremendous westward migration. Both immigrant families from foreign shores, as well as many family groups from both our eastern farming and urban areas were pressing into the West in search of the self-sufficiency traditionally ascribed to the landowning American farmer. Where could they better realize that ambition than by re-creating in the West the environmental pattern of the independent owner-operated family farms which had so successfully contributed to rural development throughout the East. Furthermore, vast areas of high-potential agricultural land lay untouched by the plow in our nation's public domain, awaiting settlement and development.

By the turn of the century, however, it had become increasingly apparent that the successful development of much of the remaining public domain situated in semi-arid to arid areas would be dependent on the firm availability of irrigation water. It was that realization that led the Congress to bring the Reclamation program into being. In so doing, the Congress concurrently recognized that, for practical
operational efficiency of future projects would be necessary to include intermingled or contiguous areas of private land. Much of this private land variously acquired from the public domain had only been utilized for grazing or was otherwise uncultivated. How to preclude speculative price increases in sales to eager home seekers in the area to be irrigated through the expenditure of Federal funds became a problem. After extended consideration, the Congress met the problem by incorporating the now familiar acreage limitation provisions as a fundamental part of Reclamation law.

Over the years, what has this meant in terms of rural environment? Today, after nearly 68 years of Reclamation development throughout the West, we find that Reclamation facilities can serve nearly 9,691,000 acres of land on 157 regular and small loan projects. On our regular projects alone as recently as 1968 some 139,000 farm families, representing a farm population of 573,000 received either all or part of their livelihood from their Reclamation project farms. This, in itself, certainly must be viewed as indicative of a beneficial environmental influence on rural life in the West.

How, you may ask, have acreage limitations aided in the attainment of such environmental benefits? A brief summary of the basic requirements of the law may be helpful at this time. Water cannot be delivered to more than 160 irrigable acres held by an individual
landowner. This has, over the years, been construed to permit delivery to 320 acres held by husband and wife under community property or other tenancy in common situations. The area by which the landowner's acreage exceeds that is termed excess land. Excess land can only receive water if the owner places it under what is termed a recordable contract with the United States. In that contract, he agrees to dispose of the land to nonexcess ownerships usually within a 10-year period. Should he fail to do so, that contract confers power of attorney on the Secretary of the Interior to make the agreed-upon disposition for the landowner.

Successful administration of those fundamental requirements of law, which I have so briefly outlined, has not been easy. Over the years, somewhat varying legal interpretations and administrative policy enunciations have developed. Various statutory modifications, waivers, and exemptions to the basic law have been enacted from time to time. The complex interrelationships thus built up have frequently made it extremely difficult to precisely evaluate a given situation and categorically determine that complete compliance with the controlling provisions of law has been attained. Nevertheless, in the face of such complexities, by dint of continuing efforts and the cooperation of the many contracting water user organizations with whom we work, we have reached a state of compliance where, of the more than 9 million acres to which I previously referred, nearly 90 percent can eligibly receive Reclamation service. While some 10 percent thus remains ineligible for service, only 0.7 of one percent of the
9 million plus total acres randomly distributed among 41 projects, has intermittently received such service without having established the requisite eligibility. It is inevitable that such instances will occur. Neither the Bureau nor the contracting water user organizations have sufficient staff members at their disposal to maintain constant day by day surveillance over each acre that represents a potential source of violation. Accordingly, instances arise where after-the-fact determination of service indicates violations. In each instance, every practicable effort is made to correct the irregularity as soon as it comes to our attention.

Up to this point then we can realistically claim to have implemented, with reasonable success, the fundamental concepts of acreage limitations as originally set forth in Reclamation law. In so doing, we have significantly contributed to the perpetuation of the family farm as a vital factor in our rural environment. Notwithstanding that apparent success, there are a number of major aspects of the matter which cause us to have serious misgivings.

First let us reflect for a moment on the changes which, especially during this dynamic last half of the 20th century have brought agriculture to its presently high state of efficiency. First, the total number of farms in the United States has decreased to about half that which we had 30 years ago. This has not resulted from any corresponding reduction in agricultural acreages. On the contrary, the average size of all classes of farms has been steadily increasing. Furthermore, despite the fact that farms have become fewer and larger, the relative distribution of farms by size groups has remained comparatively constant.
So too has the proportionate output of those farms. Today, as has been the case for many years, the upper two-fifths of all farms, representing, of course, the larger farm, produce about 80 percent of total output. The remaining three-fifths, consisting of medium-size to small farms, produce but 20 percent of the total output.

How does the family farm fit in this picture? First, let us adopt for discussion purposes the definition of a family farm as one that employs less than 1½ man-years of hired labor. With such a definition we find that despite the obvious trends in size and number, or the steadily increasing capital necessary for successful modern-day farming, there has been little change in the traditional proportion of family to nonfamily farms. About 95 percent of all farms throughout the nation can still be categorized as family farms. These family farms have, however, become increasingly specialized. Increased availability of efficient farm machinery has reduced the farm labor requirement while permitting an increase in the acreage the farmer can effectively operate through his own efforts. Improvements in transportation have made the farmer far more mobile than ever before, thus affording him and his family ready access to stores, churches, recreational facilities, medical care, and the host of other benefits which in past years were available only to those individuals dwelling in nearby communities. Thus from many aspects it is difficult to differentiate between a successful rural or urban family.
Next, let us look to the changes which have marked the development of the Reclamation program itself. No longer is the emphasis predominantly focused on projects involving total conversion from unimproved dry land to irrigated agriculture. On the contrary, over half of the acreage which Reclamation facilities can now serve receive only varying quantities of supplemental water rather than a full irrigation supply. Even more significant is the fact that in 1968, of the new acreage added to the total Reclamation service area, the supplemental service acreage represented 2.5 times the added full service acreage. Almost without exception such supplemental service areas are characterized by privately owned lands. Furthermore, such privately owned lands in most instances have already been fully developed through private initiative and non-Federal capital and can demonstrate a sustained pre-Reclamation history of successful irrigated agricultural production. In such circumstances a corresponding state of local economic equilibrium has long before been attained. There can be no question but that, in consideration of the fully developed nature of such lands, their value will be high. That already attained economic equilibrium for the most part effectively eliminates the prospect of speculative enhancement in values in anticipation of Reclamation service. Such a situation is diametrically opposite to that which in past years was so obviously evident where dry land
was to be converted to irrigated agriculture.

With the foregoing in mind, we would emphasize our support of the objective of a viable rural environment made up of successful family farming enterprises on such lands. To assure such a successful environment, however, means that the family farming enterprises which will contribute to that environment must be of a size that will ensure their continuing operation on a sound economic basis. This in turn means that when such comparatively expensive land is disposed of in tracts of a size that will meet the objective the purchase price will be quite high. Our past experience in disposing of such land clearly demonstrates that only a very few can and will make the investment necessary to establish and maintain such a viable farm. Is it then in the best interests of both the local and national welfare to require the disruption of an already stabilized segment of our economy and thus disrupt what may well be in that particular instance the most practicable environmental pattern attainable?

Finally, we come to the question of the continuing effects of present acreage limitation requirements on the family farm environment already evident on our existing Reclamation projects. Many young men who have had the benefit of technical agricultural education and training in our splendid agricultural colleges and universities are turning their efforts toward other lines of endeavor rather than attempt to become an established farmer under the inflexible
restrictions applicable to Reclamation projects. When faced with
the arbitrary 160-acre limitation, it becomes immediately evident,
especially on high-elevation short-growing season projects, that
even though such prospective farmers subscribe completely to the
owner-operated family farm concept, there is an effective upper limit
on the economic benefits they can expect to derive for themselves
and their family. Even though possessed of outstanding personal
initiative, fully versed in the use and application of modern farming
techniques, and endowed with financial resources ample to ensure the
availability of the most efficient of modern-day farm machinery,
their developmental efforts cannot be effectively employed for the
benefit of their family once they have reached the ceiling imposed
by the 160-acre limitation. For this reason alone, one can logically
question the effect such restrictive measures may exercise on our
project areas. This becomes even more relevant when one looks to the
future and considers the inevitable acceleration in the tempo of
farming, its constantly increasing complexity, its insatiable demands
for greater capital investments, all from the perspective of the 95
percent of the farms throughout the nation that today are representative
of family farming enterprise.

To summarize, we subscribe wholeheartedly to the desirability of
the family-farm enterprise as the mainstay of a viable rural environment.
We must, however, face the compelling need for modernization of the
acreage limitation provisions of law. Only by such modernization can
the family farmer expect to most effectively employ his personal abilities and initiative, his capital resources, and the modern-day equipment and technical know-how available to him. We furthermore adhere to the objective enunciated by the original farmers of the Reclamation program that its benefit should be spread as widely as practicably possible. To this end, we believe each and every bona fide farm operating individual or group should be able to enjoy those basic benefits to the same degree. Third, we continue to endorse the objective of precluding the accrual of unearned speculative windfall benefits by those who would take advantage of the Federal funds expended for the national good. We temper our thinking, however, with the understanding that in today's complex business of agriculture the economic factors controlling to its successful perpetuation are significantly different from those which in an earlier day opened the way to large-scale windfall benefits.

Accordingly, we are confident that in our search for common ground a sound and practicable program of acreage limitations can be developed. In it we would maintain the viability of the family farm enterprise on our projects in a manner that will permit such farms to compete in the market place in reasonable equity with the comparatively few larger farms that may concurrently contribute to the total agricultural production. We would finally establish adequate safeguards to preclude windfall benefits in the firm belief that payment commensurate with benefits over and above those basically afforded to all is in the best interest and to the overall benefit of the rural environment we seek to enhance.
With that as an objective, we are pressing forward with a proposal which, if favorably received as we believe it will be, will encompass this complex matter in its total perspective while reenunciating in modern connotation its fundamental principles. Additionally, we are earnestly endeavoring to incorporate sound mechanics for equitable adjustment in the future as economic changes may necessitate, in order to be certain that our search has honestly and truly led us to uniformly acceptable common ground.
There is another area of interest to this audience, I am informed. That area relates to the so-called 160-acre limit of Reclamation law. Here, too, we need to search for common ground to resolve problems of longstanding.

So that you will understand what I mean when I refer to the 160-acre limit, let me quote from the omnibus adjustment act of May 25, 1926. Incidentally, prior to 1926, the Bureau of Reclamation contracted with individuals for water service. Subsequent to that time and pursuant to the 1926 act, we have contracted primarily with organizations such as irrigation districts and water districts. The 1926 act in Section 46 provides that no water shall be delivered upon completion of a new project unit until a contract shall have been made with an irrigation district organized under State law providing for repayment and other matters.

The law further states, and I quote "such contract or contracts with irrigation districts hereinbefore referred to shall further provide that all irrigable land held in private ownership by only one owner in excess of 160 irrigable acres shall be appraised in a manner to be prescribed by the Secretary of the Interior and the sales price thereof fixed by the Secretary on the basis of its actual bona fide value at the date of appraisal without reference to the proposed construction of the irrigation works; and that no such excess lands so held shall receive water from any project or division if the owners thereof shall refuse to execute valid recordable contracts for the sale of such lands under terms and conditions satisfactory to the Secretary of the Interior and at prices not to exceed those fixed by the Secretary of the Interior; ** **"
While the quotation just cited is from the 1926 act, the 160-acre limitation applied to individual contracts from the inception of the Reclamation program in 1902. In administering the law we have permitted delivery of project water to 320 acres in the ownership of husband and wife. For any owner of excess land to obtain project water, he must agree to dispose of his excess land usually within a 10-year period. If he fails to do so, power of attorney passes to the Secretary of the Interior who may dispose of the excess land in behalf of the landowner.

Between the categories of federally owned land and land owned privately by individuals or corporations, there has been a gray area of publicly owned land involving ownership by States, State institutions, irrigation districts, counties, airport authorities, and the like. Legal opinions have gone from one extreme to the other in defining whether such lands are private or non-private. Essentially there has been no change in the general land limitation law since 1902.

In the meantime, however, almost everything else relating to agriculture has changed. Horsepower has been almost completely replaced by mechanical power. Farm machinery has become larger, more efficient, and costly. Farming methods have changed radically. Use of fertilizer and crop yields have increased. New crop varieties have been introduced. Farm sizes have enlarged. Agricultural support programs have been introduced and are applicable to farms regardless of size. Flood control for the protection of flood plain lands has expanded and the benefits therefrom apply to all land ownerships in the flood plain regardless of size. Thus almost everything about farming has changed in the past 68 years except the 160-acre law applicable to the Reclamation program alone. The 160-acre figure
evidently was first derived as a carryover from the homestead policy.

The Congress has authorized a few exceptions to the law. In a few cases the law has been waived completely and in others its application has been modified. In total the Congress has done this about 20 times over the years and has rather consistently introduced modification in the authorization of new projects during the past 10 years.

Recognizing these facts and factors there has been growing belief that the basis for and the application of the 160-acre law needs to be reviewed and modernized. Specific areas to be considered include the basic 160-acre figure, the so-called Class 1 equivalency concept, the definition of various classes of private and public land, and the policies and procedures under which landowners may make their lands eligible for project water or terms under which landowners agree to dispose of their excess lands.

For example, how much time should be allowed for disposition of land? Should stage disposition be required and, if so, over how long a period? Or should the landowner be permitted to obtain water for his excess lands provided there is no Federal financial subsidy involved? (In other words, if the landowner pays the full cost with interest of providing irrigation water for his lands.) If the landowner agrees to dispose of his land but fails to do so within the required period, what ground rules should prevail for Secretarial disposition under power of attorney? Should the price be based on fair market value without regard to project benefits or should it be sold at auction to the highest bidder? Under what conditions should trust arrangements be acceptable and what type of partnership interest should be acceptable?
Now, having outlined the elements of the law itself and the complicated problems related to its administration, and assuming we agree that a review and modernization is in order, who should make such a study? Should it be by the Department of the Interior, the Bureau of Reclamation, or should a special factfinding committee be named by the Congress?

Many of these pertinent questions have been discussed off and on for at least 6 years, dating back to the Special Report made by the Department to the Congress in 1964 in response to a request from Senator Anderson in which he asked that the Department make a study and report to the Committee setting forth the history of the laws, regulations, and policies of the Federal Government respecting limitations on the delivery of water from Federal projects to lands for irrigation purposes in excess of a specified or limited number of acres in individual or family ownership.

Actually no one has had longer nor closer association with administration of the 160-acre law than staff members of the Bureau of Reclamation. We know the questions that have been raised by those who support the law and by those who condemn it. We know the problems of administration. We know the areas where violation is most likely. We know the strengths and weaknesses of established procedures for seeking compliance with the law. Therefore it may be that the first cut at a proposal for its modernization should come from the Bureau of Reclamation. Any such effort, however, will be strictly an inhouse effort until it has been presented to, discussed with, and tailored to conform to ideas, policies, and objectives of the Administration.

Assuming that common ground, satisfactory to the Administration, can be found, a legislative proposal would likely be presented to the Congress. At that time all concerned should have an opportunity to study the proposal
and submit their thoughts regarding adoption or revision. If common
ground cannot be found by the procedure outlined herein, the remaining
alternative is for the Congress to name a factfinding group to make a
study and to report its findings and recommendations to the Congress.

What does the future hold? As you know, bills have been introduced
in this Congress to amend the 160-acre provision of Reclamation law. I
don't believe that congressional action is immediately imminent; however,
I predict that the land limitation issue will get a significant amount of
attention by the 92nd Congress and I would expect some legislative action
to result.
UNITED STATES DEPARTMENT OF AGRICULTURE
Economic Research Service

DYNAMICS OF COMMERCIAL AGRICULTURE

Talk by M. L. Upchurch, Administrator
at the Annual Agricultural Outlook Conference
Washington, D.C., 1:30 P.M., Tuesday, February 18, 1969

For each of the past several years, we have provided time in the Outlook
Conference to discuss some aspects of the changing character of our commercial
agriculture. We have done so again this year, not because we have vast new
information or new insights into the forces and directions of change. Rather,
our inclusion of this topic on the program is prompted by its importance in
any discussion of the future of American agriculture.

What are the changes? Why are changes occurring? Where are the forces
of change taking us? What sort of a commercial agriculture is emerging?
What are the implications of change with respect to farm income, costs,
supplies, and prices of commodities, Government programs, and many other
topics? What is happening to the people in agriculture? These questions
bother many of us. They deserve thoughtful discussion by farmers and farm
leaders.

None of us has any precise or pat answers to these questions. Certainly
I have no private peephole into the future. I shall try, however, in the
brief time allotted to examine some of the facts and factors involved with
the hope that you may be stimulated to further thought and discussion.

Number and Size of Farms

The changes in number and size of our farms is well known to students of
agriculture. Nevertheless, a brief review of the trends is in order to re-
fresh your memory and to get us all started thinking from a common set of
facts.

We have roughly 3.0 million farms in the United States at the present
time, about half the number we had 30 years ago. Of this 3.0 million, roughly
one-third are commercial farms producing gross sales of $10,000 or more per
farm, roughly one-third are commercial farms producing less than $10,000 in
gross sales, and roughly one-third are residential farms. (For convenience
of communication, let us call commercial farms producing more than $10,000
in gross sales "big" farms, and those producing less than $10,000 in gross sales "little" farms. The terms "big" and "little" will have no other connotation in this discussion.)

Big farms have increased in number from 320,000 in 1939 to slightly more than 1.0 million in 1969. The percentage of all farm sales accounted for by this group increased from about 40 percent in 1939 to more than 80 percent today.

Little farms have shown quite an opposite trend. Their numbers have declined from nearly 4 million in 1939 to about one million today. The percentage of farm sales from this class has declined from nearly half to about 15 percent of the total.

The number of residential farms, in contrast to both big and little commercial farms, has remained relatively constant for the past 30 years, declining a little, but not drastically. We will come back to residential farms later.

The shifts in number and output of big and little farms suggests increasing concentration of farming in the hands of big operators. But this conclusion needs closer scrutiny.

The biggest farms (those with over $40,000 in gross sales) tripled in number between 1949 and 1964, but the percentage of gross sales only doubled. The bigger farms (those with gross sales of $20,000 to $39,999) increased in number by 2-1/2 times in the same period, but their percentage of gross sales increased only 80 percent. The merely big farms (those with gross sales of $10,000 to $19,999) increased in number only 40 percent, and their proportion of gross sales just about held its own.

The odd fact is that the average size of all size classes of farms has been moving upward. If you array all farms by size and divide the total into quintiles, you find that the upper two-fifths of our farms have produced about 80 percent of total output. The proportion has changed little for many years. The lower two-fifths of our farms consistently have produced about 10 percent of total output. The middle quintile has produced the remaining 10 percent with little change over time. Although farms have become fewer and larger, the relative size distribution among farms remains surprisingly constant.

Why have our farms become larger and fewer? Some claim that the cause is greater efficiency of large farms. Our studies cast doubt on this as an adequate explanation. Virtually all of the internal economies of size are exhausted for most types of farms when a farm is big enough to fully use one set of modern equipment. This means a good one- or two-man farm in most regions.
Some claim that farm programs are the cause. We find little evidence to support and much to refute this hypothesis.

Other explanations must be sought.

Constant improvements in the size and performance of farm machinery and other modern technology makes the individual farmer more productive than farmers of past generations. Today's farmer with 6- and 8-row equipment has the capacity to operate on a larger scale than his father did with 2-row equipment, and than his grandfather did with horse-drawn equipment.

Farmers today, just as you and I, have an appetite for more income. Given the capacity to operate on a larger scale and the urge to increase total net income, the modern farmer seeks to expand. He rents or buys more land. When he does this, he may reduce unit costs of production, but he will strive to expand even at increasing unit costs, if he can increase his total net profit.

So farmers have the capacity in modern technology to increase size of operations. They have the incentive in the normal urge for more income. It goes without saying that the county which once had 1,000 320-acre farms may now have room for only 500 640-acre farms.

There is some evidence that the size of each quintile of farms in the size spectrum is increasing at about the same rate. One would think that if technology were the chief cause of size increases, the largest farms would show distinct advantage. In modern agriculture, however, a wide array of modern technology is available at competitive costs to a wide range of sizes of farms. Farmers who are too small to afford specialized equipment often can hire custom operators at reasonable costs. Fertilizers and pesticides frequently are applied by custom firms or suppliers themselves. This accounts in part for the persistence of part-time farming in this country and for the staying power of small farms, even though small farms themselves are getting bigger.

Nevertheless, the absolute number of small commercial farms is declining rapidly. Neither the availability of technology nor differences in efficiency among farms seems to give an adequate explanation. Little commercial farms with limited resources simply do not offer a sufficiently attractive economic opportunity for people, especially young people. Older farmers now on small farms may very well continue until they retire or pass away. Their sons or grandsons are not likely to maintain the same farm unit. They are more likely to combine "the old home place" with two others to make a farm big enough to be an attractive economic opportunity or they are likely to seek opportunities outside of farming.

The Family Farm

Despite the trend in number and size of farms and despite steady increases in the capital required for modern farming, most farms are still family farms.
Self employment by the farmer and his family remains predominant in American agriculture.

If you define a family farm as one that employs less than 1-1/2 man-years of hired labor, 95 percent of all farms are family farms. This percentage has changed little for many years.

The labor required in farming has decreased rapidly. Only half as much labor is used now as in 1950. Despite this dramatic shift, the proportion of all labor supplied by farmers and their families remains at a constant three-fourths. Use of family labor and hired labor in farming has declined at virtually the same rate.

The proportion of labor supplied by farm families varies considerably by States and by type of farming. Throughout the Corn Belt, from Pennsylvania and Nebraska, and from Oklahoma to Minnesota, farm families supplied from 85 to 90 percent of all farm labor. In Arizona, California, Florida, and New Jersey, the percentage dropped to 20 to 40.

These numbers suggest several observations. As farms have become bigger and fewer, farmers have not hired more labor. They have bought bigger machinery and have extended their own labor over bigger operations. Thus, when measured by the hired labor standards, many of the larger farms have become family farms by substituting bigger machinery for hired labor. The modern family farm with $100,000 or more in capital investment may look quite different from grandfather's family farm, but self employment of the farmer and his family remains a dominant characteristic of most types of farming.

**Specialization and Diversification**

The modern farm is increasingly specialized. You need no statistics to observe this trend. The reasons for this are many and the trend continues. The shift away from horses to tractors relieved farmers of the necessity to grow feed and pasture. Growing use of fertilizers and pesticides relieved them of the necessity to diversify to maintain yields. Better roads and faster and cheaper transportation permitted separation of feed production and livestock feeding. Easier access to stores decreased the need to produce food at home. These, and many other reasons, prompted the trend toward fewer enterprises and more specialized production on farms.

But farmers have been diversifying in another way. Off-farm income has become an increasing factor in the life of farm families. In 1967, the farm population got $13.0 billion net from farming and $10.7 billion from nonfarm sources. On the average, each farm operator family received $4,526 net from farming, and $4,452 from nonfarm sources. Nonfarm income per farm family more than doubled between 1960 and 1967.

Farm families are increasingly indistinguishable from urban families. The farmer more frequently is moonlighting. The farm housewife more frequently is participating in the nonfarm labor force. Better roads and
easier access to town, increasing demand for nonfarm labor in many areas, increasing need for income by farmers themselves, all play a role in this trend. Farmers are diversifying, but off the farm, rather than on it. This fact too may help explain growing specialization on farms.

The Agricultural Industry

We can see and count fairly easily some of the changes in commercial agriculture. Numbers of farms, numbers of tractors, even numbers of people working on farms are tangible quantities that generally can be observed and tabulated. Other changes, and perhaps some of the most important changes, are more subtle, more difficult to define, and more difficult to count and analyze. These are changes in the way in which the agricultural industry is organized, the nature of the firms (including farms) in the industry; the functional relationships among these firms; and the effects of the changing organization and relationships on the economic health of the industry or major segments of it.

It helps perhaps to think of the agricultural industry as the entire spectrum of firms and functions extending from the basic resources and input producers at one end to the retailers of the final product at the other. At many stages in this spectrum, entrepreneurs bring resources or inputs together and perform functions that transform these into useful products. The product of one stage becomes an input in the next stage of production until the final consumer is reached.

The organization and functions of the agricultural industry was once not too difficult to understand. The farm and the farmer were identifiable. James Whitcomb Riley defined farms and farmers as well as anyone, and everyone understood what he said. The farmer spread his labor over his land and with nature's rainfall and sunshine, he created a combination of products. He combined his efforts and his enterprises to give him the most satisfactory total output. The products he did not need at home were sold at the nearest suitable market and he bought necessities that could not be grown or made at home. Thus, the "farm gate" became an identifiable place and a useful concept in agricultural statistics and economics.

We sometimes wonder now where the "farm gate" is and whether we should even look for it. This is only a crude way of saying that the organization of the entire industry has been changing rapidly in recent years. With these changes, the identity of a farm product, or of a farm input, the point at which prices are made, and the relationships among vertical stages of the spectrum of production become more difficult.

Perhaps the most subtle and most important of all changes is the change in the attitude of farmers regarding the purpose of farming. The purpose of modern commercial farming is to make money. This may be too simple and too obvious; but when you reflect on this idea you may better understand the changes that are remaking our agricultural industry and reshaping the lives of farm people.
I can remember when our agricultural leadership advised farmers to be more self-sufficient, to use horses instead of tractors because they required no cash money for fuel and reproduced themselves, to diversify because this improved fertility and avoided the need to buy fertilizers, to combine crop and livestock enterprises because this provided work all winter (I never could understand the virtue of more work), and above all, to stay out of debt. These and a number of companion concepts make up what I call the "former philosophy of farming." Farmers who failed to heed most of this good advice from their leadership most often were the ones who made money and who bought their neighbor's land.

The pursuit of profit is pushing our commercial agriculture into new ways of doing business and new configurations of business organizations and relationships. The biological processes of putting seed in the ground and harvesting the issue, of mating animals and raising the offspring, of nurturing trees and picking the fruit are all functions of farming. But the business organizations that perform these functions and the way in which they relate to other business organizations is a rapidly changing picture.

We do not yet have this picture in clear focus. Our present statistics do not define or measure it very well. We have bits of information on how some firms are vertically integrated with others. We have some observations on how some stages in the spectrum operate. We believe that the entire spectrum is becoming more tightly intertwined, more mobile, and more sensitive to economic forces that may be injected anywhere in the spectrum. We have much work to do in the years ahead before we can get a proper grasp of this dynamic industry.

Corporations in Farming

During the past year, we have been striving to bring one bit of this changing picture in sharper focus. We have gathered some information on the number and nature of farms operated under a corporate form of business.

Information has been collected through the local Agricultural Stabilization and Conservation offices. Data from 22 States were published in a preliminary report last August. These and data from an additional 25 States will soon be in print. These data will cover all the 48 contiguous States except California.

We have learned that in the 47 States we have about 11,000 farms operated by corporations. Most of these, about 7,500, are family corporations, and an additional 1,300 are individual corporations. Only about 2,200 are classed as other than family and individual firms.

Half of the individual corporations and two-thirds of the family corporations are engaged in farming only. More than 40 percent of the "other" corporations are classed as "farming only" in their business interests.
Of all corporations counted, 40 percent had business in addition to farming. Some were in agri-business enterprises, about half had other business not related to agriculture, and a few had combinations of interest.

Very few of these corporations had really big farming interests. Eight percent are reported to have grossed more than $500,000 from farming. A fifth of them, at the other end, grossed less than $20,000. Oddly enough, 6 percent of the family corporations were in the half-million dollar plus class.

We know from this study that nearly half of these corporations were organized before 1960. We cannot tell for sure from these data whether corporations in farming is a growing characteristic for we have no comparable data for earlier years. We presume that it is. From Internal Revenue Service data, we know that corporations identified as "agriculture, forestry, fisheries" numbered 6,820 in 1949, and 27,582 in 1965. In 1963-65, these data identified farming separately; in these years the number of corporations in farming grew from 16,227 to 18,526.

These data do not tell us all we would like to know about corporations engaged in farming, but they do tell us something. A large majority of these corporations are family affairs organized by farmers themselves to facilitate business functions. In total, they show a range of size distributions not unlike the range for all farms, although a little larger.

As one might expect, the proportion of farms operated by corporations varies widely among States and among types of farming. Corporations are more common in ranching than in crop farming. We suspect they may be numerous in specialty crop farming, but our data are not firmed up on this point.

Our efforts so far tell us that the corporate form of business organization, especially the large conglomerate public corporation, has not made large inroads on our farming at the present time. One would expect that, as the capital required for modern farming continues to increase, farmers themselves may increasingly adopt the corporate form of business to facilitate accumulation of capital, to limit liability, to ease inter-generation transfer of assets, and for other purposes.

There is no reason to believe from our skimpy studies so far that the huge public corporation has any unique advantages in farming over other forms of business. Some agri-business corporations engage in farm production and some farm corporations engage in agri-business to facilitate integration in the input-farm-product-market complex. One would expect innovative businessmen in farming and out to exploit these opportunities when they can to their advantage.

A footnote should be added here. We should avoid confusing the corporate form of business with size of business. Although farms operated by corporations tend to average larger than all farms, the data do not support the association of "big" and "corporate" often found in agricultural literature.
Summary

Let us recap. Farms are getting bigger and fewer. The farm population is now down to about 10 million. Farms are becoming more specialized, more frequently livestock enterprises are separated from crop enterprises. Nevertheless, family farms predominate and likely will continue to do so although the family farm of tomorrow will be quite different from the family farm of yesterday. These changes are well known.

Less well known, however, is the changing functional relationships among firms in the whole spectrum of agricultural industry. The ways in which successive stages in the spectrum of production complement each other and compete with each other are changing rapidly and are little understood.

The nature of the business organizations at these stages and the way in which they operate, one with another, are changing too. The legal form of the business--whether corporate or private--the methods used in assembling capital, the strategies of firm growth, and the bargaining relationships among firms are all part of the picture. Our present data and state of knowledge do not bring this picture into clear focus. Understandably, our view of future trends is far from clear.

Despite our lack of clarity, we know that these changes have far-reaching implications for the role of agriculture in our national economy and for the development of economic and social programs for farming and rural people. When most rural people were farmers, we could more easily equate farm product prices with rural welfare. But when few rural people farm, and when farming is but one stage in a highly complex industry reaching into both rural and urban areas, our traditional views of farming and rural life must change.

I have not answered the questions I asked at the beginning of this talk. I did not promise to do so. I hope, however, I have hinted at the dynamics of commercial agriculture sufficiently to stir your thinking and to prompt discussion. For we do need to think about and discuss these changes we observe about us. We need to clarify how we want our agricultural industry to look in the future and, with it, influence change, rather than letting change influence us.
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