THE WYOMING STATE ENGINEER'S OFFICE
AND THE WYOMING WATER ASSOCIATION
UPON THE OCCASION
OF THE WYOMING WATER ASSOCIATION'S

WYOMING WATER 2000

NOVEMBER 1ST THROUGH 3RD
ANNUAL MEETING AND EDUCATIONAL SEMINAR
HAVE APPRECIATIVELY COMPILED:

SELECTED WRITINGS OF
ELWOOD MEAD
ON WATER ADMINISTRATION
IN WYOMING AND THE WEST

FOREWORD

Elwood Mead (1858-1936) was a fascinating man who, as stated by his biographer, worked tirelessly for over fifty years to ensure that water went to its best use. Here in Wyoming, many people have heard of him and are aware that he wrote our water laws, and that those laws have changed very little since the time of Statehood. Like George Washington, the "father of our country," and a man about whom the average American can recite but a few things learned back in grade school, very little is generally known by the citizens of Wyoming about Elwood Mead - beyond the fact that he may be considered the "father" of the water law that has worked so well for over 100 years for our State. Yet this is not altogether surprising, for the allocation and distribution of water is, in many ways, a complicated subject. So too, was Elwood Mead. We intend this booklet to add to both your understanding of Engineer Mead and of the water administration system that he developed and that continues to be used, every day, across this State.

In the preface to his book, *Turning on Water With a Shovel, the Career of Elwood Mead*, author James Kluger observed "[l]inked as it is to environmental issues and recent droughts, water has become a major contemporary concern and a hot topic for historians." Prior to and at the time of Statehood for Wyoming, surely the matter of water allocation was a contemporary concern as evidenced in these compiled writings by Mead. Further, Kluger notes that "[a]s people today seek to understand and explain the problems in arid America, they look back to the roots of such developments, and any examination of those origins will involve Elwood Mead." We agree, and believe the necessity to include Mead in our examinations is doubly true for those of us fortunate enough to live in Wyoming.

Mr. Kluger's book, released in 1992, was a significant contributing factor in choosing the theme for this year's annual meeting of the Wyoming Water Association. A different year than most; a year with 3 "zeros" needed to write it down. On the dawn of a new millennium, the temptation is to reflect, examine and wonderingly consider the "big picture." Where have we come from? Where are we going? Accordingly, on the occasion of the Year 2000 annual meeting, the Association's Program Committee proposed that the theme of the meeting be "From Elwood Mead To the New Millennium - a Continuum of Water Management." Selected for the November 1st through 3rd annual meeting and educational seminar were program presentations and panel discussions which offer an "eye" for casting a backwards glance at the past 100-plus years of Wyoming water administration, staring hard (without blinking) at certain of the most important, current challenges and ongoing activities with water in the Cowboy State, and to squinting attentively toward a horizon with issues and opportunities just on the next rise and far down the valley - to consider what the future may hold for management of Wyoming's most precious natural resource.

The Wyoming Water Association's backwards look this year therefore has involved, and, as Mr. Kluger aptly notes, must involve Elwood Mead. When the WWA approached Anne MacKinnon to speak at the meeting about Elwood Mead, Anne agreed but quickly suggested that the best person to explain Mr. Mead's thinking and his legacy, is, obviously, Elwood himself. There are many things in the State Engineer's Office with his fingerprints and his inked signatures on them, his methodical and systematic approaches are still being employed to this day, and of course, we have the annual reports he compiled as he went about his important work. The contents of this booklet come from those reports and other selected writings by an eloquent student of the allocation and distribution of water. A man who made it his life's work. We hope this booklet increases your understanding of water law and the water rights system that we are fortunate to enjoy here in this state. His system, an original copied by many other states, was crucial to launching the system we have today.

John W. Shields and Anne MacKinnon October 2000

ACKNOWLEDGEMENTS

Thank you, Anne MacKinnon, for suggesting and making the selections for the compilation of selected writings of Elwood Mead in conjunction with presentations and discussion at the special year 2000 annual meeting of the Wyoming Water Association. A great suggestion. Thanks to John Shields, Interstate Streams Engineer at the State Engineer's Office for enthusiastically adding to the idea and crafting this document. As Program Committee Chairman for this Wyoming Water Association annual meeting in this special year of 2000, John is very pleased that you, as an attendee at this Wyoming Water Association meeting, have chosen to take home a copy of this "millennium compendium."

Thanks to Jim Kluger, whose assistance with the introduction briefly describing Mead's public life and career is gratefully acknowledged. This material, largely taken from Mr. Kluger's well-written biography of Elwood Mead, will perhaps encourage some to read more about Mead's life and influence across the arid West.

Time and effort were generously offered by others who directly assisted with this project: a special thank you is extended to Laura Watson, Executive Assistant in the State Engineer's Office, who did the great majority of the computer entry, both quickly and efficiently, of the material found within this booklet. The support of the Acting State Engineer, Richard "Dick" Stockdale, for this project, intended to bring additional notoriety to his long-ago predecessor, is gratefully appreciated. Nancy McCann, Libby Cavaliere and Sue Lowry also provided assistance within the State Engineer's Office. Jody Jackson of the Water Development Commission is also thanked for her assistance. Appreciation is extended to Barry Lawrence, WWA Executive Director, for his efforts in providing document production support. Finally, a "thank you" is extended to WWA members for participation in the WYOMING WATER 2000 annual meeting and for investing effort in learning more about Wyoming's water.

Acknowledgment of the right to quote from the works listed hereinafter, is gratefully made to:

American Heritage Center, University of Wyoming, P.O. Box 3924, Laramie, WY 82071: Elwood Mead Papers, Acc. # 5258, Box 1, Scrapbook 5.
Water Resources Center Archives, Univ. of California, Berkeley, CA.: Elwood Mead Papers: file #2; file #13-6.
Arno Press Inc., New York.

FURTHER READING

For manuscript collections, visit the archives listed above. For further reading in printed materials:

Annual Reports of the Territorial Engineer of Wyoming, 1888-89, and *Biennial Reports of the State Engineer of Wyoming*, 1890-1898. Cheyenne: S.A. Bristol Co. Printers and Bookbinders,1888-1900.

Conkin, Paul K. "The Vision of Elwood Mead," *Agricultural History*, April, 1960, v.34, pp. 88-97.

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Pisani, Donald. *To Reclaim a Divided West: Water,Law and Public Policy, 1848-1902*. Albuquerque, NM: University of New Mexico Press, 1992.

Robinson, Michael. *Water for the West: The Bureau of Reclamation, 1902-1977*. Chicago: Public Works Historical Society, 1979.

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INTRODUCTION

Elwood Mead (1858-1936) was an engineer who pioneered western water law and development and worked tirelessly for over fifty years to ensure that water went to its best use. Ever the idealist, Mead consistently held to his nineteenth-century view of agrarian life based on the individual farmer living on a small, irrigated plot. His career spanned the history of irrigation from the first corporate ditch enterprises in Colorado in the 1880s through the construction of Hoover Dam a half century later. In all his endeavors, whether serving as state engineer in Wyoming, investigating irrigation use for the U.S. Department of Agriculture, developing model rural communities in Australia and California, or administering the Bureau of Reclamation, Mead always sought to give the benefits of water to small farmers and average citizens. One of Mead's greatest achievements-the construction of Hoover Dam-was completed just as he died, and Lake Mead is named for him.

For over fifty years, Elwood Mead devoted his life to the problems of irrigation and irrigators. His career paralleled the rise to maturity of reclamation in the United States. When he arrived in the West in 1882, irrigation as a cooperative venture was coming to an end. Simple diversion structures that watered the lowlands along a stream were the order of that day. At the time of his death in 1936, Mead had just finished directing the construction of a $100 million dollar multipurpose dam that took almost 5000 men five years to erect. Five million barrels of cement, eight million tons of sand and massive quantities of other materials went into the giant structure.

Engineering feats and construction statistics are only part of the story of Elwood Mead's contributions to the conquest of arid lands around the world. Mead had an international reputation as an irrigation engineer, but he looked beyond the technological aspects of dam and canal building. To him, the reclaiming of desert lands was more than an engineering problem; it encompassed all aspects of putting the land to use and settling it with family farmers.

Raised on a farm in Indiana, Mead loved rural life and hated to see it destroyed as tenant farming replaced owner-occupied farms in post-Civil War southern Indiana. In college, Mead majored in agriculture. After graduation, he accepted a teaching position in Colorado, where he came into contact with irrigation farming. He returned to the Midwest only briefly, picking up a graduate decree in civil engineering and knowledge of law. With this unique combination of training, he spent the rest of his life working for the betterment of rural society. In Colorado, the three characteristics that molded Mead's attitude toward his life's work-love of farming, of order and of efficiency-were threatened at every turn. Speculation was widespread, the laws chaotic, and water wasted. Although in no position to affect conditions in Colorado significantly, he studied the problems of irrigation and formulated solutions to deal with them. As he aired his views, he gained a reputation as something of an expert on irrigation.

When Wyoming officials began to deal with the problems of water distribution, they consulted the Colorado professor, and then hired him as territorial engineer in April, 1888. At last, Mead had the opportunity to test his ideas. In 1890, when Wyoming became a state, he wrote its water code and devised the system to administer it. These innovations served as a model for most states in the American West as well as in Australia, New Zealand, South Africa and Canada. It was a significant contribution to the arid regions of the world. Wyoming's water laws followed a logical arrangement that ended conflicts over rights and gave order to the distribution of the water supply.

To Mead, distribution was a first step toward realizing the full potential of irrigation. After the water was divided, it had to be applied to the land. The law required that it be appropriated "for beneficial use," which Mead regarded as more than a convenient application of water. It implied using the water in the most efficient manner for the most effective results. The efficient use of water encompassed two ideas. From a social standpoint, it meant providing agricultural opportunities for small farmers; from an engineering standpoint it meant regulating the flow of streams to obtain maximum benefit from the available supply. In Wyoming, Mead sought to combine a small plot of irrigated land with a larger area of grazing land so that more people would have a financial base to succeed as farmers. Her wanted the federal lands in the West ceded to the states, who would lease them for grazing. The proceeds would be used to finance irrigation works needed to regulate the rivers for greatest effect.

In the early 1890s, Mead opposed federal involvement in irrigation, and only reluctantly, after the Carey Act proved to be a disappointment, did he advocate a limited role for the federal government. He believed, for the most part, the states were better qualified to direct the development of resources within their boundaries and the federal government should become involved only in the construction of large reservoirs for stream regulation. Mead opposed a large-scale building program directed from Washington, an attitude that put him in disfavor with the proponents of a national reclamation policy. He predicted unfavorable consequences and urged a cautious approach, but his warnings were not heeded. With the passage of the Reclamation Act in 1902, the federal government was in the reclamation business. That program required various modifications to maintain solvency during succeeding years, and Mead played an important role, both as a member of the Fact Finders Committee and as Commissioner of Reclamation, in formulating statutory and policy reforms to the Reclamation Act and its administration in the 1920's.

By 1897, Mead had advanced professionally as far as he could in Wyoming. He had written the water code, set up the administration for running it, and formulated the state's participation under the Carey Act. That year his wife Florence died of a toxic goiter, leaving him with three small children under the age of seven. About the same time, he was reluctantly being drawn to the view that federal action was necessary to realize the full benefits of reclamation, and he naturally wanted to be involved. Mead began looking for new opportunities and challenges. In November, Senator F.E. Warren approached Secretary of Agriculture Wilson about reestablishing the Division of Irrigation in his department. Wilson hired Mead as a part-time consultant until congressional approval of the plan was obtained early in 1899. Mead then resigned as state engineer and moved to Washington, D.C. to direct irrigation investigations. Between 1899 and 1907, Mead served as full-time expert-in-charge of irrigation investigations for the Office of Experiment Stations in the Department of Agriculture.

In the fall of 1901, Mead attended a baseball game, one of his favorite hobbies. He caught a trolley car for home, and as it neared an intersection where he was to transfer, he saw the other car and feared that he would miss it. As he started to climb aboard, Mead lost his balance and fell beneath the trolley. One wheel passed over his outstretched right arm, nearly severing it. He was rushed to a hospital where the crushed limb was amputated. Mead accepted his misfortune with characteristic good nature, writing to his good friend Berkeley (CA) University President Wheeler: "if I understand my field, I can do as well without any hands as with both of them." Mead went to Atlantic City to recuperate and to learn to write with his left hand. In 1904, Purdue University recognized Mead's accomplishments in irrigation by conferring on him its first honorary doctorate in engineering. Mead was extremely proud of this honor from his alma mater, and was thereafter called "Doctor."

In 1907, officials in the state of Victoria, Australia, asked Mead to come there to help with a variety of water problems. A six-month interlude turned into an eight-year stay during which his ideas matured about what should be done to revitalize rural life. The program he developed tied community planning to irrigation and dam and canal facilities; ultimately settlers were discouraged by heavy debts, poor prices, drought and hard work - but Mead sailed back to the U.S. before the disillusionment with his program had set in. Back in the U.S., he advocated planned settlement on the pattern he had developed in Australia, becoming first Professor of Rural Institutions at the University of California, Berkeley, and then head of the new Land Settlement Board he helped instigate in California. That "colonization" effort also eventually ended in failure, brought on by the agricultural depression of the 1920s, poorly chosen land, and farmer resentment at the paternalism of Mead and his board.

After he became Commissioner of Reclamation in April 1924, Mead continued to advocate his proposals for planned settlements on a national level, but he was unsuccessful in both the irrigated lands of the West and the cutover and swampy areas of the South. His basic concept finally saw fruition in the Subsistence Homesteads Program of the New Deal. Its organizers acknowledged Mead's influence both for the theory and for the years he had promoted planned community settlements. As a member of the Fact Finders Committee, Mead played a key part in formulating a new policy for reclamation. As Commissioner of Reclamation, he directed the implementation of that policy. Under his leadership, federal reclamation underwent a thorough reordering. His was a "business" approach, but it was not legalistic. He insisted that water users meet their obligations to the government, but he also insisted that those debts be legitimate-water users ought not pay for the government's mistakes. At the same time, he initiated changes to decentralize reclamation by giving the water users control of their irrigation facilities and the responsibility for operating them-to get the government out of reclamation as much as possible.

By 1926, Mead had set the Reclamation Bureau on a new path. Through the changes he introduced, the financial position of federal reclamation showed a steady and substantial improvement until the Great Depression. Even during that period of severe economic difficulties, federal reclamation was on a more solid base than most enterprises; the moratoriums on construction repayments, for example, were necessary for only five years.

Additionally, Mead was determined to avoid a repetition of the problems that stemmed from inadequate planning. He insisted that no new projects begin until investigations showed their feasibility and until there were assurances that the facilities would benefit actual farmers, albeit with less than total success. He also launched a long-range program to complete facilities on partially developed projects. This work put the Bureau in an excellent position to aid in the economic recovery of the country through the public works projects of the New Deal. The Reclamation Bureau was ready to begin a massive building program as soon as funds were appropriated.

The largest project directed by Mead as Commissioner of Reclamation was the construction of Boulder Dam on the Colorado River. It was also the most carefully planned undertaking the Bureau had ever attempted; years went into the preparations for the giant structure. Mead had primary responsibility for its overall direction and assembled an excellent staff to handle the operations. Still, he took an active role, especially in areas of direct interest to himself. For example, Mead was concerned about the welfare of the workers on the remote, hot and dangerous construction site. He attempted to provide living conditions to make their task as comfortable as possible.

Boulder City was Mead's final attempt as a model community. He planned it not only for the construction period, but also as a town for tourists and the permanent employees of the dam and powerplant. In some ways, his vision of it for the future proved to be more successful than its prime purpose of serving the workers during the building of the dam. However, the town's problems were not so much Mead's fault as they were the result of the haste of beginning construction to relieve unemployment and a certain amount of greed on the part of the Six Companies consortium who had been awarded the contract to build the dam.

Despite the problems that arose over Boulder City, construction of the dam moved at a remarkable pace. Finished two years ahead of schedule, the giant concrete structure was a tribute to Mead's organizing genius-and it was fitting that the sprawling lake that formed behind the dam was named in his honor. It is somewhat ironic that Mead, who in the 1890s had opposed federal involvement in reclamation, should direct the construction of the largest reclamation project in America. Mead had firm convictions, but was not dogmatic. His whole life showed a constant adjustment to new realities. If his warnings had been heeded, the federal government would not have become so deeply entrenched in reclamation, or, at least not in such a haphazard fashion. Once it did become involved, however, Mead sought to ensure that it would achieve its original purpose-helping men own farms.

Mead's paramount concern was the welfare of the common man - the small farmer who formed the backbone of the world he envisioned. He was a public servant, not just a government employee. As his ideas evolved, he came to accept a larger and larger role for the government in reclamation, but only as it provided expanded opportunities for the average citizen. To hasten the realization of this goal, he strove to apply the principles of engineering to community planning. In promoting agrarian ideals through technological advances, Elwood Mead attempted to secure the betterment of society by combining the best from the past with the hopes of the future.

NOTE: The material above is largely taken from *Turning on Water With a Shovel - The Career of Elwood Mead* by James R. Kluger, University of New Mexico Press, Albuquerque, New Mexico, 1992. Mr. Kluger is an instructor of history at Pima Community College in Tucson, Arizona. This account of Mead's public life describes his key role in creating water policy and overseeing reclamation projects.

"Recollections of Irrigation Legislation in Wyoming"
Written by Elwood Mead
Enclosure with letter to Grace Raymond Hebard, March 27, 1930

My first contact with the irrigation and water right questions of Wyoming came in the early winter of 1887 and 1888, when Gibson Clark, an attorney living in Cheyenne, visited Fort Collins, Colorado, which had formerly been his home, and conferred with me about a bill to create the office of territorial engineer of Wyoming. I was at that time professor of irrigation engineering in the Colorado Agricultural College, and had been for one year assistant state engineer of Colorado.

Mr. Clark explained that this bill was to be introduced in the forthcoming legislature of Wyoming, by J. A. Johnston, of Wheatland. Mr. Johnston, as the manager of the largest irrigation enterprise in the state, had given considerable attention to water right matters, and believed that the time had come for the creation of the position of territorial engineer, and for exercising general public control over the streams or the territory. At that time there had been nine different water districts created, and considerable litigation looking to the settlement of the priorities and amount of water rights, but there was nothing in the law which coordinated the work on different tributaries of a stream or created a record which would show the extent of the state's irrigation development.

I don't recall offering any advice regarding the bill. It required the territorial engineer to do the things which are now generally done by the state engineers of all the arid states, but included in the duties of the engineer was the following provision:

"He shall become conversant with the waterways of the territory and the needs of the territory as to irrigation matters, and in his report to the governor he shall make such suggestions as to the amendment of existing laws or the enactment of new laws as his information and experience may suggest."

Requiring the engineer to suggest new laws opened the way for consultations with the territorial engineer, when the Constitutional Convention came to deal with irrigation and water rights. It was known that I had been making a study of the laws of other counties, and in the report of the territorial engineer for 1889, there were recommendations almost identical with those of Article VIII of the Constitution.

Mr. Clark did not intimate that I had been considered for the position which the bill would create, and it did not occur to me that this might be the case because I had practically no acquaintance with either the state of Wyoming or its people. I knew Gibson Clark and Mr. Johnston, but outside of these two I did not know a half dozen people in the state. Nothing more was heard about this legislation, until I read in the Denver Republican the day after the Wyoming Legislature adjourned, that in the last hours of the session the bill had passed, and that I had been appointed and confirmed territorial engineer. A few hours later a letter came from Governor Thomas Moonlight, telling of my appointment and asking me to accept. The Governor said he had refrained from writing me because he did not believe the bill would pass and he did not wish to raise hopes that might not be realized.

I found it difficult to convince President Ingersoll of the college that the offer had gone wholly unsought and was a much of a surprise to me as it was to him. However, shortly afterwards I went to Cheyenne, met Gibson Clark, Andrew Gilchrist, C. A. Campbell and J. A. Johnston, the author of the bill, and together we went to the Governor's residence, I told him that I could not leave the college until the end of the term, but if this was agreed to, I would accept, and the matter was so arranged. That afternoon I met the governor on the street. He said "you have been on my conscience ever since I first saw you this morning. I had no idea you were so young. If I had known this I would never have offered you the place, and the reason is that if you come here I am sure you will fail." The Governor had quarreled with the legislature and had an unfavorable opinion of the influences which dominated public life in Wyoming. He ended his talk with me by saying "I so hope and pray to God that you will reconsider and not accept this place."

I told him I would take a week to think it over, but before the decision was made, J. C. Arthur, one of the leading citizens of Fort Collins, and who had property interest in Wyoming, called on me and urged me to accept. He said, "I have run cattle in Wyoming for fifteen years. I know its people. They are the finest body of men on

earth. You will like them and they will like you." He further told me that ex-Governor Warren was in the city, had stayed at his house the night before, and wanted to talk to me. I met Warren and told him of my misgivings, based on youth and lack of political experience. He urged me to accept and mentioned a number of territorial officers who had served through different administrations, among these being Robert Morris and Daniel Gill. This was the beginning of a friendship which lasted unbroken until Senator Warren's death, and in which my admiration for his great ability and kindness of heart grew with the years. In speaking of it, Senator Warren rightly regarded himself as being responsible for my going to Wyoming, but, like Governor Moonlight, the principal impression of our first interview was my youth. Talking of it a year or two ago, Senator Warren said that when I came to Cheyenne I was still wearing pinafores.

It was manifest at once that if the territorial engineer was to amount to anything, he must have a record of the water filing. These were being recorded at the time in the offices of the different county clerks and I began at once to secure copies of these. It required the examination and transcribing of over 3000 claims, and the rearranging of these so that the ditches taken from a particular stream would be grouped together and arranged in the order of the priorities. The first thing which was manifest was that the virtue of self-denial had not been conspicuous on the part of claimants. If the amount of water claimed had existed, Wyoming would have been a lake. This grew mainly out of the fact that claimants had no idea of the meaning of the terms of water measurement used nor any clearly-defined idea as to what purpose the record would serve. In many cases the recorded claims gave no idea of where the ditch or the land it irrigated was located. One notice claimed the water of Wagon Hound Creek, stating it was to be diverted "at the place where I now stand." Another said the ditch and land were somewhere on the western slope of the Big Horn Mountains.

Not only was the location uncertain, but very few gave the dimension of the ditches and the unit describing capacity included claims for source inches, agricultural inches, California inches and miner's inches, in a territory where the law recognized no unit except cubic feet per second.

The uncertainties of the water claims were not, however, as serious as the emissions in the court decrees which had already been rendered. For this no one in particular was to blame. The system was wrong. In order to avoid expense, the recording of claims and the determination of rights had been imposed on officials who had other duties and who had no special knowledge of the subject or any direct responsibility for results. The county clerk was made recorder of claims, the county surveyor was to measure the ditches, and the district judge was to fix the rights. There were no salaries, but the harassed irrigator soon found that the fees of the arrangement were far more costly than would have been the expense of a proper system of control. For example, the owners of the ditches on two small streams in Laramie County paid in fees for recording their claims and measuring the ditches, over $10,000, and in the end, there was no official to whom they could appeal to protect their rights.

Because of the greater use of water in the vicinity of Cheyenne, the first scarcity appeared there, and the first suits to determine priorities and amounts appropriated came on in the court presided over by Judge McGinnis, who had recently been appointed to the territory from Ohio, where the main problem of water was how to get rid of it. These cases were entirely outside the sphere of his previous law practice, and he did not seem to realize the significance of his decisions. The rights to water, included in his decrees, would fix the value of farms and the security of the lives of the unnumbered generations in the future who cultivated these farms.

Instead of attempting to determine what were the conditions on the streams where rights were being decreed, the Judge dealt only with the claimants who appeared before him, and ignored those who did not appear. Hence, on Bear Creek, the decree included only 6 rights out of the 42 actual users of water on the stream, and instead of fixing the place of diversion and the area of land irrigated, the language of the decree made these water rights personal grants to the individual claimants, regardless of any location or use.

The first request received by the territorial engineer to exercise his authority in dividing the waters of a stream, was made early in 1888 by the city of Cheyenne, which under the McGinnis decree had the first right to the waters of Crow Creek. This request asked that the 75 ditches above the city be so regulated as to allow water so come to meet the needs of the city.

On consulting the decree it was found that not one of these seventy-five ditches were named or located. Instead, the decree made grants of water to individuals who might live in Cheyenne, on their farm, or in Hong Kong. I consulted the Judge and asked him how I was to determine what headgates to close or partly close in order that the city's requirements might be met. He said I would have to look up the individuals to whom the water had been granted and ascertain from them where they proposed to use the water allocated in the decree.

I also pointed out that the decree showed no relation between the actual use of water and the amount used. For example, Anon Simmons, with 28 acres of land, was granted a right to over 11 cubic feet of water a second, while the next appropriation, with 300 acres of land, was only given 5 acre feet of water a second. In other words, the first appropriation was given twenty times as much water for an acre of land as the second. I told the Judge I knew something about the opinions and prejudices of irrigators and that if I attempted to give one irrigator twenty times as much water for the same acres as I gave another, it was probable that I would be lynched, and his reply was the if I did not carry out the decree he would see that I was jailed!

Realizing the hopelessness of attempting to begin public administration of streams on this basis, I appealed to the Attorney General, Hugh Donzelman, pointing out the omissions in the decree and its departure from what was generally recognized as the principle which should govern appropriations, and asking for his advice. In his letter, which was published in the first report of the territorial engineer, he stated the decree did not conform to the law, did not give the information which I must have to prepare instructions for the water commissioner, and said if the settlers would agree among themselves on a list of priorities and appropriations, and ask me to act in accordance with it, I could go ahead.

I secured from the court record the testimony given in the trial and from it made up a list of ditches, priorities and amounts of water, based on the acres irrigated, and this table governed the action of the water commissioner as long as I remained at the head of the state water system.

While living in Colorado I had become familiar with the discrepancies in court decrees where the rights to water on a stream had been determined in proceedings similar to those of ordinary courts of law, and the experience in Wyoming led to the conviction that the first step in a determination of rights should be a thorough physical examination of the stream, the measurement of the water it carried, the location and measurement of the ditches which diverted the water, determination of the area of land actually irrigated, and the area of land that could be irrigated from the works already built or in process of construction. In other words, instead of leaving the determination of water rights to be fought out by the different water users, either on the banks or ditches or in the court, there ought to be an impartial and competent examination by public authorities. Furthermore, any system, to be efficient, must deal with watersheds. It must bring together in some coordinated record not alone the diversions on each small tributary of a stream, but on the main stream and all the waters which contributed to its flow.

In my contact with county officials, in examining the claims to water rights, and with the irrigators in their homes and on the banks of their ditches, I became the voice of John crying in the wilderness for a more adequate public control, and for a better understanding of the principles which should govern the determination of water rights and the limitations on those rights.

The idea of a public control which would operate was not readily accepted. In fact, it was generally objected to, outside of those whose water supply had been interfered with by diversions above, and this mental attitude was due to the fact that these early irrigators had built their ditches and diverted water without having to ask the consent of anyone. They had taken and used streams just as they used the grass on the public range, and they fought control of the stream just as they fought all leasing laws for governing the range. They looked on their water right as they did on a homestead filing, and they thought the claim which they had recorded gave them a Title to the amount of water stated in the claim, just as their homestead filing gave them a title to 160 acres of land. The idea of absolute right to the water claimed went even further. They looked on the stream as they did on the air, as something to be enjoyed without any limitation from a public authority, and to be taken just as they shot game or caught fish.

A majority of these talked with could not realize that the time would soon come when there would be more water diverted than the streams could supply, and that later diverters above would rob earlier users below, unless

some authority would interpose to protect the earlier priorities. Even this argument did not convince those lower down when it was coupled with the idea that the amount which they had claimed should be reduced to the amount they were actually using.

Nevertheless, the idea of basing rights on actual uses and on the necessities of those uses, and having the location and areas of land irrigated, settled by an impartial state authority, gained support among the more thoughtful and informed people of the state. H. R. Mann, one of the leading citizens of Buffalo, Wyoming, was specially insistent that I should prepare for the Constitutional Convention an argument for such an administrative code of laws, and when the Constitutional Convention met, this idea was very forcibly and clearly presented by C. H. Burritt of Buffalo, who in submitting my statement brought out the fact that in the court decrees already registered, not half of the ditches had been included, and that among those included they were, as a rule, given whatever they claimed, rather than what they needed or were entitled to on any proper basis of use or ability to use.

The proposal which I submitted to the Constitutional Convention was for a special tribunal, which would have practical knowledge of irrigation and water methods, and that its decisions as to water rights would be based first upon measurements of the stream, surveys of the ditches and determination of their capacity, and a surveyed location of the lands irrigated or susceptible of irrigation. I rather feared that this interference with what had heretofore been regarded as the function of the courts, would be opposed by lawyers of the state, as a profession, because water litigation promised to be a very fruitful field of employment, but when the matter was before the Constitutional convention, the leading lawyers in it supported Section VIII, and among those outside, the influential fire of Lacey and VanDevanter approved it. Without the endorsement of Willlis VanDevanter, now Justice of the (U.S.) Supreme Court, these features of the Constitution would not have obtained the impressive endorsement of 35 votes for and only 2 against.

The state legislature, 1890-91, passed a law for carrying into effect the constitutional provisions on irrigation and water rights, and put into effect the scheme for acquiring rights to water in the future. This scheme provides that intending appropriators must file with the state engineer an application for a permit to divert and appropriate water. This serves as a notice to all other appropriators and enables the state authorities to make an examination as to whether there is water to be appropriated. The state engineer is given authority to refuse these where detrimental to the public interests.

The first exercise of authority to refuse subjected the engineer to considerable criticism. Handbills were distributed in Cheyenne, which had the lurid heading "Do you want to live under a czar?" Anyone who would take the trouble to think about the matter dispassionately, would know that the engineer would be reluctant to refuse a permit and that he would only do it where it meant that the exercise of this right would rob some existing user of water. The authority granted has never been abused. On the contrary, it has been exercised all too sparingly.

The provisions for a special tribunal and for reminding those intending to appropriate water to secure a permit therefore in advance of spending money, both worked well and have been adopted by a majority of the arid states. Some, because of constitutional inhibition, have to submit the findings of the board which makes the examination of streams and determines the amounts and priorities of appropriation to a court for confirmation, but this legislation by Wyoming has, on the whole, exerted a greater influence on irrigation development and on irrigation law then any other single enactment.

When the bill was passed and the board of control had been appointed, it was confronted by the pressing need of an early decision of water rights on many streams. The district courts of Johnson and Sheridan Counties immediately terminated court hearings and transferred the conclusion of the adjudications on those streams to the board of control.

When the board of control entered on its duties, it found that the settlement of water rights was attended by peculiar difficulties. It came in direct contact, on the ditches and in the fields, with the water users and had to discuss with them the complex question of what constitutes an appropriation, and in the final determination, in 99 cases out of 100, reduced the amount of the right far below the amount stated in the claim. Notwithstanding this, out of 947 certificates of appropriation issued in the first two years, appeals were taken in only 6 cases, and in 4 of

these cases the testimony as to the appropriation was taken under the territorial law and transferred to the board by order of the court.

One reason for this popular approval was the fact that the operation of the law did not cost the irrigator anything. The ditches were surveyed at public expense. The testimony was taken on the ground and required little time and no outlay of money. For the first two years there was no provisions for fees for issuing certificates, and when the certificates had been issued there was a water commissioner armed with authority to prevent waste, protect prior rights, and in general bring stability and security where there had been unrest and anxiety.

The greatest difficulty was in overcoming the view that the filing of the statement with the county clerk, under the territorial law gave to the party filing this statement an absolute ownership in the stream, of the volume of water stated in the claim. This *ex parte* statement was always referred to by the party who made it as his water right, and was regarded as giving him as valid a title to the stream as his patent to land, gave to his homestead.

The fact that these statements were prepared by men who had no knowledge of the volume of water used or the significance of the terms applied, that they were recorded by officials who had no control over public waters and no special knowledge of the requirements of irrigation, that there was no investigation as to their accuracy nor opportunity for persons having adverse interests to contest them, had little weight at the outset. The law won its way slowly by the beneficial results which came from its operation.

EXCERPTS FROM *SECOND ANNUAL REPORT OF THE TERRITORIAL ENGINEER TO THE GOVERNOR OF WYOMING FOR THE YEAR 1889:*

[pp. 2-4]

DEVELOPMENT IN THIS TERRITORY.

Wyoming differs from nearly all the commonwealths of the arid region in the fact that its settlement and development is not the result of mining excitements and discoveries. The chief employment of her people has been and is yet the care and management of the grazing and farming interests. To this fact is due the surprising agricultural development which has taken place within the past decade. Handicapped as the territory has been by the lack of transportation facilities, the enormous expenditure involved in the construction of our irrigation works would not have been met save through the proceeds of the cattle business and the necessity arising therefrom for a winter's food supply. As it is, Wyoming, although the youngest territory in the Union, stands third in the area of irrigated land and in the number and mileage of irrigation canals. Or to state it differently, it shows an area of farming land greater than the average of the New England states and an irrigated territory equal to one-half that of Italy and greater than that of France and Spain combined. This is an extraordinary record when it is remembered that it is largely the work of the past ten years, under very unfavorable conditions, and should forever put at rest all questions as to the ultimate greatness or wealth of this commonwealth. If the pioneers of this work can produce such results what may not be accomplished through the intervention of ample capital or of state and national aid?

With Wyoming, as with the remainder of the arid belt, the construction of ditches and the utilization of their waters has been in advance of legislation for the regulation and protection of the various interests connected therewith. This has resulted in unavoidable injustice and hardships in some cases and has greatly increased the gravity and difficulty of inaugurating, and putting in operation, a system for properly regulating the division and use of the public water supply.

LACK OF EFFECTIVE SUPERVISION.

The most unfortunate feature, however, is the fact that the location and manner of construction of ditches has been left entirely to the inclination or financial resources of the settler. There has been no preliminary control of the streams and the waters have been diverted in a haphazard fashion, rather than in pursuance of a definite policy, having for its end their full utilization and economical distribution. As a result, while we have many works of an excellent character, leaving in their admirable design and substantial construction nothing to be desired, considered as a whole the result is far from satisfactory. In many instances defective works make the proper supervision and control by the state extremely difficult and expensive. These evils will in time undoubtedly disappear but they

could almost wholly have been obviated by the exercise on the part of the territory of an intelligent preliminary supervision over the location and construction of all irrigation works.

While the advantages of such supervision have long been apparent to all who are familiar with our situation, the reasons for delay in its being undertaken have been numerous and important; they are found in the character and previous training of the people and in the nature of our territorial government. In the first place, our agricultural population are descendants of people inhabiting the most important humid districts on the globe, and whose whole previous training and inherited traditions led them to look with disfavor on any restrictions or control of the use of water. The part that the inherited idea that water was public property to be seized and used in any manner or at any place which inclination or profit might dictate has probably much to do with the delay in providing needed safeguards, as well as leading to the evasion and disregard of the laws already in existence. Experience has, however, shown the fallacy of such ideas and the dangers incident to neglecting the properly protected vested rights or to supervise the disposal of the commodity on which so large a share of the future prosperity of the territory will depend.

THE PRESENT A TRANSITION PERIOD.

There is every reason to believe that we are now at a turning point in the history of this interest, not only in this territory but throughout the arid belt, in which the unaided and, in many cases, misdirected efforts of individuals are to give way to works constructed according to systematic plans having for their object the economical distribution of water and the reclamation of the largest areas of land.

We are fast coming to realize that agricultural values inhere in the water rather than in the land which it reclaims, and with this knowledge is the conviction that more efficient supervision is required in its disposal and utilization. Important national measures are now under consideration having for their aim the improvement of methods and the furthering of the full and rapid development of our agricultural resources. Local governments are taking more efficient steps for protecting and securing the proper use of one of the most important resources and there is an increased interest in the subject on the part of the public at large. The prospective admission of Wyoming to statehood gives the subject unusual importance. With the adoption of a constitution there comes a stability to the measures adopted by the local government not before obtainable. The provisions of this subject in the constitution just adopted contain a number of features which distinctly mark the advanced views now prevailing and their early inauguration will undoubtedly greatly stimulate the development of our agricultural resources.

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[pp. 96-98]

FUTURE DISPOSAL OF THE PUBLIC WATERS.

PRELIMINARY STATEMENT.

In the preceding recommendations I have dealt entirely with the settlement of priorities growing out of ditches already built. There yet remains to be settled the policy to be pursued by the government in the regulation of future appropriations. That the present laws need amendment is almost universally admitted. Some of their defects have been referred to in this report in connection with the difficulty encountered in obtaining ditch building statistics. The fundamental objection is that the present system makes state ownership of water simply a fiction. No supervision is exercised over its diversion nor over the claims of appropriation. The theory has apparently been that whoever first laid claim to the waters of a stream acquired therein unrestricted ownership. This is shown in the absence of any supervision or approval being required when filing claims, in the extravagant character of many of those recorded and in the views of citizens who are familiar with the law. As illustrations I may state that claims are recorded which gravely recite that individuals have appropriated all the waters of both Green and Snake Rivers, two of the largest streams in the territory, and that a letter came to this office during the present year complaining that an individual who had neither lands nor ditches had obtained a monopoly of all the water of a certain district by filing claims on the streams. The prevalence of such ideas is an evidence that the theory of state ownership of water is not generally understood. There is, unfortunately, no practical means provided in our laws for applying the theory.

STATE OWNERSHIP.

If state ownership is to be anything but a delusion, if it is to be more than nominal, there must be the same authority and control over streams and over diversion of water as is now exercised by the general government over the occupation and settlement of public lands. No diversion or appropriation should be permitted, therefore, until the sanction of the territory, through its constituted authorities has been obtained, and the beneficial character of the proposed use established. Such oversight and precaution is necessary for the proper protection of public interest (public water supply being of greater agricultural value than public lands) and in order that controversies growing out of extravagant and injurious claims may be avoided.

Instead of the present absence of supervision over either the nature of the diversion and use or the amount of the claim, I would recommend that each and every intending appropriators be required to make application to the irrigation authorities for a permit to divert and use the public waters and that approval of such authorities must be had before work is begun. For convenience in recording, and as a matter of economy, I would recommend that all such applications be made to the territorial engineer.

NATURE OF THE APPLICATION.

This application should specify the location and nature of the proposed distributing works, amount of water proposed to be utilized, purpose to which it is to be applied and any additional facts which may be required to show that the enterprise is a meritorious one. It should be accompanied by a map or plat showing the location of the works for diversion, and if the water is for irrigation, the land on which it will be applied.

On receipt of this application, which may be of form prescribed by law or furnished by the engineer's office, it should be the duty of the engineer to examine it for completeness and learn if there is anything in the proposed use of the water which might be detrimental to public interests. If it is satisfactory record should be made of its receipt and a copy filed in his office, and a duplicate, showing the date of receipt and approval by the engineer, returned to the applicant, whom it serves as a license for his guidance and protection in future work. The conditions governing the actions of the engineer may be prescribed by law or prepared by the board of control, the important feature to be that all actions shall be based on fixed rules or principles, as is now the case with the entry of public lands.

With each license to divert water there should be conditions stipulating the nature of the proposed use and limiting the time for the completion of work, and on receipt of proof of compliance with these conditions a final certificate of appropriation should be issued corresponding exactly to a land patent. All of these transactions should be made of record in the engineer's office, but only the final certificate need be recorded with the county clerk.

When the proposed diversion is regarded as detrimental to the public interests, approval of the application should be withheld until the case is considered by the board of control, which body shall have the authority to approve or reject.

REFUSAL OF APPLICATIONS.

The policy of the territory refusing permission under any circumstances to divert the public water has been seriously questioned, but a brief acquaintance with the evils growing out of over appropriation will dispel that objection. Every ditch built in excess of the capacity of a stream means one of two things, either it will be a useless and losing investment or those entitled to water will be robbed thereby, and as a rule it results, to a certain extent in both. Nor should ditches be permitted to carry water where the diversion is against the public welfare, as is the case with some ditches now constructed. A large part of the productive wealth of this territory is in our grazing lands and the water supply which makes them available should be as carefully protected and permanently secured to these lands as to lands reclaimed by irrigation; if not done their abandonment must follow. I believe, therefore, that the ultimate benefits to be derived from the use of our public waters will as largely depend on restraining injudicious diversion as in permitting appropriations which are beneficial, and that the duty of the government is as much involved in one as in the other.

EXCERPTS FROM *FIRST BIENNIAL REPORT OF THE WYOMING STATE ENGINEER TO THE GOVERNOR OF WYOMING. 1891 AND 1892:*

[pp. 56-62]

OPERATIONS OF THE STATE BOARD OF CONTROL

ADJUDICATION OF CLAIMS TO WATER. CREATION OF WATER DISTRICTS. SUPERVISION OF THE DIVISION OF WATER AMONG APPROPRIATORS

The Board organized in March, 1891, the Superintendent of Division No. I, J. A. Johnston, being chosen secretary. Since that time the testimony in proof of appropriations to water from 35 streams has been completed; 947 certificates of appropriation have been issued and 199 proofs of appropriation in Water Division No. I and a large number in Water Division No. 3 are now before the Board, awaiting final action at the meeting in March, 1893.

These results have been secured without claimants, in the majority of cases, being subjected to any expense whatever. The blank proofs were furnished by the State. The places of taking and exposing testimony have been chosen with reference to the convenience of claimants, and the preparation of maps of ditches, by the State, has enabled appropriators to secure correct descriptions of land reclaimed at either nominal cost or at no cost whatever. Not only has the evidence of the use of water been secured at small cost, but it has been far more definite and conclusive than would be possible under the former system, even with a greatly increased outlay. That this is true is shown in Water Division No. I, where, out of over 500 certificates of appropriation issued, there has been only one appeal from the decisions of the Board. In Water Division No. 2 there have been five appeals, but this has been due, in part, to the transfer of cases, on which the evidence was completed, from the District Court, and in part to a misunderstanding, on the part of appropriators, which led to the submission of incomplete statements. In this connection it is desired to call attention to the recommendation of the Superintendent of Water Division No. I, for the modification of the law which will permit the Board to require the submission of additional evidence when such is required. If this could have been done nearly all the appealed cases in Water Division No. 2 would have been satisfactorily determined by the Board in the first instance and the expense of an appeal to the Court avoided.

The determination of rights to water in this State is attended with peculiar difficulties; the differing views of claimants as to what constitutes an appropriation; the large area of unused land under ditches and the lack of definite data as to when the first work was performed, greatly complicate the determination of both the dates and the amounts of appropriations under the present, as under any system of adjudication. That the law has worked well is conclusively shown by the fact that out of 947 certificates issued, only six have been appealed from, and it is only justice to the Board to state that the original evidence in four of these cases was taken under the former law and transferred to the Board by order of the court.

When the Board began its labors the settlement of water rights was greatly in arrears. Appropriations on only six streams had been determined under the territorial law. The entire number of claims adjudicated was less than 200, while the priorities of over 3,000 recorded claims were awaiting settlement.

It is imperative that immediate action be taken on some streams, while the early determination of the rights on all is important. It is necessary to the protection of prior appropriators, since it must precede the division of water by the State in time of scarcity. The evidence of the date and amount of appropriations is more easily obtained now than at a later date, and the information, thus secured, is required by the State Engineer in acting on applications for new ditches.

It is of great importance, however, that the acquirement of rights be so guarded as to preserve all unused water for those requiring it hereafter, and preventing its being absorbed in speculative holdings. This the Board has endeavored to accomplish in the adjudications completed. In doing this, a wide difference of opinion has been encountered among claimants as to both the legal basis of rights to water and the means by which they are acquired.

As these rights have already great pecuniary value, and as the future agricultural progress of the State is intimately connected with the establishment of correct principles to govern appropriations of water, it is important that the interpretation of the law by the Board be generally understood. This is essential, both to facilitate their labors, if their views are correct, or to hasten their correction, if erroneous.

WHAT CONSTITUTES AN APPROPRIATION

In determining the extent and priorities of appropriations the Board has adhered to the following fundamental principles:

1st. That to constitute a valid appropriation the water must have been applied to a beneficial use, and in the case of appropriation for irrigation the water must have actually been applied to the land.

2nd. That the amount of the appropriation is governed by the volume used and by the requirements of this use. In the case of appropriations for irrigation, by the needs of the land reclaimed.

3rd. Where reasonable diligence is shown in the construction of diverting works and utilizing water, the appropriation dates from the beginning of work on the ditch, the survey to be considered as a part of such work. Where reasonable diligence is not shown, the appropriation to date from the utilization of the water.

4th. Priority of appropriation to give priority of right except in the case of appropriations made between 1888 and 1891, during which time the law, made appropriations for domestic use a preferred priority.

5th. The present law restricts appropriations for irrigation to one cubic foot per second for each seventy acres irrigated. While this does not apply to lands reclaimed before its enactment, no appropriation for a larger amount has been made, because in all cases, so far considered, this volume has appeared to be ample.

6th. Transfers of rights to water, made in advance of any adjudication, either by the courts or the Board, have not been recognized, the reason being that parties had not such ownership as would enable them to give valid title to the water sold. No transfers, involving changes in location or character of use, have been recognized. The Board has taken no formal action on this subject, but the views of the writer are stated at the conclusion of this discussion.

It will be observed that the volumes of appropriations have been determined by the amounts used, or, in the case of appropriations for irrigation, by the acreage reclaimed. The legality of this interpretation of an appropriation was seriously questioned when the position of the Board was first stated, but the results which have followed have been generally accepted, as will be seen from the small number of appeals.

OPINIONS OF APPROPRIATIONS

Those who dissent from the doctrine that the water must be used before an appropriation is completed, do not agree as to what is required for its perfection. By far the larger class hold that the filing of the statement with the county clerk, of itself, gave the claimant an absolute ownership to the volume stated in said claim. This *ex parte* statement is usually referred to as their water right, and is regarded as being as valid a title to water as the patent of the government is to land.

Others believe that the carrying capacity of the ditch determines the volume appropriated. They base their opinion on the fact that the "Statement of Claim" required only the facts relating to the dimensions of the ditch; that a law was passed requiring county surveyors to measure ditches and give official certificates of their capacity. The question is asked, what was the necessity of this if the volume appropriated is to be determined from other considerations? They explain that county surveyors' certificates were an expensive luxury, and are not disposed to accept the opinion that not only have they no value, but, on the contrary, have been an unmitigated evil. They determined nothing; established nothing; were a fruitful source of expense and trouble to irrigators, and the failure to confer any benefit has prejudiced many against all laws and against all attempts to regulate and control the diversion and use of the public water supply.

The majority of those holding the above views were at first disposed to regard the determination of unadjudicated claims as an interference with rights already established. The fact that a decree from the district court was necessary to the perfection of title to water under the territorial law is apparently not understood by one appropriator in ten.

The doctrine that statements of claim conferred ownership scarcely needs discussion. They were *ex parte* statements, prepared in many cases by claimants who had no knowledge of the volume of water used, or of the significance of the terms used in the statements. They were recorded by an official who had no control over the public waters and no direct connection with irrigation. There was no investigation as to the accuracy of these statements not opportunity for persons having adverse interests to examine or contest them. If they are to be regarded as conclusive evidence of ownership of the amount of water claimed, then there will be chaos at once. There is scarcely a stream in the State on which the first half-dozen claimants to not assert ownership to more water than the stream carries. There is one on record which claims 60,000 cubic feet per second, or more than the combined discharge of all the rivers in the State. The ditch to divert this volume is two feet wide and six inches deep. There are six separate claims to all the unappropriated water in the North Platte river, and on every stream of any magnitude are several statements of a similar character.

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[pp. 66-67]

The evils which extravagant grants would in the end entail, would not at once be manifest. Few persons have an accurate knowledge of the volume of water they have been using, and few would, at first, appreciate the possibilities of an extravagant allowance. It is probable that the making of large appropriations would, for the present, have been a popular proceeding for the Board, because it would have more nearly coincided with the ideas of the great majority of claimants. Those who believed themselves to be the owners of 20, 50 or 100 cubic feet of water felt somewhat aggrieved at an order which only gave two or three cubic feet, and it was only a partial satisfaction to be assured that this volume covered all the water that had ever been used, and was ample for all their present requirements.

There are few streams, on which the rights to water have been adjudicated, that the aggregate of the appropriations, as made by the Board, does not equal the discharge. To have made appropriations equal in amount to the wishes of claimants would not have increased the water supply a particle, but appropriators do not always reflect upon this fact. Even those holding late priorities are as urgent for the Board to be liberal in its decrees as those holding the earlier rights. Yet, a moment's reflection would show them that such a policy on the part of the Board would give the entire stream to a few of the early priorities and render valueless the claims of later ones.

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[pp. 68-69]

Only one thing more is needed, which is to limit appropriations to the locality where they are acquired. It is the belief of the writer that appropriations for irrigation should not be made, or regarded as made, to either ditches or owners of ditches, but should inhere in the land reclaimed and be inseparable from it. Any departure from this will inevitably lead to confusion in the administration of the law, and tend to impair the stability and value of agricultural holdings.

It must be remembered that a considerable percentage of the water diverted and used in irrigation returns to the stream through surface or underground channels, and is utilized a second time by appropriators below. The volume of water thus returning to the stream continues to increase for several years after irrigation begins, after which period it is practically uniform in amount. It is only after this equilibrium is established that the Water Commissioner can perform his duties with certainty and satisfaction. If constant changes are to be made in the location where water is used there will be a constant disturbance of this equilibrium and consequent uncertainty and dissatisfaction with the labors of the Water Commissioner. It must also be remembered that the location of the diversion has much to do with the value of an appropriation. It will be seen in Mr. Naismith's report that many streams which have a large volume of water for a few miles in their course entirely disappear at other places to reappear farther down. This is true of so many streams that to make possible a complete revolution in the

conditions which now prevail, or which may prevail at the time the waters are adjudicated. It would throw an uncertainty over water rights of all except the first appropriators on the stream, would make irrigated agriculture a hazardous occupation instead of being what it should be, an exceptionally stable form of agriculture. It would lead to endless controversies and absolutely prevent a systematic division of water among those entitled to its use.

EXCERPTS FROM *SECOND BIENNIAL REPORT OF THE WYOMING STATE ENGINEER TO THE GOVERNOR OF WYOMING. 1893 AND 1894*

[pp. 33-35]

THE LIMITATIONS OF RIGHTS TO WATER.

Do Appropriators of Water become Owners Thereof or Only Possessors of the Right to its Use? Do Rights to Water for Irrigation Inhere in the Land or in the Individual who Applies the Water to the Land?

Shall the water of our streams become private merchandise or shall it remain the property of the public? This a fundamental problem of our irrigation system. It is of too much importance to remain longer a matter of doubt or controversy. The doctrine which is to govern ought to be definitely established, if it is not already, and be fully understood. On it must rest in a large degree the character of State administration of streams, the methods to be pursued in building and operating canals, the security of our agriculture and the value of irrigated land.

Because of its importance, and because of the conflicting interests involved in its settlement, legislators have been reluctant to pass laws defining, in specific terms, the limitations of a right to water. While, in the opinion of the writer, this State is an exception to the rule, the fact remains that among appropriators there exists a wide difference of opinion both as to the intent and meaning of the law and as to the correctness of the State Engineer's interpretation.

From its nature, it is one of the questions which the State Engineer has had constantly before him. Persons claiming absolute ownership of the water of streams have sold the same to persons willing to admit such ownership and have sought to enforce the recognition by the State of the transfer. The sales have been made in advance of the legal determination of appropriations; they have involved changes in the nature of the use from that by which ownership was claimed to have been acquired; they have contemplated changes in the means of diversion and place of use. The State Engineer has been asked to recognize as valid, sales of water which contemplated a change in an appropriation for mining purposes to use in agriculture; from an appropriation to run a mill to fill an irrigation ditch; from a diversion near the head of a stream to a proposed diversion miles below.

In each and every instance the recognition of the validity of these transfers has been denied, and the denial has been based upon the belief that no right to the water of our streams exists except the right of use; that this right is restricted not only to the use by which acquired but to the place where acquired, and that it cannot be separated therefrom; that to recognize the right to sell water is to recognize a property right in water not contemplated by the laws of the State, and that its recognition would work untold injury to the material interests of the State.

This position has been approved by the Board of Control and followed in all its decisions. While its legality has been called in question by a few appropriators there has been no authoritative decision of our courts which would either dispute or affirm its correctness, nor has there been any subsequent legislation which in any way impairs its validity. The importance of this question and the difference of opinion which exists regarding the legality of the Engineer's action makes it proper that the reasons therefor should be stated in this report.

It was based on the belief that water being one of the gifts of nature the title thereto should forever remain in the public; that such public ownership was recognized by the people of this State prior to the adoption of our State Constitution and prior to the enactment of any specific law on this subject, and that in the adoption of our State Constitution such public ownership was made a part of the fundamental law of this State; that such public ownership is not only in accord with our laws but that the greatest prosperity of our citizens will be secured by maintaining the limitations above stated.

To recognize the right of an appropriator to sell water or to divorce it from the conditions by which it was secured is to make of water a speculative commodity. It is the creation of conditions under which a man can own the water of a stream and dictate to users the terms on which it can be had. It separates the ownership of water from the ownership of land and makes the selfishness of the owner of the stream. These conditions are opposed to all public interests. They set aside every consideration which justifies the doctrine of appropriation.

EXCERPTS FROM *THIRD BIENNIAL REPORT OF THE WYOMING STATE ENGINEER TO THE GOVERNOR OF WYOMING. 1895 AND 1896.*

[pp. 37-46]

THE ADJUDICATION OF RIGHTS TO WATER

THEIR CHARACTER AND LIMITATIONS AS DEFINED IN THE RULINGS OF THE BOARD OF CONTROL

When the reclamation of the Arid West becomes a matter of history it will be seen that many of the arid States have wholly ignored the experience of other irrigated lands, and have enacted laws and established customs which thorough and repeated trials have shown to be utterly pernicious and destructive.

History will also show that the experience of the arid States has resulted in an evolution in which legislation often fails to conform to the growth both in ideas and practices of water users, but on the contrary are often directly opposed thereto; that where legislation has been based on our own experience irrigation laws conform closely to the institutions of irrigated Europe, but that where they have been framed without regard to such experience they are not only inferior to the laws of other lands but to the customs of our own, and instead of promoting irrigation are a menace to its interests. It also frequently occurs that courts, which deal only with isolated features of the subject which happen to be presented in a particular case, add to the complications and uncertainties which inadequate laws have created.

This situation is not surprising. Water laws for arid lands must differ widely from those for humid lands and from the past traditions and jurisprudence of this country. All who deal with this subject must adjust themselves to new conditions, and in bringing this about actual experience is the most rapid and effective educator. The man who studies its problems from day to day learns its conditions more rapidly than the man who deals with it at occasional intervals and from a standpoint and environment not entirely favorable to its mastery.

These are the facts which gave to the creation of the Board of Control its significance and value. Whatever may be the ultimate outcome of its labors, its creation is in accord with the best experience of the irrigation states of Europe.

In Spain and Italy the best administration of irrigation laws and most satisfactory adjudications of water rights have been had from special tribunals having an intimate acquaintance with irrigation and dealing solely with this question.

At the outset of its labors the Board has had to deal not only with conflicting interpretations of our laws but with problems which no law can prevent being both perplexing and difficult.

It is easy to fix the boundaries of land and to mark these by monuments which shall be enduring and known to all men. The nature of a land patent is simple and the kind of title it confers easily understood, but it is otherwise with rights to the river which flows past the farm and determines its value. We have here to deal with a form of property which exists to-day and is gone to-morrow. To regulate the division of a common and fluctuating supply in such a way that the farmer may be assured that his portion of the snows which fall on distant summits will find its way certainly and surely to his fields before the stream runs dry, and that he shall have his proper share and others not suffer unwarranted loss, is one of the most complex administrative problems which has ever taxed the mind of man. We can fix no boundaries to ownership in the stream nor can we give a patent to the snows which may or may not fall next year, nor to the waters which flow to-day and are gone to-morrow. The stream we deal with to-day is not that of yesterday, and the supply which meets the demands of this month will not be the same next

month or next year. Yet the waters are of value and must be divided. The irrigated home is important and its productiveness must be made secure, not for this year only, but for next year and for all time.

The most important ruling of the Board of Control has been that limiting rights to water to the use by which acquired and the place where acquired and refusing to recognize private ownership of water or a right equivalent to such ownership. This action of the Board was fully discussed in the Engineer's Report for 1894.* Because this action is not in accord with the decisions of some of the other arid States its correctness in this State has been questioned. As this is a matter on which the State Engineer has to rule repeatedly, and as the events of the past two years have made it increasingly prominent, it seems necessary to again discuss this question in order that his position, and the effect of the rulings of the Board of Control, may be clearly understood and appreciated.

* ["Limitations of Rights to Water," pages 33 to 48 inclusive; see pp. 16-17 of this booklet.]

The success of water laws depends upon their stability. To secure this it is necessary that rights shall not expand as the control of water becomes valuable. It is also necessary that in our administration of water laws we give as careful consideration to the right of the last appropriator as is generally given to that of the first. Where all the water of a stream is used, anything which augments earlier rights robs later ones. A careful study of the laws of many States and of the decisions of their courts will show that this fact has not been properly considered, but that the tendency has been to augment the importance and unjustly extend the control of early priorities.

It will also show that the rights of the public in streams have to some extent been disregarded, and that the liberality, which permits an appropriator to take and use this public property without cost, has not been appreciated, but on the contrary it has been perverted to mean an entire surrender of public interest therein, so that the individual who has acquired a right to use water to irrigate a field has come to believe that he owns that quantity of water whether he irrigates the field or not. He has also come to believe that because he has used the water to irrigate the field one month of the twelve he has a right to control and dispose of it for the other eleven months as well.

The Board has ruled that appropriations of water cannot be sold but are inseparable from the place and use where acquired. The correctness of this ruling has been questioned. It is admitted that if the State, the unquestioned owner, were to sell a stream to the highest bidder and authorize the purchaser to exact tribute from users the transactions would outrage public sentiment and seriously menace our prosperity and development. Our laws, therefore, make no provision for the sale by the State of water rights. Only those prepared to beneficially use water and those who have so used it can obtain rights in our stream by appropriation, but it is claimed that having once been beneficially used and thereby appropriated this limitation is abandoned and the appropriator to a use may make an unconditional sale of the volume so appropriated, and that the situation and intentions of the purchaser are not material factors, but by such purchase he gets a title free from all limitations.

According to this remarkable doctrine we can accomplish by indirection what our law admittedly does not permit to be done directly. The appropriator from the State can give a better title than he receives and can be safely permitted to make of water a speculative commodity, although the State, its original proprietor, has no such right.

The Board of Control has ruled that an appropriation of water does not give title to any specific quantity but only to such volume as is necessary to accomplish the use by which and for which the appropriation was acquired. The correctness of this ruling has been questioned.

The language of certificates of appropriation is indefinite as to this limitation and many believe that where such certificate has been issued the appropriator of one cubic foot per second for irrigation has a right to claim and control the volume specified during every month of the year; in the non-irrigation as well as during the irrigation months. Such a conception is as devoid of common sense as it is of a proper regard for the spirit of our laws and the rights of late appropriators. It ignores alike the appropriators' needs, the fluctuations in the flow of our streams and the fact that the use by which the right was established affords no basis for such claim.

Adjudications of rights usually occur soon after reclamation begins. It has been fully established that the requirements of land at this period are much greater than after it has been irrigated for a number of years. The law of Wyoming, permitting a maximum allowance of one cubic foot per second for each seventy acres irrigated, is intended to cover this maximum requirement and is fully equal to or above what is needed. This augmented need, to overcome the aridity of centuries, continues only for a brief period. The same volume of water will suffice to irrigate two or three times as much land after it has been cultivated a few years. It must also be borne in mind that this maximum volume is needed during only a limited portion of the year, not in any case to exceed two months, and in the great majority of cases it will not exceed thirty days.

This increasing duty of water is not the result of care or economy on the part of the irrigator, but is the inevitable and uniform working of natural forces. There is no reason, therefore, for giving to prior appropriators the control of the surplus and permitting them to make it a speculative commodity. Justice to the public, and a proper regard for the extension of irrigation, require that water rights for irrigation should be restricted to the actual needs of the land where acquired, and that the surplus, which increased duty of water makes available, should be subject to appropriation on the same liberal terms as were given to the first rights on the stream.

The significance of the increased duty of water, which comes with its continued use, is too important to be disregarded. The generally accepted mean duty of water in Colorado in the beginning of irrigation was once cubic foot per second for each fifty-four acres watered. It now varies from two to six times this area.* If, therefore, we are to say that an appropriator is entitled to a definite volume of water, and to the continuous flow of that volume, and disregard the greater service which this will render as irrigation becomes better understood and the subsoil saturated, we are conferring on every early appropriation an expanding right and inflicting a corresponding loss on the public and on subsequent appropriators.

It is all the more important that these facts should be borne in mind because lack of means to properly investigate the actual needs of irrigated land has prevented a proper limitation of the allotments in certificates of appropriation.

We have been compelled to establish priorities in advance of any complete or systematic investigation of the volume used. The poverty of the State has prevented such investigation and our crude methods of distribution and use prevent a proper determination of ultimate possibilities. Our laws have had to be adjusted to these conditions. This makes them seem extremely primitive when compared to the irrigation codes of European countries.

There can be no questions that increasing experience and more adequate means for the administration of our water laws will result in the adoption of regulations similar to those in force in Italy and Spain, under which rights in winter as well as in summer are established and the diversions are in exact accord with the economical needs of users. It is important, therefore, that we recognize no law or custom which will make this subsequent regulation impossible.

Under the rulings of the Board of Control the conditions which govern the acquirement of a perpetual right to the use of water must limit its subsequent exercise. In other words such a right is simply a perpetual license to take and use this water for a certain specific purpose in a certain definite place. Under these rulings water appropriated to run a mill is restricted both to that purpose and to that mill. The owner of the right cannot use it to run another mill, nor divert it to the irrigation of land. No transfers of appropriations to other locations or other purposes have been recognized, but, on the contrary, it has been held that rights to water for irrigation *belong neither to the canal builder nor the land owner, but attach to the land reclaimed and are inseparable therefrom.*

The Board of Control has applied these limitations to all appropriations for irrigation whether the right was acquired prior to the adoption of the State Constitution or subsequent thereto. Water Commissioners have been

instructed in case of scarcity to reduce the volume diverted to the actual amount applied to the beneficial use stated in the original certificate, without any regard to the volume designated in such certificate.

While these rulings have had the support of the great majority of water users and their necessity is becoming increasingly apparent, there have been a few instances where their correctness has been contested. Those who disagree with the Board's position hold that these limitations constitute an illegal restriction of vested rights. This opinion is not so much due to the injury which these limitations might inflict in any particular case as to the fact that they are contrary to the judicial decisions of several other arid States. That this is true is admitted, but the radical difference which exists between the water laws of Wyoming and those of the States where these decisions prevail lessens the importance which would otherwise attach to these precedents.

The State Engineer and Board of Control disclaim any authority or desire to make law. They simply hold that the limitations imposed are necessary to the conservation and best use of our streams and are indispensable to the protection of the rights of actual irrigators. That while such limitations were not made mandatory by territorial laws they are in harmony with the spirit and purpose of these laws and are fully warranted by their provisions.

No question has had more careful or conscientious consideration. It has only served to confirm the belief that these rulings are correct, as added experience has served to show their necessity and importance and to intensify the conviction that a change to the doctrine of private ownership of water or a right of use equivalent thereto, which prevails in some of the arid States, would be nothing less than a public calamity. The users of water should study this question and inform themselves of the consequence of a departure from the principles which now govern the administration of our streams. As an aid to such investigation a brief review of a few of the cases involving these questions will be given, with the reasons for the decisions made and the results which, in my judgment, would follow the adoption of a contrary policy.

SALE OF SURPLUS WATER AND TRANSFER OF AN APPROPRIATION TO OTHER LANDS.

Soon after the adjudication of rights to water from Little Goose Creek, in Water Division No. 2, an inquiry was made of the State Engineer as to whether he would recognize the sale of one of the priorities thus established and the transfer of a portion of the water right to other lands than those described in the certificate. Accompanying this inquiry was the following statement of facts:

That, subsequent to the adjudication, the irrigation of contiguous lands lessened the volume which had to be diverted to irrigate the land described in the certificate, and a measurement showed that only a fraction of the appropriation was being used. The comparatively early priority made this water right valuable and the inquirer desired to purchase the surplus if he could legally do so.

The intending purchaser proposed, if the sale were sanctioned, to file on a tract of public land, to construct a new ditch and use it to reclaim land then arid.

The State Engineer ruled that under the provisions of Sec. 25, Chapter 8, Session Laws 1890-91, and Sec. 1359, Revised Statutes, the right was not transferable to other lands and that in no case could there be a surplus. That if all the appropriation was not beneficially used, for the purpose designated in the certificate, the remainder belonged to the public and subsequent appropriators were entitled to its use.

This ruling was accepted as final and has since governed the distribution of water from the stream. Each year has emphasized the necessity of its maintenance. As the subsoil of the land first irrigated has become saturated less water is needed, until under some of the earlier ditches one second foot of water will now irrigate twice or three times as many acres as were allotted in the adjudication.

When priorities were established the stream was regarded as being notoriously over appropriated. For several previous years there had been serious losses of crops. Late priorities were held of little value because the total volume allotted was twice the discharge of the stream. Since that time the losses have diminished each year,

and, with a continuation of the labors of superintendent and water commissioner to promote system and economy in the use of water, there is every reason to believe that in a few years all the land described in these certificates will be assured an adequate water supply. No one has been injured, since every appropriator has been protected in his right to use water for the purpose for which appropriated and by which the priority was acquired. The surplus, which has come from better methods and lessened needs, has not been wasted; it has all been used to make more fertile the fields of later appropriators, the value of which has thereby been increased and the homes dependent thereon made more secure. It has diffused the bounty of our streams among more people and relieved them from the curse of litigation, which attends every attempt to make water rights a salable commodity.

The sanction of this projected sale would have taken the water away from homes already created to apply it to sage brush and cactus. It would have conferred an additional speculative value on early priorities but would have destroyed the orchards and gardens of later users. A law which will make each appropriator the owner of the volume allotted in the Board's order and confer on him the right to sell what he does not use will give the first thirty appropriators on this stream control of its waters. Under such a law, the last thirty-seven appropriators could take their choice between abandoning their homes or buying the water needed, after the middle of June, from the fortunate possessors of the early rights and of the State's improvident liberality.

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RULINGS OF THE BOARD IN ACCORD WITH THE EXPERIENCE OF THE IRRIGATED DISTRICTS OF EUROPE

If human experience has any value we ought to heed its lessons. Irrigated agriculture is as old as civilization. The water laws of southern Europe are the growth of centuries, during which time every form of control of streams, from exclusive state ownership to absolute private ownership, has been tried.

It is surely worth considering that there is not an irrigated district in any of these countries where security and content have not followed attaching water rights to the land, nor is there a district where separate ownership of land and water has not resulted in disastrous controversies, misery and wrong.

The significance of these results ought not to be disregarded. When Governor Richards, in discussing the rulings of the Board of Control, said: "In taking this advanced view of this question, I believe that Wyoming is blazing a trail that will be followed by other States and Territories of the arid region," he had behind his prophecy the experience of every irrigated land old enough to have a history.

The European country which most nearly resembles ours in its climatic conditions is Spain. Its rainfall is less than that of Wyoming, hence irrigation is indispensable. Spain is also the country which best repays study, since its code of water laws is both the most concise and most complete of any country in the world where irrigation is largely practiced.

These laws are the outcome of the experience of a thousand years in which local laws and customs, widely different in character, have operated side by side in the same province.

The most impressive of these lessons, both to Spain and to the people of this country, is afforded by the experience of the province of Valencia. The plain near the city of that name is one of the oldest and most celebrated irrigation districts of Spain. "Its works date from the time of the Moors; its water rights are founded on custom which antedates existing property records." The prosperity of its people and the success of its institutions have been admired and commended by every writer, and all agree that they rest on the inseparability of land and water.

In the same province with the district of Valencia is the district of Elche. Here the waters originally owned by the land holders but not made inseparable from the land have gradually passed into different hands from the owners of the soil. "The land holder has no right to irrigate at all. When he needs water he buys it, the same as he does manure for his land when he wants to use it." The result of this separate ownership has been to impoverish water users, and although the district has equal resources with those which surround it the people are far less prosperous.

In like manner the province of Murcia where water is attached to the land is prosperous and progressive, while in the adjoining district of Lorea where land and water have been gradually separated the outcome of this separation has been "Large dividends for water owners, a languishing agriculture, a poor peasantry, and no enterprise to develop the country."

There is another provision, found in European irrigation laws, which is worthy of careful consideration by our legislators. Under these laws there is no such thing as a free appropriation. Every user of water must pay the state a rental therefor. These rentals are, in most cases, very small, being only intended to pay the expenses of supervision and to prevent the salaries of Water Commissioners and Superintendents becoming a burden to the general tax-payer. The great value of the system is its influence in promoting economy. The man who pays for what he gets will not be wasteful. It also places the doctrine of public ownership in a form to be comprehended by all, something not true of our method of free grants in perpetuity.

It is probably too early to seriously consider its adoption. That it will come, however, when increased use and augmented value make systematic distribution a more important consideration than it is at present, is confidently expected.

That the policy of making free grants in perpetuity is not only an unnecessary surrender of public property but one fraught with great possibilities of misunderstanding and abuse is clearly shown by the history of irrigation in Italy. The streams of that country have from ancient times been held to be the property of the state exactly as ours now are. In exercising this right of property the government has disposed of the waters by one of three methods. First, sale of the water in absolute property to parties paying certain established sums for it. Second, grants of a perpetual lease of the water on the payment of a certain annual amount. Third, grants of a temporary lease for a variable time at a certain annual rate, control of the water reverting to the state on the termination of the lease.

In the beginning of all institutions the primitive conception is the one in which public interest is least regarded, and the most common method of disposing of streams at the outset was to sell them to the highest bidder.

So clear a description of the results of this policy is given in Baird Smith's History of Irrigation in Italy that it is inserted herewith:

"A grant in perpetuity of such a material as water, whose value must necessarily go on augmenting with the progress of agricultural irrigation, is an act of injustice towards the government, and is especially so in a country where the revenue derived from the water forms a legitimate addition to the resources of the State, supplying it with the means of extending the works, which, in the actual condition of society, it alone is able to undertake. Hence, therefore, I am distinctly of opinion, that for the government of India to follow the example of that of Lombardy, in parting forever with its right of property in the waters of the country, on receipt of sums which cannot possibly represent the real value of the article, would be an unwise course, not only as regards its own interests, but also those of the irrigating community. For there is no one point better established by experience in northern Italy generally, and in Lombardy particularly, than this, that the selfishness of grantees in perpetuity of water has been one of the most serious obstacles to the development of irrigation. Acting on the principle that they had a right to do what they liked with their own, they had a habit of suspending arbitrarily the supplies of water disposed of by them to other parties under subordinate grants, of increasing as they thought fit the prices to be paid, and, in a word, of pushing to its utmost limits the right of absolute property purchased by them from the State. But an agriculture founded on artificial irrigation cannot advance as it ought to do, under such an arbitrary system." (Vol. 2, pp. 137 & 138.)

"The holders of ancient grants in perpetuity have occasionally asserted an absolute right of property in the water thus granted to them; but the legal tribunals have invariably rejected such claims, on the ground that the grants were made for the general good of the country, as much as the special advantage of the grantees." (Vol. 2, page 259.)

Because of this experience it has been found necessary, to secure the greater development and prosperity of irrigated agriculture, for the development and prosperity of irrigated agriculture, for the Italian Government to

purchase a large number of these early and important grants in order that the State might reassume a comprehensive and effective control of the streams.

EXCERPTS FROM "IRRIGATION INSTITUTIONS"

Elwood Mead, 1903, The MacMillan Co., New York
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[p. v-viii]

PREFACE

This work is based on twenty years' experience in the development of irrigated agriculture in the arid West.

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The lesson of these years is that the vital agricultural problem of the arid West is to establish just and stable titles to water and provide for their efficient protection in times of need. Every farmer in this region comes to understand the overshadowing importance of water. Their farms extend along many rivers for scores and even hundreds of miles. Every irrigator from a stream is bound to his fellow-irrigators by their common tie of dependence upon it. The amount diverted by one ditch is a matter of concern to all other ditches below, because it affects the volume remaining for their use. The independent life of the farmer in humid lands is impossible. Irrigated agriculture is an organized industry, and the prosperity and happiness of those engaged in it are largely determined by the character of its institutions.

The changes wrought by irrigation in the last half century have been little less than marvelous. The highest-priced farming lands on this continent are found in areas once regarded as desert and worthless, and great cities have been reared in regions it was once believed would always be dreary solitudes. In some sections material development has outrun the creation of institutions needed to insure enduring success. Irrigation laws are so ambiguous or contradictory that the finite intellect is not able to interpret their meaning. The water rights which govern the value of farms have many forms and are acquired by many methods. In one respect, however, they are all alike; no matter whether acquired by compliance with a statute or by purchase from a ditch company, they are a source of more perplexity at the outset and of more anxious thoughts afterward than are all the other questions of irrigation combined. The irrigator whose water right does not furnish grounds for either an inquiry or a grievance is a rate exception.

Nor are irrigators alone in finding the issues created by the use of streams hard to define. Lawmakers and courts have found them equally perplexing. They involve the determination of the kind of ownership which shall be recognized in the rains and snows which are gathered together in rivers, in order that each user shall receive his proper share and monopolies in water be prevented.

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The interest of the nation has been awakened to the opportunities here presented, and the civic pride of Western communities has been aroused to secure the creation of irrigation codes which will be worthy of a self-governing people. . As an aid to local effort, the general government is engaged in gathering facts on which future developments should be based. The Department of the Interior is measuring the water-supply, and finding out where it can be used to the best advantage and with the largest return. The Department of Agriculture is studying the methods of distributing and using water in order to promote its more skillful and effective use, and is inquiring into the social and legal questions created by the use of streams in irrigation, both in this country and in other lands. From its beginning the writer has been in charge of the latter investigation. It is hoped that what is here written will be an influence for good. The convictions expressed have been more largely shaped by what has been seen than by what has been read. They are the result of careful study, having at its foundation an abiding faith in the future importance of the arid West, a pride in the success already won, a belief in the future greatness of the regions most concerned, and a profound sympathy for the pioneers in the development of these regions, in the perplexities and uncertainties which have beset them.

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CHAPTER IV: THE DOCTRINE OF APPROPRIATION

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The first generation of irrigators gave no thought at the outset to their right to use creeks or rivers. They found water running to waste and put it to use, just as they breathed the pure air or enjoyed the abundant sunshine. They saw no more need of making an official record of diverting a stream than of keeping a record of the elk and antelope they shot for food.

There was an almost complete failure to understand the overshadowing importance of streams, or to realize that a climate so different from that of the East as to modify profoundly the structure of plants and the colors and habits of animals required a corresponding modification of laws and institutions to bring human settlement into harmony with its environments.

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In the absence of public control men took the water from streams and used it; that is, they "appropriated" it - using the word "appropriate" in its ordinary sense - to take for one's own use. When water laws were enacted, this practice was legalized and the basis of such laws became known as the doctrine of appropriation.

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Justice seemed to demand that when there was not water enough for all, those who first used water from a stream should have the better right to continue that use, and the doctrine of priority was the result. This doctrine grew out of the belief of the first settlers that their claims were superior to those of later comers, and they insisted that the owner of the last ditch built should be the first to suffer when the stream failed to supply the needs of all. The first builders of ditches could not anticipate how many were to follow. Unless protected by some such principle, the greater their success, the sooner they would be injured by the attempts of others to benefit by their experience. The general principle that among appropriators the first in time is the first in right, is now a recognized rule in the water laws of the arid region.

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As scarcity of water led to the adoption of the doctrine of priority, the two led to the necessity of defining the quantity of water to which an appropriator should be entitled. While the early appropriators were entitled to protection in their use of water, the later comers had an equal claim to protection from an enlargement of those uses. The first appropriator had the first right, but he had not the right to take all the water he might want at any future time. His right must, in justice to others, be defined as to quantity as well as to time. In theory, beneficial use has been made the measure of a right. That is, each appropriator has a right as against a subsequent appropriator to a continued use of whatever quantity of water he had put to a beneficial use at the time of the acquirement of the subsequent right. What constitutes beneficial use, and the determination of the quantity of water so used, has been left to the courts in most States, and their decisions on these points have been the cause of a large part of the controversies over water rights. This, however, is not a fault of the theory, but of its application.

With the adoption of the doctrine of priority the need of providing some notice of the extent of rights already acquired became apparent. [Editors' note: Mead goes on to note the laws in most Western states requiring the posting of a notice by the point of diversion, and the filing of a claim to the water in the county records.]

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The filing of these claims does not give complete title to water. In all of the States except Wyoming, Nebraska, and Nevada, this has to be established by litigation in the courts. Sometimes these lawsuits take the form of injunctions, sometimes equitable actions to determine the respective rights of appropriators or to quiet their titles. But whatever their form, they all have one thing in common: they are waged as though the issue were purely a private matter, and the disposal of the rains and snows that make streams were something in which the public had

no concern. There is no disinterested or public measurement of the ditches and streams or of the lands irrigated. The testimony submitted is often inaccurate and contradictory, but it is all the judge has on which to base his decree. Even the government, as the owner of large areas of land requiring irrigation, is never a party to these suits, nor is the State, although nothing so vitally concerns the public welfare as the establishment of ownership or control over streams. One of the results of this lack of public investigation of actual conditions has been the granting of extravagant rights to water. The excesses in this line have been almost as marked as in the filing of claims. In some instances appropriators have agreed among themselves as to the share of the stream which each would claim in court, and, as they furnished the testimony, there was little difficulty in securing a decree in accordance with this agreement, the court being either an unconscious or helpless instrument for giving legal sanction to a fiction if now a fraud. In some cases these excessive decrees have not stopped with giving away all the actual water supply, but grant rights to many times this volume.

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As the demands upon the water supply have grown, necessity has led to a gradual decrease in the freedom of the appropriator and an increase in the control exercised by the public authorities. This change has been so gradual that the legislatures of Wyoming and Nebraska have in effect abandoned the doctrine of appropriation, although retaining the word in their statutes. The person wishing to use water must secure a permit from a board of State officials, and the right acquired is not governed by the appropriator's claim, but by the license for the diversion issued by the State authorities. This tendency toward public supervision is manifest in the other arid States, and it seems only a question of time when the doctrine of appropriation will give way to complete public supervision. The law of Wyoming, the pioneer in this new system, is discussed in a succeeding chapter.

CHAPTER XI: IRRIGATION IN WYOMING

[pp. 247-266]

Recently two men were talking about the importance of irrigation in the different arid States. One said that Colorado and California were the leading States, and that in these States about every question had been litigated and settled, so that irrigators knew what they were doing. The other asked why he did not include Wyoming, and was told that irrigation had not made much progress in Wyoming, that an investigation had shown that only two water-right cases had ever been decided by the State supreme court. In the mind of the speaker, litigation went with irrigation, as fever with malaria, and a State with only two lawsuits was not worth notice.

Nevertheless, over nine thousand irrigators are taking water from over six hundred streams with a certainty as to their rights and an absence of friction in the protection of these rights, which is in such striking contrast with the situation in surrounding States as to make the methods by which this result was accomplished of unusual interest.

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The report of the State engineer for 1900 says that 9418 parties are appropriators of water under the Wyoming law. Thirty-six hundred and forty-nine of these acquired their rights under the Territorial law, the remainder under the State law. Nearly all of the Territorial rights have been established by the board of control. These rights were acquired under a diversity of conditions and under beliefs regarding the nature of appropriation which differed widely from the principles which have governed the board's action. Nevertheless, the board's action has resulted in a final settlement of these titles in nearly every instance. There has been no more discontent over its rulings than accompanies the determination of an equal number of land filings. The contrast between the stability of water rights in Wyoming and the uncertainty, the litigation, and the excessive appropriations which prevail in the surrounding States, shows that the existence of better conditions in Wyoming is not a matter of accident, but is due to the operation of a more effective plan.

In one of its early rulings the board refused to recognize the transfer of rights from the place where acquired to other lands. This refusal was based on the fact that there was no statute conferring such right or defining a procedure which would give notice to other appropriators who might be injured by the transfer, or furnish

a reliable guide to the water commissioners. This ruling has been frequently objected to and is now being contested in the courts. The board has had the following additional reasons for refusing to recognize these transfers: The party seeking to make such transfer has never been willing to surrender the right to water for the land described in the original certificate or to accept a right for an equal number of acres elsewhere. In every case the real object of the transfer was to establish a right to more water. In every case the changes proposed would injure other appropriators and increase the labor and difficulties of the State irrigation authorities.

A case now in the courts fairly illustrates the character of all these transfers. [Editors' note: Johnston v. Little Horse Creek Irrigation Co., 79 P. 22, 13 Wyo. 208, decided by the Wyoming Supreme Court 1904 - *after* Mead wrote this book.] The first appropriator on the stream received a certificate of appropriation from the board of control giving him a right to water for the irrigation of 700 acres of land. The location of the land was described by legal subdivisions and the maximum amount of water allowed for this land was 1 cubic foot per second for each 70 acres. On the stream were three appropriators. There was water enough for two of them but not enough for all three. In order to increase his water-supply the third appropriator bought from the first his appropriation for one-half the time. The construction placed on the appropriation in this transfer was that the right was to 10 cubic feet of water per second, regardless of the necessities of the land. In selling the right to this amount of water for one-half of the time, the first appropriator did not abandon any of the land described in his original statement. On the contrary, he extended the ditch so as to include additional lands. The party who bought the water for half the time did not, in the transfer or elsewhere, designate the use to which he intended to put this water, nor the land to which it was to be applied if used for irrigation. The practical result of the sale was to more than double the demand made on the stream by the first appropriation, to destroy the rights of the second appropriator, and to give them to the third appropriator. The board of control refused to recognize the sale, and litigation to compel it to do so followed. The decision of the lower court held that the sale was valid, and an appeal was taken to the supreme court, where the matter now rests. In the decision of the lower court it was held,

That the right to the use of water is a property right which belongs to the appropriator and can be sold and disposed of as other property;

That water rights acquired for irrigation prior to the passage of the State law may be used on any land whatsoever at the will of the appropriator;

That an appropriation of water up to the maximum amount allowed by the law constitutes a right to a continuous flow of water up to that amount, regardless of the necessities of the land for which the appropriation was acquired.

All these rights were acquired during the Territorial period and before the passage of the law of 1886. At that time rights were wholly based on the necessities of the land, and the decision of the court could not be based on the states of Wyoming, but on the decisions of other courts based on entirely different statues. It is not believed, therefore, that it will be sustained by the supreme court. If it is, water rights acquired during the Territorial period will become personal property. The water of the public streams will become a form of merchandise, and limitations to beneficial use a mere legal fiction. It will render futile and useless the requirement of the State statute that the lands to which the appropriation is attached must be described in the certificates, because the right can then be separated from this land without any legal formality as soon as the certificate is recorded. If water is to be so bartered and sold, then the public should not give streams away, but should auction them off to the highest bidder. Commenting on this decision, Fred Bond, State engineer of Wyoming, in his last annual report, says:

"There was nothing in the order of the board authorizing the use of any more water than the amount necessary for the irrigation of the land described, nor does it state what this amount is. The Springvale Ditch Company (the party selling the right) was not decreed the use of 10 cubic feet per second of time, nor was it given the use of any other specific number of feet of water; but it was decreed the use of water to irrigate 700 acres of land, an amount not to exceed 1 cubic foot per second of time for each 70 acres irrigated. In the view of the board there is a vast difference between the granting of the use of a flow of 10 cubic feet per second of time outright and independent of use, and the granting of a sufficient flow to irrigate 700 acres of land. The working of the decree shows this conclusively. The board did not undertake to designate the exact amount of water needed by the Springvale Ditch Company to irrigate the land described . In fact, it did not know."

[Editors' note: In 1904, the Wyoming Supreme Court upheld the lower court decision, ruling that a water right is a property right that can be conveyed separately from the land if other appropriators are not injured. The Wyoming Legislature, with Mead's blessing, reversed the 1904 Johnston decision in 1909 with a flat ban on transfer of water rights away from the lands or purpose in which the rights were acquired.]

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Appropriation under State Laws

[p. 266]

The settlement of Territorial rights has now practically been completed, and hereafter the more important business of the board of control will be the supervision of future appropriations and the issuance of certificates of appropriation for the water actually used in order to govern and protect all interests and prevent disputes. The law provides that any party desiring to establish a right to water must, before he begins the construction of new works or the enlargement of old ones, secure a permit or license from the State Engineer.

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[pp. 268-271]

The right to appropriate water can be obtained only by compliance with the law. Use without compliance will not answer. Rights cannot be established by prescription. Taking water from a Wyoming stream without a permit from the State engineer's office, or cutting timber from State land without a permit, are both misdemeanors, and for the same reason. Those who comply with the water law receive a definite title to water. The title comes from the State, and is a State patent to a share in the stream.

The care with which the State guards these rights, causes water users to respect them. Instead of the uncertainty which once existed when each did what was right in his own eyes without regard to the rights of his more peaceable or less favorably situated neighbor, there is now certainty that each will receive his just share. If there is objection to any ruling of the commissioner, the rule is obeyed, but the matter is referred to the division superintendent. If his ruling is not satisfactory, the matter may be carried up to the State engineer or to the courts.

EXCERPT FROM *BIENNIAL REPORT OF THE STATE ENGINEER TO THE GOVERNOR OF THE STATE OF WYOMING. 1907 AND 1908.*

"Mr. Elwood Mead, who more than any other man is responsible for the recognition of the best principles which today are incorporated in the irrigation laws of the West, has traveled and studied this subject extensively throughout the world. He is at present in charge of the irrigation in Australia, and writes as follows from Melbourne:

THE STATE RIVERS AND WATER SUPPLY COMMISSION

MELBOURNE, July 30th, 1908

Mr. C.T. JOHNSTON
STATE ENGINEER,
Wyoming.
DEAR SIR:--

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I hope that your Legislature this winter will overcome the mischievous tendencies of the Supreme Court decision in Johnston *vs.* The Little Horse Creek Ditch Company. Not only did this decision render meaningless and practically inoperative some of the most important features of the State's water law, but, if carried to its logical conclusion, it would throw Wyoming back into the ruck of the arid States of America, whose water laws belong to the lower Silurian period. I believed at the outset, and believe now, that in giving the *use* of water the State conceded all its should grant and that no sale of an appropriation should ever be recognized. I am proud of the fact

that for ten years our Board maintained that doctrine. Under it future generations of irrigators would have looked to the State for their right to use water and not to the holder of a purchased property right such as that decision created.

It ought not to be difficult to get back on the original safe basis. The Court decision ignores the obvious and ordinary meaning of the words which declare the waters of the State the property of the State, and is contrary to the interpretation given to the same words in other irrigated countries.

The difficulty encountered in maintaining public ownership of water in the United States grows out of the fact that for fifty years we have been a spendthrift nation, and public opinion has favored the prodigal disposal of public resources. The consequence is that it is ceasing to be a land of opportunity, and is becoming instead a land where the predatory and powerful rich have most of the resources and privileges, while the great body of the middle and working classes have narrower opportunities than in many older and poorer countries.

I do not believe that this is to continue, and a good place to begin the reform in Wyoming is to make the State the certain owner of water....

Sincerely yours,
ELWOOD MEAD

IRRIGATION IN AUSTRALIA
BY ELWOOD MEAD

PUBLISHED IN THE *INDEPENDENT*
CIRCA 1913
(AMERICAN HERITAGE CENTER ARCHIVES, UNIVERSITY OF WYOMING)

Dr. Mead is well known in this country as a leader in the irrigation movement which has already added thousands of acres to the arable area of the United States. While in the service of the States of Colorado and Wyoming and later of the Department of Agriculture at Washington he did much to solve the problems which confronted the farmers in the arid region and also to free them from the embarrassments of antiquated and in-adequate laws which caused them more trouble than the alkali. A few years ago he was called to Australia to do a similar work there and he is now in this country on a brief visit as the representative of the State of Victoria for the purpose of calling the situation of Americans to the advantages offered by the unsettled lands of Australia - Editor. [Written by the Editor of the *Independent*]

To most Americans Australia is an unknown country. It is not likely to remain so much longer. If the conservation of resources becomes a national issue in America, no country has more valuable lessons than Australia and New Zealand, because these two democracies have from the first taken an advanced position in industrial legislation of this character. These who are struggling for better water laws in the Western States will find in Victoria legislation a convincing demonstration that industrial development may be secured without any surrender of public rights. The lessons of Victoria's experience can safely be applied to the United States, because the climatic and industrial conditions of the two countries are remarkably alike.

These facts will, it is hoped, give interest to the impressions of an American who left irrigation work in the United States to assume the chairmanship of the Water Supply Commission of Victoria. The letter of the Minister of Water Supply offering me this position said that the State was entering upon an extensive scheme of irrigation development. Great storage works were to be built and large areas of fertile land reclaimed. Some one with practical experience in the management of irrigation schemes was desired to direct this work.

The position was made additionally attractive by the fact that Victorian laws governing the ownership and use of streams carried into effect the principles for which I had been contending in America for twenty years. Under these laws the State has not only reserved to itself the perpetual ownership of the water of all streams, but has retained title to the bed and banks as well. The State is, therefore, the sole riparian proprietor. It is not possible here, as it is in America, to secure speculative perpetual rights to public water supplies by acquiring a few acres of riparian lands or by posting a notice on a cottonwood stump in some obscure bend of the stream.

The profligate surrender to private ownership of water powers worth untold millions of money has never been a feature of Victorian development, nor is there any possibility of it becoming so in the future. Whatever value these natural resources possess has been retained for the benefit of the community. Believing fully in the doctrine that public waters should remain perpetually a public property, and that to grant private perpetual rights is to sacrifice the welfare of future generations. I was curious to observe at close range the operations of such laws. The position offered me not only permitted this, but gave the privilege of helping shape development under them.

[After outlining the Australian system for disposition of irrigated land in small plots as "irrigation colonies," with government aid in construction of houses, grading and seeding of land, low interest loans for improvements, and other assistance, Mead concludes:]

Such an organization in the United States would doubtless be called Socialism gone mad, and the same sentiment has occasionally been heard here, but fears regarding the outcome have been largely allayed by the successful results of past experience in other lines of development. Undoubtedly leaving settlers to contend unaided with every obstacle, as was formerly done in the United States, has created men of great enterprise, initiative and hardy mental fiber, and there is some danger that the State by doing so much may weaken the individual strength of its citizens. Nevertheless, after two years' study of the results obtained here, I cannot but regret that more was not done in American for the pioneer in the arid American States. I feel sure that the hardship which many families underwent might have been entirely averted with no loss to the public but with a very material gain to the nation in the rapidity and character of the development.

SYSTEMATIC AID TO SETTLERS THE FIRST NEED IN IRRIGATION DEVELOPMENT

ADDRESS DELIVERED AT THE IRRIGATION CONFERENCE, DENVER, COLO., U.S.A., ON APRIL 9TH, 1914 BY ELWOOD MEAD, C. E., CHAIRMAN, STATE RIVERS AND WATER SUPPLY COMMISSION, VICTORIA, AUSTRALIA

For the past seven years I have had the privilege of working for a government that has shown great wisdom and sagacity in its social and industrial legislation. Nowhere has this been more conspicuous than in its land and water laws and the policy followed in irrigation development. In this it has blazed trails which this country can follow to advantage. Recently I explained to Governor Johnson of California the methods by which Victoria, one of the Australian States, is securing settlers on its irrigated lands and aiding them to rapidly become self-supporting and prosperous. He has greatly interested and asked me to come to this convention as a delegate from California and explain what I had told him. Believing that a national policy of aid to settlers on irrigated lands will prove of immense value in developing this country and stop the drift of American farmers to other lands, I availed myself of the Governor's suggestion, and did this the more readily because of the opportunity of meeting many whom I had formerly known.

The absence of adequate financial help for settlers, during the first five years, is the main cause for the stagnation in irrigation development in this country, and for the calling of this conference. One only needs to put himself in the place of the settler to realize what a costly and serious venture it is to attempt to transform unimproved land into an irrigated farm and how much danger there is to the man of small capital that the attempt will prove a disaster. Before the settler can have any return from his land he must do many things not required in an unirrigated country. A house must be built, ditches dug, land cleared and graded, seed sown and the somewhat difficult art of irrigation mastered under untried conditions before he can have any return. While this is being done there is no income. His scanty capital is being swallowed up in living expenses. Often there is much hardship for himself and his family. Many a poor settler's wife has aged ten years in ten months. If money has to be borrowed, interest rates are excessive and all combine to discourage those to whom these conditions are strange and new.

To these have been added, in recent years, great increases in charges for land and water. Costly dams and permanent works mean much higher water charges than were paid by the earlier generation of irrigators, until the

marvel is not that many fail, but that any endure. With water rights costing from $40.00 to $60.00 per acre, and with the present western interest rates, the chances are all against the success of the settler who has less than $5000.00 or $6000.00 capital. The question which now needs to be decided is whether opportunities under national or private works are to be restricted to men with this or larger capital, or poorer men encouraged by helping them to improve their farms.

PROBLEMS OF SETTLEMENT HAVE BEEN NEGLECTED

Thus far in America we have almost entirely ignored the requirements of colonization and settlement. We have looked upon the building of irrigation works and the marketing of irrigation securities as the main problems of irrigation development. We have not given enough thought to the obstacles which confront the farmer in completing the work of reclamation, and the risks and hardships imposed on himself and his family when they undertake the development of raw land, and the payment of high charges now imposed. Another mistake has been to regard irrigation enterprises as something which could be paid for quickly. We have taken it for granted that if the works were built the farmer would come forward and foot the bills. The actual facts are entirely different. Irrigation works do not create irrigated agriculture. The money spent on dams and canals must be followed by an equal or greater expenditure for houses, farm buildings, fences, grading and ditching fields before the water can be used and irrigation works have either revenue or productive value.

Owing to settlers not being able to obtain financial aid many have not been able to complete the preparation of their land for irrigation in a reasonable time, and, as a result, have failed when through timely assistance they would have succeeded. These failures have deterred others from attempting settlement, hence a large part of the irrigable land is unoccupied. Until this is changed the reclamation of irrigated land will continue to involve regrettable hardship and loss to many deserving settlers. Development will be slow, and irrigation securities will have uncertain value. Irrigation works will not fulfill their greatest purpose, which is to create opportunities for poor men, and American farmers will continue to emigrate to the ready made irrigated farms of Australia and Canada.

STATE AID IS FEASIBLE

Adequate financial aid for settlers during the first five years is the greatest question before this Conference. It is also the one about which there is likely to be the greatest difference of opinion. No one, I think, doubts its need or value if wisely and honestly managed, but many do not regard it as feasible simply because it has not been attempted.

With respect to the latter, I have had during the past five years a most convincing and instructive experience. As Chairman of the State Water Commission of Victoria I have assisted in carrying out one of the most complete schemes of state aid to irrigated settlement ever attempted. Its success will, I hope, encourage this country to adopt a similar policy.

Seven years ago the situation under the irrigation schemes of Victoria was not unlike that under the Reclamation and Carey Acts projects today. Canals were built, water was available but settlers were not there to use it and hence the works were unprofitable. The State Government determined to change this be creating conditions which would enable anyone who had industry and thrift to secure an irrigated farm even if he had little or no money, and which would warrant its inviting settlement from distant countries. It has succeeded in its purpose by requiring only small initial payments and giving adequate aid and direction. No charge is made for water rights and the annual payments for water are only intended to cover 4% interest on the cost of works and the expenses of operation and maintenance. The cash payment on land is only 3% of its cost and thirty-one and one-half years is given in which to complete payments with interest at 4 ½%. Houses are built for settlers on a cash payment of about one-fourth the cost, payments of the remainder may extend over twenty years with 5% interest. The State, when desired, grades and seeds a portion, up to one-fourth, of each farm, on the payment of one-fifth the estimated cost and allows the payments of the remainder to extend over ten years. It employs disinterested expert advisers to help the settler select his farm, buy his horses and cows and do what is needed to get established on his farm. The saving in money and time which this system effects can only be appreciated by those who have seen it in operation. Many settlers select their farm and arrange for the erection of their house before leaving Europe; are able to go

directly from the ship to their new home, and have a living income from a dairy herd within a month from their arrival.

The state follows up this initial assistance by loaning the settler 60% of the value of any improvements he makes. This enables men with small capital to complete without delay the grading, seeding and improvement of their farms. The settler does not need to halt when he exhausts his own capital. When he has one field graded he can borrow money on that to grade another.

This generous aid and the thoughtful consideration for his welfare is a great encouragement and incentive to the ambitious and earnest beginners. I have never seen elsewhere men work as hard or achieve as much in the first two years as on those Victorian settlements. But all who come are not industrious or capable. Such a scheme is especially attractive to the visionary and incompetent. Some of the settlers seem to regard the house, the farm and the graded fields as an endowment, and to believe that the state which has done so much to help them succeed will do the remainder. To help the inexperienced and guard against being imposed upon by the idler or indifferent, the state employs in each district a tactful, practical farmer who is the friend, counselor and adviser of the working settler and a stimulator to others. When his efforts and influence fail the fact is reported to the head office. The settler knows of this and also knows that such report will have a controlling influence in determining whether or not he is to obtain loans or be given sympathetic treatment when payments are delayed. The law is so framed that the commission administering it has discretion to defer payments where settlers are unfortunate, but it also has authority to eliminate promptly any settler who fails to show earnestness, industry and thrift.

This scheme of comprehensive aid has now been in operation for six years. The settlements that are three years old are practically established and self supporting. It is the unanimous opinion of all those familiar with development that nowhere else have they seen such rapid progress in the cultivation of land or such large returns in the earlier years of settlement. Once of the inspectors was formerly a successful farmer in the Imperial Valley, California. It is his belief that as much progress is made in these settlements in Victoria during eighteen months as was made on an average in the Imperial Valley in five years.

One cannot help being inspired by the hope, the gratitude and the tremendous industry that is everywhere manifest. The Government that inaugurated these measures is nearer a real democracy than a Government that leaves the settler to struggle unaided. While Australia and New Zealand have led in the movement to aid settlers, their example is now being followed in other developing countries. South Africa has adopted it and the newspapers report that British Columbia intends to adopt it. The Canadian Pacific Railway is loaning each settler on its irrigated tracts in aid of these initial improvements, and the Argentine is beginning to consider making such aid a feature of its colonization policy.

SHOULD THE POLICY OF THE UNITED STATES BE CHANGED?

The adoption of a similar policy in the United States would relieve settlers of much anxiety and hardships without imposing any burden on the tax payer. By using the public credit, long terms for repayment could be obtained at low rate of interest, and with settlers fitted for their work and given practical advice by the Government, repayment of loans would be assured and development would then continue under opportunities as favorable as those provided in other countries. Every condition that has secured the success of State aid in Australia exists here in equal or greater measure. The tenant farmers of the Middle West furnish a large body of the very best class of settlers. The country does not have to look for them on the other side of the world. The lands are here, the works have been built. All that is needed is the inauguration of some business-like scheme which will provide the funds, and exercise the necessary direction and oversight over the settlers.

The greatest need in this country is the complete use of the works already built. From Colorado to California are private and public works, with less than half the land under cultivation, and with inadequate revenues are struggling to maintain their financial credit. Suitable settlers would completely change the situation. Under some of these schemes the conditions for extending this aid are altogether satisfactory, whilst under others, settlement under present conditions should be prevented. Either the water supply is inadequate, the land is unfit, or the charges for land and water are too high. To extend public aid in the settlement of such enterprises means inevitable disaster to all concerned, and the first step in all such cases should be an investigation by some competent

public authority, to weed out the sound from the unsound schemes. Starting with sound enterprises, there should, in each case, be an organization to meet and take charge of the settlers, and there must be some way by which large sums of money can be provided to give them the necessary aid.

In the State of Victoria this money is provided in a large measure by the State Savings Bank, which has deposits of $110,000,000.00, on which three and three and one-half per cent interest is paid. This money is loaned directly to the farmers at four and a half and five per cent. A remote country, with small accumulations, thus gives the farmers money at about half the interest rates prevailing in the western part of the United States. It would seem that the Victorian policy might wisely be followed in the United States, and the funds deposited in the Postal Savings Bank of the nation loaned to farmers developing irrigated lands, rather than to the banks, as at present. The experience of all of the Australian States shows that not only is this a safe use for these funds, but it can be made a great agency for national development. Safety could be further insured by an arrangement under which the states would guarantee the returns of all funds loaned to settlers within their boundaries. In any event, the cost of improving land is as great as the expense of providing water for it, and if we are to have a humane and rounded out scheme of development, the settler's side must receive more consideration.

GOVERNMENT AID AND DIRECTION IN LAND SETTLEMENT

BY ELWOOD MEAD
THE UNIVERSITY OF CALIFORNIA

A SPEECH TO THE AMERICAN ECONOMIC ASSOCIATION, 1917
(PRINTED IN *AMERICAN ECONOMIC REVIEW*, VOL. 8: SUP. PP. 72-98, MARCH 1918)

[pp. 72-77]

I wish to present the benefits which would come to the country from the adoption of a definite scheme of land settlement to be carried out through government aid and direction, and to describe some of the methods and policies now in operation in other countries, and needed here to secure the full utilization of our agricultural resources. In doing this I shall deal with the conditions which existed before the war and those likely to exist after the war ends. This explanation is necessary to avoid reference to the temporary prosperity growing out of the present urgent demand for food products.

The adoption of the policy proposed would be a radical departure from the ideas and methods which have prevailed in the past; but that is not an objection: the time has come for a change. This is an entirely different nation from the one which have 100,000,000 acres of lands to railroads and other corporations, and still larger grants to the states.

The social and economic value of having land owned by its cultivators was not recognized. Its influence on rural civilization was disregarded. These buyers of government, railroad, and state lands did not buy with the idea of becoming farmers or of creating an enduring form of agriculture. They bought simply to sell again at a profit. And so we had the government selling land, the railroads selling land, the private speculator selling land - all seeking colonists and creating an agricultural expansion far beyond the needs of the country. It was no advantage to the nation to entice a farmer away from Connecticut, where he was needed, and place him in the far West, where a surplus of crops made corn a cheaper fuel than coal. The great areas of land thrown on the market caused the social and economic needs of agricultural development to be disregarded. Men who had never farmed, who had no intention of becoming farmers, bought farming land as they bought corner lots in boom towns, not to make a profit from its improvement and cultivation but to obtain the unearned increment; to share in the advanced prices which development by others would bring. Settlement became migratory and speculative. Men gave no regard to the future in adopting a kind of cultivation which exhausted the fertility of the soil. When this occurred they went west and repeated the process. The speculative spirit pervaded all classes; clerks, stenographers, miners, people in every ovation, bought land without any investigation into its productive value or any intention of living on it. The result was that land prices have in many cases risen above productive values. This adds to the burdens of the future buyer and cultivator.

Because development has been speculative, because the state has never recognized the responsibility it should have assumed in so shaping the settlement of the public lands as to create an organized mature society at the outset, we have an agriculture wasteful of soil fertility, lacking organization, and especially inefficient in the distribution of what is grown. If the needs of agriculture and the organization of rural society had been understood when the nation was disposing of the public land, the first step would have been its classification, which would have indicated its productive value and the cost of its development. Moreover, some of the land, like the forest land, would have been retained permanently in public ownership, and there should have been such a limitation of tenure as would have prevented the speculative accumulation of great landed estates. The farm unit would have been adjusted to climatic conditions. In some instances it would have been made much larger than the one generally adopted, and in others smaller. Science would have gone hand in hand with the settlement of the land and semi-arid country, and all that science could give would have been utilized, first in the creation of the conditions of settlement and then in aiding the settler in his difficult task. Because nothing was done, these heroic but uninformed souls were bedeviled by winds, cold, drought, and insect pests. They wasted their efforts, lost their hopes and ambitions, and a tragic percentage left, impoverished and embittered. The tragic part of this history is that nearly all this suffering and loss could have been avoided under a carefully-thought-out plan of development.

The pictures of rural New England life in Mrs. Wharton's *Summer*, the portrayal of the struggles of western pioneers in Hamlin Garland's *Son of the Middle Border*, the conditions of tenants and settlers in the West and Southwest described in the Report of the Commission on Industrial Relations, *Farm Leases in Iowa*, and the Report of the California Commission on Colonization and Rural Credits, show that there is need of doing something to make farm life more attractive, to create broader opportunities for poor men to buy farms; and that the continued increase of nonresident ownership of land and its cultivation by tenants must be checked if this country is to avoid an agrarian revolution.

With the disappearance of free land this country entered on a new social and economic era. Free land or cheap land furnished an open road to economic independence. This road has been closed and nothing has been devised to take its place. Privately owned lands have risen rapidly and continuously in price. On an average farming lands in the United States sell for nearly three times as much as in the opening years of the century.

Men of small capital are finding it increasingly difficult to become farm owners. The number who attempt it is decreasing; and the years required to pay for a farm out of the products of the soil have been doubled and quadrupled. As a result American agriculture is breaking down. Its currents are setting in the wrong direction. Well-to-do farmers are flocking to the cities and their children go with them. In the most fertile sections of the country there are scores of counties with less people now than they had ten years ago. There is a disquieting increase in the percentage of land owned by nonresidents. Farm tenantry is coming to be accepted not as a step towards farm ownership but as a permanent condition, and the position of the American tenant is less satisfactory than that of his European counterpart, because neither law not custom throws around him the safeguards which are found in most countries where tenantry is a permanent feature of rural life.

The American farm laborer is disappearing. In many sections he is being discriminated against because he is too independent. Landowners are seeking men with low standards of living but familiar with hard bodily toil. "What we want," declared a recent conference, "is farm labor weak in the head but strong in the knees," and this want is being filled by recruits from Asia or the Balkan Peninsula, who may be good laborers but who do not contribute to the political or social strength of the nation. Immediate corrective action should be taken to prevent the extension of this. American rural life cannot retain its hopefulness and independence if it is to become a great pool wherein are dumped people who labor without ambition; without any agreement as to the standards of life, or any interest in our political institutions.

In too many of the newer rural districts of America there is less social progress than in some of the older European countries. We are doing less than they to enable people who have industry and thrift, and but little else, to buy and improve farms. The importance of this can hardly be overestimated. The experience of the world indicates clearly that the best farms, the most contented people, and the most stable political conditions are found where farmers own the houses they live in and the land they cultivate. Those who realize the full significance of these facts believe that our indifferent attitude toward the social problems of the farm must be abandoned and that in order

to hold young people on the farms we must plan a rural development which will provide economic, intellectual, and social opportunities at least equal to those of other countries.

The economic foundation of this planned rural development is the ownership of the land by those who cultivate it. Only those who live under their own vine and fig tree realize the full value of rural life. The most satisfactory social progress and the greatest advances in agriculture are found where patriotism has its roots in the soil. Several of the leading countries of the world have realized this fact. In order to check political unrest, to lessen the economic loss by migration to other countries and lessen the movement from the country into the cities, Denmark, Ireland, New Zealand, the Australian Commonwealth, Germany, and, to a lesser degree, a number of other countries, have inaugurated a plan of rural development in which the land is bought in large areas, subdivided into farms and farm laborers' allotments, and the sold to actual settlers, on long-term payments. The buyers are aided in improving and cultivating these farms by a competent organization, adequately financed by the government. They are given the benefit of expert advice, not only in their agricultural operations but in forming buying and selling organizations. In other words, these countries are creating an organized community development.

This plan of rural development is the greatest agrarian reform of the last century. It is enabling discontented tenantry and poor laborers to enjoy landed independence, to live in better houses, to have more and better live stock, to educate their children and to have a deeper love for their country for what it is doing for them. A new and better civilization is being born.

The adoption of this policy by the United States will not, therefore, be an experiment. It has been a financial and economic success in the thickly populated countries of Europe and in the sparsely populated countries of Australia and New Zealand. The need for it in the United States is far more acute than this optimistic nation realizes. In the ten years before the beginning of the present water 900,000 people left the United States to take farms in Canada. They took with them millions of capital and an energy, ability, and experience that we cannot afford to lose. In the year preceding the war one of the Brazilian states had 1600 applications for farms from the single city of San Francisco. In the stress of this war the Commonwealth of Australia has appropriated $100,000,000 to be spent in buying and subdividing land and making farms ready for cultivation for the returning soldiers. England is preparing homes for the Empire's returning soldiers. Germany has a complete set of plans for the agricultural development of Poland. Our young men will return home filled with enterprise, looking at a world in a new way; and unless we make provision in advance for enabling them to enjoy landed independence without undergoing the privation, the hardship, and anxiety involved in the purchase of land under the conditions imposed by private colonization agencies, they will not remain here. They will embrace the broader opportunities afforded by the state-aided and directed development of other countries.

The most important land settlement bill thus far considered by Congress is the National Colonization Bill, introduced in the last Congress by Hon. Robert Crosser of Ohio [H.R. No. 11329, 64th Cong., 1st Session]. It provides a revolving fund of $50,000,000 to be administered by a National Colonizing Board made up of the Secretaries of Labor, Interior, and Agriculture. The Secretary of Labor is to be its president. This board is authorized to expend the fund in purchasing land and in preparing it for settlement. The land acquired would be subdivided into farm units of varying sizes each of which would be large enough to afford a living for a family. Roads and drains would be built before settlement and, if deemed expedient, houses and barns would be erected so that farmers could begin without delay to cultivate their fields. If the land were arid, irrigation works would be built and the surface prepared for the application of water. The powers and the duties of this board would not end with material improvements. The board has authority for developing and supplying timber, coal, power, telephone, and other services to settlers; for organizing facilities for purchasing, marketing and other cooperative activities; and for securing any other improvements or services necessary for the efficient organization and development of any colony established under this act.

Under this act the land will forever remain the property of the United States; instead of a freehold title the settler will be given a perpetual right to use. When his use ceases his right to control the land will cease and the land will revert to the government and become available for some other cultivator. Nonresident ownership and tenant farming, in the ordinary sense of the term, would be impossible. The passage of this bill would make it possible for hundreds of people to own farms who could not hope to do so under the ordinary conditions of private

sale and private credit. The anxieties and tragical percentage of failures that have accompanied development in the past would be eliminated. All this would be possible without it becoming a charitable measure, or imposing any burden on the taxpayer. Every settler buying land under this bill would be expected to repay all the money advanced in buying a farm, or providing equipment, with 4 per cent interest on deferred payments; and with the business management that has attended similar undertakings in other countries this could easily be done.

CALIFORNIA LEADS STATE LEGISLATION

In the past there have been isolated efforts to create rural communities of a definite character. But such settlements as the Greeley Colony in Colorado and those of the Mormon Church in different western states were based on some social or religious idea rather than on the conception that land settlement is a public matter and should be under public direction. California is the first American state to attempt to create a rural life in accordance with carefully-thought-out, prearranged plans.

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FEDERAL AND STATE GOVERNMENTS SHOULD COOPERATE IN THIS DEVELOPMENT

Thus far the federal government has provided all the money spent on reclamation projects and has assumed all the risks. This should not continue; the states in which reclamation work is carried out should share both in the direction of settlers and in the financial responsibility for the expenditure. The participation of the state will be of great aid to the federal authorities because it will correct a mistaken idea which prevails that anything that the state can secure from the federal treasury is clear gain; which then causes a tolerant opinion of steps to repudiate obligations. This would not exist if the losses of such repudiation fell in part to the state.

There is another, and even more important, reason for this separation. The state has a greater interest than the United States in the kind of communities created by these projects. It has to educate the children in these settlements; it is the main gainer from increased production, taxation, and trade. It ought, therefore, to have an important part in shaping the agricultural, the economic organization, and the civic ideals of these communities, and the time to begin this is at the inception of development.

The Australian plan should be adopted here. Under it the federal government lends the states money with which to buy, improve, and settle the land, and makes the state responsible for the return of this money and for the payment of money spent on irrigation works. The federal government charges the state 4 per cent for the money advanced and the state charges the settler 5 per cent. Under such an arrangement the carrying out of reclamation projects would involve both federal and state legislation and the creation of cooperative organizations, the federal government to be supreme in matters of construction and management of works, the state in the selection of projects, purchase and settlement of land, and the development of agricultural and economic institutions of the project. In this way each cooperator would perform the part it is best fitted to perform. Such state action has not been attempted in this country, but the California Land Settlement Act shows how it can be done. The last legislation of Wyoming favored such cooperation in the future reclamation of irrigable public land in that state. A memorial to Congress, passed unanimously by the state legislature, contained the following recommendations:

That the federal government construct and operate the irrigation systems under the provisions of the United States Reclamation Act.

That the state direct the subdivision, sale, and settlement of the land inaugurating a system of financial aid and practical advice to the settlers, including loans for essential farm improvements at low rates of interest with long-time amortized repayments.

That the whole development be planned in advance so as to insure everything required for complete and harmonious community life; including the provisions of homes for farm laborers, farm units of varying sizes, and plans for towns, roads, and schools.

The time has come when our negative, irresponsible treatment of land settlement should end. There ought to be created at an early date a competent land commission, composed in part of state and in part of federal authorities, to investigate this problem and make recommendations for a new land policy.

RECLAMATION AND RURAL LIFE

SPEECH DELIVERED BY ELWOOD MEAD, COMMISSIONER OF BUREAU OF RECLAMATION AT DINNER AT NATIONAL ARTS CLUB, NEW YORK CITY, TUESDAY, MAY 5, 1925

(WATER RESOURCES CENTER ARCHIVES - UNIVERSITY OF CALIFORNIA, BERKELEY)

The problem we are to consider tonight is how to make rural life more attractive, to increase its rewards for toil, to help men of small means become farm owners and to put into operation social forces needed to save rural civilization. We are also to consider an Act of Congress passed last December 24 which has a direct relation to our main problem. It authorized the appropriation of $100,000 for investigations to determine how arid and semiarid, swamp, and cut-over lands may best be developed. The language of the authorization limits the investigation to the development of these lands, but no area is truly developed until it is settled and put to human use, and the problem of how to select the settlers and how to help them become established in permanent homes, is more important than a study of how to dig ditches or pull stumps.

To many, the importance of aid and direction to settlers is not realized. Many look on the idea that it is a public question as nonsense, that federal aid is paternalism, but these views arise out of the fact that we have not recognized the revolutionary change in conditions wrought in this country by the disappearance of free fertile land. For more than a century this free land had been the beacon of hope to the industrious and enterprising. It had caused the nation to look on a settlement as a frontier problem, which was being solved by crowding the Indian farther West and making free farms out of his domain. This was a solution only so long as we had great natural wealth at our disposal. That is now gone and we must provide something to take its place.

The need for this is not imaginary. We are faced with a rural exodus which in the last census showed a declining farm population in most states, and will show a great increase in that decline in the next year. Michigan farmers leave the open country and Michigan farms are abandoned. Their owners move to Detroit. It pays better to work for wages in an automobile factory than to cultivate farms of their own. In the South the same lure of higher wages is taking the people away from the farms in the Carolinas to work in newly erected factories.

The investigation, if undertaken, should deal with neglected lands, where settlement can begin with the least preliminary outlay, where money and effort can be saved for the improvement of the farms and financing the settlers. There should be gardens and comfortable houses for farm workers who have no capital, and money to help complete the development of farms when settlers have from $1,500 to $3,000 of their own. The chief satisfaction the country can give is a mode of life superior to that of the city, and the basis of that to the wage-worker and farmer must be ownership of his home.

We need a system which will enable John and Mary, who have saved a little money, to get married and enter on life on a piece of land where they have a lifetime in which to improve and pay for it. That means longer credits, lower rates of interest and an attention to detail in preparation for settlement that other countries have come to regard as a national necessity but which we are just beginning to consider. It is not a matter for private enterprise because there is no margin for profit under the depressed rural conditions that prevail. It is a call to altruism and patriotic effort, and it is a public need that both the state and Federal government will in time recognize as they have in other countries.

Control of these settlements ought to be local. The Federal government is too far away, but the Federal government should cooperate as it now does in agricultural education, road building, and many other things that vitally affect rural life.

One demonstration, if successful, will do more to educate the public as to where we are drifting than all the books which could be written. If it fails the loss will be small. Whatever is done should be regarded as experimental and educational, something to help solve the fundamental problem of democracy, which is the relation of the people to the land.

FOLLOWING PAGES:

PHOTOGRAPHS AND TERM OF SERVICE OF EACH OF THE WYOMING STATE ENGINEERS

Elwood Mead
Mar. 31, 1888 to Jul. 15, 1899

Fred Bond
Jul. 15, 1899 to Aug. 25, 1903

Clarence T. Johnston
Aug. 25, 1903 to Feb. 1, 1911

Adrian J. Parshall
Feb. 1, 1911 to Feb. 20, 1915

James B. True
Feb. 20, 1915 to Jun. 30, 1919
Apr. 1, 1933 to Jul. 1, 1933

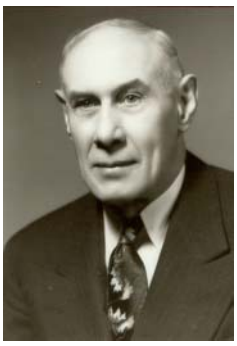
Frank C. Emerson
Jun. 30, 1919 to Jan. 3, 1927

John A. Whiting
Jan. 3, 1927 to Apr. 1, 1933

Edwin W. Burritt
Jul. 1, 1933 to Jul. 27, 1936

John D. Quinn
Jul. 27, 1936 to Apr. 1, 1939

Loren C. Bishop
Apr. 1, 1939 to Apr. 1, 1957



Earl Lloyd
Apr. 1, 1957 to May 1, 1963

Floyd A. Bishop
May 1, 1963 to Dec. 1, 1974

George L. Christopulos
Dec. 1, 1974 to Mar. 15, 1987

Gordon W. Fassett
Mar. 15, 1987 to Jun. 15, 2000

Richard G. Stockdale
Jun. 15, 2000 to Jan. 15, 2001