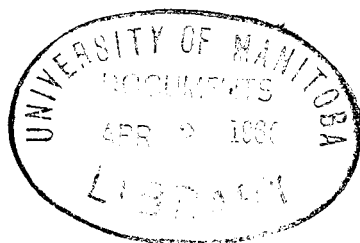


# THE DISTRIBUTION OF WATER

## POWERS AND DUTIES OF IRRIGATION OFFICIALS IN COLORADO

BY

H. N. HAYNES.



PUBLISHED BY THE EXPERIMENT STATION  
Fort Collins, Colorado.

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## 1. *The State Engineer.*

Appointed by the Governor for a term of two years.

## 2. *Superintendents of Irrigation.*

One to each of the six water divisions. Subordinate to the State Engineer. Superior to the Water Commissioners. Appointed by the Governor, term of two years.

## 3. *The Water Commissioners.*

One to each water district. Subordinate to Water Superintendent and to the State Engineer. Appointed by the Governor from persons recommended by the several Boards of County Commissioners in the counties in which the water districts extend; term of two years.

The water districts consist of "the land now irrigated or which may be hereafter irrigated from ditches taking water from the following described rivers or natural streams of the State of Colorado."

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### WATER DIVISIONS AND DISTRICTS.

1. *The Platte, or Water Division No. 1.* Consists of all the water districts consisting of lands irrigated from the North and South Platte, Big Laramie River, North and Middle Forks of the Republican, Sandy and Frenchman Creeks and tributaries.

*Water Districts.* 16 in number. Nos. 64, 1, 28, 23 on the South Platte numbering from the State line; 3 on the Cache la Poudre; 4 Big Thompson; 5 St. Vrain; 6 Boulder and Coal Creeks; 9 Bear Creek; 46 and 47 North Platte (North Park); 48 Big Laramie; 65 Republican, Sandy and Frenchman Creeks.

2. *The Arkansas, or Water Division No. 2.* Consists of water districts of lands irrigated from the Arkansas River and its tributaries, Smoky Hill, South Fork of the Republican and Dry Cimarron.

*Water Districts.* 13 in number. Nos. 11, 12, 14, 17 and 67 on the Arkansas, in order down stream; 10 Fountain Creek and tributaries; 13 Grape Creek; 15 St. Charles; 16 Huerfano; 18 Apishapa; 19 Purgatoire; 49 South Fork of the Republican and Smoky Hill; 66 Dry Cimarron.

3. *The Rio Grande, or Water Division No. 3.* Lands watered from the Rio Grande and its tributaries.

*Water Districts.* (8). Nos. 20 and 24 Rio Grande; 21 Alamosa and La Jara Creeks; 22 Conejos; 23 Rio Grande and Costilla; 25 San Luis, Sand or Medano, Big and Little Spring Creeks; 26 Saguache; 27 Tuttle, Carnero and La Garita; 35 Trinchera.

4. *The San Juan, or Water Division No. 4.* Lands irrigated by San Juan River and its tributaries.

*Water Districts.* (6). Nos. 29 and 32 San Juan; 30 Rio Las Animas; 31 Los Pinos; 33 La Plata; 34 Rio Mancos.

5. *Grand River, or Water Division No. 5.* Lands in Colorado irrigated by the Grand River and its tributaries.

*Water Districts.* (20). Nos. 28, 39, 42, 45, 51, 53, Grand River; 36 Blue River; 37 Eagle; 38 Roaring Fork; 39 Grand, Elk, Rifle and Rhone; 40 Crystal Creek, Smith's Fork and Gunnison; 41 and 68 Uncompahgre; 42 Grand, Gunnison in Mesa County; 50 Muddy and Troublesome Creeks; 59 Gunnison; 60 San Miguel; 61 and 63 Dolores; 62 Gunnison.

6. *Green River, or Water Division No. 6.* Lands irrigated by water taken from the Green River and its tributaries.

*Water Districts.* (7). Nos. 43 White River; 44, 55, 51 and 58 Yampa; 54 Little Snake; 56 Green River.

## INTRODUCTORY.

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Every person who uses water in Colorado, whether for agricultural or domestic purposes is affected by the methods of distribution of the state, or by their application.

At least two sets of administrative machinery are required to deliver water to the consumer; one under the direction of the state officials provides for the division of water from the streams to the ditches and the protection of their various rights; the other, for the carriage and distribution of water from the head gates of the ditches to the consumer.

The machinery of the state is more particularly the subject of this bulletin. The methods of distribution to be followed by the ditches, and the duties of the ditch officials, are left to the ditches themselves. These are generally provided for in the by-laws of the ditches, or by custom. It is hoped to take up the division in ditches more fully in a future bulletin.

This bulletin consists of two lectures given by Hon. H. N. Haynes of Greeley, before the Short Course for Irrigation Officials, given at the Agricultural College in the spring of 1901. Their importance concerning one of the subjects which touches closely on the agricultural welfare of Colorado justifies a wider distribution.

They give a summary useful to every consumer and to the officials themselves on the powers and duties of the State Irrigation Officials, and aside from the intrinsic importance and the value of the views of a careful legal student, the information is widely scattered and difficult of access.

To those who have been acquainted with the development of Colorado irrigation law, Mr. Haynes needs no introduction. To others, it is sufficient to say that he was one of the first to represent the state as judicial referee in decrees relating to the appropriation to ditches. In the subsequent development of Colorado law on irrigation he has been actively concerned in the settlement of almost every question of importance brought for judicial determination in Northern Colorado; and a student of irrigation law in its broader aspects.

L. G. CARPENTER, Director.

# THE DISTRIBUTION OF WATER

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## POWERS AND DUTIES OF IRRIGATION OFFICIALS UNDER COLORADO LAWS.

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By H. N. HAYNES.

It is the purpose of this paper to consider the powers and duties of state officials in distributing water. The American law of irrigation is yet in a formative state. It was unknown to the common law of England, from which we have borrowed the great body of our system of jurisprudence. It has been gradually building as the result of customs of the early settlers in the arid part of the United States, judicial decisions announced thereon, and the enactment of statutes, both by Congress and the several Territorial and State governments. Most of the decisions of the courts on irrigation subjects up to this time, have pertained to questions of appropriation of water from running streams, and from other sources of supply, and to controversies between rival ditch owners as to their relative rights, while comparatively little attention has been given to the matters now under consideration. So noticeable is the dearth of judicial decisions on the question of distribution of water by officials in charge, that in the two text-books on irrigation law, written respectively by Mr. Kinney and Mr. Long, the space devoted to the subject occupies but a very small fraction of the volumes.

In Long on Irrigation, which is divided into 15 chapters, but one chapter, the 12th, containing only four sections, is on the subject of public control of irrigation, and that chapter consists in the main of references to statute law. The space devoted to the same subject in Kinney on Irrigation, is about as limited.

It follows from the foregoing that little more can be said on the subject of the duties of the several water officials than to call attention to the statutes of the state prescribing their duties, to make some comments thereon with reference to practical questions likely to arise, to indicate the probable position which may be taken by the courts, and to suggest what line of policy and action should guide the officials under the statutes, to carry out their true intent and purpose, and so far as possible, to obviate the necessity of contentions and unnecessary litigation. It can readily be seen, it is difficult to go very far into this discussion

without traveling into ground which is somewhat open to controversy. The lack of authoritative judicial decisions on many questions likely to arise, is necessarily a source of embarrassment in making such comments from a professional standpoint.

#### EARLY LEGISLATION.

It is interesting to note that the first Legislature of Colorado Territory, on November 6, 1861, passed an act to protect and regulate the irrigation of lands, the fourth section of which, down to the proviso, reads as follows:

"That in case the volume of water in the stream or river, shall not be sufficient to supply the continual wants of the entire country through which it passes, then the nearest justice of the peace shall appoint three commissioners as hereinafter provided, whose duty it shall be to apportion in just and equitable proportion, a certain amount of said water upon certain or alternate weekly days to different localities, as they may in their judgment, think best for the interests of all parties concerned, and with a due regard to the legal rights of all."

The proviso of the section excepted from its operation land on what is known as Hardscrabble Creek, a tributary of the Arkansas. In the Revised Statutes of 1868, the same section was re-enacted, except that the Probate Judge was made the official to appoint the three commissioners, instead of the nearest Justice of the Peace. In 1870, by act approved February 11th of that year, that portion of said section 4, which referred to Hardscrabble Creek, was repealed. (Session Laws, 1870, p. 158, Sec. 1.)

In 1872, there was further legislation concerning the duties of the water commissioners in the County of El Paso. It was provided that they should receive \$5.00 per day when discharging their duties, to be paid by means of a tax levied by the County Commissioners, on each person using water for irrigation, in proportion to the amount of water used by each person.

In the second section of the act approved February 6, 1872, concerning irrigation in El Paso County, it was provided that the commissioners, with a due regard to prior vested rights, should establish such rules and regulations as in their judgment are necessary and proper to secure the purposes of the act, and to control the use of water for irrigation.

The third section of the act made it a misdemeanor subject to a fine and imprisonment, for a person to use water from any ditch or water course of the county to which he was not entitled, when the commissioners were controlling the same, or to hinder any commissioner in the performance of his duties.

A statute adopted February 9, 1872, applicable only to Pueblo County, required each ditch company to construct a tail ditch to return water with as little waste as possible, to the river, and made it unlawful to take more water into a ditch than was

necessary to irrigate the land under it when water was scarce in the stream. The second section amended the act of 1868, by substituting one commissioner for three commissioners. The third section required in Pueblo County, before a commissioner should be appointed by the Probate Judge, that a majority of the riparian owners on each stream, should sign a petition, requesting an appointment to be made, mentioning whom they preferred. (Session Laws, 1872, p. 144.)

The General Laws of 1877, which was a compilation of previous general statutes, as well as of those enacted by the first general assembly of the State of Colorado, contained the fourth section of the chapter concerning irrigation in the Revised Statute of 1868 without change, except that the words County Judge were substituted for the words Probate Judge. The compiler of the General Laws evidently overlooked the amendment of 1870, repealing the Hardscrabble proviso.

In the compilation known as the General Statutes of 1883, this important section of early Colorado law is printed with the amendment made in 1870, as Section 1714 thereof. It reads as follows:

"In case the volume of water in said stream or river shall not be sufficient to supply the continual wants of the entire county through which it passes, then the County Judge of the county shall appoint three commissioners as hereinafter provided, whose duty it shall be to apportion in a just and equitable proportion, a certain amount of water upon certain or alternate weekly days to different localities, as they may in their judgment, think best for the interest of all parties concerned, and with a due regard to the legal rights of all."

The same section was again printed in 1890 as Section 2259, of Mills Annotated Statutes.

Just how far any part of this old statute can be considered as now in force, may be a somewhat open question. Certainly the act of 1879, providing for the appointment of one water commissioner for each water district, constitutes an implied repeal of the power of the County Judge to appoint three commissioners; but whether the courts will or will not hold that the power "to apportion in a just and equitable proportion, a certain amount of water upon certain or alternate weekly days to different localities, as the commissioner may in his judgment think best for the interests of all parties concerned, and with a due regard to the legal rights of all," still vests in the water commissioner of the district, may be fairly debatable.

Further on we will consider this subject of apportioning water in time to different localities under the discretionary powers of the water commissioner, without reference to this statute. From any point of view, it is interesting to note that there has been legislative recognition of the wisdom of such alternate supply under certain circumstances of scarcity.

Prior to the year 1879, the system of dividing the water of running streams among the different ditches entitled thereto, was extremely crude. There had been no provision made to determine judicially or otherwise, except in the discretion of the commissioners, to how much water each ditch was entitled.

#### LEGISLATION NOW IN FORCE.

In 1879 the present Colorado system of adjudicating priorities and providing for the enforcement thereof, had its inception. It was attempted in that year, by the second general assembly, to provide a system of procedure to adjudicate priorities, but that part of the act of 1879 was found defective, and amended in 1881. In the act of 1879 ten irrigation districts were created, and it was provided that others might be created by the Governor, on petition of parties interested. Subsequent legislation has created new districts so there are now 69. The sixteenth section of the act provided for the appointment of one commissioner for each district, and the method of his appointment.

#### WATER COMMISSIONERS.

##### POWERS AND DUTIES UNDER THE STATUTES.

The 18th section of the act of 1879 (Section 2384 of Mills Annotated Statutes) defined the duties of the water commissioner as follows:

"It shall be the duty of said water commissioner to divide the water in the natural stream or streams of their districts among the several ditches taking water from the same, according to the prior rights of each respectively; in whole or in part to shut and fasten, or cause to be shut and fastened, by order given to any sworn assistant, sheriff or constable of the county in which the head of such ditch is situated, the head gates of any ditch or ditches heading in any of the natural streams of the district, which in a time of scarcity of water, shall not be entitled to water by reason of the priority of the rights of others below them on the same stream."

In 1887, Superintendents of Irrigation were provided for and their duties prescribed. The 5th section of the act (Sec. 2451, M. A. S.), reads as follows:

"Each water commissioner shall report immediately to the superintendent of irrigation of his division, when he is called out, and when he ceases to be needed, and shall, during the continuance of his duties, be under the control of the superintendent of irrigation of his division."

The 8th section of the same act (Sec. 2454, M. A. S.), reads as follows:



"Said superintendent of irrigation shall have the right to call out any water commissioner of any water district within his division, at any time he may deem it necessary, and he shall have the power to perform the regular duties of water commissioner in all the districts within his division."

In the 9th section of the same act (Sec. 2455, M. A. S.), each water commissioner is required to make reports to the superintendent of irrigation as often as required by him. Such reports of a water commissioner must contain information concerning.

- (a) The amount of water needed to supply all ditches and reservoirs in his district, meaning of course, under each stream in the district.
- (b) The amount of water coming into the district to supply such needs.
- (c) Whether the water supply is on the increase or decrease.
- (d) What ditches or reservoirs are, at the time of the report, inadequately supplied.
- (e) The probability concerning the supply prior to the next report.
- (f) Such other and further information as the superintendent of irrigation of that division may suggest.

Printed blank forms prepared by Superintendent of Irrigation would be helpful in the matter of such reports.

The 10th section of the same act of 1887 (Sec. 2456, M. A. S.) pertains in part to the duties of the water commissioners. It provides, in substance, that when any ditch or reservoir is not receiving its regular water supply, its owner may report such fact to the water commissioner of his district, who shall, if practicable, apportion the water in his district to aid the ditch mentioned, if he can do so, and shall, if necessary, by telegram report the situation to the superintendent of irrigation, to enable that official, if necessary and practicable, to supply the needed water at the expense of junior appropriators from some other district.

In 1889 an act was passed, the first section of which (Sec. 2293, M. A. S.) requires any person or corporation diverting water from a public stream, to erect and maintain headgates and waste gates in connection with his ditch, and provides that after five days' notice so to do by the water commissioner of the district or by the state engineer, if such headgates are not erected, then the same shall be constructed by the water commissioner, who is also vested with power to recover the expense thereof from the delinquent ditch owner.

The second section of the same act (Sec. 2294, M. A. S.) contains similar provisions, with reference to the keeping of suitable locks and fastenings on headgates where water is taken from a public stream, and on failure of the owner so to do, it is made the duty of the water commissioner to provide suitable locks and fastenings, and collect the cost thereof from the ditch owner.

By another act adopted in 1889, many important new duties and powers were thrown upon water commissioners. By its first section (Sec. 2386, M. A. S.), a water commissioner in discharging his duties is vested with the power of a constable, and is authorized to arrest any person violating his orders relative to the opening or shutting down of headgates, or the using of water for irrigation purposes, and to cause the offender to be prosecuted before a Justice of the Peace.

In a proviso to the same section, the orders of the superintendent of irrigation and of the state engineer shall be treated as superior to those of the water commissioner.

By the 3rd section of the same act (Sec. 2388, M. A. S.), the water commissioner is given power to employ a suitable assistant or assistants to aid him in discharging his duties. Such assistants are to take the same oath as the water commissioner, and to obey his instructions.

The 5th section of the same act (2391, M. A. S.), being a very important one, is here quoted in full, as follows:

"It is hereby made the duty of the water commissioner, after being called upon to distribute water, to devote his entire time to the discharge of his duties when such duties are required, so long as the necessity of irrigation in his district shall require; and it is made his duty to be actively employed on the line of the stream or streams in his water district, supervising and directing the putting in of headgates, waste-gates, keeping the stream clear of unnecessary dams or other obstructions, and such other duties as pertain to a guard of the public streams in his water district; and for willful neglect of his duty he shall be liable to fifty dollars fine, with costs of suit."

The 6th section of the same act (Sec. 2392, M. A. S.) provides that the water commissioner shall not begin his work until called on by two or more owners or managers or persons controlling ditches in his district, by written application, stating necessity for their action; it is also provided that the water commissioner shall cease to perform his duties when the necessity therefor shall cease.

In the same year, 1889, another act was passed imposing a penalty for the bribing of persons in charge of the distribution of water. This section (Sec. 2398, M. A. S.) makes it a misdemeanor for any water commissioner or his assistant to take or receive any money, promises or favors, or anything of value intended to influence him dishonestly to favor any person in the distribution of water to the injury of others.

In 1895 another statute was passed providing for the regulation of the use of the waters of the state. The same, consisting of three sections, is printed in the third, or supplemental volume of M. A. S., as sections 2384a, 2388a, and 2384b.

By the 1st section of the act (Sec. 2384a, Mills' Sup.), each water commissioner is empowered, and it is made his duty on

application of the owners of one or more ditches in his district, immediately to make or cause to be made, a thorough examination of all ditches within his district, to ascertain what use is being made by the consumers thereunder. If he ascertains that any ditch owner is permitting any water flowing in his ditch to be wasted, or to be wastefully, extravagantly or wrongfully used by its consumers, or put to any other use than that to which it is entitled to be used in its priority order, when needed by others, it is made the duty of the water commissioner immediately to shut off the supply of water in such ditch, to such an extent as in his judgment water was wasted, or wastefully, extravagantly or wrongfully used.

The 2nd section of the act (Sec. 2388a, Mills' Sup.) authorizes the water commissioner to appoint not to exceed two deputies to speedily make the examination provided for in section 1, just mentioned.

The 3rd section of the act (Sec. 2384b, Mills' Sup.) makes it a misdemeanor for any water commissioner to fail to perform the duties mentioned.

This act is one of special importance, increasing both the powers and duties of the water commissioners, and if properly executed will be of great benefit.

In 1897 an act was passed to regulate the exchange of water between reservoirs and ditches and the public streams, whereby, among other things, it was made the duty of any person or company transferring water from one public stream to another, to construct and maintain under the direction of the state engineer, measuring flumes or weirs, and self-registering devices, where the water leaves its natural watershed, and is turned into another, and also where it is finally diverted for use from the public stream.

The 3rd section makes it the duty of the water commissioner of the district where the water is used, to keep a record of the water so turned into his district from another.

The 4th section contains similar provisions as to delivering water to a public stream from a reservoir, so that the owner of the reservoir may take an equivalent amount higher up the stream in exchange. The section requires the water commissioner to determine and regulate this matter of exchange.

In 1899, by an act in relation to irrigation, a system of procedure in court is provided, in case a permanent change of the point of diversion of an appropriation is desired, to enable the court to determine whether the proposed change will be injurious to juniors or not. When a decree is entered in such a cause, a certified copy thereof is to be delivered to the state engineer, and that official thereupon issues a notice to the water commissioner of the district affected, notifying him of the

change made. Thereupon the water commissioner is required to allot the priority right to the new ditch, in pursuance of the new decree.

The 3rd section of the same act, permitting between ditch owners an exchange of water for a limited time to save crops, or to use the water more economically, provides for the owners making such loan or exchange, to give notice concerning the same, and thereupon requires the water commissioner to recognize the exchange in distributing the water.

No legislation of the Thirteenth General Assembly which has recently adjourned, affecting the duties of water commissioners has been brought to our attention.

#### COMMENTS ON POWERS AND DUTIES OF WATER COMMISSIONERS.

The foregoing compilation of legislative enactments defining the powers and duties of water commissioners makes it plain that the office is one of great responsibility and importance, requiring for the efficient discharge of its duties, to carry out both the letter and the spirit of the statute, constant attention, strict impartiality, energy, tact, hard work, and ability. From the very nature of the duties imposed, the fluctuations in supply of water during an irrigating season, the need of its use frequently being greater than the supply, considerable discretion must be exercised by the official in charge. It may be said at the outset that it is probably not possible, with the necessary limitations of human wisdom, for any water commissioner to attain perfection in performing these duties. But every faithful official should aim to attain as near an approach as possible to a perfect discharge of all the duties imposed upon him.

It is to be hoped that in the course of time, and with increased experience, the service will be improved; that mistakes and neglect of commissioners in the past and the injuries resulting therefrom, will occasion greater diligence and care, and more freedom from error in the future; that in time, the sooner the better, the selection of these officials will be removed more and more from the scrambles of politicians, so that a trained class of officials to perform these important duties necessary for the proper development of one of the leading industries of the state, will be evolved. In time, the demands of the irrigators of the state will be such that a faithful, conscientious and experienced official will be retained in office irrespective of the fluctuations in political control of the state government.

An effort will now be made to make some suggestions concerning the proper discharge of many of the duties of water commissioners prescribed by the statutes.

The principal duty of a water commissioner is that defined in the first statute whereby the office was created, tersely expressed in Sec. 2384, M. A. S.

"To divide the water in the natural stream or streams of his district, among the several ditches taking water from the same, according to the prior rights of each respectively."

The language following the above in the statute, conferring power to shut down and fasten the headgate of any ditch not entitled to water is a mere incident to the language quoted.

The duty now under consideration involves consideration of the decrees whereby priorities have been judicially determined. Those decrees fix relative priorities of the several ditches in the stream in whose behalf evidence was introduced, the dates of such priorities, and the maximum amount of water under each priority to which the several ditches were then entitled. They do not provide that the maximum amount so defined under each priority shall be permitted to run into the ditch named at all times, irrespective of the necessities of consumers under the ditch. In most of the districts, perhaps in all, the decree defining priorities was made subject to several conditions, among which perhaps the most important was that which in substance stated that the decree should not be construed as adjudging to any claimant the right to take and carry by means of any ditch or reservoir, any water except to be applied to the use for which the appropriation was made, nor to allow any excessive use or waste of water whatever, nor to allow any diversion of water except for lawful and beneficial uses.

It is not the intention of the statute or of the decrees that the water commissioner, who is the executive officer to see that the decree and its provisions are enforced and observed, shall be permitted to ignore the limitations and conditions stated in the decree, and to deliver the maximum amount constantly throughout the irrigating season to a senior appropriator, or to deliver the maximum amount at any time when it is not actually needed for the necessary and beneficial irrigation of crops. In considering this general power and duty it is necessary also to discuss later statutes enacted for the purpose of emphasizing the importance of certain duties incident to the general power, and necessary to render the same effective. First among such provisions is the fifth section of the act of 1889 making it the duty of the water commissioner to devote his entire time to the discharge of his duties when necessary, and specially to be actively employed on the line of the stream to supervise the water delivery; to keep the same clear of unnecessary dams and obstructions, and to act as a guard of the stream. This requirement

of the statute demands the most constant vigilance. Many grave wrongs have been permitted on account of the failure of water commissioners to discharge this important duty. The writer's attention was called within the last two or three years to the fact that on one of the streams of the state for several years persons having ditches of quite late construction and without judicial decrees, had been taking water from sloughs and tributaries of the river, to the injury of early decreed appropriators on the stream, without any interference or action of the water commissioner to prevent such abuse.

It is manifestly the intention of the law that the water commissioner should act as faithful servant of all the appropriators on the stream, to see that their rights are protected under the judicial decrees. The administration of the water system of the state was provided by the legislature so that there should be some one person to act as agent for all, to see that their rights were respected, so as to obviate the necessity of farmers, busy with their agricultural work, employing a man to patrol the stream and to discover whether or not they were defrauded of their property rights. It is to be feared that there are too many water commissioners who are neglectful of the emphatic language of the statute requiring them to be constantly watchful. Too many commissioners wait to have complaint made to them of unlawful diversions, without themselves taking the initiative in such matters. It is evidently not the purpose of the statute that a water commissioner shall draw a fairly liberal per diem merely for giving orders concerning a few of the main ditches in his district, and waiting for some one to complain that a wrongful diversion is being made by a late ditch from some slough or tributary, or from the main stream itself, but that he should be actively concerned and have his assistants under his immediate supervision active to watch for abuses, and to prevent them, if necessary by the full force of the county.

It would seem that the statute mentioned was passed in 1889 to enforce greater vigilance on the part of the water commissioners. Three sections (Secs. 2386, 2388 and 2391, M. A. S.) were enacted for this purpose. The vesting a water commissioner with the power of a constable, and imposing upon him the duty of prosecuting for violation of his orders, and particularly the fifth section (2391 M. A. S.), making it his duty to be actively employed, supervising and directing putting in headgates, waste gates, etc., and acting as a guard of the public stream, and especially making it a misdemeanor subject to \$50 fine to willfully neglect this duty, indicates the legislature was led to believe that the previous general definition of his duty to divide the water according to the prior rights of all, was not found in practice sufficiently definite to bring forth the activity

needed. Everybody knows that the imposing of a penalty to follow a successful prosecution for neglect of duty, is not of itself very effective in many matters, because of the reluctance of citizens to institute such prosecutions, and of the difficulty of obtaining convictions. But the passage of such a statute should have great influence on faithful officials in calling their attention to what is expected of them under their oaths of office. It is sometimes unfortunately true that persons in public service are less disposed to make active and constant exertion than are those in the employ of private persons or companies. It is respectfully urged that the water commissioners of this state should each and all resolve not to fall into such careless habits, but to remember what is expected and demanded of them by the plain language of the law and by their official oaths.

Another duty specially imposed by statute in 1895, which is really only ancillary to the duty of apportioning the waters of the stream according to the prior rights of all, is that defined in Sec. 2384a, Mills' Supplement. The water commissioner is required, on application of the owners of any one or more ditches in his district, at once, thoroughly to examine the ditches under his supervision to ascertain what use of water is being made by consumers. Then if he ascertains the water under any ditch is being wasted, or is wastefully, or extravagantly or wrongfully used to the injury of other appropriators, he must shut off the water supply of such ditch to such extent as in his judgment the water was so wasted or otherwise wastefully or wrongfully used. As the greater includes the less, it is believed that if a ditch owner asks a water commissioner to make an investigation of some particular ditch and not of all of the ditches in his district, he should do so either in person or by a deputy. It will be noted that the third section of the same act of 1895 (Sec. 2384b, Mills' Supp.) makes it a misdemeanor for any water commissioner to fail to perform this duty. It may be further observed that it is certainly not improper, and in many instances it may be the duty of a conscientious official if his attention is in any way called, without formal complaint of a ditch owner, to the fact that water is being wrongfully and wastefully used under some particular ditch in his district, to make the investigation on his own initiative and prevent the abuse if he find it is taking place. It is further suggested that in any event when a water commissioner has reason to believe that any ditch with an early priority is demanding more water at a particular time than it really needs, or for the purpose of using some water for an improper purpose to the injury of some junior appropriator, he can keep fully within the law by advising the superintendent of irrigation of his belief that investigation of such ditch is necessary,

whereupon that official can give him special instruction to make the investigation.

While the power and duty now being considered is specially enjoined by statute and should, whenever necessary, be faithfully and fearlessly performed, it cannot be overlooked, that the power is one of a very delicate nature since it reposes very much discretion in the water commissioner, sometimes likely to be abused and even with the greatest care liable to result in litigation. Each water commissioner should endeavor practically to accomplish the end desired by adopting such a course, at least in the first instance, as will prevent the waste or extravagance complained of or suspected, through the pressure of persuasion and advice before resorting to more arbitrary and extreme measures. To illustrate: If a water commissioner has good reason to believe under some ditch in his district having a large early priority, when water is demanded up to the maximum amount called for by a decree, that with such delivery of water, a good deal is wasted, that the roads under such ditch are flooded, and other like indications of wasteful use are brought to his attention, it may be the part of wisdom for him, first to approach the superintendent or owner of such a ditch, and inform him of his reason to believe that the ditch should get along with considerable less water without anybody being injured, call his attention to the power and duty thrown upon the water commissioner under the statute, and request the superintendent or ditch owner for a few days to see how he can get along with a more limited supply. It is believed in many cases extravagant use of water, particularly that due to carelessness can be prevented, and the rights of junior appropriators in this way be protected without the water commissioner being compelled to go to considerable expense to adopt more rigid and arbitrary methods. However, in all cases when the commissioner finds it necessary, he should vigorously use all the powers given him by the statute to prevent such wasteful use of water.

Under the general power of distributing water with due regard to the prior rights of all, another general topic should be treated. So far as it is possible so to do, it should be the aim of the water commissioner to use the influence of his office to bring about the largest possible production of crops under all the ditches in his district. When he finds that crops are becoming parched and withered under some ditch he can properly seek to persuade owners of ditches having senior appropriations, who are not in very urgent need of water at the time, to make some concessions for the benefit of those in greater need.

In this connection, attention is again called to the early legislation of Colorado Territory, whereby commissioners appointed by the County Judge were required to apportion water



of the stream on alternate days to different localities as they may in their judgment think best for the interests of all parties concerned, and with due regard to the legal rights of all. Experience has shown in distributing water under the larger ditches with numerous consumers, at a time when the supply is limited, much better results are accomplished by delivering the entire available supply alternately, to a fraction of the consumers for one or two days, to other consumers, and so on, because with a better head of water better results can be obtained in a short time than with a small head in a much longer time. The same principle if permitted by law could probably be applied successfully in distributing water among different ditches when the supply in the stream becomes limited. It is, of course, a subject of grave doubt as to whether a water commissioner can alternate the supply in the manner suggested against the consent of the ditch owners affected thereby. But it is suggested, that such consent may be obtained in some instances through the exercise of tactful suggestions by the water commissioner upon the understanding that some benefit will result to the party making the concession, by means of a return concession in his favor later on.

To illustrate: We will suppose that there are two ditches each having a capacity of carrying 100 cubic feet per second, and that there are no other ditches to interfere with the arrangement; that ditch A has priority numbers 1 and 3 each for 50 cubic feet per second; that ditch B has priorities numbers 2 and 4, each for 50 cubic feet per second, and that the river at the particular time under consideration supplies only 100 cubic feet per second for the two ditches, we will say for a period of two weeks. It is evident under the circumstances stated that a strict compliance with the prior rights of the two ditches will give each of them 50 cubic feet per second during the time mentioned. Consumers under both ditches under those circumstances would derive benefit by authorizing the water commissioner to deliver 100 cubic feet per second to ditch A for half the time, and 100 cubic feet to ditch B for the remaining half of the time or on alternate days. It will be noticed that under this hypothetical case each ditch will get just as much water as under the other plan, but the probabilities are that the same amount of water will do very much more good if given in double the quantities for half the time.

The last section of the statute of 1899 confirming temporary loans or exchanges of water, was evidently adopted to apply to just such a case where two ditch companies themselves get together to make such an agreement and notify the water commissioner thereof. But it is here suggested that a water commissioner would be enabled in many instances to accomplish a great deal of good by himself taking the initiative and urging

the owners of different ditches to enter into such an arrangement at times of scarcity. He is familiar with conditions in the whole district, and can see what ditches can be best helped by such an arrangement with justice to all.

Human nature is such that men can be induced to do things by good tact and by persuasion of an official in charge, to which they will not submit under arbitrary exercise of power. It is perhaps unnecessary to state, to enable a water commissioner to accomplish the best results in the exercise of discretion and the use of persuasion, he must have the confidence of the ditch owners of his district as an official who is wholly disinterested and impartial, who is not seeking to aid any particular ditch to the disadvantage of another, but who is conscientiously striving to attain the best result for all the ditches in his district. To attain this confidence, he should have no favorites or pets, he should always show his readiness to respect the rights of senior appropriators; he should be vigilant in protecting the stream and all its sloughs and tributaries from invasions of persons who are wrongfully taking water therefrom. When owners of ditches with early appropriations have full confidence in a water commissioner, when they know that he has supplied them and is ever ready to supply when they really need it with all the water to which they are entitled, they will be much more ready at times when they are not in such urgent need to forego some of their claimed rights at his suggestion for the benefit of others whose crops are suffering. Under such circumstances the senior appropriators will readily acquiesce in suggestions made by water commissioners, believing that they will obtain a full equivalent for any concession they may temporarily make.

Another power or duty required of water commissioners worthy of some comment, is that mentioned in the fifth and ninth sections of the act of 1887 (Secs. 2451, 2455, M. A. S.) The last named sections call for reports to be made by the water commissioners to the superintendent of irrigation as often as required by him. It is to be observed that these reports are to contain not only the special matters mentioned in the statute, but also further information when called for or suggested by the superintendent of irrigation. A water commissioner has more direct and immediate knowledge of the conditions in his own district than does the superintendent of irrigation. Without abusing his power and in full compliance with the spirit of the statute, it is proper and desirable that water commissioners shall make frequent reports, and as the result of their experience make frequent suggestions to the superintendent of irrigation so that that official can study the whole problem in his whole division and make suggestions to other water commissioners helpful to bring about the best results of husbandry.

## SUPERINTENDENTS OF IRRIGATION.

## POWERS AND DUTIES UNDER THE STATUTES.

As we have already seen, the division of the irrigated area of the state into water districts, each managed by a water commissioner, had its inception in the legislation of the year 1879. The creation of larger divisions, known as water divisions, was made in the year 1881 under an act to provide for the appointment of a state engineer, etc. Four water divisions were created in 1881, and two more in 1889. One was created by proclamation of the Governor in 1901. There are therefore now seven water divisions.

The office of superintendent of irrigation having general supervision over each division was not established until the act of April 4, 1887. The first section of that act (Sec. 2447, M. A. S.) provides for the appointment of superintendents of irrigation for each water division, with proviso that the Governor shall not appoint such official for any division until the Board of County Commissioners of some county included therein shall have adopted a resolution requesting such appointment.

The duties of superintendent are defined in the act. The second section (Sec. 2448, M. A. S.) was as follows:

"Said superintendent of irrigation shall have general control over the water commissioners of the several districts within his division. He shall, under the general supervision of the state engineer, execute the laws of the state relative to the distribution of water in accordance with the rights of priority of appropriation, as established by judicial decrees, and perform such other functions as may be assigned to him by the state engineer."

The third section (Sec. 2449, M. A. S.) provides that the superintendent of irrigation shall be governed by the statutes, and to better discharge his duties he is authorized to make other regulations to secure equal and fair distribution of water in his division in accordance with the rights of priority of appropriation, which regulations adopted by the superintendent shall be merely supplemental to and in aid of the general statutory provisions.

The fourth section (Sec. 2450, M. A. S.) gives the right of appeal to the state engineer from any order or regulation from the superintendent of irrigation.

The fifth section (2451, M. A. S.) requires the superintendent of irrigation to commence the discharge of his duties when the first water commissioner in his district is called out, and to continue to perform the same until the last commissioner therein ceases to be needed. It also provides for reports from water commissioners to the superintendent as heretofore noted.

The seventh section (Sec. 2453, M. A. S.) requires each

superintendent of irrigation within thirty days after his appointment, to send to the Clerk of the District Court in all counties in his division having jurisdiction over the adjudication of priorities, a notification of his appointment, and requesting a certified copy of every decree of the District Court establishing priorities of appropriations of water used for irrigation purposes. It is made the duty of such clerk to transmit such certified copy to the superintendents of irrigation, and that official is then required to cause to be prepared a register of priorities of appropriation of water for his division, based upon such decrees. He is then required to prepare a list of all the ditches, canals and reservoirs within his division, arranging the same in consecutive order according to the dates of appropriations in the whole division, and without regard to their number in each water district alone. He is also required to make a tabulated statement of all ditches, canals and reservoirs in his division, to whom such priorities have been decreed, containing in separate columns,

- (a) The name of the ditch, canal or reservoir.
- (b) Its number in the division.
- (c) The district in which it is situated.
- (d) Its number in its proper district.
- (e) The number of cubic feet per second to which it is entitled under each priority.
- (f) Such other and further information as he may deem useful.

The 8th section (Sec. 2454, M. A. S.) gives the superintendent of irrigation power to call out any water commissioner in his division at any time he may deem it necessary; also power to perform the regular duties of the water commissioner in all districts in his division.

The 9th section of the act of 1887 (Sec. 2455, M. A. S.) provides that all water commissioners in the division shall report to the superintendent of irrigation. The contents of said report have heretofore been referred to in discussing the powers and duties of water commissioners. In addition to the matters detailed in the statute, the superintendent of irrigation is authorized to call for such other and further information as he may suggest. Said official is required to file such reports, to ascertain how water is being distributed, and if as the result of the division into districts, ditches are deprived of water to which they are entitled in the division as a whole by some junior ditch in one district receiving water when a senior ditch in another district which can be supplied with the same water is not receiving its proper supply, then it is the duty of the superintendent to at once order the post-dated ditch, canal or reservoir to be deprived of supply so that the water will run down to the older ditch in the other district. This section specially enjoins upon the superintendent of irrigation to make orders to enforce the priorities of appropriation according to his tabulated statement of

priorities for the whole division, without reference to the district lines. The reports of water commissioners to the superintendent are required to be filed in the office of the state engineer.

In the 10th section (Sec. 2456, M. A. S.) it is provided that when the owner of any ditch, canal or reservoir in any district within the division fails to receive the regular supply of water to which he is entitled, its owner or manager may report the same to the water commissioner, and that official, if he finds it necessary, shall report by wire to the superintendent of irrigation, and said last named official shall thereupon, if he finds he can give such ditch, canal or reservoir a supply at the expense of a latter priority in another district, to enter orders accordingly.

In 1901 there was passed an act in relation to irrigation, found in Session Laws of 1901, pages 193 to 196.

Under the 1st section (p. 193), when the owner of any irrigation structure taking water from any stream fails to erect or maintain in good repair a suitable and proper headgate and measuring flumes or weirs at its point of intake, together with necessary embankments therefor so as to control the water at all ordinary stages, the superintendent of irrigation (or the state engineer), after giving ten days' written notice, is required to refuse to deliver to the owner of such irrigation structure any water until such owner shall erect or repair the headgate and measuring flumes.

The 2nd section (p. 194) pertains to the maintenance of measuring flumes or weirs to determine the amount and volume of water turned into one stream from another, or from a reservoir or ditch into a public stream to be again rediverted. When the owners of a ditch or reservoir so used fail and neglect to erect suitable and proper measuring flumes or weirs for the purpose mentioned, it is made the duty of the superintendent of irrigation (or the state engineer), after five days' written notice, to refuse to allow any water to be taken out from a public stream in exchange for water so turned into the same until the owner shall cause to be erected or repaired such flumes or weirs, both at the point of delivery to the stream and at the point of delivery of taking from the stream.

The 3rd section of the act (p. 194) requires the superintendent of irrigation (or the state engineer) to rate the measuring flume and weir referred to in first and second sections, and to supply the water commissioner of the district where such measuring flumes or weirs are located with a rating table to be used in measuring water.

The 5th section (p. 195) provides that all headgates and measuring weirs used in connection with any irrigation structure to measure and deliver water therefrom and thereto, shall

at all times be under the supervision and control of the irrigation officers of the state.

The 6th section (pp. 195-6) pertains principally to the duty of the owner of a reservoir situated upon or in the bed of any natural stream, to cause a survey to be made of the reservoir with contour lines for every vertical foot in depth, to be properly rated by the state engineer. In case of the owner failing to do what is required, the superintendent of irrigation (or the state engineer) is directed to refuse to permit the use of such reservoir.

#### COMMENTS ON THE POWERS AND DUTIES OF SUPERINTENDENTS OF IRRIGATION.

Evidently this office was created to relieve the state engineer of duties which otherwise might have been too onerous. It was deemed proper by the legislative department of the government to have a special officer in general charge of all the water commissioners in a single division. The duties of a superintendent of irrigation plainly arrange themselves into two classes. First, the duty to protect senior priorities irrespective of district limits; second, to exercise general supervisory control over all water commissioners in their ordinary discharge of duties. We will discuss these two powers separately.

1st. The power to enforce senior priorities from a main stream as against junior priorities from a tributary of such stream in a different water district, is absolutely necessary to carry out the doctrine of priority of appropriation, since the water of a main stream is practically the result of accretions from its tributaries. Before the enactment of the statute of 1887, there was no proper machinery through the regular water officials to enforce this requirement of the law. Even after the enactment of the statute, little was done until the matter received consideration by the Supreme Court in 1896. It is true that prior to that time: in the case of *Strickler vs. Colorado Springs*, 16 Colo. 61, reported in 1891, the Supreme Court had declared that any different doctrine would wipe out the principle of priorities upon which our whole system is based. As said by Judge Hayt in that case, "To say now that an appropriator from the main stream is subject to subsequent appropriation from its tributaries would be the overthrow of the entire doctrine."

Still it was not until the decision of the Supreme Court in the case of *The Farmers Independent Ditch Company vs. The Agricultural Ditch Company*, 22 Colo. 513, handed down May 18, 1896, that the legislation of 1887 had judicial construction. In that case the court, by Chief Justice Hayt, used the following language:

"The legislature, by the act of 1887, has attempted to solve the difficulty by providing an officer and making it his duty to distribute water according to the decrees rendered, without reference to the water district in which such decrees are to be found. As we have said, the act does not attempt to make such decrees conclusive as between the various districts, but, in effect, it provides that until the courts shall determine otherwise in some appropriate proceeding, the superintendent shall treat the decrees as *prima facie* correct and distribute water accordingly. We believe this regulation is fairly within the police power of the state, as defined in the case of *White v. The High Line C. & R. Co.*, *supra*, and that it violates no constitutional provision; the effect being only to require the distribution of water in a certain way until such time as the rights of the parties can be definitely ascertained and adjudicated."

Again, in the case of *The Lower Latham Ditch Company vs. The Loudon Irrigation Canal Company*, decided March 5, 1900, reported in 60 Pac. Rep. 629, it was held that the plaintiff having priorities in water district No. 2 from the South Platte river was entitled to a decree requiring the water officials to protect its priority, if necessary, at the expense of junior priorities, from the Big Thompson river, in water district No. 4.

In view of the rule of priority in time giving the better right, the statutes and the judicial decisions, it must now be regarded as beyond controversy that one of the principal duties of the superintendent of irrigation is, without fear or favor, to issue such orders as will enforce senior rights in one district, when they cannot otherwise be supplied, by cutting down the supply of junior rights in other districts on tributary streams.

In connection with this duty of a superintendent of irrigation some discretion must be exercised in determining to what particular water commissioner orders shall be directed, where there are many tributaries supplying the same main stream, having in view the location of the particular ditch needing relief, and the location of junior ditches from which its needs may be supplied. The prime duty of the superintendent is to furnish water to the senior appropriator in the main stream needing it. It may be that such senior appropriator is needing water at a time when thirty different juniors are enjoying water under several tributaries of the main stream and in several districts. In theory, the latest appropriation should be the first cut down, but if, in fact, that appropriator is forty or fifty miles away, and another junior is within a few miles, relief can best be given by depriving the junior on the nearest tributary. In practice, the latter course usually will be found to be necessary. The superintendent in such cases may be able to supply the needs of the senior appropriator by reducing to some extent a large number of juniors, thereby interfering less violently with the regular distribution of any particular district.

Another matter worthy of special note in this connection which must be considered by the superintendent of irrigation,

grows out of natural conditions. The writer was informed that on one occasion older ditches in the vicinity of the town of Sterling, in Logan County, were needing water when junior ditches in Morgan County were fairly well supplied, and that a large amount of water, by order of the superintendent of irrigation, was shut out of the junior ditches and required to run into the South Platte river in the month of July or August, when the heat was very great and there was very little water in the main stream, and it was found that all, or nearly all of the water thus taken from the junior ditches was lost by evaporation and otherwise in the sand beds of the South Platte river. In that particular instance, as reported, it was found practically impossible to supply the senior ditch. In 1901 another test was made in the same locality, resulting in large increase of supply, it is claimed, to ditches near Sterling. It is here suggested that in all such cases the superintendent of irrigation should not hastily jump to conclusions, but should in perfect good faith endeavor to supply the senior appropriator, and not refrain from so doing until convinced that natural conditions render it practically impossible.

2nd. The remaining class of duties devolving on a superintendent of irrigation pertain to his general control over the water commissioners in his division, his duty to execute the laws pertaining to distribution and in so doing to make rules and regulations, to carry on correspondence with all his water commissioners, and, at times, if necessary, actively to discharge the duties of a water commissioner. All suggestions made concerning the duties of water commissioners apply equally to superintendents of irrigation. If the superintendent keeps up a constant and active correspondence with all commissioners in his division and makes frequent suggestions to them concerning the proper discharge of their duties, he can be a great aid in reducing the whole work of his division to a more perfect system. By such correspondence he can learn how thoroughly each commissioner is discharging his duties; if complaints are made to him of inefficiency of service in some district, he can give the water commissioner thereof the benefit of his knowledge as to the more efficient conduct of some other water commissioner in another district. If suggestions by correspondence fail to remedy negligence or inefficient discharge of duty in some particular water district, he can, if he sees fit, himself perform the duties of water commissioner in that district for a short time, and thus by personal example give the water commissioner full knowledge of what is expected of him. The power conferred on superintendents of irrigation to obtain information from water commissioners on any subject pertaining to irrigation in his division as he may suggest, enables a brainy superintendent who desires to use the entire power of his office to improve and perfect the



system, to do much in that direction, to become a center from which radiates an energy and an influence which will make himself a potent factor in the perfection of the system, whereby the purpose and intent of the law will be carried out, and the best interests of the state and its agriculture be subserved.

Water commissioners and superintendents of irrigation, in carrying out the orders of the state engineer, and in aiding that official in the discharge of his duties, also will improve the efficiency of the system as a whole.

Incidental to all the other duties of a superintendent of irrigation there should not pass unnoticed his importance as a peacemaker and settler of petty disputes, which may arise in his division and the several districts thereof. Much unnecessary litigation doubtless has been and hereafter will be prevented by superintendents of irrigation on the line here suggested. A visit of that official to a water district in which a commissioner is having serious trouble and disputes with ditch owners has a wholesome influence leading to amicable adjustment of such controversies.

It has sometimes been believed that the office of the superintendent of irrigation was somewhat superfluous. Persons inclined to that view have taken the position that the state engineer, as the general center of authority and supervision of all water districts, would be sufficient. Development of agriculture and irrigation is such, however, and the other duties of the state engineer necessarily take so much of his time and attention that it would be difficult, if not practically impossible for any state engineer, however capable, fully to discharge the duties of all the superintendents of irrigation without being compelled to neglect other important duties of his office.

It is believed by the writer hereof that if the superintendents of irrigation constantly devote themselves to a study of the water distribution in their respective divisions and to the thorough and efficient discharge of all of the duties of their offices, both advisory, administrative, appellate, and corresponding, they can constantly be employed and become important factors in improving the water service of the state.

## THE STATE ENGINEER.

### POWERS AND DUTIES WITH REFERENCE TO IRRIGATION MATTERS.

In 1881 an act was passed providing for the appointment of a state engineer in Colorado and of his assistants, and for the establishment of water divisions. (Sess. Laws 1881, pp. 119 to 122). The first five sections of the act cover the matter of water divisions, and the remaining seven sections had reference to the office of state engineer or "state hydraulic engineer," and his duties. The last seven sections were repealed upon the en-

actment of a new statute on the subject in the year 1889. The original act (Sec. 6) gave the state engineer supervision over the water commissioners of the different water districts in the state. In section seven the state engineer was required to make careful measurements and calculations of the maximum and minimum flow of water in each natural stream from which irrigation ditches took their supply; also to collect facts and make report as to the system of storage reservoirs, and to keep full records of his work, observations and calculations. The tenth section required the state engineer to prepare and render yearly, and oftener if required, full reports to the Governor. The eleventh section required the state engineer, on request of any interested party, on payment of his expenses, to measure and ascertain the capacity of any ditch, canal or reservoir thereafter constructed or enlarged, and to give an official certificate concerning the same. The twelfth section provided that the owners of any ditch, canal or reservoir having decreed water priorities should construct and maintain, under supervision of the state engineer, measuring weirs to measure in cubic feet per second water at the headgate of such ditch, canal or reservoir, or as near thereto as practicable, and the state engineer was required to arrange in tabular form a computation showing the amount of water that would pass such weir in cubic feet per second at different stages or height of water therein, and to furnish copy thereof to the water commissioner interested.

The act approved March 30, 1889, pertaining to state engineer, repealed the last seven sections of the act of 1881, and in lieu thereof adopted eleven new sections still in force. This change removed all the qualifications formerly required. In the original act "no person shall be appointed as such hydraulic engineer who is not known to have such theoretical knowledge and practical skill and experience as shall fit him for the position."

The 1st section (Sec. 2458, M. A. S.) concerned the appointment and qualifications of the state engineer and other like matters.

The 2nd section (Sec. 2459, M. A. S.) gives the state engineer general specific control over the public waters of the state; requires him to make careful measurements of the flow of the public streams of the state from which water is diverted and to compute the discharge; also to collect data and information pertaining to the location, size, cost and capacity of dams and reservoirs to be constructed, similar data concerning the feasibility and construction of reservoirs on eligible sites on which he may obtain information; also data and information regarding the snowfall in the mountains each season to predict the probable flow of the water in the streams.

The 3rd section (Sec. 2460, M. A. S.) requires the state

engineer to approve plans and designs for construction and right of way of all dams or reservoir embankments in the state exceeding ten feet in vertical height.

The 4th section (Sec. 2461, M. A. S.) gives the state engineer general charge over the work of water superintendents and water commissioners, requires him to furnish them with all data and information necessary for the intelligent discharge of their official duties. It also requires the superintendents of irrigation and water commissioners to report to the state engineer at suitable times, and especially to make annual statements on blanks furnished by him of the amount of water diverted from public streams under their control and other statistics which he deems of benefit to the state.

The 5th section (Sec. 2462, M. A. S.) pertains to the duty of the state engineer, on the request of any party interested, on payment of his expenses, to appoint a deputy to compute and measure any canal, dam or reservoir or any construction of like nature.

The 7th section provides for the appointment of deputies by the state engineer, under his control, and for whose official actions he shall be responsible.

The 9th section (Sec. 2466, M. A. S.) enables the state engineer to request the owners of any ditch having decreed priorities to construct and maintain under his supervision measuring weirs at or near the head of such ditch, canal or reservoir. The state engineer is required to compute and arrange in tabular form any statement concerning the amount of water that will flow through such a weir at different stages, and furnish a copy thereof to any superintendent or commissioner having control.

The 10th section (Sec. 2467, M. A. S.) makes a cubic foot per second a unit of measurement of flowing water, and a cubic foot the unit of measurement of volume.

The 11th section (Sec. 2468, M. A. S.) requires the state engineer to prepare a full report of his work bi-ennially and to deliver the same to the Governor to be laid before the general assembly.

We have already noted that the fourth section of the act of April 4, 1887 (Sec. 2450, M. A. S.) gives the right of appeal to the state engineer from any order or regulation made by any superintendent of irrigation.

In 1897 an act was passed to provide for and to regulate the exchange of water between reservoirs and ditches and the public streams. (Sess. Laws of 1897, pp. 176-7.)

The 1st section requires the state engineer to determine what reasonable deduction shall be made for seepage and evaporation when a person or company shall divert water from one

public stream into another and then divert it from the latter stream.

The 2nd section requires any person or company so transferring water from one public stream to another to construct and maintain, under the direction of the state engineer, measuring flumes or weirs and self-registering devices where the water leaves its natural watershed and is turned into another, and also where it is diverted for use from the public stream.

In the 3rd section it is made the duty of the water commissioner of the district where the water is used, to keep a record of the water so turned into his district.

The 4th section permits, without injury to others, the owner of a reservoir to deliver storage water either into a ditch or into a public stream to supply early appropriations, and in exchange therefor to take from the public stream higher up an equal amount of water, with deduction for loss, if any, to be determined by the state engineer. The same section requires the person or company desiring such exchange to construct and maintain, under the direction of the state engineer, measuring flumes or weirs and self-registering devices at the point where the water is turned into the stream or ditch, so that the water commissioner may readily determine and secure a just and equitable exchange.

In 1899, an Act in Relation to Irrigation, adopted, had special reference to the matter of changing the point of diversion by an appropriator when it can be made without injury to the prior rights of others, and a judicial consideration in advance of the proposed change. In connection with the procedure, the state engineer is to receive and file a copy of the map and decree permitting the exchange, and thereupon to issue a notice to the water commissioner in charge, notifying him of the change. (Sess. Laws of 1899, p. 236, Sec. 2.)

Also in the year 1899 an act was passed in relation to reservoirs. (Sess. Laws of 1899, pp. 314 to 317.)

The 1st section provides that no reservoir of a capacity of more than 75,000,000 cubic feet, or having a dam or embankment in excess of ten feet in vertical height, and covering more than twenty acres shall thereafter be constructed, unless plans and specifications therefor shall first be approved by the state engineer. The state engineer is required to act as consulting engineer during the construction of such reservoir, with authority to require the work to be done to his satisfaction. A written statement concerning the work of construction and the completion thereof to his satisfaction must be given by the state engineer specifying the dimensions and capacity of the reservoir.

The 2nd section provides for the expenses of the state

engineer, and a per diem for his services to be paid by the reservoir owner.

The 3rd section requires the state engineer annually to determine the amount of water which it is safe to impound in the several reservoirs within the state. It is made unlawful for the owner of any reservoir to store therein water in excess of the amount determined by the state engineer to be safe.

The 4th section makes it the duty of the water commissioner to withdraw from any reservoir any water impounded therein in excess of the amount determined by the state engineer to be safe, and to prevent the reservoir to be refilled beyond the limit fixed.

The 5th section makes it the duty of the state engineer, when complaint is made to him by persons so located as to be in danger if the embankment of a reservoir should break, that the reservoir is in an unsafe condition, or being filled so as to render it unsafe, to make an examination of the reservoir and determine the amount of water which can be safely impounded therein. If on such examination he finds the reservoir unsafe, or being filled so as to render it unsafe, he shall cause water to be drawn off to such an extent as to render the same safe and prevent further storage of water beyond what he considers the safety limit.

The section enables the state engineer to use any force necessary to perform the duties previously mentioned. It is also made the duty of a water commissioner in such case, if an attempt should be made to refill the reservoir, to act as provided in the fourth section.

The 7th section provides for compensation to the state engineer for mileage and other expenses incurred in making examination.

The 8th section provides for an appeal to the court from any decision of the state engineer in such matters, but with the proviso that the decision of the state engineer shall control until the case is finally disposed of in the courts.

The 9th section provides for owners of reservoirs being responsible for all damages in case of breakage.

The 10th section provides that any reservoir company which after ten days' written notice has been given, fails to obey the directions of the state engineer with reference to the construction or filling of any reservoir, shall be subject to a fine of fifty dollars for each offense, and each day's continuance after the time of notice has expired shall be considered as a separate offense.

In addition to the duties required of the state engineer on the general subject of irrigation, distribution of water, etc., above referred to, many statutes have been passed requiring that of-

ficial be a member of divers boards of control of sundry internal improvements, to perform important services about state canals, with reference to desert land entries, and many other similar matters not pertinent to this paper except as showing how much of the time of the state engineer is necessarily invaded by other duties besides the important ones above indicated.

An act in relation to irrigation, passed in 1901, has been referred to at the close of the statement of powers and duties of superintendents of irrigation. All the powers conferred upon superintendents of irrigation by that act are also conferred upon state engineers. The sixth section of said act of 1901 (pp. 195-6) makes it especially the duty of the state engineer, on the request of the owner of a reservoir situated upon or in the bed of a natural stream, at the expense of the owners thereof, to cause a complete survey of the contour lines of said reservoir to be made for each vertical foot in depth, and also when he deems it necessary of fractions of a foot; also to prepare a table showing the number of cubic feet capacity of said reservoir for each foot in depth and fractions thereof, and to place a gauge rod in said reservoir, marked in correspondence with the contour lines. In event the owner fails to cause said survey, etc., to be made, it is made the duty of the state engineer to refuse to permit the reservoir to be used until such survey, etc., is made.

#### COMMENTS ON POWERS AND DUTIES OF THE STATE ENGINEER.

The mere recapitulation of the functions of the state engineer as the head of the system of irrigation and distribution of the state, his supervisory control of all water commissioners and superintendents of irrigation, his appellate jurisdiction over subordinate officials, his special duties with reference to the measurement of canals and reservoirs, his supervision and control over the construction of reservoirs, his duty to provide for self-registering devices in many instances, is sufficient of itself to make plain the responsibility of his office.

It is plainly within the intent and purpose of the statute that the state engineer must devote considerable time to a thorough study of the whole system of irrigation distribution of the state. In that connection he must become familiar with the work of the several superintendents of irrigation, and satisfy himself that they are properly performing the duties by law of them required. This also applies to the reports of the several water commissioners. As the state engineer is required to be a man of professional ability as an irrigation engineer, his advice and suggestions to superintendents of irrigation and water commissioners should be of special helpfulness. The result of his study

should enable him in his reports to make suggestions to the Governor, and thereby indirectly to the legislature on any desirable change in the law from time to time. His office has always been, and ever should be, of special importance in perfecting the efficiency of the official water service of the state.

The state engineer should insist on obedience to the statute law by persons constructing reservoirs, and by those who desire to exchange water between reservoirs and public streams, or to turn water from one public stream into another. Since the water commissioners are under the control of the state engineer, it is believed that it is within his power to direct water commissioners to refuse to recognize the rights of persons to divert water which is turned into a public stream from some other source of supply, unless the statute concerning self-registering devices and other legal requirements are complied with. The purpose of the statute is that exact justice may be done. The person who adds to the amount of water in a running stream by turning water therein from another stream or from a reservoir, should certainly be entitled to again draw the same amount of water from the stream as a just reward for his enterprise and capital invested. But on the other hand, every safeguard against abuse of this privilege, and to prevent the diversion to the injury of regular appropriators from the stream of a greater amount of water than is supplied thereto, after proper allowance is made for incidental losses, should be rigidly enforced.

Special comment should be made with reference to the importance of measuring weirs at the headgates or canals. It is unfortunately true and well known that when many of the decrees concerning priorities were rendered by the courts, sufficient care was not taken to have correct measurements made, whereby any ditches were decreed priorities really in excess of their carrying capacity. When for a large number of years it has been shown by experience, and as the result of careful measurement, that a ditch has not carried and cannot carry the amount provided in the decrees, sufficient data will be collected to prevent the subsequent enlargement of such ditch to enable it for the first time to carry the maximum mentioned in the decree, and thereby injuriously to affect the rights of junior appropriators. Moreover, such measuring weirs are of great value and aid to the water commissioners in distributing and apportioning the water at times of scarcity, and when ditches having several priorities limited to one or more of their earlier ones.

