IRRIGATION IN OREGON.*

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N the state of Oregon, we have but recently passed from the pioneer stage of irrigation development into the more complicated stage of expensive works, shortage

in water, and numerous controversies. With only seven people to the square mile (over 500 to the square mile in one county) it is apparent that there is yet much room for development. We expect in the near future to reach that stage of irrigation development where the ordinary summer flow of our streams will be augmented many fold through the release of stored water, as is the case in a number of the older irrigation states.

This transition from the pioneer period of unregulated diversions to that of strict public control of all diversions is not easy of accomplishment. The entire thought and life of the water user must be adjusted to the new order. He must abandon the indefinite miner's inch and think of water in second feet and acre feet. He must respect public and private rights to water and suffer the penalty for violating law. Until the new water user, the courts, and public generally, understand the reasons for each feature of the new system, and appreciate the general benefits to be derived from a strict enforcement of its provisions, it will be difficult for the administrative officials to attain the best results.

The Need of Irrigation.—Irrigation is necessary in Eastern and Southern Oregon, but until recently has not been considered necessary in the northwestern, or more densely populated section of the state. The annual precipitation is unevenly distributed, as illustrated by the government record at Glenora, 135 inches; Portland, 45 inches; Government Camp, 90 inches; The Dalles, 15 inches, and Umatilla, 8 inches; each point being approximately 50 miles west of the one preceding.

In the extensive and fertile Willamette Valley only three inches out of the 45 inches of annual precipitation falls during the summer months, while about 20 inches fall during the winter months. Already several irrigation projects are being constructed with a view to supplement this summer deficiency.

Throughout much of central Oregon, which ranges in elevation from three to four thousand feet above sea level, the precipitation varies from about eight to fifteen inches. This district, which has long been famous as being the largest area in the United States without any railway transportation, is now being rapidly settled, due in part to the active railway construction now under way, to the reduction from five to three years' residence required for homestead entry, to the increase from 160 to 320 acress allowed to each entryman, on non-irrigable land, and primarily to the fact that the precipitation in this vast empire is believed to be ample for dry farming purposes.

With only 686,129 acres of land irrigated out of a total of 61,200,000 acres, and with about 4,000,000 acres susceptible of irrigation, the public has become aroused to the importance of irrigation development in Oregon. It is apparent that from six to ten times the population can be supported on irrigated lands in comparison with an equal dry farming area. As the land to be irrigated is well scattered throughout the dry farming and grazing

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The courts are becoming educated to the value of water and are now less willing than formerly to grant extravagant claims in water adjudications. If twice the amount of water necessary to produce crops is allowed, it is readily apparent that the ultimate area to be irrigated will be reduced approximately one-half. For this reason the public is vitally concerned as to the duty of water. Public funds have accordingly been appropriated for the making of accurate stream measurements extending over a long series of years, for the making of topographic surveys and river profiles, and for determining the quality of the public waters. There is thus a general awakening among all classes as to the importance of irrigation.

Value of Water.—The value of dry farming land ranges from about \$5 to \$30 per acre. Irrigated, this land would sell from \$40 to \$100 or more per acre. Improved irrigated land has been known to sell at from \$500 to \$1,000 per acre and over. Water has, therefore, considerable value, and water rights and titles are now receiving careful consideration. In some sections one cubic foot per second of water, flowing continuously during the irrigation season, is estimated to be worth approximately \$10,000.

The cost of irrigation works has increased from \$5 per acre in 1900 to an average of \$15 in 1910, according to the government census, and systems are now planned or are under construction estimated to cost \$40 to \$100 per acre. The amount of water and record evidence of water titles are, therefore, important matters, which are now given serious consideration by the investor, the water user, and the public.

Water Laws.—In 1909, Oregon adopted a water law which is similar in many respects to that now in force in the province of British Columbia. It has in general been found satisfactory to both the water user and the prospective investor, and is not burdensome to the public, as the fees, collected and paid into the State Treasury, have gone far towards meeting the appropriations for its maintenance.

The law deals primarily with (1) the adjudication and recording of rights to water which were initiated prior to its adoption; (2) the granting of new rights, after proper application and record, and (3) the protection of all recorded rights, as well as of the public interest in unappropriated waters. Its administration is in the hands of the state engineer and the superintendents of the two water divisions into which the state has been divided, each of whom has special duties to perform. All important grants or decisions are made by these officers sitting as a board.

This law declares all water within the state to be the property of the public and makes beneficial use the basis of rights to its use. In the water right certificate, which is record evidence of title, this basis is qualified by a definite statement as to (1) the priority; (2) the purpose; (3) the period, and (4) the place of use of water; also by (5) the maximum rate of flow or quantity of water. Such certificate gives also the name and address of the owner of the right, and the stream from which the water is diverted.

Owing to the peculiarities of climate and soil, and to the necessity for diverting water for irrigation and other uses, the strict common law doctrine of riparian rights established by early court decisions has been so modified in recent cases that only the faintest shadow of this conflicting doctrine remains to cloud the horizon of the in-