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Protection in Means of Diversion of Ground-Water Supplies

Wells A. Hutchins*

THE marked increase in recent years in the utilization of ground-water¹ supplies for irrigation, domestic or municipal, and industrial purposes, has presented important problems to the legislatures and courts. Doctrines governing rights to the use of such waters have been reexamined by the courts, sometimes modified, and sometimes abrogated in favor of new rules designed to effectuate better utilization of this valuable natural resource; and statutes in several western states have been enacted for the purpose of bringing the use of ground waters under administrative control.

Development of doctrines of ground-water law is necessarily predicated upon concepts of ownership of such waters. No appreciable change has taken place in the rules relating to definite underground streams, excepting in those jurisdictions in which the rules governing the use of surface streams have been modified, for the law of watercourses with its concepts of ownership of water is applicable equally to streams upon and below the surface. It is with the law of percolating waters—ground waters other than those flowing in defined underground streams—that the recent developments

*Irrigation Economist, Division of Irrigation, Soil Conservation Service, United States Department of Agriculture; LL.B. 1909, George Washington University; author of *Water Rights for Irrigation in Humid Areas* (Nov. 1939) 20 AGR. ENG. 431; *Ground Water Law in the Western States* (Nov. 1939) TWELFTH ANN. CONV. OF THE ASS'N OF WESTERN STATE ENG., PROC. 93; *Summary of Irrigation-District Statutes of Western States* (Jan. 1931) U. S. DEPT. AGR. MISC. PUB. NO. 103; *SELECTED PROBLEMS IN THE LAW OF WATER RIGHTS IN THE WEST*, in press, to be issued as a publication of the U. S. Department of Agriculture; and of numerous bulletins on irrigation institutions and organizations.

¹ "Ground water" as used herein refers to all available water under the surface of the earth, that is, water which is found under one's land, and which percolates laterally from the subsurface of one tract to that of another, or which enters or leaves the surface flow or subflow of a surface stream. It includes both artesian and nonartesian waters.

have been primarily concerned and, in this field, efforts to achieve public control in the West have started with a legislative declaration that such waters are the property of the public, subject to appropriation for beneficial use, and subject to existing rights to their use. Public regulation of private uses of percolating water, under judicial doctrines of ownership of the water by the owners of overlying land, has also been discussed, but has not yet been effected in the West. Thus there are three primary concepts of the ownership and rights to the use of percolating waters: (1) absolute ownership by the owner of overlying land; (2) ownership by the landowner subject to reasonable use and correlative rights of owners of all land overlying the common ground-water supply; and (3) ownership by the public, subject to appropriation for beneficial use.

An element of the right to use ground water is the extent to which the holder of the right is afforded protection in his means of diversion, which in most cases is a pumping plant. Such water must be brought to the surface from the available water table, which may involve a pumping lift of a few feet or perhaps hundreds of feet. Each additional draft upon the supply, as more and more wells are installed in a given area, tends to lower the level of the water table, and if the water is under artesian pressure, tends to lower the height to which the water will rise naturally in the well. In consequence the earliest user finds it necessary to deepen his well, and to install a more powerful pump and use more power to raise a given quantity of water to the surface, necessarily at increased capital and operating costs, as development of the common ground-water supply by later users progresses. The question for consideration is whether, granted that a water supply of equivalent quantity and quality is available at lower depths, this first user may require the later ones to reimburse him for his added costs of pumping the quantity of water the right to the use of which he has established. This discussion is confined to the situation in the seventeen western states.

DIVERSIONS FROM SURFACE STREAMS AND THE QUESTION OF REASONABLENESS

As a background, it may be stated that the decisions of several courts have involved the right to continuance of established methods of diversion from surface streams, under appropriative rights, where the questions in issue were not merely the quantity of water appropriated, but also the effect of junior appropriations in rendering the

senior user's diversion works inadequate, although leaving enough water flowing in the stream at his point of diversion to satisfy his right if his existing dam or headgate were replaced or substantially altered. The test of reasonableness of his existing means of diversion seems to have been generally the determining factor, either expressly so, or at least impliedly where there was no imputation of unreasonableness under the facts presented to the court. In view of the importance of the term "reasonable" in connection with the main subject under consideration, it is desirable to explore somewhat the use and application of the term in representative decisions involving diversions under appropriations from surface streams.²

Nearly a half-century ago the California Supreme Court³ held that reasonably efficient appliances must be used in making a diversion, in order not to deprive others of the use of the surplus water, and denied an injunction against a junior upstream diversion which, by reason of its location on the body of slack water above the senior appropriator's dam, would require the use of flashboards on his dam in periods of high as well as low flow in the stream. The unreasonableness of use of water was later discussed in a federal case⁴ in

² 2 KINNEY, *THE LAW OF IRRIGATION AND WATER RIGHTS* (2d ed. 1912) 1246, states that "no extraordinary or unreasonable method can be used by an appropriator, whereby the like right to appropriate the waters of any stream by others may be prevented. If there is ample water in the stream for all desiring the use of the same, the appropriation by some should not be prevented by the mere method of diversion by others. The diversion must be made in a reasonable manner, and so as not to deprive others of their rights. For the right to the appropriation of water 'is not unrestricted. It must be exercised with reference to the general conditions of the country and the necessities of the people, and not so as to deprive a whole neighborhood or community of its use,'" quoting from *Basey v. Gallagher* (1874) 87 U. S. 670, 683.

The general principle that an appropriator's means of diversion must be reasonable is undoubtedly well established; the difficulty, as is frequently the case with general rules, lies in applying the principle to concrete cases. The amendment to the Constitution of California added in 1928 (art. XIV, § 3) provides that the right to water from any natural stream or watercourse is limited to reasonable beneficial use and does not extend to the waste or unreasonable use or unreasonable method of use "or unreasonable method of diversion of water." As stated by the supreme court in *Peabody v. City of Vallejo* (1935) 2 Cal. (2d) 351, 367, 40 P. (2d) 486, 491, the limitations and prohibitions of the amendment apply to every water right "and every method of diversion," including those of riparian owners as against appropriators; the mandates being plain, positive, admitting of no exception, and applying "to the use of all water, under whatever right the use may be enjoyed. The problem is to apply these rules in the varying circumstances of cases as they arise."

³ *Natoma Water & Min. Co. v. Hancock* (1894) 101 Cal. 42, 35 Pac. 334.

⁴ *Schodde v. Twin Falls Land & Water Co.* (C. C. A. 9th, 1908) 161 Fed. 43, *aff'd*, (1912) 224 U. S. 107. The court stated that this particular method of diversion and the right to the current were not appurtenances of the appropriation, and furthermore, the

which an appropriator who diverted water from Snake River, Idaho, by means of a water wheel the operation of which required a current in the stream, but who had made no appropriation for power purposes, unsuccessfully sought to enjoin the raising of the water level by a downstream dam the effect of which was to destroy the current and thus to render his means of diversion inoperative. And the Oregon Supreme Court⁵ has stated that the holding of five or six times the quantity of water claimed by an appropriator for irrigation, in order to propel a water wheel, was unreasonable under the circumstances, although a reasonable appropriation of the current might be made.

One of the leading decisions affording protection to the appropriator against material injury to his existing method of diversion is the Utah case of *Salt Lake City v. Gardner*.⁶ The Utah Supreme Court⁷ has taken the position that the rendering ineffective of methods of diverting small quantities of water, by reason of subsequent large appropriations, would be a confiscation of property rights, and that while an appropriation of surplus water should not be denied simply because it would necessitate a change in the existing diversion of a prior user, the later appropriator must bear the expense of making the necessary change. Recent decisions from other states have been to the effect that a senior appropriator cannot be required to bear the expense of pumping water to lands theretofore irrigated by gravity, as the result of acts of junior appropriators in practically nullifying the senior gravity rights, but must be insured both as to quantities of water and timeliness of delivery if the junior rights are allowed to be exercised;⁸ and that the prior appropriator's right is

appropriative right must be exercised with some regard for the rights of the public. The public interest, it was stated, would not be served by devoting the current of an entire stream to the lifting of a comparatively small quantity of water over the banks. Compare this statement of public interest with the implications of the decision in *Herminghaus v. Southern Cal. Edison Co.* (1926) 200 Cal. 81, 252 Pac. 607, dealing with the right of a riparian proprietor, and the constitutional amendment which followed [CAL. CONST. (1928) art. XIV, § 3].

⁵ *In re Water Rights of Owyhee River* (1927) 124 Ore. 44, 259 Pac. 292.

⁶ (1911) 39 Utah 30, 114 Pac. 147.

⁷ See also *Big Cottonwood Tanner Ditch Co. v. Shurtliff* (1920) 56 Utah 196, 189 Pac. 587; *Logan, Hyde Park & Smithfield Canal Co. v. Logan City* (1928) 72 Utah 221, 269 Pac. 776.

⁸ *Joseph W. Bowles Res. Co. v. Bennett* (1932) 92 Colo. 16, 18 P. (2d) 313. The court did not discuss the reasonableness of the senior appropriator's method of diversion, other than to set out an agreed statement of facts and to repeat from that statement that it was not feasible for the senior appropriator to lower the gravity outlet pipe from its reservoir.

the right to divert and use water, not merely to have it left in the stream bed, and that not absolute efficiency but *reasonable* efficiency is required in his means of diversion.⁹

The inference to be drawn from these decisions is that the right of an appropriator extends beyond the right of use of a specific quantity of water and includes the right to "a reasonable means employed by him to obtain the water, of which the subsequent appropriator cannot rightfully deprive him, at least unless such subsequent appropriator provides at his own expense another adequate means or method for such prior appropriator."¹⁰ The "reasonableness" of a method of diversion is a question of fact to be decided according to the circumstances of each particular controversy; and as in case of "reasonable beneficial use" of water, of which the method of diversion is simply one element, the controlling factors will doubtless vary from place to place and even from time to time.¹¹ It is noteworthy in this connection that in arriving at standards of reasonable-

⁹ State *ex rel.* Crowley v. District Court (1939) 108 Mont. 89, 88 P. (2d) 23, 121 A. L. R. 1031, granting application for a writ of supervisory control directing the district court to revoke an order sustaining demurrers. The court stated that subsequent appropriators take with notice of the conditions existing at the time of their appropriations, including existing diversion systems of prior appropriators.

¹⁰ Note (1939) 121 A. L. R. 1044, case annotation to State *ex rel.* Crowley v. District Court, *supra* note 9. See also Oliver v. Jordan Valley Land & Cattle Co. (1933) 143 Ore. 249, 22 P. (2d) 206, in which it was held that subsequent appropriators for artificial storage in a lake must provide devices at their own expense for dividing the water from that naturally stored and claimed by prior appropriators; and Ortel v. Stone (1922) 119 Wash. 500, 205 Pac. 1055, in which a junior appropriator for storage in a lake was required to reserve a sufficient supply of water in the lake to insure delivery to the prior appropriator of his supply "throughout the irrigation period by the appliances now in use when kept in good working order." *Ibid.* at 504, 205 Pac. at 1057. Statements in other decisions have been to the effect that methods of diverting water must be reasonably efficient. Dorn v. Tanner (D. Mont. 1932) 60 F. (2d) 626; Hough v. Porter (1909) 51 Ore. 318, 98 Pac. 1083; Hardy v. Beaver County Irr. Co. (1924) 65 Utah 28, 234 Pac. 524. This would seem to be properly a minimum requirement from the standpoint of the public welfare, where the existing method is under attack by an appropriator of the surplus.

¹¹ "What is a beneficial use, of course, depends upon the facts and circumstances of each case. What may be a reasonable beneficial use, where water is present in excess of all needs, would not be a reasonable beneficial use in an area of great scarcity and great need. What is a beneficial use at one time may, because of changed conditions, become a waste of water at a later time." Tulare Irr. Dist. v. Lindsay-Strathmore Irr. Dist. (1935) 3 Cal. (2d) 489, 567, 45 P. (2d) 972, 1007. More recently, in Rancho Santa Margarita v. Vail (1938) 11 Cal. (2d) 501, 81 P. (2d) 533, a contest between riparian owners, this court stated that whether the use of underground basins simply to support a surface stream, thereby making it possible for a riparian owner to water his cattle without having to extract ground waters artificially, is or is not a reasonable beneficial use, is a question of fact that must be passed upon according to the circumstances of each case.

ness of use of water the courts, while stating repeatedly that unreasonable losses and unnecessary waste of water must be avoided,¹² have accorded great weight to prevailing local customs in the community, which were not necessarily the most efficient methods of use;¹³ and the statements in some decisions indicate some skepticism of the value to the public of the "latest and most approved scientific method,"¹⁴ at least where the possible scrapping of long-established practices and physical systems would be required in the interest of

¹² *Rodgers v. Pitt* (C.C.D.Nev. 1904) 129 Fed. 932; *Washington State Sugar Co. v. Goodrich* (1915) 27 Idaho 26, 147 Pac. 1073; *Doherty v. Pratt* (1912) 34 Nev. 343, 124 Pac. 574; *Hough v. Porter*, *supra* note 10; *Foster v. Foster* (1923) 107 Ore. 355, 213 Pac. 895; *Hardy v. Beaver County Irr. Co.*, *supra* note 10. Reasonable losses of water in transit between the point of diversion and place of use do not affect the validity of the appropriation: *Barrows v. Fox* (1893) 98 Cal. 63, 32 Pac. 811; *Tulare Irr. Dist. v. Lindsay-Strathmore Irr. Dist.*, *supra* note 11; *Basinger v. Taylor* (1922) 36 Idaho 591, 211 Pac. 1085; *Joseph Milling Co. v. Joseph* (1914) 74 Ore. 296, 144 Pac. 465; *In re Althouse Creek* (1917) 85 Ore. 224, 162 Pac. 1072. But if diversion of the full quantity of water called for by the appropriation is to be allowed, the diversion works must be maintained in such condition and the water distributed and applied in such manner as to entail the least possible waste: *Town of Sterling v. Pawnee Ditch Extension Co.* (1908) 42 Colo. 421, 94 Pac. 339; *Stickney v. Hanrahan* (1900) 7 Idaho 424, 63 Pac. 189; *Clark v. Hansen* (1922) 35 Idaho 449, 206 Pac. 808; *Court House Rock Irr. Co. v. Willard* (1906) 75 Neb. 408, 106 N. W. 463; *Doherty v. Pratt*, *supra*; *In re Willow Creek* (1915) 74 Ore. 592, 146 Pac. 475; *Cook v. Evans* (1921) 45 S. D. 31, 185 N. W. 262, (1922) 45 S. D. 43, 186 N. W. 571; *Biggs v. Miller* (Tex. Civ. App. 1912) 147 S. W. 632. A reduction of avoidable losses in the diversion of water, to the use of which others also have rights, will be required, even though some expense must be incurred in putting the facilities in reasonably effective condition: *Foster v. Foster*, *supra*; *Broughton v. Stricklin* (1934) 146 Ore. 259, 30 P. (2d) 332.

¹³ *Barrows v. Fox*, *supra* note 12; *Joerger v. Pacific Gas & Elec. Co.* (1929) 207 Cal. 8, 276 Pac. 1017; *Tulare Irr. Dist. v. Lindsay-Strathmore Irr. Dist.*, *supra* note 11; *Beasley v. Engstrom* (1917) 31 Idaho 14, 168 Pac. 1145; *Worden v. Alexander* (1939) 108 Mont. 208, 90 P. (2d) 160; *Enterprise Irr. Dist. v. Willis* (1939) 135 Neb. 827, 284 N. W. 326; *Roeder v. Stein* (1895) 23 Nev. 92, 42 Pac. 867; *Little Walla Walla Irr. Co. v. Finis Irr. Co.* (1912) 62 Ore. 348, 124 Pac. 666, 125 Pac. 270; *Foster v. Foster*, *supra* note 12. The federal court in *Rodgers v. Pitt*, *supra* note 12, intimated that while in the absence of any law upon the subject it could not compel water users to adopt any particular system, nevertheless, in case of extravagant and wasteful use it might give the excess to later appropriators; but stated further that the system of irrigation in common use in the vicinity, if reasonable and proper under existing conditions, is to be taken as the standard, even though a more economical method might be adopted. From the decisions in which this matter has been considered in various states, some of which as noted are very recent, the rule appears to be that while an appropriator is under an obligation to keep his appliances in repair and to incur some expense if necessary to prevent substantial leaks which materially deprive others of the use of water, he will not be required to reconstruct his system at substantial expense in order that water may be saved for the use of later appropriators if such system is typical of those prevailing generally in the region and is reasonably efficient as measured by local standards.

¹⁴ *Enterprise Irr. Dist. v. Willis*, *supra* note 13, at 836, 284 N. W. at 331. Compare

conservation without convincing demonstration that the value of the water to be saved by the installation of new systems would be greater than their net cost.¹⁵

UTILIZATION OF PERCOLATING WATER UNDER DOCTRINES OF
PRIVATE OWNERSHIP

The English or common-law doctrine of absolute ownership of percolating waters, by the owner of overlying land, was originally accepted by decision or acknowledged by dictum in nearly all the western states and is still the rule in some of them.¹⁶ The result of

the statements in *Joerger v. Pacific Gas & Elec. Co.*, *supra* note 13, to the effect that an appropriator is not bound to adopt the best method for utilizing water or to take extraordinary precautions to prevent waste, and in *Tulare Irr. Dist. v. Lindsay-Strathmore Irr. Dist.*, *supra* note 11, to the effect that he is not required either to irrigate or to divert water in the most scientific manner known, so long as his methods are reasonable according to the customs of the locality. In the *Enterprise and Joerger* cases, as well as in *Worden v. Alexander*, *supra* note 13, the courts declined to give controlling weight to the testimony of experts on the duty of water, where the opinions of the latter were at variance with those of farmers who were familiar with the character of the land and its practical water requirements.

¹⁵ The Supreme Court of Oregon stated in 1912, in *Little Walla Walla Irr. Co. v. Finis Irr. Co.*, *supra* note 13, at 352, 124 Pac. at 668, that while the methods of use of water by the old settlers were the least expensive and no doubt somewhat extravagant, "yet they cannot be expected to install methods now that might reduce to a minimum the amount of water necessary, at a cost that would absorb the profits." This observation applies to the reconstruction and replacement of existing systems; the Oregon court has emphasized on several occasions the necessity for maintaining irrigation systems in proper condition. Note, for example, the statement in *Foster v. Foster*, *supra* note 12, at 363, 213 Pac. at 897, that "We have not arrived at the stage of irrigation when farmers can practically lay iron water-pipes, or construct concrete ditches; yet the question that water for irrigation must be used economically and without needless waste is no longer debatable," and the requirement in that case that proper repairs be made, which could be done "without building concrete or new ditches, and at a reasonable expense." *Ibid.* at 366, 213 Pac. at 898. The Montana Supreme Court in 1939, in *State ex rel. Crowley v. District Court*, *supra* note 9, at 97, 88 P. (2d) at 27, 121 A. L. R. at 1037, recognized the importance of conservation of water, but did not feel that it had yet become such a controlling consideration as to require the wholesale abandonment of established practices and their replacement by "diversion systems by which the last drop may be taken from the stream," where the expense of new systems would not be warranted by the actual saving of water. Compare the later observation by the same court in *Worden v. Alexander*, *supra* note 13, at 216, 90 P. (2d) at 164, to the effect that while the policy of all western states is to require the highest possible duty of water, "economy should not be insisted upon to such an extent as to imperil success," quoting from *Allen v. Petrick* (1924) 69 Mont. 373, 380, 222 Pac. 451, 454.

¹⁶ *Arizona*. Several decisions have stated the rule of ownership by the landowner: *Howard v. Perrin* (1904) 8 Ariz. 347, 76 Pac. 460, *aff'd*, (1906) 200 U. S. 71; *McKenzie v. Moore* (1918) 20 Ariz. 1, 176 Pac. 568; *Campbell v. Willard* (1935) 45 Ariz. 221, 42 P. (2d) 403. In *Maricopa County M. Water Conserv. Dist. No. 1 v. Southwest Cotton Co.*

extreme application of the rule is to allow a landowner not only to

(1931) 39 Ariz. 65, 4 P. (2d) 369, judgment was reserved as to whether the English rule or the American modification should apply; and a dictum favoring reasonable use appears in *Fourzan v. Curtis* (1934) 43 Ariz. 140, 29 P. (2d) 722; but it cannot be said that the English rule has yet been squarely rejected. Certain limitations have been applied by reason of contractual relations between a water users' association and landowner-members: *Brewster v. Salt River Valley Water Users' Ass'n* (1924) 27 Ariz. 23, 229 Pac. 929; *Adams v. Salt River Valley Water Users' Ass'n* (1939) 53 Ariz. 374, 89 P. (2d) 1060.

Kansas. An early decision indicated acceptance of the rule, while holding that the facts constituted an exception or limitation: *City of Emporia v. Soden* (1881) 25 Kan. 588 (1882) 37 Am. Rep. 265. A later decision involving contamination of ground water stated that the development of the law was away from the rule: *Gilmore v. Royal Salt Co.* (1911) 84 Kan. 729, 115 Pac. 541. Statutes enacted in 1891 [KAN. GEN. STAT. ANN. (Corrick, 1935) § 42-301, later modified by § 42-305] and 1911 [KAN. GEN. STAT. ANN. (Corrick, 1935) § 42-305] relating to ground waters have not yet been construed by the supreme court. The inference is that percolating waters of certain character in the southwestern portion of the state and all percolating waters in the eastern portion are still subject to the English rule, and that in the northwest portion the rule has been qualified by statute.

Montana. The supreme court has made statements approving the rule, subject to the proviso that the right be exercised without malice or negligence: *Ryan v. Quinlan* (1912) 45 Mont. 521, 124 Pac. 512. The rule so stated, whether dictum or not, apparently is accepted in Montana: *Rock Creek Ditch & Flume Co. v. Miller* (1933) 93 Mont. 248, 17 P. (2d) 1074.

Nevada, New Mexico, Oregon. The English rule, accepted or at least recognized in court decisions [*Mosier v. Caldwell* (1872) 7 Nev. 363; *Strait v. Brown* (1881) 16 Nev. 317, 40 Am. Rep. 497; *Keeney v. Carillo* (1883) 2 N. M. 480; *Vanderwork v. Hewes* (1910) 15 N. M. 439, 110 Pac. 567; *Taylor v. Welch* (1876) 6 Ore. 198; *Boyce v. Cupper* (1900) 37 Ore. 256, 61 Pac. 642; *Hayes v. Adams* (1923) 109 Ore. 51, 218 Pac. 933], has been qualified or replaced by appropriation statutes, as noted below. The New Mexico and Oregon statutes apply to ground waters of designated character; the Oregon statute, furthermore, applies only to the eastern portion of the state.

North Dakota, Oklahoma, South Dakota. The doctrine is a matter of statute in these states, under which the landowner is declared to "own" the water standing on his land, or flowing over or under the surface, but not forming a definite stream: N. D. COMP. LAWS ANN. (1913) § 5341; OKLA. STAT. (Harlow, 1931) §11785; S. D. CODE (1939) §61.0101. However, notwithstanding the statute, the Oklahoma Supreme Court has adopted the rule of reasonable use: *Canada v. City of Shawnee* (1936) 179 Okla. 53, 64 P. (2d) 694. Under the South Dakota statute as reenacted in the 1939 code, this ownership is made subject to the provisions of the code relating to artesian wells and water. The South Dakota Supreme Court has affirmed the rule of ownership by the landowner: *Metcalf v. Nelson* (1895) 8 S. D. 87, 65 N. W. 911; *Deadwood Cent. R. R. v. Barker* (1901) 14 S. D. 558, 86 N. W. 619; *Madison v. City of Rapid City* (1932) 61 S. D. 83, 246 N. W. 283.

Texas. The rule has been accepted in *Houston & Texas Cent. R. R. v. East* (1904) 98 Tex. 146, 81 S. W. 279, *rev'g* (Tex. Civ. App. 1903) 77 S. W. 646; *The Texas Co. v. Burkett* (1927) 117 Tex. 16, 296 S. W. 273; see *Farb v. Theis* (Tex. Civ. App. 1923) 250 S. W. 290. But it does not exempt one from liability for negligence in polluting the common ground-water supply: *Texas Co. v. Giddings* (Tex. Civ. App. 1912) 148 S. W. 1142.

Wyoming. The one decision relating to percolating water states that such waters developed artificially belong to the owner of the land on which developed: *Hunt v. City of Laramie* (1919) 26 Wyo. 160, 181 Pac. 137.

abstract water from his land for any legitimate enterprise, but in so doing, to exhaust the common ground-water supply underlying his neighbor's land as well as his own and without liability for the resulting injury to the neighbor's water supply, regardless of the length of time the latter may have been using these ground waters beneficially.¹⁷ If, then, under the rule of absolute ownership a landowner has no cause for redress against his neighbor for abstracting common percolating water to the point of exhaustion of the supply, it would follow that he cannot be heard to complain of an abstraction by such neighbor which simply lowers the ground-water level and renders his pumping equipment inadequate but without depleting the supply at lower depths.

The American rule of reasonable use is predicated likewise upon private ownership of percolating water, but with the essential requirement that as between owners of land which overlie a common supply each is limited to a reasonable use of the water as against the others.¹⁸ The question of reasonableness as between landowners

¹⁷ The Texas Supreme Court, in *Houston & Texas Cent. R. R. v. East*, *supra* note 16, at 149, 81 S. W. at 280, quoting from *Acton v. Blundel* (1843) 12 M. & W. 324, 354, stated the English doctrine to be that "the person who owns the surface may dig therein, and apply all that is there found to his own purposes at his free will and pleasure; and that if, in the exercise of such rights, he intercepts or drains off the water collected from underground springs in his neighbor's well, this inconvenience to his neighbor falls within the description of *damnum absque injuria*, which cannot become the ground of an action." The practical arguments stated in favor of the English rule were that the source and flow of these waters are so unknown as to make it impossible to formulate any legal rules governing them, and that a recognition of correlative rights would substantially interfere with many important public projects such as drainage of lands. The Oregon Supreme Court, in *Hayes v. Adams*, *supra* note 16, at 57, 218 Pac. at 935, thus stated the rule with respect to "subterranean, percolating waters, the course of which is unknown and unascertainable" as "the rule recognized by all the authorities, that such waters are a constituent part of the land, and belong to the owner of the land, with the right in such owner to make any reasonable use thereof, including a use which, either by reason of its character or the manner of its exercise, cuts off or diverts the flow of percolating waters from his neighbor's spring, and renders the same dry and useless."

¹⁸ This is the rule in California, Nebraska, Oklahoma, and Washington.

California. While some early California decisions appear to have adopted the English or common-law rule [*Hanson v. McCue* (1871) 42 Cal. 303, 10 Am. Rep. 299; *Huston v. Leach* (1878) 53 Cal. 262; *Southern Pac. R. R. v. Dufour* (1892) 95 Cal. 615, 30 Pac. 783; *Gould v. Eaton* (1896) 111 Cal. 639, 44 Pac. 319], the well-known decision in *Katz v. Walkinshaw* (1903) 141 Cal. 116, 74 Pac. 766, departed from the rule of absolute ownership of percolating waters and adopted an adaptation of the American rule of reasonable use which has come to be known as the California doctrine of correlative rights. The principle has since been consistently applied to controversies between owners of land overlying a common supply of ground water: *Newport v. Temescal Water Co.* (1906) 149 Cal. 531, 87 Pac. 372; *Burr v. Maclay Rancho Water Co.* (1908) 154 Cal. 428, 98 Pac.

has been raised in a number of the western decisions, but usually in cases in which one landowner sought to transport the water to distant lands, that is, to lands outside the ground-water basin, to the

269, (1911) 160 Cal. 268, 116 Pac. 715; *Barton v. Riverside Water Co.* (1909) 155 Cal. 509, 101 Pac. 790; *Corona Foothill Lemon Co. v. Lillibridge* (1937) 8 Cal. (2d) 522, 66 P. (2d) 443; *Lemm v. Rutherford* (1926) 76 Cal. App. 455, 245 Pac. 255, Sup. Ct. *hearing den.*, (Apr. 5, 1926); *Revis v. I. S. Chapman & Co.* (1933) 130 Cal. App. 109, 19 P. (2d) 511. The applicable rules are summarized in the syllabus of *Burr v. MacLay Rancho Water Co.*, *supra*, on the first appeal decided in 1908; they include the principle that owners of overlying lands are limited as against each other to the quantity of water reasonably necessary for use on such lands, and that each is entitled to a reasonable proportion if the supply is not enough for all, none being permitted to take water to distant lands to the injury of others. Appropriations may be made of the surplus for use on distant lands.

Hawaii. The Territorial Supreme Court, in a case involving the constitutionality of a statute requiring permits for the installation of artesian wells in the district of Honolulu, approved "the rule of correlative rights" in deciding that the community as a whole could not, without compensation, decree that no further artesian wells should be installed, but found that there was no necessity of stating with exactness the precise principles which should govern the admeasurement of the share of each co-owner: *City Mill Co. v. Honolulu Sewer & Water Comm.* (1929) 30 Hawaii 912. There have been no later decisions of this court on this subject.

Nebraska. Without previous adherence to the English rule, the supreme court has approved and apparently adopted the American rule of reasonable use, with the factor of proportional distribution in event of shortage: *Olson v. City of Wahoo* (1933) 124 Neb. 802, 248 N. W. 304; *Ostermann v. Central Neb. Pub. Power & Irr. Dist.* (1936) 131 Neb. 356, 268 N. W. 334.

Oklahoma. In the one case involving percolating waters the supreme court held that the statutory declaration [OKLA. STAT. (Harlow, 1931) § 11785] that the landowner owns the water under his land, not forming a definite stream was not intended to convey such an absolute ownership as to result in unreasonable injury to one's neighbor, who has a similar ownership; that each is restricted to a reasonable use, which does not contemplate exhaustion of a neighbor's supply for transport to distant lands; but that this does not mean that there must be, in actual practice, an apportionment of such waters between such owners: *Canada v. Shawnee*, *supra* note 16.

Washington. Early decisions [*Meyer v. Tacoma Light & Water Co.* (1894) 8 Wash. 144, 35 Pac. 601; *Charon v. Clark* (1908) 50 Wash. 191, 96 Pac. 1040] placed no limitation upon the rule of ownership by the landowner, there being no occasion therefor; but subsequent decisions adopted the rule of reasonable use and correlative rights in percolating waters: *Patrick v. Smith* (1913) 75 Wash. 407, 134 Pac. 1076; *Evans v. Seattle* (1935) 182 Wash. 450, 47 P. (2d) 984. However, in the latter case, it was held that a city which had excavated a deep ditch on its own land in order to operate more efficiently a gravel pit, the result of the excavation being practically to cut off percolating water which supplied neighboring lands, was making a reasonable use of its own property and had the right so to drain the pit as to make the product available for use, without thereby incurring liability to others. Examples of unreasonable use were stated to be found in cases in which the water was being wasted for no good purpose, or taken for commercial purposes by one landowner to the exclusion of others. While the principle of apportionment of water in time of shortage was not involved or even discussed, the apparent implication of this decision is to negative such principle.

injury of others who wished to use the water on overlying lands. The question of protection of means of diversion only, where the only uses of water were on overlying lands, does not appear to have been squarely involved.

The rule of reasonable use was so applied in the Washington case of *Evans v. Seattle*¹⁹ as to absolve a landowner, a city which was held to be making a reasonable use of its land, from liability to a neighboring landowner whose water supply was practically cut off as a result of the city's operations. If under such circumstances destruction of the water supply is not actionable, injury to the mere method of diversion could even less be considered so.

The question of a lowering of the water level under one's land resulting from the operation of pumping plants located upon other overlying lands has been in issue in several California cases which have arisen under the rule of reasonable use as developed under the California doctrine of correlative rights, but the grievance has been against pumping for distant use. Taking of percolating water for distant use by one landowner, to the injury of another who owns land overlying the common supply is not within the correlative right, and the taking has been held actionable where the result was to threaten depletion of the supply and to injure materially the latter's method of diversion.²⁰ But is the use of a reasonable proportion of

¹⁹ *Supra* note 18.

²⁰ In *Burr v. Maclay Rancho Water Co.*, *supra* note 18, both parties owned land overlying a common water supply, having obtained their tracts from a common grantor who had previously taken water for distant use. Defendant acquired the tract on which the grantor's original wells were located. Plaintiff installed pumping equipment and used the water on one of his tracts. Defendant later began taking larger quantities of water for distant use than the grantor had taken; the effect was to lower the water in plaintiff's wells beyond the capacity of his pumps. In addition, depletion of the supply was threatened. It was held that defendant had succeeded to the appropriation by the common grantor; but beyond that, its right was subject to plaintiff's right to make use of the water on his overlying land. Defendant was enjoined from pumping to such an extent, after its appropriation was satisfied, as to deplete the water supply in the basin or to lower the water level in plaintiff's wells beyond the capacity of his existing pumps. In *Newport v. Temescal Water Co.*, *supra* note 18, the water level had dropped in a valley from which water was being transported for distant use, but it was found that periods of drought and pumping by third parties, as well as by the defendant, were substantially responsible. In *Revis v. I. S. Chapinan & Co.*, *supra* note 18, the result of digging ditches on the land of one party was to dry the upper soil on an adjoining tract and to make it impossible to farm without artificial irrigation; and it was found that the water so diverted on the first tract was greatly in excess of its share and was wasted, not used on the land. In *Corona Foothill Lemon Co. v. Lillibridge*, *supra* note 18, a gradual material lowering of the water level, in spite of the bringing in of additional supplies from outside, thus seriously interfering with reasonable beneficial use by owners of overlying

the water on overlying lands within the correlative right, if the draft upon the ground water forces another owner to deepen his existing well and install a larger pump, the water supply at lower depths being adequate for reasonable use by both owners?²¹ As between uses of water on overlying lands, the correlative doctrine purports to give the landowners coequal rights in the common supply. A coequal right obviously is not an exclusive right. None of the decisions have predicated these correlative rights, as against each other for reasonable use on overlying land, upon the portion of the water supply available only at the depth at which the first landowner encounters it. Furthermore, priority of use is not a factor as between uses on overlying lands;²² should there then be priority in the means

lands, was held to be ground for the issuance of an injunction against pumping water out of the basin. In *Hillside Water Co. v. Los Angeles* (1938) 10 Cal. (2d) 677, 686, 76 P. (2d) 681, 686, it was stated that the owners of overlying land have the right to the use of the ground waters as a supporting subterranean supply available to and for the benefit of their farming operations, such as would result from minimizing the requirements for surface irrigation, and that "it may not be rightly said that such use is not a beneficial use of the underground waters"; but the diversion complained of was for transport of the water to distant points. In this case an injunctive order requiring the maintenance of the ground-water table in its natural state and in effect preventing the beneficial utilization of water underlying 98 per cent of the area in order that the water table be maintained in natural condition underneath 2 per cent of the area, was reversed to conform to the new state constitutional policy. A physical solution was approved as to certain holdings; as to the others, as public use had attached, reverse condemnation proceedings were invoked and applied as the only appropriate course to pursue.

²¹ Apparently Justice Shaw, in *Katz v. Walkinshaw*, *supra* note 18, believed that the method of diversion might be involved in the right to make a reasonable use under the correlative doctrine. He spoke of the possibility, under the absolute-ownership rule, of a landowner's taking unlimited quantities of water by means of stronger pumps and deeper wells than those of his neighbor; and then stated that the doctrine of reasonable use affords some measure of protection to property now existing, and greater incentive to make new developments. But under the facts of this case, the diversion complained of was for use on distant lands.

²² The correlative doctrine is comparable in this, as in certain other respects, to the riparian doctrine of rights to the use of water of surface streams; the right arises by virtue of location of land with regard to the water supply. Adjoining property owners are entitled to protection in their "superior natural rights . . . to the flow and use of" percolating waters: *Cohen v. La Canada Land & Water Co.* (1907) 151 Cal. 680, 692, 91 Pac. 584, 589. The natural right is not lost by nonuse, but may be preserved for future use by a declaratory decree which will prevent an appropriator for distant use from acquiring a paramount right by adverse use or lapse of time: *Burr v. Maclay Rancho Water Co.*, *supra* note 18. As ownership of the land carries with it all the natural advantages of its situation, subject to reasonable use on the part of all who are similarly situated and who thereby have a common right, the waters of a stream and the percolating waters connected with it are a common supply; each owner of overlying land and of riparian land can begin his reasonable use at pleasure and priority in beginning use is not a factor; ex-

of diversion, which is essentially a means of effectuating use? The right to use water in California is limited, among other things, to a reasonable method of diversion.²³ Whether the method of diversion employed by the holder of a correlative right is a reasonable method, if to render it continuously useful the entire body of water in a subterranean basin must be held at a given level, would doubtless be a question of fact to be decided according to the circumstances of that particular case.²⁴ It would not seem to be a reasonable method if, to insure its maintenance, the owners of other overlying lands must be deprived of the opportunity of exercising their own coequal rights to make use of the common supply—rights of the same legal classification and degree, in which priority of use is not an element—unless they compensate the holder of one coequal right for the added expense of making his first diversion continuously useful.²⁵ If this generalization is correct, it would seem to follow that the owners of land overlying a ground-water basin would not be precluded, in an ordinary situation, from access to such supply for reasonable, beneficial use on their overlying lands, simply because such use may force

clusive or paramount rights can be obtained by none, whether because of nonuse by others or because of any other reason than grant, condemnation, or prescription: *Hudson v. Dailey* (1909) 156 Cal. 617, 105 Pac. 748.

²³ *Peabody v. City of Vallejo*, *supra* note 2; CAL. CONST. art. XIV, § 3.

²⁴ In *Rancho Santa Margarita v. Vail*, *supra* note 11, a riparian owner claimed that as against another riparian owner, it was entitled to have the ground-water basins maintained full in order to support the surface stream, so that its cattle could be watered from the surface. The supreme court refused to say that as a matter of law, applicable to every case, the use of underground basins simply to support a surface flow, is or is not a reasonable beneficial use. That was stated to be a question of fact that must be passed upon in each case. Hence it was error for the trial court to rule, in effect, that it would not pass upon this question of fact, but would hold that as a matter of law the quantity available in the basins was a totally immaterial factor.

²⁵ Compare the language in the first decision by Justice Temple in *Katz v. Walkinshaw*, *supra* note 18, at 141, 70 Pac. at 665, to the effect that all members of the community have a common interest in the water and that "it is an anomaly in the law if one person can for his individual profit destroy the community and render the neighborhood uninhabitable." This observation was not made in connection with the point under discussion, for maintenance of the water level as between reasonable uses on overlying lands was not involved, but it does emphasize the common interests of the landowners.

Note the statement in 2 WIEL, WATER RIGHTS IN THE WESTERN STATES (3d ed. 1911) 1061: "Since all the overlying landowners have equal opportunity of access to the water, and its presence contributes to the value and potential enjoyment of the land of all, they have a common interest in the water, and equal rights to use and share in its benefits and uses to the capacity of their lands." After quoting Justice Temple's statement above: "Their rights are correlative, and interdependent. The landowner who first uses the water has not greater rights than other landowners. Nor is the right of one lost by non-use."

other owners in that basin to deepen at their own expense their existing diversions.²⁶

APPROPRIATIONS OF GROUND-WATER

Recent or fairly recent decisions from four states²⁷ are in accord

²⁶ That there may be equities on both sides of a controversy between holders of equal rights over the method of diversion of one of them, is pointed out in discussing the matter as between riparian owners in Conkling, *Administrative Control of Underground Water: Physical and Legal Aspects* (1937) 102 AMER. SOC. CIV. ENG., TRANSACTIONS 753, 768: "It is patent that all degrees of deprivation might be incurred in such a case from the most minor to one in which the cost of changing diversion methods would be so expensive as to be complete confiscation of property. Actually, this latter would rarely be the case, and it would seem just that protection be given against such contingency. Most cases are not so serious but nevertheless any additional expense would be partial confiscation unless recompense were made. On the other hand the 'hurdle' faced by the individual who proposes to divert at an up-stream point would indeed be high if he had to compensate all down-stream riparians whose diversion works would have to be reconstructed because of his act. Development would be seriously curtailed."

²⁷ *Arizona*. In *Pima Farms Co. v. Proctor* (1926) 30 Ariz. 96, 245 Pac. 369, both parties relied upon the doctrine of appropriation, it being assumed or conceded that the appropriated supply was from a definite underground stream. (Percolating waters belong to the landowner in Arizona, *supra* note 16.) The installation of wells by a junior appropriator resulted in lowering the water level at the prior appropriator's wells, although there was ample water at lower levels which could be reached at substantially increased cost. It was held that the senior appropriator was entitled to have the water reach him in the natural channel or by other means equally effective, but that appropriation of the surplus should be permitted if he were properly safeguarded; judgment was suspended pending acceptance by the junior appropriator (a public carrier) of a plan to furnish the prior appropriator water at reasonable rates.

California. In *City of Lodi v. East Bay Mun. Util. Dist.* (1936) 7 Cal. (2d) 316, 60 P. (2d) 439, rights to a ground-water supply fed by a surface stream were in issue, the city being the prior appropriator of the ground waters and the district an appropriator later in time on the surface stream, the waters in the stream being found to constitute the sole source of replenishment of the ground waters, further substantial interference with which would require the city to deepen its wells. [While California adheres to the correlative doctrine as basic in the determination of rights to the use of percolating waters, appropriations may be made of the surplus above the reasonable requirements of overlying lands: *Burr v. Maclay Rancho Water Co.*, *supra* note 18. Priorities govern as between such appropriators, as in case of appropriations from surface streams: *San Bernardino v. Riverside* (1921) 186 Cal. 7, 198 Pac. 784. But there is no statutory procedure under which rights to the use of percolating water may be acquired, for the procedure for appropriating water under the Water Commission Act applies only to "surface water, and to subterranean streams flowing through known and definite channels." Cal. Stats. 1933, p. 955.] It was held that under existing conditions the city's method of diversion was reasonable, and the case was sent back for evidence as to the level to which the water in the wells could decline without substantially endangering the city's water supply. If the ground-water level reached the danger point, the district would be required to supply water to the city or else release sufficient water in the stream to raise the ground-water level. It was stated that the trial court had the power to suggest and

to the effect that the holder of a valid prior appropriation of ground water not only is entitled to protection against junior appropriators in the quantity of water so appropriated, but must be compensated for such interference with the water supply as to cause a substantial lowering of the water level below the lowest point at which his present equipment can make that quantity available for use, in default of which injunction will issue against the continuing injury. In the California decision it was specifically stated that the method of diversion in litigation was a reasonable method. Under such circumstances the acts of later appropriators which result in such lowering of the water level as to require substantial expense for a deeper diversion would be actionable, but this does not mean that great quantities of water must be withheld from appropriation by others for the sole purpose of maintaining the water level in one area. The courts have adequate power to arrange for physical solutions which will contribute to conservation and beneficial use of the entire water supply while safeguarding existing rights of use.²⁸ The Arizona decision likewise left the way open for a physical solution which would ac-

enforce a physical solution even if the parties could not agree, but that any major expense necessary should be borne by the junior appropriator.

Colorado. In *Faden v. Hubbell* (1933) 93 Colo. 358, 28 P. (2d) 247, the waters in issue percolated under adjoining lands to a river and therefore, under the Colorado law, were a part of the river system and were therefore subject to appropriation to the same extent as the water flowing in the stream itself. (The question of rights to the use of percolating waters not trihutory to a stream system has not yet been squarely decided by the Colorado Supreme Court.) It was held that the prior appropriator of such ground waters had no right to interfere with the flow to the injury of a junior appropriator by deepening his own diversion and so changing the characteristics of the underground flow; that the junior appropriator had a vested right, as against the senior, in a continuation of the conditions existing at the time he made his appropriation.

Idaho. In *Noh v. Stoner* (1933) 53 Idaho 651, 26 P. (2d) 1112, both parties were appropriators of water from an artesian basin. [A statute provides that the right to the use of "subterranean waters" may be acquired by appropriation: IDAHO CODE ANN. (1932) § 41-103. The most recent decisions of the supreme court adhere squarely to the doctrine of appropriation of ground waters, although there have been some marked inconsistencies in reaching this point. See *Le Quime v. Chambers* (1908) 15 Idaho 405, 98 Pac. 415; *Bower v. Moornan* (1915) 27 Idaho 162, 147 Pac. 496; *Jones v. Vanausdell* (1916) 28 Idaho 743, 156 Pac. 615; *Public Util. Comm. v. Natatorium Co.* (1922) 36 Idaho 287, 211 Pac. 533; *Union Cent. Life Ins. Co. v. Albrethsen* (1930) 50 Idaho 196, 294 Pac. 842; *Hinton v. Little* (1931) 50 Idaho 371, 296 Pac. 582; *Silkey v. Tiegs* (1931) 51 Idaho 344, 5 P. (2d) 1049.] The junior appropriators sank a well to a greater depth than that of the senior, the result of which was that the water level was so lowered as to render the senior appropriator's pumping plant inadequate; and the cost of lowering his well and increasing the power of his pump would be substantial. Injunction was granted, it being held that any substantial expense in such case for the accommodation of junior appropriators must be borne by the latter.

²⁸ See also *Hillside Water Co. v. Los Angeles*, *supra* note 20.

comply the same purpose, inasmuch as the state policy favored the broadest possible use of public waters. The Idaho court held that substantial expense required in changing a prior appropriator's diversion for the benefit of later users must be borne by the latter, but did not discuss the question of a physical solution. It was stated, however, that a lowering of the prior appropriator's well and an increase in the power of his pump would in turn cut off the flow at the junior appropriator's well and require him to do the same thing, which would result in a race to the bottom of the basin without solving the problem. In the Colorado case it was a junior appropriator who was complaining of a change in a senior appropriator's diversion which was made after the junior appropriative right had vested.

IS THE PRIOR APPROPRIATOR UNDER A GROUND-WATER ADMINISTRATIVE STATUTE ENTITLED TO MAINTENANCE OF THE WATER LEVEL AT THE DEPTH FROM WHICH HE FIRST PUMPS THE WATER IF AN ADEQUATE SUPPLY IS AVAILABLE AT LOWER DEPTHS?

None of the decisions cited under the foregoing discussion of appropriations of ground water involved appropriations made under an administrative procedure applying especially to ground waters, and including determinations by the state engineer of the existence of unappropriated waters in the proposed source of underground supply. Four states²⁹—Nevada, New Mexico, Oregon (eastern portion

²⁹ *Nevada*. All ground waters belong to the public, and subject to all existing rights of use, are subject to appropriation. Small domestic uses of nonartesian water are exempted from the statute. Application must be made to the state engineer for a permit to make the appropriation. Nev. Stats. 1939, c. 178, §§ 1, 3, 9.

New Mexico. Waters of underground streams, channels, artesian basins, reservoirs or lakes, having reasonably ascertainable boundaries, belong to the public and are subject to appropriation. Application must be made to the state engineer for a permit to appropriate such water for irrigation or industrial purposes. N. M. STAT. ANN. (Court-right & Allen, Supp. 1938) § 151-201. A previous statute was declared unconstitutional on technical grounds, in a decision which nevertheless laid the basis for passage of an act free from the objectionable features; it being concluded that "the waters of an artesian basin whose boundaries have been ascertained are subject to appropriation," and that the previous statute, while objectionable in form, was declaratory of existing law and not subversive of vested rights of owners of lands overlying artesian waters: *Yeo v. Tweedy* (1929) 34 N. M. 611, 286 Pac. 970.

Oregon. In counties lying east of the summit of the Cascades, waters in underground streams, channels, artesian basins, reservoirs or lakes, the boundaries of which may reasonably be ascertained, belong to the public and are subject to appropriation for any purpose other than domestic and culinary use, stock, or watering of small lawns and

of state), and Utah—have provided by statute administrative procedure governing the appropriation of ground water from determinable sources. The statutes are silent as to whether the first appropriator may require the ground-water level to be held at the depth from which he first pumps it, or compensation in the event it is lowered as the result of later appropriative diversions, where an adequate water supply is available at lower depths, and the courts of last resort have not had occasion to decide the matter in cases arising under the administrative statutes. The question then arises as to whether the rule applied elsewhere in connection with appropriations of ground water is logically applicable to appropriations under ground-water administrative procedure.

Under each of these four statutes, upon receipt of an application for a permit to appropriate ground water, the state engineer has authority to determine whether there is unappropriated water in the area in which development is proposed, and his authority to grant an application is contingent upon the existence of unappropriated water in the proposed source. The Oregon statute goes farther than the others in making the determination of the safe yield of a ground-water basin expressly contingent upon a reasonable or feasible pumping lift in case of pumping developments, or a feasible reduction of

gardens. Application must be made to the state engineer for a permit to make the appropriation. Appropriations are subject to existing rights of use; and the statute is not to be construed as taking away or impairing vested rights where the water is economically and beneficially used. ORE. CODE ANN. (1930) § 47-1301; ORE. CODE ANN. (Supp. 1935) § 47-1302.

Utah. All waters, whether above or under the ground, are the property of the public, subject to all existing rights of use. Unappropriated public waters are subject to appropriation, and applications for permits to appropriate water must be made to the state engineer. Utah Laws 1935, c. 105, §§ 100-1-1, 100-3-1. Prior to 1935, the appropriation statute had referred to ground water in known or defined channels; and the decisions of the supreme court had passed through the stages of recognizing the rule of absolute ownership of percolating waters as against an attempted appropriation, then the rule of correlative rights as between owners of land overlying a common artesian basin, and recently the doctrine of appropriation. The latest decisions adopting the appropriation doctrine were rendered a few months prior to the legislative amendment declaring all ground waters the property of the public, subject to appropriation. For typical decisions in the first stage: *Crescent Min. Co. v. Silver King Min. Co.* (1898) 17 Utah 444, 54 Pac. 244; *Willow Creek Irr. Co. v. Michaelson* (1900) 21 Utah 248, 60 Pac. 943; see *Sullivan v. Northern Spy Min. Co.* (1895) 11 Utah 438, 40 Pac. 709. For the correlative doctrine: *Horne v. Utah Oil Refining Co.* (1921) 59 Utah 279, 202 Pac. 815; *Glover v. Utah Oil Refining Co.* (1923) 62 Utah 174, 218 Pac. 955. For the appropriation doctrine: *Wratshall v. Johnson* (1935) 86 Utah 50, 40 P. (2d) 755 (on demurrer); *Justesen v. Olsen* (1935) 86 Utah 158, 40 P. (2d) 802. Two of the five justices in these last two cases objected vigorously to abrogation of the correlative doctrine.

pressure in case of artesian developments.³⁰ Regardless of the quantity of unappropriated water in any subterranean source, ground water is not available for use unless it can be brought to the surface in a feasible manner, and a yield is not "safe" if not susceptible of practicable use. Furthermore, economic feasibility is as important as engineering feasibility. The water level in a ground-water basin is a very sensitive thing; whether or not the water is under artesian head, pumping creates a cone of depression which affects the water level in other wells within the area affected, though without necessarily endangering the permanency of the common water supply unless the aggregate withdrawals continue to exceed the safe yield.³¹ It would appear, in short, that in case of ground-water developments, where the interdependence of diversions from the common source is generally so much more pronounced than in case of surface streams, the feasibility of diversion of the entire safe yield is an essential factor in the administrative findings of safe yield under a statute the purpose of which is to effectuate the conservation and best use of the water supply.

Granted that one who has developed ground water at what he finds to be a feasible depth, without knowledge of the extent and permanence of the supply, might have some justification for insisting upon continuance of the conditions as he found them and upon which he based his appropriation, he is under no misapprehension as to the physical situation if he secures a permit after the state has made an adequate scientific investigation of the ground-water supply—its origin, destination, boundaries, and quantity and rate of flow—and the safe yield under feasible lifts to the surface. If this is done, such is the basis upon which permits are issued, none being issued beyond the capacity of the safe yield. All applicants, from the

³⁰ ORE. CODE ANN. (1930) §47-1307.

³¹ It was stated in Thompson and Fiedler, *Some Problems Relating to Legal Control of Use of Ground Waters* (1938) 30 AMER. WATER WORKS ASS'N, JOUR. 1049, 1075, with reference to the Idaho cases *Bower v. Moorman*; *Noh v. Stoner*, both *supra* note 27, that: "There is no indication in the decisions that the defendants set up as their justification, that by the laws of nature it would generally be impossible for any subsequent user of ground water to pump from the same water-bearing formation without affecting to some degree the water level and yield of every well previously installed in the area." See also Thompson's discussion of Conkling, *Administrative Control of Underground Water: Physical and Legal Aspects* (1937) 102 AMER. SOC. CIV. ENG., TRANSACTIONS 798, 813-814. For an even more recent treatment of the geological and legal aspects of ground water see Tolman and Stipp, *Analysis of Legal Concepts of Subflow and Percolating Waters* (1939) 65 AMER. SOC. CIV. ENG., PROC. 1687, and discussions in subsequent Proceedings.

first one on, are on notice to this effect. This brings us to the question: if under these circumstances the first appropriator, with at least implied knowledge of the physical situation, chooses to install a pumping plant with much smaller lift than the maximum feasible pumping lift, owing to the fact that he can get along with the smaller lift while he is the only appropriator, is his method of diversion a reasonable method in the light of all the circumstances, if its legal effect is to give him a substantial monopoly of the entire water supply in the irrigation of a comparatively small area?

The question as to whether the method is reasonable will be answered by the court upon consideration of the facts presented to it in a litigated case. Probably the answer would be in the negative if the only possible result of protecting the existing diversion were to withhold the entire supply of a large ground-water basin for the use of one small farm, for that result would be palpably opposed to the public interest. The alternative, if the prior appropriator is to be protected against additional expenditures, is to require all subsequent appropriators to reimburse him for his added costs; but this likewise raises serious questions as to the public welfare. It will mean not only that the first appropriator may claim damages from each subsequent appropriator, but that each one in turn may claim compensation from all those junior to him, each time a substantial lowering of the water level takes place, until the last appropriator from the common supply is required to contribute to the cost of development of each of the other users in the area. Not only would this complicate the administration of water rights in the area, by necessitating repeated and constantly expanding adjustments of damage, but it conceivably would seriously curtail the fullest utilization of the ground-water supply, for later intending appropriators may well hesitate to embark upon such an enterprise with the knowledge that they must pay not only the cost of their own individual developments, but also part of the cost of many earlier ones from which they will derive no gain. Later uses under such a handicap may be economically impracticable. If the result in a given case is to complicate administration seriously and to discourage otherwise feasible development of a natural resource, the public welfare is not being served. Under such circumstances the reasonableness of the early diversions, with their small pumping lifts, may be justifiably challenged.³²

³² "If the doctrine of appropriation is to accomplish the desired end of making full use of the ground-water resources of the state, it must be recognized that some lowering

The appropriative right is essentially an exclusive right. However, at least in a physical sense, uses of water from a common ground-water supply are necessarily correlative, and the recent ground-water administrative statutes are intended to provide for orderly development in the interest of complete utilization. It is perhaps unfortunate that in respect to relative rights in methods of diversion, they are incomplete. The character of administration may have a bearing upon the judicial decisions in controversies which are likely to arise over this feature, as among those who make appropriations under the statutes. The circumstances are not altogether the same as those surrounding the nonstatutory appropriation of ground water. And as reasonableness of the method of diversion bears such a close relationship to utilization of the entire safe yield of a ground-water basin, these factors as well as the public-welfare objective of the statutes are worthy of consideration in arriving at a determination of reasonableness.

of the water table or of the artesian pressure is a reasonable result of a reasonable method of diversion (pumping) of the water, and should not constitute a basis of damages." Thompson and Fiedler, *op. cit. supra* note 31, at 1075.

"If the future decisions should hold that rights to divert and use water from ground-water bodies include the right to maintenance of the elevation of the water in the wells through which such water is diverted, it would be a severe blow to the interest of conservation and highest utilization of such supplies. There is a great need for clarification of this phase of ground-water law." Baker, *Analysis of Legal Concepts of Subflow and Percolating Waters* (1940) 66 AMER. SOC. CIV. ENG., PROC. 378, 380, discussing Tolman and Stipp's paper, *loc. cit. supra* note 31.