THE ECONOMIC EFFECTS OF THE KANSAS WATER APPROPRIATION ACT

by

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PREFACE

Access to and use of water is now a major resource problem in the United States and will likely become more important in the future. Water demands in Kansas are increasing and water scarcities are imminent or present in some places. The older water laws had been found wanting, and in 1945 Kansas undertook large-scale modification in its water rights laws. The Kansas water rights law of 1945 replaced the common-law doctrines of water rights with the appropriation doctrine. Kansas is one of the few states which fully recognizes the inter-relatedness of ground and surface water and applies the appropriation doctrine to both. The state has a diversity of water supply conditions which provide an excellent testing ground for water rights doctrines.

After seventeen years experience with the Kansas law, it is desirable to appraise its economic effects on water allocation and to attempt to foresee what its future effects will be. The appraisal will also provide information which it is believed will be helpful in improving Kansas water resource policy and aid other states which may be considering adoption of the appropriation doctrine.

Special acknowledgment is given Dr. E. S. Bagley of the Department of Economics for his invaluable guidance

and generous counsel in the writing of this thesis, and to the Division of Water Resources, State Board of Agriculture for its assistance in the review of water right records and in the interpretation of the law.

I. INTRODUCTION

The primary question to which an answer is sought in a study of the economic effects of a system of property law is whether or not the system leads to the highest level of efficiency in the use of the property. This is an ambitious undertaking and probably cannot be completely successful because it requires that the most efficient uses of the resource be known. It also requires that effects of the property law be distinguishable from other factors that affect the use of the resource.

If the experience during a particular period of time is being evaluated, instead of attempting to ascertain in advance what the effects of a system of property law might be, the advantage of hindsight may be helpful. The task of deciding what the best use of the resource was is probably easier than predicting what it will be. Separating out the effects of the law from other factors may, however, be complicated by the numerous and changing influences actually present during the period under study.

The problem of choosing a system of property law on its economic merits involves another question. Any system probably will fall short of perfection so it is not enough to know, difficult though it may be to discover, how much a particular system has fallen short (or might fall short).

What is wanted is knowledge about which among various possible systems is the best. In a historical study this question becomes one of determining whether or not the particular system in use during that time was better or worse than other systems that might have been employed.

Another factor which must be considered in a historical study is the effect of time lags. The ultimate pattern of resource use which may develop under a particular system of property law may not emerge at once. A considerable period of time may elapse before the working of the law may be fully manifested. This will be influenced by the fact that the law does not, in all probability, represent a "starting from scratch," as it were, but replaces or is grafted on to an existing system whose influence will undoubtedly persist for some time.

It should be noted that economic criteria are not the only criteria of significance in choosing a property law. Economic effects must be weighed against non-economic factors in making the choice. Economic and non-economic objectives may not be entirely compatible. A given system of property law may be superior from an economic standpoint, but inferior from the standpoint of political, social, or other goals. Or two systems, equally satisfactory from an economic point of view, may not be equally suitable in achieving non-economic goals.

The above discussion of some of the conceptual problems in evaluating property law must now be put in the context of

the particular subject of this study, the economic effects of the 1945 Kansas water rights law between the date of enactment in 1945 and 1962.

The following topics are discussed: (1) Development of Kansas water law; (2) Study of the actual uses of water in Kansas during the period 1945-1962; (3) Determining the extent of the influence of the Water Appropriation Act on the allocation of water in Kansas; (4) Ascertaining what would have been the best uses of water in Kansas during the period 1945-1962; (5) Comparison of the experience under the Appropriation Act with what might have been expected had the pre-1945 water law remained in effect; (6) Comparison of the Appropriation Act with other types of water law which might have been adopted in place of the pre-1945 law of water rights; (7) The best system of water law for Kansas.

II. DEVELOPMENT OF KANSAS WATER LAW

The history of water law in Kansas reveals a notable and particularly interesting development. Until 1945 Kansas water law was marked by an adherence to the common-law doctrine of riparian rights on the part of the Kansas Supreme Court, while the legislature and the state administrative groups attempted to get recognition of the doctrine of prior appropriation.[1] Finally in 1945 the legislature passed the Kansas Water Appropriation Act and in 1949 the Kansas Supreme Court upheld the constitutionality of this legislation.

A review of the legislative acts and court decisions pertaining to surface and ground water should lead to a more complete understanding of present water law in Kansas.

Surface Water

Surface water is ordinarily defined as "that which is derived from falling rain or melting snow, or which rises to the surface in springs and is diffused over the surface of the ground, while it remains in such a diffused state or condition."[2] Diffused surface water is therefore

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[1]Richard Pfister, Water Resources and Irrigation (Lawrence, Kansas: The University of Kansas, 1955), p. 30.

[2]The Kansas Water Resources Board, Report on the Laws of Kansas Pertaining to the Beneficial Use of Water, Bulletin Number 3 (Topeka, Kansas: State Printer, 1956), p. 23.

distinguished from stream water or water in watercourses which generally refer to inland streams of a "substantial" existence in time, flowing from a definite source within definite channels to a place of discharge.[1] In this discussion, the term surface water will include stream water so as to distinguish it from ground water. Kansas water rights law developed somewhat differently with respect to domestic, municipal, and industrial use than it did with respect to irrigation use prior to 1945. While Kansas followed the common law with respect to water rights generally, it introduced the doctrine of prior appropriation to irrigation rights; it is interesting to note that the doctrine of riparian rights and prior appropriation have appeared side by side in Kansas.[2]

In the first territorial legislature an act was passed making all of the common law of England not inconsistent with the Constitution of the United States and the Kansas-Nebraska Act the rule of decision in this territory.[3] The Act was reenacted word for word in 1862 after Kansas was a state,[4] and in 1863, the Kansas legislature declared that: "The common law as modified by constitutional and

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[1] "Waters," American Jurisprudence, Vol. LVI, sec. 6, p. 496, cited by The Kansas Water Resources Board, Ibid.

[2] Daniel R. Hopkins, "Surface Water Rights in Kansas," Kansas Law Review, V (May, 1957), p. 584.

[3] Kansas, Territorial Laws (1855), c. 96.

[4] Kansas, Laws (1862), c. 135.

statutory law, judicial decisions, and the conditions and wants of the people, shall remain in force in aid of the General Statutes of this State."[1]

In 1877, the Kansas Supreme Court declared the common law doctrine regarding surface water. In Shamleffer v. Peerless Mill Co.[2] the court said that the riparian landowner "is entitled to a stream of water flowing through his land without diminution or alteration."[3] This right, the court pointed out, is inherent in and connected with property in the land.[4]

In 1881 in Emporia v. Soden,[5] a landmark case, the Supreme Court established and redefined the law respecting surface water rights. In this case the Supreme Court of Kansas used the "reasonable use" doctrine to modify the previously announced doctrine of undiminished flow. The court stated that a riparian owner is entitled to the reasonable use of water for his own purposes even though such use might diminish the flow of the stream to the lower riparian owner.[6] In several later cases the court reaffirmed the "reasonable use" rule applied to surface water

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[1]Kansas, General Statutes (1949), 77-109.

[2]18 Kansas Reports 24 (1877).

[3]Ibid., p. 31.

[4]Hopkins, op. cit., p. 585.

[5]25 Kan. 588 (1881).

[6]Hopkins, op. cit., p. 586.

and further defined the law.[1] The principles set out in these cases, except where modified by statutory law, are the law in Kansas today. Statutory enactment with respect to domestic, municipal, and industrial use did not change the common law of reasonable use to any great extent before the Water Appropriation Act of 1945.[2]

Irrigation use. - The Kansas legislature recognized early the need to adopt a different set of rules for irrigation use. Most of the western states had adopted the law of prior appropriation as to all beneficial uses of surface water.[3] Thus, in 1886 the Kansas legislature declared that: "The right to the use of running water flowing in a stream in this state, for the purposes of irrigation may be acquired by appropriation. As between appropriators, the first in time is first in right."[4] In 1891, the legislature declared that: "In all portions of the state of Kansas situated west of the ninety-ninth meridian, all natural waters . . . shall be devoted first, to purposes of irrigation in aid of agriculture, subject to

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[1]Campbell v. Grimes, 62 Kan. 503 (1901); Wallace v. Winfield, 96 Kan. 35 (1915); Atchison Topeka and Santa Fe Ry. v. Shriver, 101 Kan. 257-258 (1917); Durkie v. Bourbon County Commissioners, 142 Kan. 690 (1935); State, ex rel. v. Kansas State Board of Agriculture, 158 Kan. 603 (1944); Heise v. Schulz, 167 Kan. 35 (1949); Weaver v. Beech Aircraft Corporation, 180 Kan. 224 (1956).

[2]Hopkins, op. cit., p. 588.

[3]Ibid.

[4]Kansas, Sessions Laws (1886), c. 115.

ordinary domestic use . . . "[1] The latter part of the statute was repealed in 1945.[2] The same Act went on to make specific provisions for the construction and maintenance of irrigation canals and reservoirs, the formation of irrigation companies and districts and the use and sale of water for irrigation. Much of the Act still remains in our statute books today.[3]

Clark v. Allaman[4] was an early landmark case with respect to irrigation and water rights in general. The court rejected the proposition that the doctrine of prior appropriation could be the law in the western part of the state while the common-law principle of "reasonable use" could control in the eastern portion, declaring the common law existed in the state of Kansas. The decision in effect declared that although the statute of prior appropriation and reasonable use could exist side by side in the same state, the common-law doctrine of "reasonable use" controlled throughout the state.[5] In Frizell v. Bindley[6] the court held that prior to 1886, when the statute of prior appropriation was enacted, all of the land had passed out of

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[1]Kansas, Sessions Laws (1891), c. 133.

[2]Hopkins, op. cit., p. 589.

[3]Ibid.

[4]71 Kan. 206 (1905).

[5]Hopkins, op. cit., p. 593.

[6]144 Kan. 84 (1936).

the public domain into private ownership and that the rights of the landowners with respect to their riparian rights had attached to the land prior to the passage of the statute, which rights could not be divested without compensation. The court held that even though the statute of 1886, providing for prior appropriation, had been complied with by the irrigators, since the land had been patented prior to the enactment of the statute, the riparian rights of adjoining landowners had attached and could not be divested by a later statutory enactment.[1]

Before 1945, the legislature passed several acts by which it desired to bring some order into the diversion and appropriation of water. In 1895 a State Board of Irrigation, Survey and Experiment was created, whose duty was to construct irrigation wells and pumping plants for experimental purposes and generally to study water supplies.[2] In 1917 the Kansas Water Commission was created "for the purpose of investigating and controlling the problems of flood prevention, drainage, domestic water supply, water power, navigation, and irrigation in the state of Kansas."[3] Priorities for beneficial use were given in the following order: domestic, transportation, water supply, irrigation, industrial uses and water power.[4] In 1927 the Division of Water

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[1]Hopkins, op. cit., p. 593.

[2]Kansas, Sessions Laws (1895), c. 162.

[3]Kansas, Sessions Laws (1917), c. 172.

[4]Hopkins, op. cit., p. 592.

Resources of the State Board of Agriculture was created to take over the duties of the Kansas Water Commission.[1] And in 1933 the duties of the chief engineer were expanded to include administration of court decrees pertaining to the diversion of water from streams for the purpose of irrigation.[2] However, in 1944 in State, ex rel v. Board of Agriculture[3] the court held that the chief engineer had no power to determine or to fix priorities of appropriation as between users of water.[4] This decision created a chaotic condition in Kansas statutory controls of water use.

Appropriation act applied to surface water. - Shortly after this decision was handed down, the governor appointed a committee to investigate the water law of the state and to report its findings and recommendations. After a careful study of Kansas statutes and judicial decisions and those existing in the other western states, the committee submitted its report in December, 1944.[5] It noted that legislative attempts to establish methods for the appropriation and the use of water in preference to the common-law rules had been ineffective and that Kansas alone among

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[1]Kansas, Sessions Laws (1927), c. 293.

[2]Kansas, Sessions Laws (1933), c. 206.

[3]158 Kan. 603 (1944).

[4]Hopkins, op. cit., p. 592.

[5]State Board of Agriculture, Laws Governing the Appropriation of Water for Beneficial Purposes, a Report to the Governor on Historic, Physical and Legal Aspects of the Problem in Kansas (Topeka, Kansas: State Printer, 1944).

the western states, was without effective statutory procedures for the appropriation of water. The committee pointed out the changing needs of the state and commented that the reasons for an early adoption of the common-law rules had diminished in importance and had been replaced by more urgent needs. The committee also noted that the use of water for navigation, milling, and water-power purposes had constantly declined but the use of both surface and ground water was also emphasized along with the need for a single system of water rights applicable to both surface and ground water. The committee submitted a proposed act to establish the right of prior appropriation and administrative control over the appropriation of the state's water resources. The Kansas legislature recognized the needs expressed by the Governor's committee,[1] and the proposed act, with some modifications, became a part of the law of this state on June 28, 1945.[2]

The purpose of the Act was to strengthen the appropriation doctrine in Kansas, and to reduce the advantage of location of lands riparian to surface streams and overlying ground waters as against appropriations of water for beneficial use on nonriparian and nonoverlying land.[3]

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[1]Pfister, op. cit., pp. 34-35.

[2]Kansas, Laws (1945), c. 390, sec. 1-24, now appearing in Kansas, General Statutes (1957), 82a-701 to 722.

[3]Wells A. Hutchins, The Kansas Law of Water Rights (Topeka, Kansas: State Printer, 1957), p. 45.

In substance the Act provides for the recognition of existing uses as vested rights and then invokes the doctrine of prior appropriation for water uses as of the date of the Act. Three cases have upheld the constitutionality of the Act[1] and one of these, State, ex rel v. Knapp[2] deals with surface water.

In the Knapp case, the plaintiff challenged the constitutionality of the 1945 Water Appropriation Act on the ground that proposed diversions by the defendant irrigation district from the Republican River would infringe upon the rights of the owners of riparian lands lying in and downstream from the district. The application by the irrigation district to the chief engineer of the Water Resources Division for a permit to divert and appropriate water from the river had been approved after notice and hearing from which no appeal had been taken. The principal question submitted for determination was whether the 1945 Water Appropriation Act was unconstitutional as a taking of pre-existing vested riparian rights of downstream owners. As stated previously, in Clark v. Allaman the court had held that although the doctrine of prior appropriation and the doctrine of "reasonable use" could exist side by side in the same state, the common-law doctrine of

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[1] State, ex rel, Emery v. Knapp, 167 Kan. 546 (1949); Baumann v. Smrha, 145 Fed. Supp. 617 (1956); Williams v. City of Wichita, 190 Kan. 317 (1962).

[2] 167 Kan. 546 (1949).

"reasonable use" controlled throughout the state. And in Frizell v. Bindley, the court held that even though the statute of 1886, providing for prior appropriations, had been complied with by the irrigators, since the land had been patented prior to the enactment of the statute, the riparian rights of the adjoining landowners had attached and could not be divested by a later statutory enactment.

By the Knapp decision, however, the court apparently recognized a distinct departure from the rule previously announced. The court stated that no owner has a vested right in the prior decisions of a court.[1] It further recognized the fact that the legislature has the right to change the law so long as it affords protection to previously existing vested rights. Therefore, it would appear that by statutory enactment and by decision of the Kansas Supreme Court, the doctrine of prior appropriation has effectively become part of the law of the beneficial use of water. Pre-existing rights must be recognized, and those having common-law rights must be compensated for any damage by reason of the loss of those rights.[2]

In 1957, the Kansas Water Resources Board made an exhaustive report to the Kansas Legislature, which included extensive recommendations for amendment of the 1945 Water Appropriation Act. These recommendations were enacted and

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[1]Hopkins, op. cit., p. 593.

[2]Ibid., pp. 593-594.

became law on June 29, 1957.[1] Although certain provisions of the 1945 Act were amended, supplemented, and original sections expressly repealed, the 1957 enactment did not change the basic outline and foundation of the 1945 Act, but instead served to clarify, bolster, supplement, and extend areas in which practical deficiencies had been found to exist.[2]

Inter-state compacts. - A relevant part of the surface water law in Kansas pertains to Inter-state Compacts. The waters of the Arkansas River which flows from Colorado into Kansas were the subject of controversy between the two states throughout most of the first half of this century, until the states settled their differences in an inter-state compact in 1949.[3] Constitutional recognition of the doctrine of prior appropriation[4] and dry weather led to a great increase in irrigation in Colorado during the late 1880's. As more and more appropriators diverted water from the river in Colorado, the already variable stream flow became even less dependable in Kansas. Attempting to alleviate the problem, Kansas brought suit against Colorado in 1901, claiming to be entitled to the full and natural

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[1]Kansas, Laws (1957), c. 539.

[2]Earl B. Shurtz, Amicus Curiae Brief Number 41,077 (Topeka, Kansas: State Printer, n.d.), pp. 84-85.

[3]Hutchins, op. cit., p. 60.

[4]Colorado, Constitution, Art. 26, secs. 55-56.

flow of the water of the Arkansas River in its regular place, at its normal height, and in its natural volume.[1] Although the U. S. Supreme Court overruled a demurrer by Colorado, it was necessary to forebear proceedings until all facts were before the court.[2]

A second Kansas suit reached the Supreme Court in 1907. The Court found that Colorado's diversion of waters of the Arkansas River for irrigation purposes did diminish the volume of water flowing into Kansas, but it did not destroy the entire flow. The benefit to Colorado in the reclamation of arid lands had been great and should be sustained if possible. While Kansas had suffered from this diminished flow, the loss was not so great as to make Colorado's appropriation an inequitable apportionment between the two states. The suit was dismissed without prejudice to the right of Kansas to begin new proceedings in the event of a material increase in the depletion of water by Colorado and injury to substantial interests in Kansas.[3]

Finally, in 1943 Colorado filed a bill in equity against Kansas to protect the right of Colorado and its citizens to the beneficial use of water from the Arkansas River. The Supreme Court refused to make a definite

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[1]Pfister, op. cit., p. 30.

[2]Kansas v. Colorado, 185 U. S. 125 (1901).

[3]Kansas v. Colorado, 206 U. S. 46 (1907).

apportionment of the stream flow, pointing out that disputes of this nature were extremely complicated and could best be handled by expert administration rather than a judicial imposition forming a hard and fast rule. The Court did, however, enjoin further actions by users in Kansas to obtain an adjudication of priorities as between Kansas users and Colorado users.[1]

After this long period of litigation, cooperative effort on the part of Kansas, Colorado, and the federal government made possible the formation of the Arkansas River Compact. This compact was approved by both states in December, 1948, and was ratified by Congress and approved by the President in 1949. The main purposes of the compact were to settle existing disputes, and remove the cause of future controversies concerning the water of the Arkansas River and to apportion equitably those waters between the two states as well as the benefits to be obtained from the John Martin Reservoir Project in Colorado.[2] The waters of that reservoir (for flood control and irrigation purposes) and of the river are divided between the states on the basis of 60% to Colorado and 40% to Kansas. The compact is administered by a commission composed of the chief officer of each state having administration of the water laws of the state and two additional representatives from each state appointed by each Governor for

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[1] Colorado v. Kansas, 320 U. S. 383 (1943).

[2] Pfister, op. cit., pp. 44-45.

specified terms. The Commission is presided over by a representative without vote appointed by the President of the United States.[1]

Thus far the administration of the compact has worked very well and has provided water for irrigation purposes which otherwise would not have been available. The Republican River Compact between the states of Colorado, Kansas, and Nebraska entered into in 1942 was approved by the Kansas Legislature in 1943.[2]

The Kansas Supreme Court in upholding the validity of the 1945 water appropriation statute, mentioned that all of the improvements that were being made or planned for the beneficial use of water of the Republican River were authorized by acts of Congress and the Republican River Compact, "both of which are binding upon the state and all citizens or owners of property within the state."[3]

Ground Water

There has been much disagreement and confusion in the definition of ground water. Although many simply refer to ground water as those waters that lie below the surface of the earth, the courts have usually divided ground water into two classes: (1) underground streams, and (2)

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[1]Hopkins, op. cit., pp. 594-595.

[2]Ibid.

[3]State, ex rel. Emery v. Knapp, 167 Kan. 546, 555 (1949), cited by Hutchins, op. cit., p. 61.

percolating water.[1] Many hydrologists, however, have the view that all waters contained in the "zone of saturation" should be classified as ground water.[2]

Underground streams are seldom encountered. Many definitions have recognized the classification, but rulings that subsurface waters are percolating are definitely in the majority.[3]

Percolating ground waters are those that ooze, seep, filter, or percolate through the ground under the surface without a definite channel.[4] The fact that such water eventually moves in a single general direction and finally reaches a river does not destroy their percolating character. The presumption, except in Colorado, is that all subsurface waters are percolating unless proven to the contrary. Such proof is difficult to produce as it is usually necessary to have visible surface indications of underground water.[5]

While there is disagreement, we may accept the factual premise that all ground waters in Kansas are percolating. There is no instance in which a court in Kansas has

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[1]Beneficial Use of Water, op. cit., p. 23.

[2]Pfister, op. cit., p. 28.

[3]Robert B. Morton, "Ground Water Rights in Kansas," Kansas Law Review, V (May, 1957), p. 597.

[4]Beneficial Use of Water, op. cit., p. 24.

[5]Morton, op. cit., p. 597.

found that an underground stream actually existed.[1] The Kansas Supreme Court held in an interstate case involving the Arkansas River, that evidence of an alleged underflow of the river did not warrant a finding that the subsurface water constituted a second and separate stream.[2] In the Court's opinion, the surface and subterranean flows constituted one stream.[3]

Artesian basins and underground lakes and reservoirs have been classed as percolating waters by authority.[4] Artesian waters are those under sufficient pressure to rise above their zone of saturation.[5]

The distinction between subsurface streams and percolating waters is important because they are governed by different rules of law.[6]

In questions concerning the diversion of ground waters where the underground stream was known or could be ascertained, the courts have applied rules pertaining to surface streams. If the presence of an underground stream was unknown or unascertainable, they have applied rules that are used for percolating waters.[7]

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[1] Ibid.

[2] Kansas v. Colorado 206 U. S. 46, 114-115 (1907).

[3] Hutchins, op. cit., p. 72.

[4] Beneficial Use of Water, op. cit., p. 23.

[5] Morton, op. cit., p. 597.

[6] Ibid.

[7] Beneficial Use of Water, op. cit., p. 23.

The Kansas Water Appropriation Act of 1945 recognizes the pre-1945 ground water rights and liabilities, thus requiring a review of the legal principles applicable to ground water in Kansas before 1945.[1]

Only in a few cases has the Kansas Supreme Court dealt with percolating waters. The courts of Kansas, prior to the judicial construction of the 1945 legislation, accepted the rule that percolating water belongs to the owner of the land in which the water is found.[2] An exception was noted in a case in which water was being abstracted from a gravel stratum shown to have been connected with a watercourse to the injury of owners of land riparian to the watercourse[3]--in Emporia v. Soden (1881)[4] where the court noted that inasmuch as the water entered the well only by percolation through the soil the law ordinarily permits no inquiry into the source of supply or other effect of such percolation upon the amount of water in any other tract of land because of the impossibility of proving with reasonable certainty the source of supply of percolating waters. But here a different result was indicated as it was equally as wrong to use a well to indirectly divert water from a stream as to do it directly.

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[1]Morton, op. cit., p. 598.

[2]Jobling v. Tuttle, 75 Kan. 351 (1907).

[3]Hutchins, op. cit., p. 69.

[4]25 Kan. 588 (1881).

The finding was that the city of Emporia should compensate Soden for the destruction or diminution of his water supply.

Thus, the only case in Kansas directly involving diversion of percolating water approved the English or Common-Law Rule, but, under the circumstances held the diverter legally responsible. According to Morton, the opinion seems to indicate that if the situation had been one involving the diminution of percolating water under adjoining land, the court would have followed the common-law rule and held the diverter free from any liability.[1]

The Supreme Court noted in 1911 that while the earlier decisions in various jurisdictions had laid down the general rule of absolute right in percolating water the trend of recent cases had been away from that view and in favor of confining each landowner to a reasonable use of water.[2] However, in State ex rel. v. Board of Agriculture (1944)[3] involving whether the then existing statutes gave authority to the Division of Water Resources to regulate the taking of subterranean waters for beneficial purposes and allot the same among such users, the court indirectly dealt with ground waters and cited the Soden Case with approval. Previously in Clark v. Allaman[4] the court had

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[1]Morton, op. cit., p. 599.

[2]Gilmore v. Royal Salt Co., 84 Kan. 729 (1911).

[3]158 Kan. 603 (1944).

[4]71 Kan. 206 (1905).

carefully reviewed the extent to which the common law of England was applicable in Kansas, and concluded that those common-law rules relating to riparian rights were the law of Kansas.[1]

The American rule of "reasonable use" arose out of dissatisfaction with the common-law rule.[2] Under the English or common-law rule of "absolute ownership" percolating ground water is a part of the land through which it moves. As the proprietor owns the gravel, rocks, clay that are in and part of his land, so too, under the rule, he owns the water that is in and part of his land.[3] This ownership entitles the proprietor to withdraw limitless amounts of percolating water from his land without incurring liability to a neighbor who might sustain substantial damages as a result of the withdrawals.[4]

The "reasonable use" rule sanctions an overlying landowner's capture of waters percolating through his lands for beneficial use to the extent reasonably necessary for the improvement of, or use upon, his lands even though such capture results in the draining of his neighbor's lands.[5]

[1]Morton, op. cit., p. 600.

[2]Pfister, op. cit., p. 29.

[3]29 American Law Review 2d 1354 (1953).

[4]The Kansas Water Resources Board, Report on the Laws of Kansas Pertaining to Ground Water (Topeka, Kansas: State Printer, 1957), p. 19.

[5]Kinney, Irrigation and Water Rights, Vol. II, sec. 1192 (2d ed. 1912), cited by The Kansas Water Resources Board, Ibid., p. 22.

Under this rule, however, the landowner may neither waste water nor transport it for distant uses away from his lands when such uses would deprive another overlying owner of water for reasonable use on his lands.[1]

According to Morton, it has been argued that some statements in State ex rel. v. Board of Agriculture[2] show that the "reasonable use" rule was considered as being applicable to percolating waters. In that case, the court observed that the facts indicated that the use of the water in question (percolating ground water) was in agreement with common-law principles, in that those desiring water had contracted for the right to obtain it and had used it as the owner of the land might use it. Thus we find no absolute certainty as to the application of the "reasonable use" rule to percolating waters in Kansas under the decisions of the Kansas Supreme Court. It is seen that prior to the enactment of the Kansas Appropriation Act of 1945, no Kansas case had ever directly held the "reasonable use" doctrine applicable to percolating ground water.[3]

Appropriation act applied to ground water. - On June 28, 1945, the Kansas Water Appropriation Act[4] became effective. Up to that time the Kansas Supreme Court had

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[1]Ground Water, Ibid.

[2]158 Kan. 603 (1944).

[3]Morton, op. cit., p. 601.

[4]Kansas, General Statutes (1949), 82a-701 to 722.

applied the "reasonable use" rule to surface flows and the common-law rule as to ground waters. The Act, however, applies the same rule of law--the doctrine of prior appropriation--for both surface and ground waters. Such treatment is consistent with hydrological realities. Morton states two conclusions as to the law regarding ground water in Kansas prior to 1945; in the absence of malice:

> 1) Users of ground water had no legal right to complain of the diminishment of the subterranean supply underlying their lands through the extraction of waters from the common source by adjoining or neighboring landowners, and
> 2) Users of ground water had the corresponding right to utilize from their own lands all the water they desired and were capable of extracting without any regard to resulting diminishment of the source of supply available to adjoining and neighboring landowners.[1]

Several old statutory provisions relating to ground waters were in effect prior to the legislation of 1945, but their construction was open to serious question. In addition, a statute providing that either surface or ground waters might be appropriated upon application to the Division of Water Resources was construed by the Kansas Supreme Court as not to authorize the state division to interfere with the use and consumption of ground water or to conduct a hearing upon the application of anyone desiring to use such waters.[2]

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[1] Morton, op. cit., p. 602.

[2] State ex rel. Peterson v. State Board of Agriculture, 158 Kan. 603, 610-614 (1944), cited by Hutchins, op. cit., p. 70.

Under the 1945 Act ground water is incapable of ownership until it is extracted. It is part of the land only so long as it is in it. Ground water is migratory in nature and after it has moved on, in, and to adjoining lands it becomes subject to the control of someone else.[1]

A considerable amount of litigation has occurred on questions involving vested rights as they apply to ground water. The validity of the 1945 statute was sustained by the Kansas Supreme Court in an action in the nature of quo warranto, in which the questions submitted to the court for determination included the effect of the legislation on riparian rights of land in the Republican River area, but without specifically mentioning ground water rights.[2] However, the court made no distinction between surface and ground waters.

The most important of these cases is Baumann v. Smrha.[3] The court held that a state had the power to depart from the common-law doctrine of riparian rights and establish the doctrine of prior appropriation and application to beneficial use. The court also stated that any such modification or change in the law must recognize valid existing vested rights. Then the court said: " . . . but we do not

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[1] Scurlock, "Constitutionality of Water Rights Regulation," Kansas Law Review, I (1953), pp. 125, 298, 300, cited by Morton, op. cit., p. 603.

[2] State ex rel. Emery v. Knapp, 167 Kan. 546, 555-556 (1949).

[3] 145 Fed. Sup. 617 (1956).

regard a landowner as having a vested right in underground waters underlying his land which he has not appropriated and applied to beneficial use." This was the first unmistakable holding that mere ownership of land does not carry with it any ownership of vested rights to underlying waters not actually diverted and applied to beneficial use. It was upon a recognition of that principle that the court based its affirmance of the constitutionality of the Kansas Act.[1] Such a holding obviously was not in harmony with some of the earlier decisions of the Kansas Supreme Court, such as State ex rel. v. Board of Agriculture but as the federal court noted, "it is cognizant with the latest decision of the Supreme Court of Kansas in State ex rel. v. Knapp which must be regarded as having overruled the earlier cases."[2]

As in the case of surface waters ground water appropriations first in time are first in right, and the priority of the appropriation dates from the time of the filing of the application. It is interesting to note that it is perfectly lawful to extract ground water without obtaining any appropriation permit. However, these users, desiring not to come under the protection of the Act, are subject to the risk of injunction if their usage violates or impairs rights recognized or granted under the Act.[3] Under

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[1]145 Fed. Sup. 625 (1956).

[2]Ibid.

[3]Kansas, General Statutes (1949), 82a-705.

the common law, no prescriptive or adverse user right could be acquired as to percolating water.[1] The 1957 amendment to the Appropriation Act provides that thereafter no water rights of any kind may be acquired solely by adverse use, by adverse possession, or by estoppel.[2]

The most recent decision of the Kansas Supreme Court dealing with ground water pertains to the Equus beds in Harvey County, Kansas. In Williams v. City of Wichita (September, 1962)[3] the court reaffirmed the constitutionality of the Kansas Water Appropriation Act of 1945 and further established the Division of Water Resources as the controlling agency in establishing water rights throughout the state. As to ground water specifically it stated: "The ownership of land does not carry with it any ownership of vested rights to underlying ground water not actually diverted and applied to beneficial use." The opinion left the way open for injured landowners to seek damages in cases where it could be shown that heavy pumping of water had destroyed land values and crop yields. In support of his claim for injunctive relief, the plaintiff had alleged that the pumping of the wells would divert subterranean water from under his land resulting in his irreparable injury, and that he had no remedy at law by which the

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[1] 55 American Law Review, Annotated 1385, 1441 (1928); Morton, op. cit., p. 610.

[2] Kansas, General Statutes (Supplement, 1957), 82a-705.

[3] 190 Kansas 317 (1962).

damage could be adequately recovered.

An appeal of this case to the U. S. Supreme Court was dismissed and a rehearing denied (October 15, 1963).[1] The Kansas Attorney General, William Ferguson, said the court decision in the Williams case should write an end to the controversy over the Kansas Water Appropriation Act's constitutionality.

In concluding this chapter let us summarize the historical development of Kansas water law. Until the turn of the century surface water was subject to the common-law "natural flow" doctrine; subsequently the courts applied the "reasonable use" rule. During this entire period the common-law doctrine of "absolute ownership" controlled ground water rights. Both surface and ground water became subject to the appropriation doctrine when the Kansas Water Appropriation Act became effective in 1945.

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[1] 32 Law Week, appeal dismissed 3135, rehearing denied 3205; Kan. 132 (October 15, 1963).

III. STUDY OF THE ACTUAL USES OF WATER IN KANSAS DURING THE PERIOD 1945-1962

Let us begin our analysis of the actual uses of water in Kansas between the years 1945 and 1962 with a discussion of vested and appropriation rights as they exist today within the state.[1] Persons making beneficial use of water as of June 28, 1945, the date when the appropriation doctrine became effective in Kansas, were not deprived of their common-law rights to continue that use. Provision was made for the chief engineer to determine all such rights and to issue vested right permits.[2] The law exempts persons who use water for domestic uses from the necessity of obtaining the approval of the chief engineer in order to acquire an appropriation right.[3] The task of determining vested right users was substantially completed by the Division of Water Resources about 1956, although there may be some other undiscovered users entitled to vested rights. Table 1 shows that as of October 26, 1962, 2,143 vested rights had been determined, 141 abandoned and terminated,

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[1]Other aspects of vested and appropriation rights will be discussed in Chapter IV.

[2]Marcene Grimes, Government and Natural Resources in Kansas: Water (Lawrence, Kansas: Government Research Center, University of Kansas, 1957), p. 41.

[3]Kansas, General Statutes (Supplement, 1957), 82a-705a.

TABLE 1. SUMMARY OF ADMINISTRATIVE ACTIONS CONCERNING WATER RIGHTS[1]

VESTED RIGHTS

Determined-2143 Abandoned & Terminated-141 Active-2002

APPLICATIONS FOR PERMIT TO APPROPRIATE WATER

Year	Applications Filed	*Pending	*Not Approved	*Applications Approved & Permits Issued 1+2+3+4	*Approp. Rights Perfected 1+2	*Abandoned & Terminated Permits 3	*Abandoned & Terminated Approp. Rights 1	*Active Permits 4	*Active Approp. Rights 2	*Cert. Issued
1945[2]	49	0	17	32	11	18	4	3	7	8
1945[3]	21	0	5	16	15	1	1	0	14	0
1946[4]	92	0	15	77	54	23	1	0	53	0
1947	117	0	14	103	65	37	0	1	65	1
1948	223	0	22	201	152	45	2	4	150	70
1949	87	0	8	79	45	28	0	6	45	35
1950	199	0	13	186	82	92	4	12	78	118
1951	99	0	8	91	60	20	0	11	60	109
1952	262	1	49	212	94	60	1	58	93	0
1953	978	2	131	845	353	261	2	231	351	10
1954	1229	2	156	1071	397	271	1	403	396	7
1955	1659	1	160	1498	421	344	0	733	421	65
1956	1698	5	168	1525	168	227	0	1130	168	175
1957	1108	3	93	1012	69	77	0	866	69	161
1958	298	1	10	287	11	5	0	271	11	152
1959	321	0	2	319	5	9	0	305	5	381
1960	242	0	3	239	4	4	0	231	4	311
1961	309	1	4	304	1	0	0	303	1	307
1962	209	18	5	186	0	0	0	186	0	122
Totals	9200	34	883	8283	2007	1522	16	4754	1991	

*The number shown does not indicate the action taken that year, but shows the action taken on the applications filed during that year indicated.

[1]As of October 26, 1962.

[2]Prior to June 28, 1945.

[3]June 28, 1945, to Dec. 31, 1945.

[4]From Jan. 1 to Dec. 31 of each remaining year.

Source: Division of Water Resources, Kansas State Board of Agriculture.

leaving 2,002 active vested rights.

Thus, the appropriation doctrine in Kansas applies only to those persons, industries, or public agencies desiring to apply water for beneficial purposes after June 28, 1945, and for other than domestic use. When an application is received by the chief engineer, it is dated and this date determines the priority of the right to appropriate water from a designated source.[1] After the application has been approved (constituting a permit to proceed with the perfection of the right) and the appropriator has constructed the works necessary to divert water and after he has actually applied water to the proposed beneficial use, an engineer from the Division of Water Resources tests the works for diversion and determines to what extent an appropriation right has been perfected in conformity with the conditions and limitations set forth in the permit and approval of the application. The chief engineer then issues a certificate of appropriation for beneficial use of water which sets forth the priority of the appropriation right, specifies the quantity of water that may be taken, the maximum rate of diversion authorized, the use to which the water may be put, and describes the land to which the appropriation right is appurtenant. Failure to use the water for the purposes stated during a period of three or more years may result in termination of the permit.

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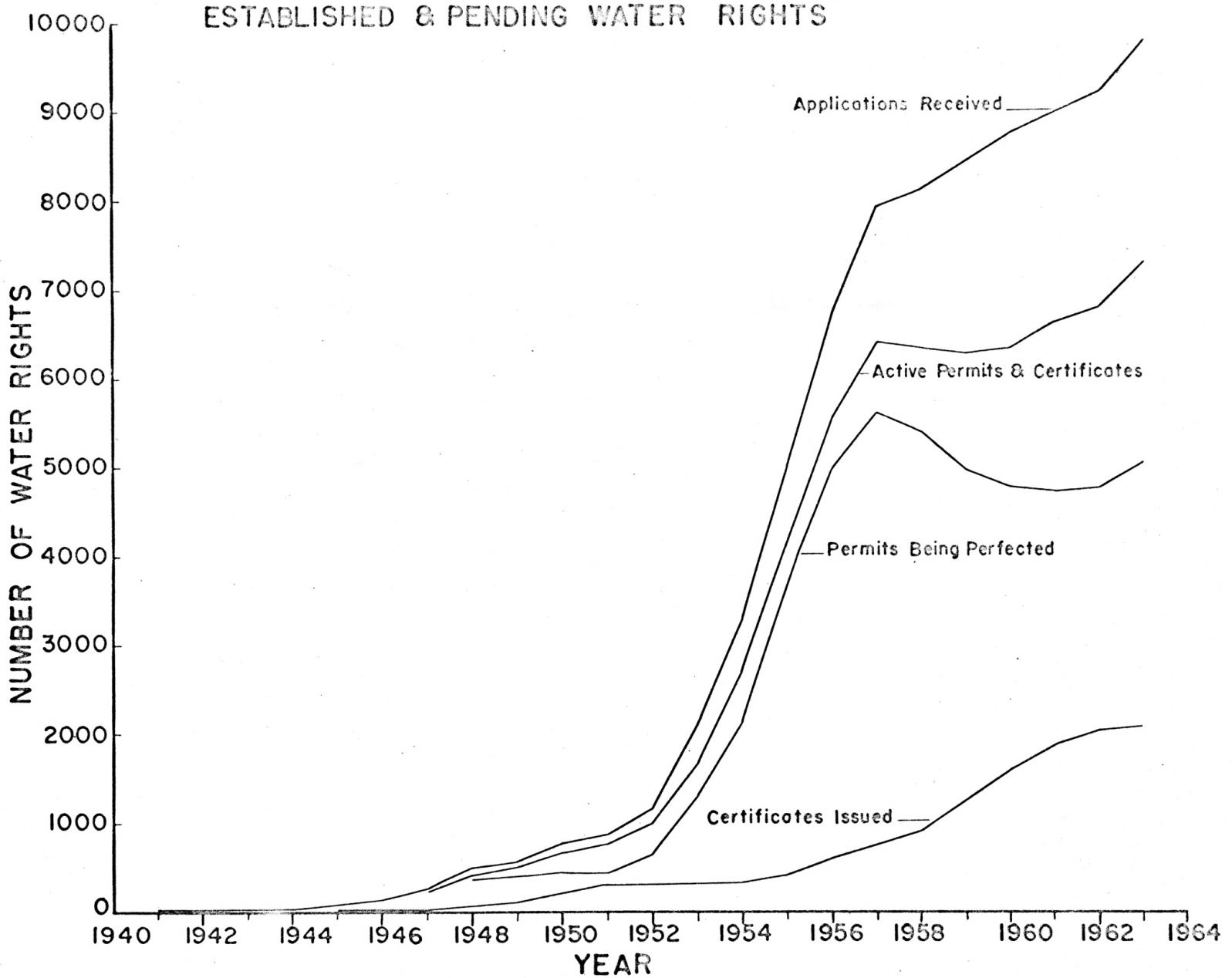
[1] Ibid., pp. 41-42.

An inspection of Table 1 reveals that by far the greatest number of applications were filed during the five year period from January 1, 1953, to December 31, 1957. The probable reason for this may be the period of dry years experienced during this interval and a growing awareness of the Kansas water law by users. A relatively small proportion of applications filed are still under consideration as pending. A larger, but still expectable, number of applications to appropriate water were not approved and other perfected rights abandoned and terminated.

A graph (Fig. 1) showing the growth of established and pending water rights from 1940 to 1963 discloses the same extraordinary rise in the number of applications received, active permits and certificates, and permits being perfected between 1952 and 1957 as shown in Table 1. The number of certificates issued has not increased rapidly, but their rise has been continual. After a general leveling off during the aforementioned period of expansion the number of applications received, active permits and certifications, and permits being perfected began a new marked increase in 1962. The growth of water rights in the future will in all probability continue to be characterized by a leveling off of applications to appropriate water in wet years, and a sharp increase in number when drought threatens.

Uses of the waters of the state are broken down under the Act to include: domestic, municipal, irrigation,

Figure 1



Source: Division of Water Resources, Kansas State Board of Agriculture.

industrial, recreational, and water power. Other uses are not thereby foreclosed, only denied any preference. Table 2 breaks down the total quantity of water used within the state among these various uses (with the exception of domestic use which will be discussed shortly) according to the character of the water rights as of October 1, 1962, and then accumulates these quantities under cumulative headings as to surface and ground waters. The largest amounts of water have been appropriated for irrigation, next for industrial use, third for municipal use, and last for recreational purposes. No water has been appropriated for water power usage. All rights for water power purposes are vested rights. Under vested rights effective as of June 28, 1945, most water was in water power use, then industrial, irrigation, municipal, and lastly recreational use. All uses of water have expanded significantly since 1945, except for water power usage which remained stationary. Irrigation showed by far the largest increase. Surface water usage predominates in industrial, recreational, and water power uses, while ground water is most significant for municipal and irrigation purposes.

A presentation of existing and projected water use in Kansas is found in Table 3. As expected municipal, industrial and irrigation uses of water are expected to rise much more rapidly than water appropriated for domestic or water power purposes.

The gross water supply for Kansas is predominantly

TABLE 2. QUANTITY OF WATER EMPLOYED UNDER VARIOUS USES[1]

QUANTITY OF WATER IN ACRE FEET
Vested Rights

Municipal Use		Irrigation Use		Industrial Use		Recreational Use		Water Power Use	
Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground
96,597	101,023	117,623	270,134	406,915	182,785	12,368	336	2,508,645	0

QUANTITY OF WATER IN ACRE FEET
Certificates of Appropriation

Municipal Use		Irrigation Use		Industrial Use		Recreational Use		Water Power Use	
Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground
641	60,761	34,716	491,243	68,419	37,289	5,680	15	0	0

QUANTITY OF WATER IN ACRE FEET
Permits and Approval of Applications

Municipal Use		Irrigation Use		Industrial Use		Recreational Use		Water Power Use	
Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground
119,983	114,662	485,586	1,414,745	127,127	135,966	65,788	17,517	0	0

QUANTITY OF WATER IN ACRE FEET
Permits & Approval of Applications & Certificates of Appropriation

Municipal Use		Irrigation Use		Industrial Use		Recreational Use		Water Power Use	
Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground
120,624	175,423	520,302	1,905,988	195,546	173,255	71,468	17,532	0	0

QUANTITY OF WATER IN ACRE FEET
Vested Rights & Permits & Approvals & Certificates of Appropriation

Municipal Use		Irrigation Use		Industrial Use		Recreational Use		Water Power Use	
Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground
217,221	276,446	637,925	2,176,122	602,461	356,040	83,836	17,868	2,508,645	0

[1]As of October 1, 1962.

Source: Division of Water Resources, Kansas State Board of Agriculture.

TABLE 3

ESTIMATED WATER USE IN KANSAS

(ACRE FEET PER YEAR)

Name of Unit	Municipal		Industrial		Rural Domestic	
	Present	1975	Present	1975	Present	1975
Marais Des Cygnes	5,500	10,000	(Mun. incl. Indus.)		9,400	9,800
Cimarron Unit	7,587	15,000	2,250	5,625	5,740	5,500
Kansas Unit	55,000	121,500	490,544	Not Est.	22,000	25,000
Lower Arkansas	59,500	105,000	165,000	173,000	11,550	13,600
Walnut Verdigris	11,700	24,400	33,700	44,900	7,250	9,160
Upper Republican	4,820	6,450	1,454	3,000	3,440	3,500
Neosho Unit	15,300	30,000	290,000	440,000	6,900	7,200
Solomon-Saline	7,400	10,400	1,500	3,000	9,300	9,600
Lower Republican	3,200	5,140	3,000	6,000	3,450	3,500
Missouri Unit	5,930	9,500	30,000	Not Est.	3,500	2,500
Upper Arkansas	11,200	22,400	31,800	33,000	6,800	7,200
Smoky Hill Unit	16,300	30,600	41,000	45,000	4,780	5,280
Grand Total	203,437	390,390	1,090,248	1,300,000	94,110	101,840

Name of Unit	Irrigation		Recreation		Water-Power	
	Present	1975	Present	1975	Present	1975
Marais Des Cygnes	1,255	10,500	3,900	-	-	-
Cimarron	359,360	1,048,000	3 state lakes		-	-
Kansas	37,300	112,000	7 state lakes, 2 res.		-	-
Lower Arkansas	88,000	180,000	8 lakes		-	-
Walnut Verdigris	5,500	11,000	6 state lakes, 1 res.		-	-
Upper Republican	50,000	100,000	1,150	2,000	-	-
Neosho	6,000	12,000	5 lakes, 6 res., 2 dams under const.		1,040,000	1,040,000
Solomon-Saline	70,000	184,600	2 res., 0 lakes		-	-
Lower Republican	83,600	246,700	2 lg. res., num. lks.		-	-
Missouri Unit	4,200	12,600	5 lakes, many ponds		-	-
Upper Arkansas	905,000	905,000	54,000	54,000	-	-
Smoky Hill Unit	246,700	343,000	17 surf. structure stor.		-	-
Grand Total	1,856,915	3,165,400			1,040,000	1,040,000

Source: The Kansas Water Resources Board, Kansas Water Plan Studies, Preliminary Appraisal of Kansas Water Problems, Secs. 1-12 (Topeka, Kansas: State Printer, 1958-1962).

the precipitation that falls within the state. To this is added the stream flow into Kansas from adjacent states, and the slow movement of water in some ground water reservoirs that extend across the state boundaries. Kansas' water gain, by precipitation and inflow, is balanced in the long run by losses from the state, chiefly by return to the atmosphere but also by outflow in streams and, to a small degree, by way of ground water reservoirs. The largest percentage of Kansas water supply is used in the production of non-irrigated agricultural crops. Water for this use comes from the soil and is dissipated into the atmosphere mostly by transpiration from growing plants. All other uses of water depend upon surface and ground water. These resources might be called the net water supply, in that they represent the supplies available for appropriation for beneficial use, as permitted by Kansas law.[1]

The average annual inflow of gauged streams entering Kansas is about 1,700,000 acro-feet. The flow of ungauged streams entering Kansas is probably very small by comparison with this total. Compared to the surface-water inflow, the ground water inflow to Kansas is probably small, and only slightly variable from year to year. The average annual outflow of streams leaving Kansas is about 12,100,000 acre-feet. The ground water outflow from the

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[1]The Kansas Water Resources Fact-Finding and Research Committee, Water In Kansas (Topeka, Kansas: State Printer, 1955), p. 13.

state is undoubtedly smaller than the ground water inflow. The total surface storage capacity for Kansas in 1954 was estimated to be in the order of 3,500,000 acre-feet. The total storage in ground water reservoirs in Kansas has been estimated at 200 million acre-feet.[1]

The fresh-water supplies available for appropriation in Kansas are less than the net supplies of surface water and ground water, and far less than the total storage capacities of surface and underground reservoirs, because of limitations on inflow and outflow, limitations of run-off within the state, limitations in storage and limitations as to quality of water. The total consumptive use of water in Kansas for irrigation, municipal, industrial, and domestic uses amounts to only about two per cent of the net water supply.[2] However, total withdrawals could greatly exceed the perennial net water supply as many of the uses for which water is withdrawn are non-consumptive, so that the same water may be used several times while passing through the state.

Figure 2 presents an illustration of the number of vested rights and active applications to appropriate water for irrigation use in Kansas as of October 1, 1962. In nearly all counties there have been more applications in the seventeen year period since the passage of the Act,

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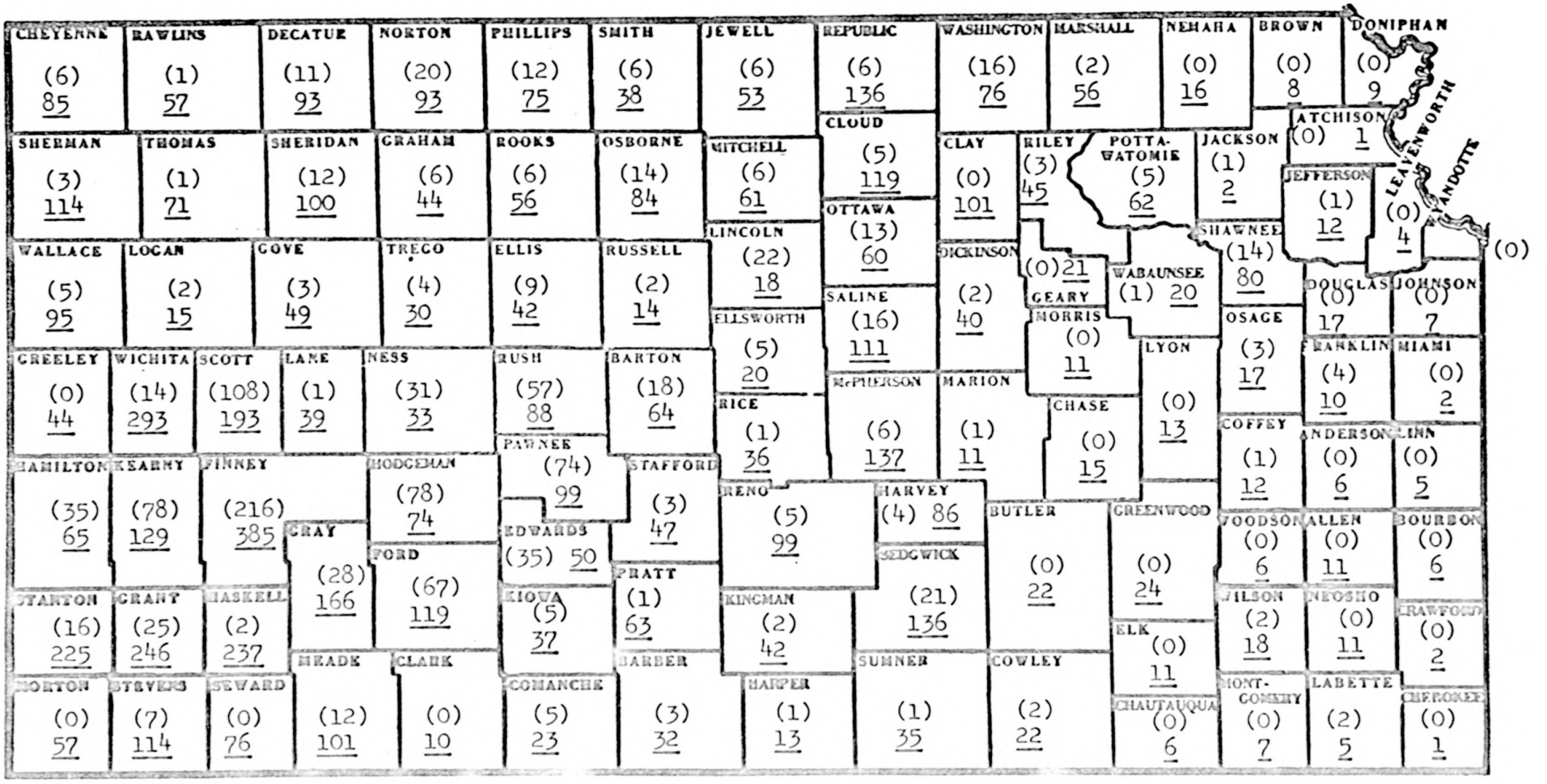
[1] Ibid., pp. 24, 27.

[2] Ibid., p. 30.

Fig. 2. Rights to Irrigation Use of Water in Kansas*



*As of October 31, 1962.

Vested Right (1)
Active Applications to Appropriate 2

Source: Division of Water Resources, Kansas State Board of Agriculture.

than vested rights effective prior to June 28, 1945. The number of applications to appropriate water for irrigation is especially significant in the southwestern part of the state.

The Kansas Water Appropriation Act is defined as use for household purposes, livestock watering, poultry, farm and domestic animals, and lawn and garden watering. Totals of domestic use of water in Kansas are not available, so an estimate of the population having a source of supply to water for domestic purposes and of the quantity of water consumed per person must be derived from primary sources.

Two methods were used to obtain the population estimate for the specific years of interest (primarily 1945 and 1962).[1]

The first method (Method A) was to subtract the municipal population served with water[2] from the state

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[1]The Kansas Water Appropriation Act was passed in 1945; the most recent population figures available were 1962.

[2]The municipal population included figures from the vested right abstracts of the Division of Water Resources: (a) for cities holding a vested municipal right to water in 1945 [379], (b) for those cities served by cities with vested municipal rights in 1945 [6], and with appropriation rights in 1962, (c) for those cities with municipal systems but not listed as having vested municipal rights to water use [3], though they had acquired appropriation rights by 1962, and (d) for those rural water districts considered by the Division of Water Resources as possessing municipal water rights [17 in 1962]. Cities possessing vested municipal water rights in 1945 could add to them certain appropriation rights after the 1945 date of the Act. Cities acquiring appropriation rights for the first time as of 1962 totaled 111.

population total[1] to obtain the estimated population with a domestic source of supply for the years 1945 and 1962. This information is broken down on a county basis and an estimate of the quantity of water consumed per person, expressed in acre-feet per year, is applied to these population totals resulting in a figure for the total quantity of water consumed by the population of each county with a domestic source of supply (Figures 3, 4, and 5). The following are the state totals:

TABLE 4

ESTIMATED POPULATION WITH SELF-SUPPLIED DOMESTIC WATER

(Method A)

Population	(1945)	(1962)
State	1,793,066	2,172,296
Municipal	1,061,619	1,578,321
Domestic	731,447	593,975
	[32,988 Acre-Feet per Year]	[26,788 Acre-Feet per Year]

An estimate of the quantity of water consumed per person in acre-feet per year was found by taking an average of an estimate made by eighteen rural water districts in the state of Kansas as to the total amount of water used by each user per year and dividing this by 3.51, the average

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[1]Kansas State Board of Agriculture, Agricultural Census (Topeka, Kansas: State Printer, 1946 and 1963).

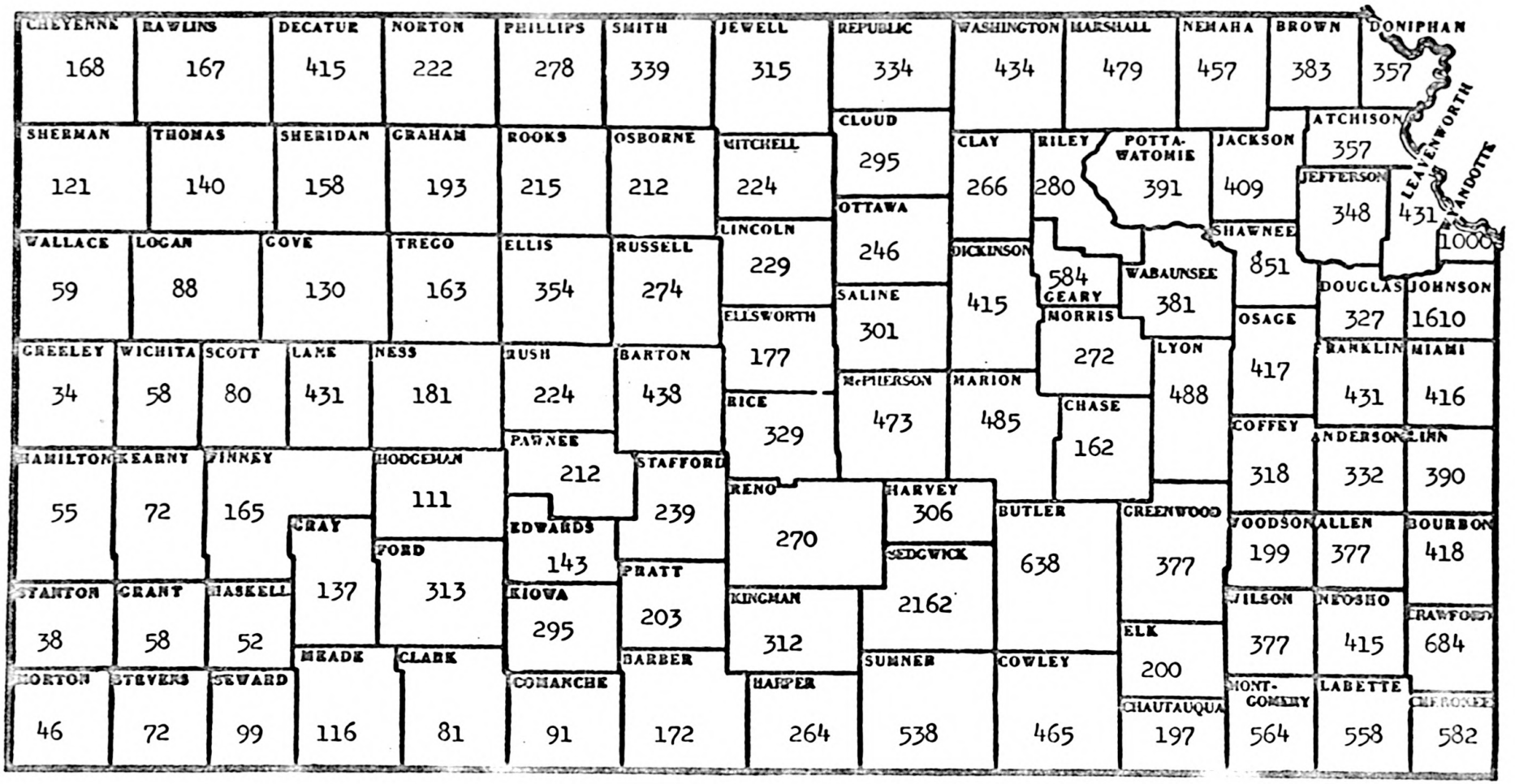

Fig. 3. Estimated Quantity of Self-Supplied Domestic Water per County in 1944
(Method A)

(Acre-Feet per Year)

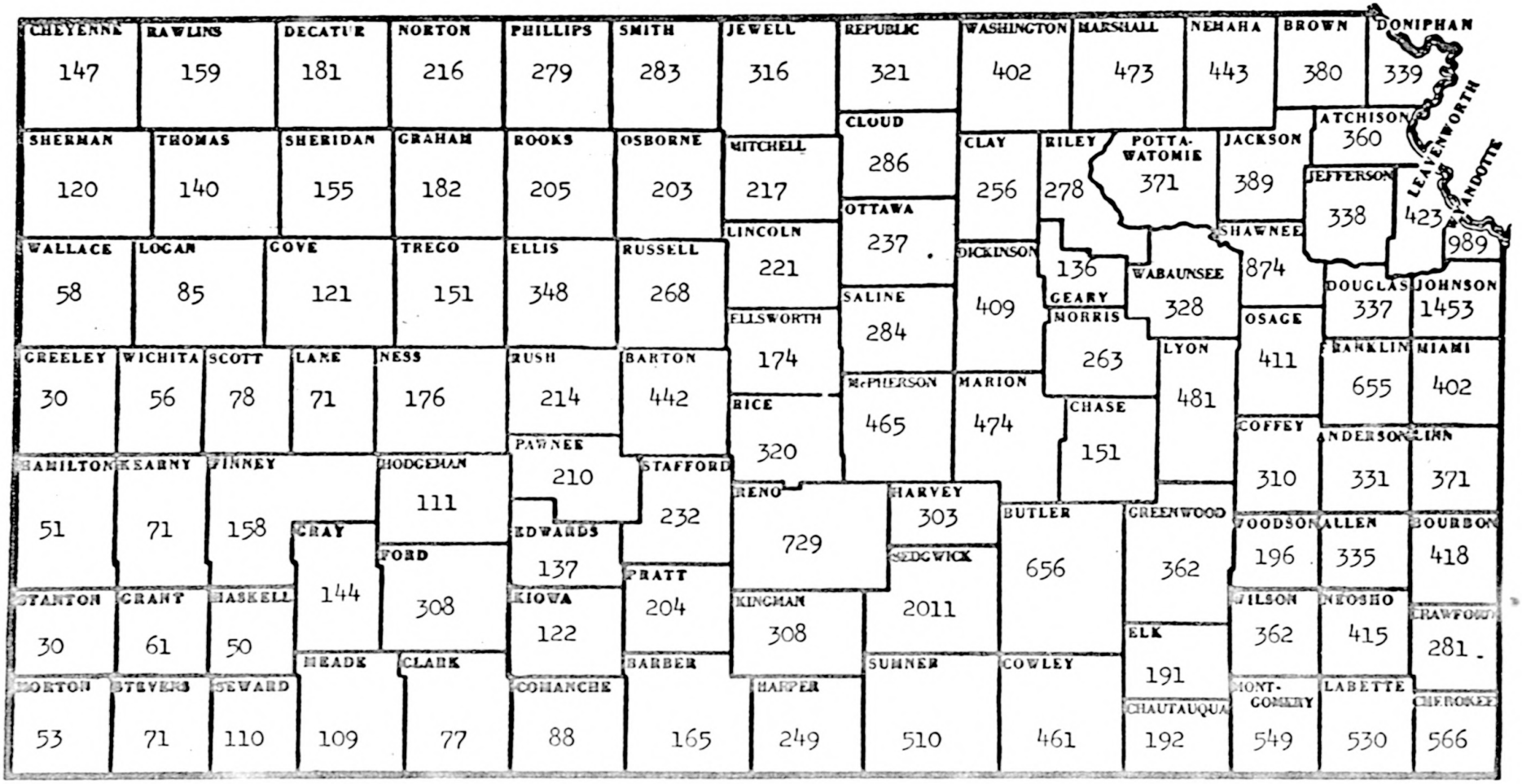

Fig. 4. Estimated Quantity of Self-Supplied Domestic Water Per County in 1945
(Method A)

(Acre-Feet per Year)

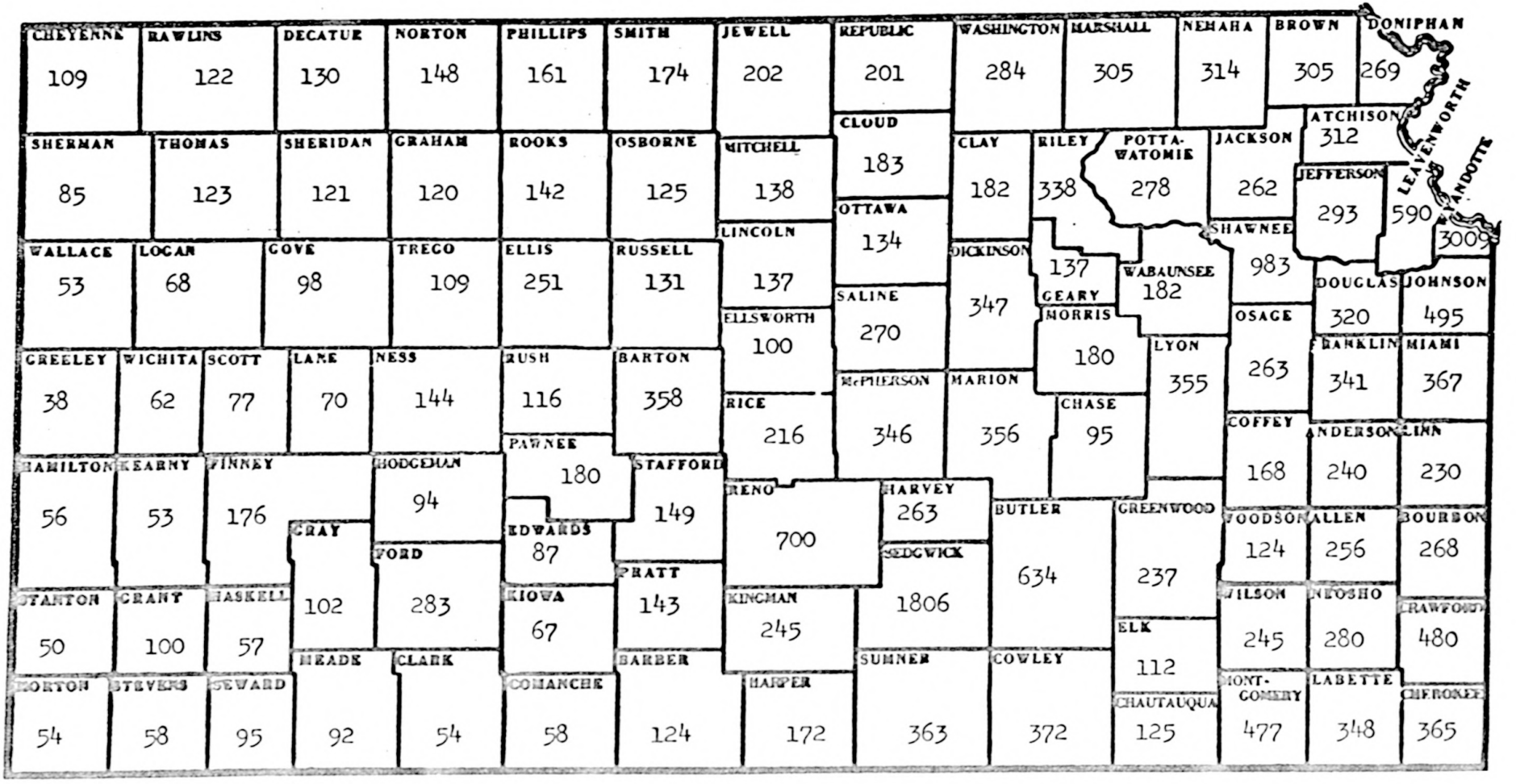

Fig. 5. Estimated Quantity of Self-Supplied Domestic Water per County in 1962
(Method A)

(Acre-Feet per Year)

number of persons per family (user) in Kansas in 1962.[1] This quotient is the total amount of water used per person each year: .0451 acre-feet per person per year.

The second method (Method B) of estimating total domestic use of water in Kansas used figures from these same cities showing the population figures[2] and estimates of population served by municipal water systems in 1944[3] and 1962[4] to obtain the estimated population with a domestic source of supply for the above years. This information is likewise presented on a county basis and the same estimate of the quantity of water consumed per person as was used in Method A is employed here to obtain a figure for the total quantity of water consumed by the population of each county with a domestic source of supply (Figures 6 and 7). The state totals follow with 1945 population figures brought forward for comparison.

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[1]U. S. Bureau of the Census, Statistical Abstract of the United States (84th ed.; Washington, D. C.: U. S. Government Printing Office, 1963), p. 43.

[2]Agricultural Census, op. cit., 1945 and 1963.

[3]No figures were available for 1945, the date of the Act so 1944 figures were used.

[4]Kansas State Board of Health, Division of Sanitation; Kansas Municipal Water and Sewerage Systems (Topeka, Kansas: State Printer, 1945).

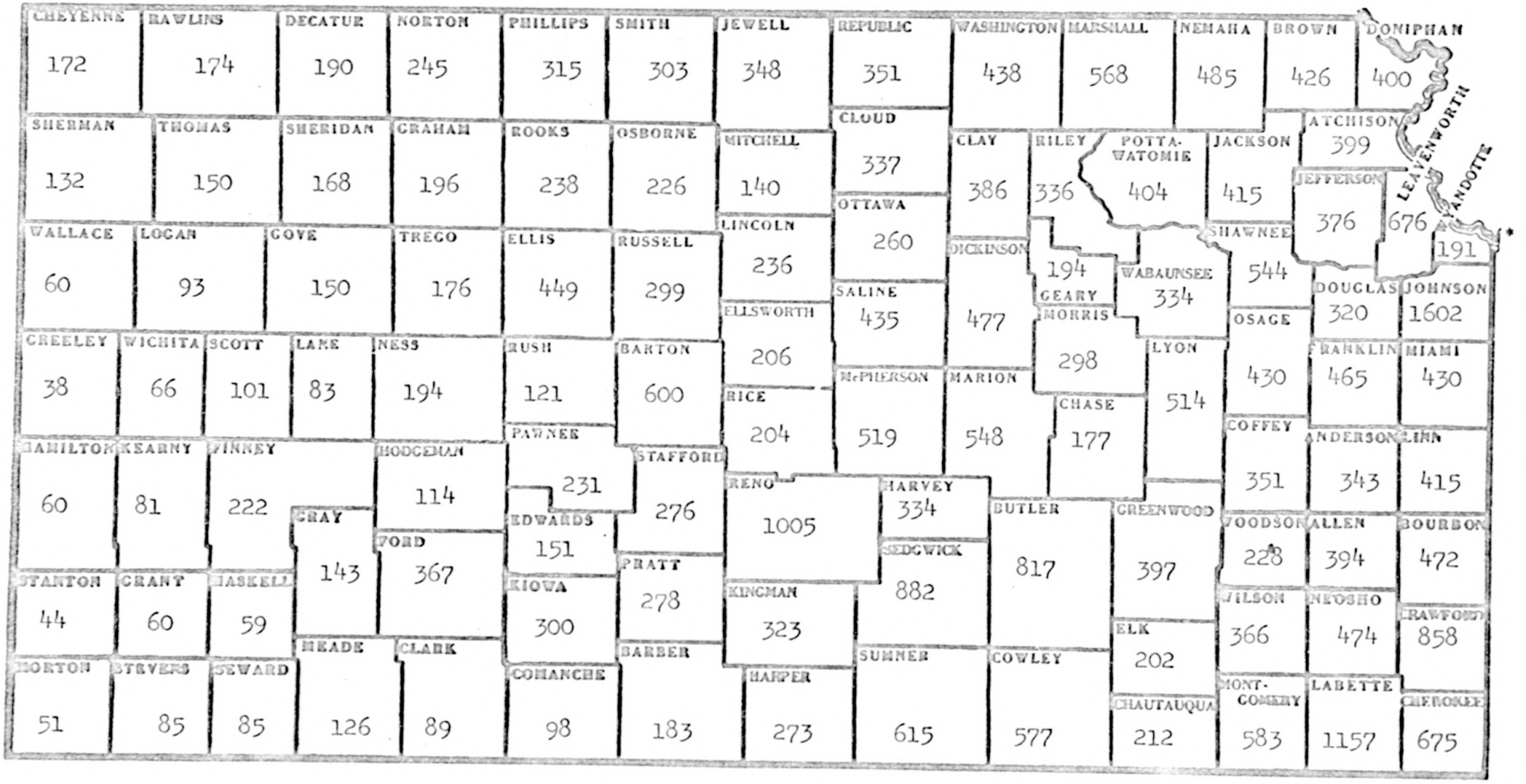

Fig. 6. Estimated Quantity of Self-Supplied Domestic Water per County in 1944
(Method B)

(Acre-Feet per Year)

*A negative figure, because the total population served by municipal water supplies exceeded the county population total.

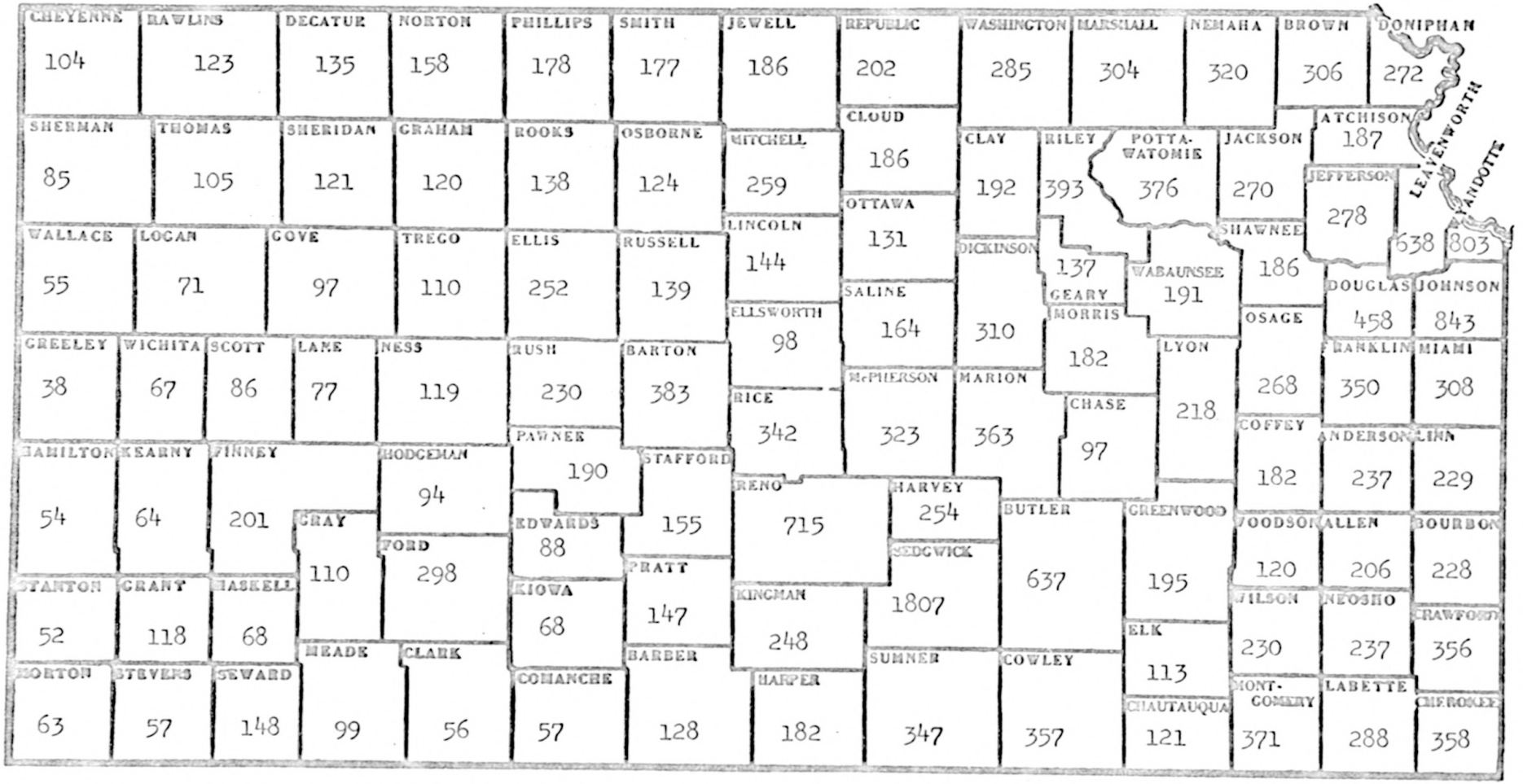

Fig. 7. Estimated Quantity of Self-Supplied Domestic Water per County in 1962
(Method B)

(Acre-Feet per Year)

TABLE 5

ESTIMATED POPULATION WITH SELF-SUPPLIED DOMESTIC WATER

(Method B)

Population	(1944)	(1945)	(1962)
State	1,803,908	1,793,066	2,181,836
Municipal	1,065,719	1,061,619	1,587,861
Domestic	738,189	731,447	593,975
	[33,292 Acre-Feet per Year]	[32,988 Acre-Feet per Year]	[26,788 Acre-Feet per Year]

TABLE 6

ESTIMATED POPULATION SERVED WITH A DOMESTIC SOURCE OF WATER

(Method B)

Population	(1944)	(1962)
State	1,803,908	2,172,296
Municipal	1,045,000	1,478,786
Domestic	758,908	693,510
	[34,227 Acre-Feet per Year]	[31,277 Acre-Feet per Year]

An estimate of the average amount of water consumed by cattle per year in Kansas would be an aid in a comparison with the estimated total domestic water use within the state surveyed above. Table 7 contains a summary of the number of cattle in the state as of January 1 of each of the years 1945-1962. A questionnaire to various commercial feed lot operators within the state reported steers to

TABLE 7

AVERAGE CONSUMPTION OF WATER BY CATTLE IN KANSAS: 1945-1962.

(ACRE-FEET PER YEAR)

Date[1]	Number[2] of Cattle	Gallons per Day	Gallons[4] per Year	Acre-Feet per Year
1945	4,231,000	57,118,500	20,848,253,000	63,981
1946	3,723,000	50,260,500	18,345,083,000	56,299
1947	3,537,000	47,749,500	17,428,568,000	53,486
1948	3,325,000	44,887,500	16,383,938,000	50,280
1949	3,624,000	48,924,000	17,857,260,000	54,802
1950	3,588,000	48,438,000	17,679,870,000	54,258
1951	3,911,000	52,798,500	19,271,453,000	59,142
1952	4,341,000	58,603,500	21,390,278,000	65,644
1953	4,341,000	58,603,500	21,390,278,000	65,644
1954	4,298,000	58,023,000	21,178,395,000	64,994
1955	4,341,000	58,603,500	21,390,278,000	65,644
1956	4,167,000	56,254,500	20,532,893,000	63,013
1957	3,459,000	46,696,500	17,044,223,000	52,307
1958	3,874,000	52,299,000	19,089,135,000	58,582
1959	4,300,000	58,050,000	21,188,250,000	65,024
1960	4,429,000	59,791,500	21,823,898,000	66,975
1961	4,562,000	61,581,000	22,477,065,000	68,980
1962	4,973,000[3]	67,135,500	24,504,458,000	75,201
Total	73,024,000	985,818,000	359,823,576,000	1,104,256
Average	4,056,888	54,767,600	19,990,198,700	61,347

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[1] As of January 1 of that year.

[2] Kansas State Board of Agriculture, Kansas Agriculture, 45th Report, 1961-1962 (Topeka, Kansas: State Printer, 1963), p. 134.

[3] Kansas State Board of Agriculture, Farm Facts, 1962-1963 (Topeka, Kansas: State Printer, 1963), p. 77F.

[4] Rounded off to the nearest thousand.

consume 13.5 gallons of water per day on the average.[1] When this figure was applied to the number of cattle within the state on January 1 of that year, the estimated total consumption of water by cattle in gallons per year was arrived at. This figure was then converted into acre-feet per year. Totaling of these yearly figures allowed for an average amount of water consumed by cattle in acre-feet per year to be computed. The resulting estimate of the average amount of water applied to stock watering uses (61,347 acre-feet per year) can now be compared with the estimated average domestic use of water outside of municipal systems.

The water used by livestock is not directly measurable, but computations show the total quantity to be far larger than may be generally realized, possibly rising to almost half as much as the annual municipal use. About 55 per cent of the water used by livestock normally comes from wells and springs, 35 per cent from stock ponds (often multi-purpose in providing for fishing, conservation, etc. as well as stock watering) and most of the rest from streams.[2]

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[1]This figure does not make allowance for evaporation, seepage, or waste in delivery and process of consumption.

[2]The Kansas Water Resources Fact-Finding and Research Committee, Water in Kansas (Topeka, Kansas: State Printer, 1955), p. 60.

IV. DETERMINING THE EXTENT OF THE INFLUENCE OF THE WATER RIGHTS LAW ON THE ALLOCATION OF WATER IN KANSAS

The 1945 statute represented a major modification of the water rights law. As recently as 1944, the Kansas Supreme Court rendered a decision strongly reaffirming the common-law right with respect to both running surface water and ground water, as against an attempted appropriation under state administrative procedure. In 1945 the legislature, for the purpose of eliminating the obstructive aspects of unused common-law water rights, enacted a statute declaring the public interest in the use of water, defining vested rights, limiting them to actual beneficial use, and strengthening appropriative rights as against conflicting claims of common-law rights not based on actual use of water. As a result of this action by the legislature and the supreme court, the riparian doctrine as formerly interpreted by the court has been considerably modified. The riparian owner previously had a vested right to water solely by the fact that he was a riparian. Beneficial use of water is now as essential to the establishment of a claim of a riparian owner as to that of an appropriator. According to the statute, a common-law claimant is entitled to compensation in an action at law,

for proved damages for property taken by an appropriator; and a common-law user with a determined vested right may enjoin diversions which impair such uses. On the other hand, one who has acquired a valid appropriative right under the statute may enjoin a subsequent diversion by a common-law claimant without vested rights, without prior condemnation.

According to the supreme court, the approach to water rights problems in Kansas is no longer on the basis of individual interest alone; the basis now is the public interest without losing sight of the key principle--beneficial use, and the right to make beneficial use.[1] The Kansas Supreme Court states that the dedication of all water within the state to the use of the people of the state, subject to the control and regulation of the state appearing in section 82a-702 of the General Statutes (1949) is:

> . . . the heart of the statute. The rest of it treats of details and procedure. It forms the basis for a different approach to the solution of questions concerning water rights than we have had in some of our opinions. Heretofore we have approached the questions largely on the basis of individual interest alone. Under this declaration and other provisions of the act we now approach them upon the basis of the interest of the people of the state without losing sight of the beneficial use the individual is making or has the right to make of the water . . .[2]

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[1]Hutchins, op. cit., p. 38.

[2]State ex rel. Emery v. Knapp, 167 Kan. 546, 555 (1949).

It might be expected that if the economic merits of the new system differ materially from the old that some manifestation of this difference would appear during the ensuing seventeen years (1945-1962).

Vested Rights

As to vested rights[1] 2,142 vested right orders were issued, 141 abandoned and terminated, leaving 2,001 vested rights that were valid in Kansas as of January 1, 1963. These vested rights were all acquired prior to July, 1945, and dispersed throughout the preceding years.

There have been many transfers of ownership of vested rights, largely accompanying the sale of land to which the water right is appurtenant. There have also been many changes in place of use, but few concerning purpose of use.

Beneficial use is not defined in the Act. The chief engineer merely allows filing of an application which on its face is a beneficial use--that is if the purpose of the use is beneficial, if the amount is reasonable, and if there appears to be no malice or bad faith on the part of the vested right applicant. The vested right must have been used for a beneficial use in the above sense therefore to be acceptable.

There have been no conflicts between vested right holders which have gone to court. Prior to 1957 the

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[1]A sizable share of the total water used in Kansas is based on water rights under laws that existed before 1945, which rights continue to be valid as vested rights.

Division, believing they had no power to determine conflicts between users under the Kansas Water Appropriation Act until the 1957 amendments were enacted, had instructed complaining users to engage the services of a lawyer to their choosing as their representative in the matter. Since 1957, there are no administrative cases in the files of the Division as to conflicts settled out of court through the intervention of the Division of Water Resources.

There have been many abandonments of vested rights (141). The Division waits for the owners to notify it concerning abandonments or finding the water right vacated declares the right abandoned.

There have been no forfeitures of vested rights. Sections of the Act here are unclear. It is provided by the 1945 statute that failure of an appropriator to use the water continuously for lawful and beneficial purposes for a period of three years, without good cause, shall constitute a forfeiture and surrender of the right.[1] An amendment of the 1945 statute in 1957 provides that every water right of every kind shall be deemed "abandoned" and shall be terminated when without good cause no lawful beneficial use is made of the water for three successive years[2] (Hutchins feels this use of the term "abandon" is unfortunate, in that it disregards the fundamental

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[1]Kansas, General Statutes, Annotated (1949), 42-308.

[2]Kansas, General Statutes (Supplement, 1957), 82a-718.

principle that abandonment depends on both intent and relinquishment and may take place instantly, whereas forfeiture results from nonuse for a prescribed period regardless of the intent of the water right holder.)[1] Procedure is provided for the declaration by the chief engineer, of abandonment and termination of a water right after notification to the holder to appear and show cause why his water right should not be declared abandoned and terminated, subject to appeal to the district court.[2]

Appropriation Rights

With regard to appropriation rights, 2,033 have been perfected as of January 1, 1963. All these appropriation rights were acquired after June 28, 1945, the date of the Act. However, a few early appropriation rights are dated prior to 1945, because those applications which were made under the unconstitutional 1941 appropriation act were to be processed under the requirements of the 1945 Act with priority as to the date of application.[3] They are not considered as vested rights as these applications followed the appropriation right procedure. In those cases where the water user had already been pumping water under his 1941 application to appropriate, prior to the 1945 Act

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[1]Hutchins, op. cit., n. 143a, p. 55.

[2]Ibid.

[3]Kansas, General Statutes (1949), 82a-715.

becoming effective, his 1941 application was dismissed and he was given a vested right.

"Paper rights". - Applications which have not been developed but were filed in order to get a prior right if ever the appropriator felt the need to develop his water use, have not been a problem to the Division of Water Resources. There have been 9,241 applications for a permit to appropriate water, and 833 of these applications that were not approved had been dismissed and their priority forfeited (resulting from applications which were not in proper form or not made in good faith). There had been 1,526 approved applications which had been dismissed and their priority forfeited; 2,033 appropriation rights had been perfected; 16 appropriation rights had been abandoned and terminated; 3,700 applicants had notified the chief engineer of completion of works and application of water in accordance with their permit (1,539 installations had had a complete or partial test of the diversion works, 2,161 installations had not had any of the diversion works tested), 1,068 applicants had not notified the chief engineer of completion of works and application of water in accordance with their permits as of January 1, 1963; 31 applications had not yet been acted upon by the Division. Those applications not made in good faith were dismissed and their priority forfeited. Very few applications have not yet been acted upon. The large number of applications in the process of being perfected is accounted for by those

users who had not yet completed their diversion works, applied water in accordance with their permit, notified the Division of completion of their works and application of water in accordance with their permit, or had not yet had a complete or partial test of the diversion works by the Division of Water Resources. The process of perfecting a water right requires an extensive time period and the Division does not have a staff large enough to test the diversion works immediately after their completion although the latter problem is being remedied. During the month of December (1962) 5,904 persons who were owners or had an interest in water rights were requested to file a report of water use for the year 1962. Although it may take some time for the applicant to perfect his appropriation right, his progress toward such a perfected right is under periodic scrutiny by the Division of Water Resources. This review of the present status of the right aids in discouraging the development of "paper rights."

Conflicts among water users. - There have been a few conflicts between vested and appropriation right-holders, and still fewer between two appropriation right-holders.[1] No real determination of right by the Division is needed in either case. In the former the vested water right-holder has the superior water right over any appropriator as vested

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[1]Cases discussing these conflicts will be cited in Chapter IV, pp. 69-74.

rights are protected under the Act, except for non-use.[1] In the latter conflicts between two appropriators the priority date determines who has the right. The only determination of water rights needed would be those between two vested right-holders, which hasn't occurred as yet. Such a case most probably would go to a court for adjudication and be subject to the water law in Kansas prior to the Act.

Beneficial use and impairment of right. - As previously stated (concerning vested rights), since beneficial use is not defined in the Act, the chief engineer merely allows the filing of any application on its face a beneficial use. The applications must not impair existing rights or be against the public interest, they must be made in good faith, in proper form, and be reasonable as to quantity and rate of diversion.

There has been no shutting down of wells as yet because of impairment of quantity or quality but the Division has interceded in some surface water conflicts between water right holders which involved impairment of quantity. The Division has to determine what constitutes impairment of a water right in conflicts between water users. This must probably be on the practical basis of shutting down the possible impairing works in order to see if flow to the user with an impaired right would be increased.

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[1]Kansas, General Statutes (1949), 82a-703.

The Division never turns down an application for the reason that water may be over-appropriated, as water may be available in some seasons and wet years though not in others. The appropriator is warned that water covered under his right may be over-appropriated and that prior rights will take precedence over his in case of shortage.

Scale of preferential use.[1] - Priorities of time and the scale of preferential use are available for protection of the public interest and to provide criteria of "impairment of right" in the approval of applications to appropriate water and in acting on requests for transfers of purpose and place of use.

The criteria of public interest protection. - This concerns "the highest public benefit and maximum economic development which may result from the use of such water."[2]

> In ascertaining whether a proposed use will prejudicially and unreasonably affect the public interest, the chief engineer shall take into consideration the area, safe yield, and recharge rate of the appropriate water supply, the priority of existing claims of all persons to use the water of the appropriate water supply, the amount of each such claim to use water from the appropriate water supply, and all matters pertaining to such question. With regard to whether a proposed use will impair a use under an existing water right, impairment shall include the unreasonable raising or lowering of the static water level or the unreasonable increase or decrease of the streamflow or the unreasonable

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[1] A more complete discussion of the scale of preferential use is presented in Chapter V, p. 85.

[2] Kansas, General Statutes (1949), 82a-711.

> deterioration of the water quality at the water user's point of diversion beyond a reasonable economic limit . . . [1]

Abandonment and forfeiture. - As of January 1, 1963, only 16 of 2,033 appropriation rights perfected had been abandoned and terminated, for the reason that no lawful beneficial use was made of the water for three successive years. The chief engineer had declared these rights abandoned after notification to the holder to appear and show cause why his water right should not be declared abandoned and terminated, subject to appeal to the district court;[2] 883 applications that were not approved (because they were not in proper form or not made in good faith) had been dismissed and their priority forfeited; 1,526 applications that were approved had been dismissed and their priority forfeited because the Division felt the appropriator failed to use the water continuously for lawful and beneficial purposes for a period of three years without good cause.[3] Thus, there have been no rejections of applications to appropriate water except: (1) when the application was made in bad faith or (2) when the application was not in good form, the instructions being improperly followed.

Court Reference Procedure

Section 82a-705 of the Appropriation Act states:

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[1] Ibid.

[2] Kansas, General Statutes (1949), 82a-718.

[3] Kansas, General Statutes (1949), 42-308.

> In any suit to which the state is not a proper party brought in any court of competent jurisdiction in this state for determination of rights to water, the court may order a reference to the division of water resources or its chief engineer, as referee, for investigation of and report upon any or all the physical facts involved . . .

The chief engineer has not been appointed referee as yet in any water suits. The chief engineer can not be a referee when he is a party to the suit and in the few cases arising thus far, he has always been a party to the suit.

Rotation of Water Between Users

Voluntary rotation of water between users is allowed under the Appropriation Act, but none has been enforced under an application to appropriate water. An old act, passed prior to 1945, is still in effect allowing the setting up of an irrigation rotation district on the Arkansas River.

Stored Water

Stored waters are found in the Army Corp of Engineer's flood-control projects and Bureau of Reclamation irrigation projects; city, county, and state reservoirs; and private ponds. Irrigation uses of water have risen to a greater extent than other uses--in percentage growth particularly in the northwestern part of the state but as an absolute quantity growth of irrigation uses of water have been most spectacular in the southwestern section of Kansas. Recreational uses have grown up around the new state lakes.

Increasing interest has been focused upon the many new dams and reservoirs being constructed within the state. All federal projects have begun since 1945, the date of the Act. The land underlying these reservoirs was voluntarily sold or condemned. The water rights, being appurtenant to the land, passed with the land unless explicitly withheld. Few water rights and requests for transfers of place of use to other land were made. The Bureau of Reclamation or the Army Corp of Engineers is usually named as the owner of any water rights in their respective federal works. Water rights to state lakes are in the name of the State Forestry, Fish, and Game Commission. County, city, and other such lakes also have water rights in the name of their respective governmental agencies. The federal government, though possessing unusable water rights appurtenant to the land underlying its projects, does not have recorded water rights either to the flood pool, conservation pool, or for any other use. Water is stored at conservation pool level and no water is taken that has been legally requested by downstream owners at a time when their water rights are enforceable. That is, when water is flowing into the reservoir an amount is bypassed which downstream owners with prior rights have requested up to the limit of the natural flow of the stream. If these downstream owners are not getting all of their quota, they simply request the Division to see that they receive it. In times when the stream is not at a level of natural flow, these downstream right-holders

have no right to the water stored previously as it would have passed downstream unused during the period when such storage occurred. Floodwater is released as quickly as possible by these agencies to supply space for future floodwaters. If the governmental agency ever found it necessary to show a beneficial use to a certain volume of water in its reservoir, it could perfect a water right to that amount and would have priority over all subsequent downstream appropriators.

Ground Water "Mining"

Ground water reservoirs are similar in many respects to surface water reservoirs that receive inflow at variable rates, and also discharge water at variable rates through outlet works. There is slow movement of water through both types of reservoirs, but their chief attribute is water storage, which may be as great as the total inflow over a period of several years. Water levels in both types of reservoirs rise when recharge exceeds discharge, and fall when the rate of discharge is greater. The inflow or recharge determines the degree of utilization that can be made perennially of either surface or ground water reservoirs.

If ground water reservoirs in Kansas, with their 200 million acre-feet of water in storage, are used effectively for continuing supply, water may be drawn from storage when recharge is low, and replaced in storage during periods of

abundant recharge. The decline in storage during droughts will mean greater pumping lifts and therefore greater cost in obtaining water, but this may be rationalized by pointing out that a supplemental water supply is needed more during a drought. It is fundamentally important, however, that for continuing supply the reservoir be capable of yielding enough water, in dry years or wet years to satisfy all established rights. For perennial supply, therefore, the development and use of water must not exceed the average annual replenishment from all sources, whether natural or artificial. That is, the right to appropriate water must not exceed the "safe yield." The estimation of safe yield is a problem requiring continuing observation and scientific analysis.[1]

In solving the problem of how to gain maximum use of ground water sources, some kind of wise management control, either governmental or private, will be necessary. Unlimited private control is probably not a sound policy. Western Kansas probably contains vast underground water resources. Recharge, however, is poor. Consequently, the resources take on a predominantly consumptive aspect.[2]

If the total discharge from a ground water reservoir is so great that it is not balanced by the recharge even in

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[1]The Kansas Water Resources Fact-Finding and Research Committee, Water in Kansas (Topeka, Kansas: State Printer, 1955), pp. 168-169.

[2]Report on the Laws of Kansas Pertaining to Ground Water, op. cit., p. xxvii.

wet years, the storage in the reservoir is inevitably reduced. As in parts of Western Kansas, where withdrawals from ground water aquifers continuously exceed natural recharge, mining conditions exist. Ground water mining is a serious problem, because appropriative rights to such water cannot be rights to a perennial supply, but only rights of a temporary nature.[1]

Ground water "mining" policy in Kansas is not clearly set forth in the Act, nor has there been interpretation of the statute on this point by the courts or the administrative agency. The statute directs the chief engineer to reject applications to appropriate if existing water rights will be impaired or if the proposed use will "prejudicially and unreasonably affect the public interest."[2] Among other things the chief engineer is to take into consideration "safe yield and recharge rate" in ascertaining effects on the public interest.[3] Impairment of an existing right consists of "unreasonable lowering of the static water level . . . beyond a reasonable economic limit,"[4] and the statute states as an express condition of each right that allowance be made for a "reasonable"

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[1]The Kansas Water Resources Fact-Finding and Research Committee, op. cit., p. 169.

[2]Kansas, General Statutes (Supplement, 1957), 82a-711; Kansas, Laws (1957), c. 539 sec. 16.

[3]Ibid.

[4]Ibid.

raising or lowering of the static water level.[1] The statute could be interpreted to prohibit withdrawals in excess of the "safe yield and recharge rate" (not defined) as contrary to the public interest, but there are other possible interpretations of public interest. Impairment of water rights could apparently be interpreted so as to allow "mining" of ground water temporarily--until a reasonable economic limit is reached.[2]

The Division of Water Resources takes the position that until considerable definitive information is forthcoming concerning the hydrological conditions in areas of the state where ground water "mining" is present or possible, all applications to appropriate water, otherwise in agreement with the requirements of the Act, should be approved. This may be the most practical approach in that it will not encourage controversy at the present time, but it may be much more satisfactory from an economic point of view to restrict ground water development in ground water basins when withdrawals exceed a "safe yield," in other words when the water table has been lowered to the point where the pump lift approaches the maximum economic limit, or when further diversion would adversely affect the economy of the area, whichever is reached first.

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[1] Ibid., 82a-711a.

[2] E. S. Bagley, "Water Rights Law and Public Policies Relating to Ground Water 'Mining' in the Southwestern States," Journal of Law and Economics, IV (October, 1961), p. 166.

State Water Plan

On April 15, 1963, a State Water Plan[1] became part of the law of Kansas. Section 4 of the Act states:

> The state water plan shall establish long-range goals and objectives for flood control and conservation, development, utilization and disposal of water based on careful consideration and estimate of the water resources of the state, and the present and projected water use and control needs of the people of the state. The plan shall state the recommendations of the board (Kansas Water Resources Board) for the development of the water resources of the state, including the general location, character, and extent of such existing and proposed projects, programs, and facilities as are necessary or desirable in the judgment of the board to accomplish such goals and objectives . . . The plan shall be formulated and used for the general purpose of accomplishing a co-ordinated, balanced, and harmoneous development of the water resources of the state.

Among other statements set forth in section 1 of the State Water Plan, two significant provisions are declared to be the policy of the state.

1) The state in developing flood control and water conservation projects is to assist public corporations of the state in developing flood control and water conservation projects that benefit the general welfare, beyond their boundaries (set forth in section 9 of this act). Section 9 provides that the state will finance part of the costs a public corporation becomes obliged to pay for all lands, easements, and rights-of-way for water development projects if such works will confer general flood

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[1]Kansas, Laws (1963), c. 514.

control benefits beyond the boundaries of such public corporation in excess of 20% of the total flood control benefits of the works. The payment is limited to an amount equal to the total cost the public corporation must pay for lands, easements and rights-of-way, multiplied by the ratio that the flood control benefits conferred beyond the boundaries of the public corporation bear to the total flood control benefits of the project.

2) The state of Kansas is to assist in the development of water conservation storage in reservoir projects within the state in addition to the flood control protection formerly provided in state and federal projects (set out fully in section 10 of this act). The Water Resources Board may recommend to any agency of the federal government the inclusion in any proposed or authorized federal project of any conservation storage features for water supply that the board expects will be needed within the state in the future. The board may extend to and procure for any agency of the federal government reasonable assurances and evidence that such expected future demands for storage will be made within a time which will permit payment of these costs within the life of the project. The board may enter into agreements with the federal government for the repayment of the costs for the inclusion of such storage features when such payment is necessary or desirable.

Case Study of Water Right Conflicts

The conflicts[1] between water users discussed here have all been investigated since 1957 when the Division of Water Resources began to do such work. As previously stated,[2] prior to the passage of the 1957 amendments to the Kansas Water Appropriation Act, the Division of Water Resources had instructed a complaining water right-holder to engage the services of a lawyer of his choosing to represent him in any conflicts between himself and other users, as the chief engineer did not believe the Division had the power to determine conflicts between water users.

An application to enforce every complaint must be made and notarized for each separate complaint of the Division of Water Resources. The procedure is as follows:

1) Complaint and request for investigation.
2) Investigation by water commissioner in a report of water supply and diversions.
3) Formal request to secure water.
4) Legal notice posted on the other user's pumping unit.
5) Written authorization for the other user to resume pumping when the requesting user's needs for water have been satisfied.

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[1]Case study of conflicts were taken from the files of the Division of Water Resources.

[2]Supra, c. iv, p. 54.

Conflicts between vested and appropriation right-holders. - 1) South Fork of the Solomon River, Sheridan County (1961): The Division of Water Resources field office was contacted by two farmers, father and son, requesting information as to the extent of their rights to the use of water in a stream for livestock and irrigation purposes. The farmers had sold land to the Kansas Forestry, Fish, and Game Commission for the construction of a state lake which impounded water from surface drainage and springs. The Commission had applied for an appropriation right for recreational purposes applicable to the lake and it had been approved. It was determined that the farmers had a vested right for livestock watering purposes and the Division of Water Resources asked the Commission to bypass sufficient water from the lake to satisfy the farmers' livestock needs under their prior vested right. The farmers were also informed that if they had made an application to appropriate water for irrigation purposes prior to the Commission's application for recreational use, it would have been effective and given them water to irrigate their downstream land.[1]

2) White Rock Creek, Jewell County (1961): Two men were using water out of a stream pool, formed from a rock

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[1]If later appropriators complain that they need water downstream from state lakes, water will be bypassed to them only when the amount of water impounded is above the storage level.

slide, for irrigation purposes. The upper riparian owner had an appropriation right; the lower user had a prior vested right. The vested right-holder, believing the water in the pool insufficient for his needs while the later appropriator was pumping, requested the Division of Water Resources to enforce his right. The Division ordered the appropriator to stop irrigation. He at first refused but then shut down his irrigation pump when informed legal action could be taken against him. After a further check by the water commissioner it was found that the vested right-holder was not using all the water, so the appropriator was notified he could resume pumping.

Conflicts between appropriation right-holders. - 1) South Fork of the Solomon River, Graham County (1961): Two vested right-holders for domestic use had additional appropriation rights to dams for stockwater purposes. The downstream appropriator with the prior appropriation right was no longer receiving any water by the stream for her reservoir because of the later appropriator's dam, so she requested the chief engineer to see that water was bypassed from the upstream dam into her dry reservoir. The parties allowed the water commissioner to regulate and bypass the natural flow of the stream, but the resulting flow was not sufficient to reach the downstream pond. The prior appropriator was notified that no further action would be taken to increase the flow. The problem was solved by heavy rains which filled the downstream reservoir.

2) Prairie Dog Creek, Decatur County (1959): A downstream appropriator filed a complaint against a highway contractor who was making an unauthorized use of the water in a stream. The contractor was notified of the Water Appropriation Act and was told that he would have to discontinue pumping from the creek during periods when the supply of water did not meet the downstream appropriator's requirements. He refused to comply and an engineer from the Division of Water Resources was called in. When informed that the chief engineer would request an injunction against his continued use, the contractor relented and made arrangements to move his pumping equipment to a nearby water supply and agreed to use the stream in question only when water was sufficient for downstream users.

3) East Oak Creek, Jewell County (1960): Two appropriation right-holders had rights on a stream. A tenant of the prior appropriator notified the water commissioner that the later appropriator was impairing the tenant's right to streamflow by diverting water the tenant needed for irrigation purposes to reservoirs at the former's damsites, some being unauthorized. The later appropriator was informed that he would if requested have to allow sufficient flow to pass his reservoirs to satisfy the diversion rate of the prior appropriator. After investigation and measurement the later appropriator was requested to either pump water over his new unauthorized dam or allow enough

water to pass his upstream authorized dam and reservoir to fill the new reservoir enabling water to flow through a pipe at its base which he would have to install. He refused to do either and after a forceful demand, put a pipe in the new downstream damsite which allowed water to flow downstream to the prior appropriator's land at times when evaporation and seepage would be minimized.

4) Paradise Creek, Osborne County (1959): An interested party acting for a group of prior appropriators made a complaint against a later appropriator who had constructed an unauthorized dam and diverted water from a stream for irrigation purposes. The interested party reported there was insufficient flow in the stream below the dam for livestock-watering purposes and that the fish in the creek were dying and the water stagnating. He demanded the dam be dynamited. The later appropriator was not by-passing any of the natural flow around the dam. The Division of Water Resources contacted the later appropriator and told him they could not stop his construction of the dam or have him remove it, but unless he got an application for an appropriation right regarding the water held behind the dam the prior users could get an injunction and have the dam destroyed. Furthermore, in any case, he would have to bypass the natural flow of the stream whenever downstream users wanted it for prior domestic livestock and irrigation uses under their appropriation rights. If the flow was not then sufficient he could discontinue

pumping water over the dam. The later appropriator then made his use legal by filing an application to appropriate water for his damsite and reservoir. Since he then bypassed water when requested to satisfy the rights of downstream users, the latter had no real basis for an injunction to remove the dam.

Weaver v. Beech Aircraft Corporation, 180 Kan. 224 (1956): An upper riparian owner had a farm upon which was located a spring which was the fountainhead of a stream. Downstream farmers used water from the creek for domestic, stockwater, and irrigation purposes. A certain corporation leased from the upper riparian owner a four-acre tract of land with the spring located in the middle, having the purported right to take and to appropriate for its use the water from the spring. The company walled in the spring, installed a pump, and constructed an eight-inch pipeline three miles long from the spring to a "lake" adjacent to its plant, the water to be used for industrial purposes. Since the company diverted the spring's course of flow, no water entered the creek, thus depriving lower riparians of their rights. Finding that the company had failed to obtain a permit to use the water, the court upheld a temporary injunction preventing the company from any further diversion of the water and its unreasonable use for industrial purposes.

V. ASCERTAINING WHAT WOULD HAVE BEEN THE BEST USES OF WATER IN KANSAS DURING THE PERIOD 1945-1962

Criteria of Best Water Use

What is the economic criterion of best use of water? It is the "maximization of the aggregate discounted net returns."[1] Professor Wantrup writes, "We may formulate the optimum state of conservation (as an *ex ante* concept) as that time distribution of use rates that maximizes the present value of the flow of (expected) net revenues."[2] This is relatively simple to state but hard to apply particularly if maximization of net return to society as a whole is the objective and if so-called "intangible" (non-monetary) costs and returns are involved.[3] The maximization of the net return to society implies that the major goal of a water use law will be to enable man to fill as many human wants as possible. It should help him to get the greatest and best use of the related water and water

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[1] "Water Rights Law and Public Policies Relating to Ground Water 'Mining' in the Southwestern States," *op. cit.*, p. 148.

[2] S. V. Ciriacy-Wantrup, *Resource Conservation: Economics and Policies* (Berkeley, California: University of California Press, 1952), p. 77.

[3] "Water Rights Law and Public Policies Relating to Ground Water 'Mining' in the Southwestern States," *op. cit.*, p. 148.

resources. What is to be maximized is welfare from water use, not water use itself. Only those developments are needed for which there is a demand, only those should be undertaken which produce greater benefits than alternative uses of the resource or the development funds. This objective is often referred to as "aggregate social satisfaction or maximum social product."[1]

The principal discrepancies between the individual and social maxima of net return from water use result from certain burdens or costs being placed on persons other than the individual water user, which are not contained in his cost calculations, and from certain benefits given to others which are not included in the individual water user's calculations of income. The formidable obstacle of interpersonal comparison of utilities and disutilities also stands as an obstacle in the way of calculating social maxima. The lack of conformity between social and individual costs and returns is especially evident in the case of migratory resources such as water under concepts of property rights which are based on the rule of capture.[2] Destruction of a replenishing supply or premature and wasteful depletion

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[1]"Legal and Economic Aspects of Water Rights in Minnesota, Wisconsin, Indiana and Ohio: Evaluation of Findings," (Unpublished Review Draft of Phase Report No. 22, 1961), pp. 13-14.

[2]Anthony Scott, Natural Resources: the Economics of Conservation (Toronto, Canada: University of Toronto Press, 1955), p. 62.

of a stock resource may result from such property right doctrines.

In addition to defining criteria of best allocation of resources there is also the problem of devising arrangements which will be most contributive to the attainment of these goals.[1] Questions suitable for the economist to examine therefore include whether one type of private property concept results in closer correspondence between social and private costs and returns than another and whether public ownership or public control are more encouraging means to the optimum allocation of resources than private ownership.

These are intricate questions--little is known with certainty regarding the institutional conditions of economic efficiency especially when efficiency is considered in a broad, dynamic sense which involves economic progress.[2]

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[1]Professor Wantrup points out the relationship of economics to law as follows:

> "Economics cannot define social optima which the law--as 'social engineering'--should aim to realize. What economics can do, however, is to explain why and how far certain conditions, which are decisively influenced by the law, facilitate or impede an increase of national income."

(S. V. Ciriacy-Wantrup, The Law of Water Allocation in the Eastern United States [n.p.: Ronard Press, 1958, p. 552]).

[2]E. S. Bagley, "Economic Considerations in Water Rights Law and Public Policies Relating to Ground Water 'Mining' in the Southwestern States," Based on a Study Undertaken on a Ford Foundation Faculty Research Fellowship in Economics (Unpublished Report 1958-1959), p. 20.

The architect of social, political and economic systems who seeks optimum economic effects must be a perceptive student of human behavior, as efficiency is people doing things in certain ways and promoting it is mostly a matter of affording opportunities and incentives (positive or negative) to individuals and groups to discover and apply efficient procedures. Planners sometimes underrate this so-called "human factor." It is not enough to devise criteria of efficiency, nor is it adequate to note that a certain system does not fully answer the requirements of this criteria. Too frequently it has been assumed without question that imperfections in a particular system of private rights can be corrected by the introduction of public controls. The possibility that public controls will bring their own kind of shortcomings is often not realized. Piper and Thomas after citing certain problems in applying the appropriation doctrine to the allocation of ground water, agree that in the future doctrines of absolute property rights in water will become out of date and that an element of the appropriation doctrine which will be of increased importance in the future is public ownership of water supplies.[1] Much of the criticism of the appropriation doctrine for its alleged inflexibility appears to be relevant to any system which recognizes private water

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[1]Arthur M. Piper and Harold E. Thomas, "Hydrology and Water Law: What is Their Future Common Ground," Water Resources and the Law (Ann Arbor, Michigan: University of Michigan Press, 1955), pp. 11-12.

rights in definite and secure terms. The basis for this criticism is rejection of private market processes in allocating water.[1]

It is beyond the scope of this analysis to attempt to compare the economic merits and defects of public versus private control of water resources. In the past, utilization of water has been subject to a high degree of public regulation. To some degree this is caused by the necessity of water to human life, but it is without doubt also to be ascribed largely to the fact that many of the uses of water are non-consumptive (navigation and water power, for example,) thus making possible simultaneous or successive use of water by numerous persons and often for different purposes. These characteristics are not so widely existent in the case of stored ground water.

It may be conceded that public control will be expanded as competition for increasing scarce supplies increases and as the size and scope of water resource development projects expand. Nonetheless much of the water in the United States is still governed by private rights, and market processes determine to a large extent the exercise of these rights. Even in public projects and public policies toward private rights market values, actual

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[1] "Economic Considerations in Water Rights Law and Public Policies Relating to Ground Water 'Mining' in the Southwestern States," op. cit., p. 21.

or imputed, are heavily relied upon in decision making.[1]

Market pricing system. - If the use of a market pricing system, based on the principles of a free economy, is to do the job of allocating water most efficiently the overriding principle of allocation is willingness to pay for water. It is not a simple matter, however, to build such a system. The law does not provide us as yet with simple negotiable instruments wherewith to buy and sell clearly defined quantities of water, and there is more involved in creating such negotiable instruments than simple application of concepts developed for stationary property. Having developed negotiable instruments, there remains a further problem of conveying and distributing water. Economic analysis is of particular service here, for it can advise society how to set prices by conscious public control. The contribution of the price system in reconciling rival claimants is to take many heterogeneous values and resources and make them commensurable, reducing decisions to one common measure, the dollar. The dollar is too useful a social invention not to apply to the problem of allocating scarce waters among competing demands.[2]

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[1] "Water Rights Law and Public Policies Relating to Ground Water 'Mining' in the Southwestern States," op. cit., p. 149.

[2] M. Mason Gaffney, "Comparison of Market Pricing and Other Means of Allocating Water Resources," An address given before the Southeastern Water Law Conference, Athens, Georgia, November 9, 1961, pp. 4-5 (Mimeographed).

However, it certainly would be a mistake to codify current market values--to make them the measure of the legal right to water from this time forward. Values will not be the same tomorrow as they are today. Nor is it an ideal arrangement to adopt a vague set of legal institutions regarding water which leaves the allocation of it largely to judicial processes. Efficiency by decree is not a promising approach. What is needed is a statutory framework that will suit economic conditions of both the present and the future, within which development of water resources is fostered and water uses are responsive to the ever changing technologies and demands for water.[1] To accomplish the task of devising a legal framework conducive to efficiency, the economic effects of the various legal rules for using resources must be understood. This question will be treated in connection with the comparison of the advantages and disadvantages of alternative water right concepts in Chapter VII.

It may be worthwhile, therefore, to consider the possibilities of adopting new or modifying existing legal concepts of private rights to the end that market processes may function more effectively and may take account more fully of social costs and returns. Public policies and legal concepts of water rights may be examined for effects

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[1]E. S. Bagley, "Some Economic Considerations in Water Use Policy," Kansas Law Review, V (May, 1957), pp. 500-501.

on incentives and opportunities for individuals to exercise or dispose of their rights in ways which will foster efficiency.

General criteria. - The Kansas Water Appropriation Act seems to fulfill the following general criteria for an effective water law listed by one authority: (1) A modern water law should give private rights that guide water users toward the attainment of maximum benefits from water resources. (2) These rights should be certain enough to encourage investment in water use, (3) yet be flexible enough to permit change of use when needs and demands change. (4) The law should provide protection for public interests. (5) It should be consistent with hydrological science, and (6) it should be administered by an impartial agency, controlled by adequate standards, supported by a sufficient staff and equipped with efficient procedures for allocating and administering water rights.[1]

Economic criteria. - For purposes of this paper we shall use an enumeration of the economic criteria of best water use in preference to the general criteria noted above. Water rights doctrines may be economically defective in a number of respects:

1) Limitations on the place of use. For example, the riparian doctrine for watercourses, the "correlative

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[1] "Legal and Economic Aspects of Water Rights . . . ," op. cit., p. 8.

rights" doctrine, and the American rule for percolating ground water all give prior claims to uses on lands where the water occurs--riparian lands for watercourses and overlying lands for percolating ground water. Unless overlying owners or riparians are permitted to transfer their rights to nonoverlying or nonriparian use, this preference may constitute a serious obstacle to utilizing water where it will yield the greatest returns. Traditional riparian concepts do not recognize such transfers, the appropriation doctrine does. Restrictions on the transfer of water out of the watershed or to another state are also examples of public policies which stand in the way of economic efficiency by foreclosing opportunities.

2) Limitations on changes in the place or purpose of use and on methods and places of diversion. Artificial barriers of this type hamper adjustment of water uses to changing conditions. The appropriation doctrine has been criticized as inflexible partly for this reason. This weakness is also present but to a lesser degree in the riparian doctrine. Inasmuch as water is often used more than once some limitation on this freedom is clearly in order to protect other rights. Quite apart from equity considerations, doctrines that do not afford such protection fail to account for the economic losses that would be sustained by other users if one user changes place and purpose of use.

3) Doctrines and policies which favor uses at certain

times over uses at other times. This is a problem of particular significance in utilization of a stock, such as a non-recharging ground water supply, where the major question is when to use the water. If rights are acquired and maintained by use, as in the appropriation doctrine, holding of water for future use is precluded, unless natural storage for an indefinite period is regarded as a beneficial use, which does not seem to be the case in the Kansas Appropriation doctrine. On the other hand, if the right is awarded to the user rather than to the speculator there may be greater incentive to find currently profitable uses of the water. However, uses of greatest future social benefit may thus be foregone.

The "absolute ownership" doctrine, including the "reasonable use" version, is also biased in favor of present uses. Applied to a transient resource such as water this doctrine becomes in effect a rule of capture, thus stimulating excessive and premature exploitation in the usual case when there is more than one person with rights to withdraw from the common stock. Present uses are favored over future uses. Depending on how it is interpreted the "correlative rights" doctrine may be subject to these same disadvantages.

4) Restrictions on the sale of water or water rights. These restrictions frustrate the market function of directing property rights into the possession of those best qualified to exercise them. If the right-holder only has

the option to use or lose, as in some appropriation statutes, or is forbidden to sell water rights as is usual with the older doctrines, inefficient utilization is encouraged and may be hard to displace.

5) Statutory preferences for certain uses. These policies favor certain uses over others, and the favored ones may not yield the greatest economic returns. Even if they are the most productive uses at the time of the statutory enactment they may cease to be, as demand and supply conditions change. To freeze scales of preferred use in statutes detracts from the flexibility of water policies, and depending on the manner of exercise of preference, may also be a source of uncertainty regarding the rights to water. If compensation is required to exercise preferences, less harm is done because preferences will not be asserted unless they can pay a fair price for the displaced right.[1]

The Kansas Water Appropriation Act states that where appropriations of water for different purposes conflict, they shall take precedence in the following specified order: domestic, municipal, irrigation, industrial, recreational, and water power uses.[2] The 1945 statute does not refer otherwise to specific uses of water. Apparently it

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[1]"Economic Consideration in Water Rights Law and Public Policies Relating to Ground Water 'Mining' in the Southwestern United States," op. cit., pp. 22-25.

[2]Kansas, General Statutes (Supplement, 1957), 82a-707.

contemplates the appropriation of water for any beneficial purpose.[1] It is provided further that as long as water users are using water properly under the terms of their rights and the laws of Kansas, such holders of water rights for "inferior" beneficial uses cannot be deprived of their uses under this scale of preferential use, either temporarily or permanently, other than through condemnation.[2]

Vested rights are not subject to the scale of preferential use. The 1945 Act in effect had two separate priority systems: one, the scale of preferential use; the other, priority as to time. The 1957 amendment strengthens time priority, allowing the preferential use scale to be of effect against appropriators employing their water in a lawful manner only through condemnation. But the Appropriation Act itself gives no power to condemn, so only those agencies already possessing such power under some other authority can use it. To the above extent the scale of preferential use has a limited effect.

6) Doctrines or policies which result in uncertainty regarding the supply available due to vagueness in the definition of the right, insecurity of the right or for other reasons, may reduce response to economic opportunities and cause poor allocation of resources. Uncertainty

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[1]Hutchins, op. cit., p. 52.

[2]Report on the Laws of Kansas Pertaining to Ground Water, op. cit., p. 56.

of water rights may frighten capital away from long-term investments that might otherwise be profitable, or it may result in investments which ultimately prove to be uneconomic because the water supply subsequently is reduced or lost.

If the exercise of unused rights imperils the water supply for existing users as in the riparian or "correlative rights" doctrines, long-term investments in water projects may be deterred. If these unused rights can be reduced to quantitative terms their influence may possibly be allowed for in advance and perhaps purchased by existing users. But since the quantity of water represented by the right of a riparian or overlying owner is continually subject to re-evaluation on the principle of reasonable use it may be difficult to put a quantitative estimate on it. The appropriation doctrine is relatively free from uncertainty of supply.

7) Legal uncertainty or insecurity of the right to water may also lead to economic waste in the form of expense and delay due to litigation which might be avoided by more clear-cut and secure concepts of property rights.

Difficulties here may also be of a procedural character. Adjudication, administration and enforcement procedures may cause uncertainty, delay, or expense. The Kansas appropriation doctrine for the most part has a clear-cut concept of property rights.

8) Concepts of property in water which require

detailed hydrological studies have economic costs which must be weighed against their advantages. On this count the "absolute ownership" doctrine stands supreme among water rights doctrines. Doctrines which correlate ground and surface water rights or require computations of safe yield of ground water are expensive to administer--if they are to be adopted their superiority for other reasons should outweigh these costs. In the case of the Kansas version of the appropriation doctrine, its superiority in development of water resources, investment stability and certainty among other points counteract these other costs.[1]

The present Kansas water law appears to be superior to any present alternative in permitting the effective development of all water usages within the state under foreseeable conditions.

Equity v. economic considerations. - Many of the issues in water right controversies are equity questions concerning distribution of economic rent from water rather than economic questions concerning returns from the purposes to which the water is devoted. There may be interconnections--efficiency in water utilization is probably affected by distribution of the rights to the income from it. But the two questions are different and should not be confused as they often are. Advantages of one doctrine or

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[1] "Economic Consideration in Water Rights Law and Public Policies Relating to Ground Water 'Mining' in the Southwestern United States," op. cit., p. 26.

policy over another are often cited as economic advantages which are in reality expressions of views on standards of equity or fairness.[1]

Confusion regarding equity and economic considerations also appears to underlie the claims for flexibility of the riparian doctrine. The riparian doctrine ("reasonable use" version) allows the redistribution of economic rent from water as reasonableness is re-interpreted and unused rights are exercised without compensation to those who suffer reductions in supply and consequent economic loss. The advantage of this, if any, is primarily a matter of equity rather than economics and it may have important economic disadvantages. It disregards losses to existing uses which are also social losses and adds an element of uncertainty which may discourage long-term planning. If the price is paid, later would-be users can obtain the water from existing users as readily, and certainly with more security, under the appropriation system as they can under the riparian doctrine.

The appropriation doctrine serves to distribute property rights to water originally on the first-come, first-served principle. Thereafter market processes, and other transfer procedures if recognized (i.e., forfeiture and condemnation) operate--some without and some with compensation. The "absolute ownership" and "correlative

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[1] Ibid., p. 27.

rights" doctrines put water rights into the hands of overlying landowners. Thereafter, the same transfer processes (minus forfeiture for non-use) may operate. Economic rent will be distributed differently under the two doctrines which may on equity grounds be a basis for preferring one system over another. From an economic standpoint, however, it is the relative merits of the two doctrines in allocating resources to their most profitable uses that is of interest.[1]

Economic reasons for public intervention. - Apart from considerations of fairness and justice, there are valid economic reasons for public intervention in the exercise of individual property rights in water. Market values are not perfect reflections of social economic values and the market mechanism is often defective in calling forth certain economically desirable practices in water resource utilization. Some examples of public control being an economic benefit can be cited.

1) Unaccounted social costs - Economic burdens are imposed by a non-consumptive water user on subsequent users if the first pollutes the water. These are direct, measurable costs, but they are not costs that will be charged by the market to the polluter. Even if polluted water is not used again, it may become a public nuisance. Diversion, delay, and other interruption of the natural flow

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[1] "Some Economic Considerations in Water Use Policy," op. cit., pp. 502-505.

may also lay economic burdens on subsequent users. The riparian doctrine fully recognizes this fact of social costs in water use, and is well adapted in many respects, to a society in which nonconsumptive uses of surface water predominate. Shifts in the proportion of the water which is consumptively used also affect others drawing from the common source of supply.

2) Social benefits - Many water enterprises are collective in character in the sense that their benefits are widely dispersed in space and time and among many persons and cannot be subjected to a market charge. Some of these benefits are difficult even to impute a market value to, others have market value equivalents, not always easily ascertained.

Often the benefits of collective enterprises are so diffused that financing by general taxation seems to be the most equitable and feasible arrangement. Where benefits can be identified and measured with reasonable accuracy, benefit assessments may be equitably made in lieu of financing by general taxation.

3) Need for co-ordinated efforts - Levees, erosion control projects, and many other water projects require the co-operation and co-ordinated efforts of many people. It is often difficult, if not impossible, to secure the full participation by all concerned through voluntary market processes. Collective decisions with legal sanctions and compulsion may be required.

4) Imperfect competition - The market economy depends on effective competition to provide incentive (positive and negative) for efficiency, progress, and fair treatment of the consumer. The physical characteristics of water supply frequently preclude effective competition. Or efficient conduct of the enterprise may dictate monopolistic organization to eliminate wasteful duplication of facilities.

5) Size of undertaking - Often water development projects are on such a vast scale that private industry cannot or is not willing to command the necessary capital funds.

6) Conservation - It is generally believed that distant future returns are undervalued in the market place. The correct conservation policy for nonrenewable resources which are unavoidably depleted by use is not obvious, but public participation in decisions regarding the rate of exploitation may yield long-run economic benefits.

7) Consumptive and nonconsumptive uses - In appraising the total social benefits of the various uses of water, the fact that some uses are nonconsumptive and noncompetitive is of particular and unique significance. The sum of the net returns from several nonconsumptive uses of the same water may greatly exceed that of a single consumptive use which would preclude them. It is economically desirable for legal institutions relating to water rights to take account of this fact. The existence of a superior legal

right for a consumptive use may still not constitute a barrier to economic efficiency, however, if water rights can be sold, because the higher economic values will ordinarily prevail in the market place.

Water resources law thus has a heavier responsibility than mere definition and protection of private property rights in water. Nevertheless, private property rights in water are universal, and have traditionally been associated with land ownership.[1]

Summary. - To summarize, the appropriation doctrine permits overlying owners and riparians to transfer their water rights to non-overlying or non-riparian uses. Limitations on changes in the place and purpose of use and on methods and places of diversion are scarcely more present in the appropriation doctrine than with its competitors. The Kansas Appropriation Act favors uses at certain times over uses at other times as most of the other doctrines do, but it is not a necessary part of the appropriation doctrine. The Kansas water law does not have restrictions on the sale of water or water rights which frustrate the market function of directing property rights into the possession of those best qualified to exercise them. Kansas water law has a scale of preferential use which favors certain uses over others, but its effect has been reduced, and the law can be changed to remedy the situation as such

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[1] Ibid., p. 505.

preferences are not inherent in the appropriation doctrine. The appropriation doctrine is relatively free from any uncertainty regarding the supply of water available for use and from legal insecurity of the right to water. The appropriation doctrine's superiority in the development of water resources, investment stability, and certainty among other factors counteract the cost of most hydrological studies that may be needed in certain instances.

Forecast of Future Water Uses

Best use today and tomorrow requires forecasting, because what is best for today depends upon what may be expected to happen tomorrow. This is especially so when one of the water allocation decisions is whether to use water now or later--whether to retain, reduce, or augment artificial and natural stored supplies. But even if the question of when to use the water was not involved the particular uses to which the water should be put in the present to maximize economic benefits will be affected by what is expected to happen in the future.

Whether planned or unplanned, the things people do with water today are likely to cast a mold for the future. Intelligent planning that includes thoughtful consideration of all aspects of prospects for the future, can prevent the setting of a rigid pattern that might some day prove unduly restrictive to the population of the state. Comprehensive planning involves two distinct problems:

(1) increasing the stability of supply for the present water users, and (2) providing for anticipated future users.[1]

Population. - The Kansas population has been increasing slowly since 1910, but it is growing and there is the significant factor in the shift from farms to cities. Two estimates of the Kansas population in 1975 are based on regional population projections by Margaret J. Haygood of the Bureau of Agricultural Economics and Jacob S. Siegel of the Bureau of the Census, and on unofficial Census Bureau projections on the U. S. population in 1975. The medium estimate indicates a population of 2,167,000 in 1975, and the high estimate forecasts 2,568,000 for Kansas.

The trend in population of rural areas has been downward for many years, but there has not been a similar downward trend in planted acreage or in farm income. The fluctuations in agricultural income indicate that the present population would benefit greatly by any measures tending to provide a more uniform water supply for agricultural use. This need is recognized by farmers generally, as shown, among other things, by application of conservation practices for retaining a larger proportion of the rainfall in the soil, and by increasing use of sprinkler irrigation in all parts of the state.

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[1]The Kansas Water Resources Fact-Finding and Research Committee, Water in Kansas (Topeka, Kansas: State Printer, 1955), pp. 9-10.

Rural domestic use. - By comparison with the water used by crops, the quantities needed for rural domestic supply are very small, but they are of great importance as shown by the expenditures for hauling water during droughts, particularly in the eastern half of the state. The domestic water consumption on Kansas farms changes from year to year, depending upon the adequacy and availability of supplies, the number and kind of livestock, farm population, the extent of modern water supply systems, and other factors. Water requirements for household purposes on Kansas farms also seems likely to increase in the future, despite the tendency toward decline in rural population.

Irrigation use. - Prediction as to future needs for irrigation may depend to some extent upon social and economic trends not only in Kansas but over the nation. But the prospects are favorable to increasing use of water for irrigation in Kansas. Irrigation has grown rapidly, especially in western Kansas, but the best uses of water for irrigation now and in the future may not be those uses which are now the most profitable.

Industrial use. - Industrial uses of water should be encouraged in order to diversify the economy of the state. Kansas is primarily an agricultural state with only a minimum of industrialization. Increased industrial uses of water resulting from industrial expansion within the state can lend stability to the state economy in periods of agricultural deflation and general economic inflation. But

diversification can not only stabilize the state economy but permit accelerated economic growth. By 1975 industry water needs may be 2½ times as great as in 1950, or 200 billion gallons a day. Water supply has always been significant in the location of industry, and it will become more important by 1975. The future requirements of industry, whether due to the changing needs of existing plants or to the addition of new industries are less predictable than the probable needs of agriculture or municipalities. If Kansas is to share the nation's industrial growth, the water requirements of industry must be considered, particularly because new industries are heavy water users. Industry can pay for its own water, including the costs of the additional facilities needed, but if Kansas is to attract industries it must assure them that adequate and suitable water is available at reasonable cost.[1]

Municipal use. - The requirements of public water supply systems are almost certain to increase in the future. Particularly in recent years the largest Kansas cities have grown rapidly. The expansion of metropolitan centers is a factor of special importance to be considered in a water plan of the state. Just how great future municipal water demands will be depends on the amount of population growth and the rate of per capita use. Several communities in Kansas have already used the water resources of areas

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[1] Ibid., pp. 10-11.

several miles away in order to supply their increasing needs for water.

Recreational use. - Water is also an important recreational resource, and there is great pressure about urban areas for water-based recreational facilities.[1] The Kansas legislature has adopted the policy of encouraging tourism, and tourist travel and outdoor recreation in general have increased many times over in recent years. A broad plan for the future should include additional recreational areas and facilities adjacent to adequate water facilities for this purpose.

Water power use. - Water power, like recreational use, will probably be chiefly a dependent use--dependent upon whether hydro-electric power can be developed in conjunction with storage releases or flow for other uses. The future of hydro-electric power generally in Kansas is limited by low gradients and the great variations in stream flow.[2]

Table 3 (Chapter III, p. 36) summarizes present and future uses of water in Kansas. This presentation, relating the present period to the year 1975, in general confirms the above projections that municipal, industrial and

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[1]Robert S. Collins, Water Supply and Tomorrow Super Cities, A Special Report prepared for Water Information Center, Inc. (Port Washington, L. I., New York: 1962), p. 4.

[2]The Kansas Water Resources Fact-Finding and Research Committee, op. cit., p. 80.

irrigation uses of water are expected to increase much more rapidly in the future than domestic and water-power uses.

VI. COMPARISON OF THE EXPERIENCE UNDER THE APPROPRIATION ACT WITH WHAT MIGHT HAVE BEEN EXPECTED HAD THE PRE-1945 WATER LAW REMAINED IN EFFECT

Comparing the experience of the new law with what might have been expected had the water law not been changed at the beginning of the period involves some conjectures about how the old law might have operated. In discussing the experience under these laws we must presume that the old law would not have been modified in some way. This may be unrealistic but there seems to be little basis for predicting how it might have been changed if the statute actually enacted had not been passed.

The Kansas courts prior to the 1945 Appropriation Act applied the American "reasonable use" rule regarding surface water, the common-law "natural flow" theory having gradually evolved into this "reasonable use" rule about the turn of the century. The common-law "absolute ownership" rule was applied to underground water prior to 1945.

The "reasonable use" rule as applied to surface water prior to 1945 gave no priority of rights; the reasonable use by each was limited by a like reasonable use in every other riparian, thereby giving priority to riparians but not as between riparians. The use of water for natural

purposes was paramount to the use of water for artificial purposes. The riparian had the right to have the water in its natural state free from unreasonable diminution in quantity and free from unreasonable pollution in quality.[1] The rights of the riparians were equal and could not be forfeited for nonuse, though subject to prescription.

The common-law "absolute ownership" rule as applied to ground water in Kansas prior to 1945 put percolating water at the absolute disposal of the owner of the land. Under this rule the landowner was not accountable in damages or otherwise for any injury he might cause to others through the taking of such waters.[2] According to some Kansas decisions, however, this rule did not permit the taking of percolating water in cases where the one taking the water was actuated by malice, allowed waste, or when such appropriation impaired the flow of a natural surface stream to the injury of the riparian owner. "Wicked motive incidental to lawful purpose, however, was probably no impediment."[3]

The distinguishing feature of the Prior Appropriation Act enacted in 1945, after an earlier statute[4] was held to

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[1]Chester H. Smith, Real Property Survey (St. Paul, Minnesota: West Publishing Co., 1956), pp. 218-219.

[2]William E. Burby, Handbook of the Law of Real Property (2d ed.; St. Paul, Minnesota: West Publishing Co., 1954), p. 65.

[3]Beneficial Use of Water, op. cit., p. 29.

[4]Kansas, Sessions Laws (1886), c. 115.

be ineffective,[1] is the protection of the right to appropriate water once perfected, in accordance with priority of appropriation--there is no equity of rights and no reasonable use limited by the rights of others.[2] Under Section 2 of the Act all water within the state is "dedicated to the use of the people," subject to the control and regulation of the state.[3] The following section[4] provides that all waters within the state, which includes surface and ground waters, may be appropriated for beneficial use, subject to existing vested rights. The appropriator is not restricted to use of the water on riparian lands as he was under the strict riparian doctrine.[5]

Due to the absence of any extended period of drought, which would have provided a greater opportunity for individual water rights to be brought into conflict, and due also to the practical approach to water problems and liberality of the Division of Water Resources both in the interpretation of the Appropriation Act and in the administration of applications to appropriate water, the development of water rights in Kansas does not appear to have been appreciably changed by the shift to the appropriation

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[1]Supra, Chapter ii, p. 10.

[2]Smith, op. cit., p. 20.

[3]Kansas, General Statutes (1949), 82a-702.

[4]Kansas, General Statutes (1949), 82a-703.

[5]Beneficial Use of Water, op. cit., p. 35.

doctrine as to ground and surface water. Irrigation use has proceeded rapidly especially in western Kansas. This development probably is unaffected by the substitution of the appropriation doctrine for its predecessors. However, there are two rather obvious exceptions to the above conclusion.

1) Appropriators, particularly in the eastern part of Kansas, have used a greater quantity of water from streams than would have been legally possible under either the "natural flow" theory of the English common law or under the American "reasonable use" rule. This is very probably a healthy situation as the water must be used for beneficial purposes under the Act, and because of the fact that the earlier doctrines often fostered convenient use at the expense of wastage of great quantities of water.

2) The appropriation doctrine can be looked upon as a force in the determination of the Equus beds controversy in Harvey County, Kansas. As previously stated, this involved the appropriation of considerable quantities of ground water by the city of Wichita. The prior appropriation by Wichita was upheld by the state and federal supreme courts with the Division of Water Resources taking an active part in defending the Act and the Division's approval of Wichita's application to appropriate this sizable quantity of water.

The appellants wished the Act to be declared unconstitutional as denying due process of law, and cited cases supporting the American "reasonable use" rule which had

never been applied to ground water in Kansas. They believed this doctrine would have prevented Wichita's acquisition of this supply of water, as not being a reasonable amount in relation to the amount taken by other users of the underground water basin. The majority opinion in Kansas decisions prior to 1945 supported the common-law "absolute ownership" rule concerning ground water. The latter rule would have allowed Wichita to use all the water it wanted as the overlying owner, while the appropriation doctrine would limit Wichita to the beneficial use of any amount taken. However, under the "absolute ownership" and "reasonable use" rules Wichita's water right would be only coequal with the other users, while Wichita could have a prior right against subsequent appropriators under the appropriation doctrine.

If in the future large numbers of individual rights come into conflict as needs for water increase, the results from the application of the appropriation doctrine may be quite significant in relation to what would have existed under the pre-1945 water laws.

VII. COMPARISON OF THE APPROPRIATION ACT WITH OTHER TYPES OF WATER LAW WHICH MIGHT HAVE BEEN ADOPTED IN PLACE OF THE PRE-1945 LAW OF WATER RIGHTS

Comparing the experience of the actual law with other types of water rights law which might have been adopted in place of the old law requires conjectures concerning the water uses that would have developed under such laws. Successful accomplishment of this step is necessary if the new law is to be measured against other actual alternatives rather than an ideal, and perhaps, unattainable standard.

Let us first compare the advantages and disadvantages of the various water rights laws. To cover problems with reference to water location and use, court decisions and statutes have developed several broad doctrines. These doctrines, one or several in combination, constitute the basis for the water laws of the various states. The doctrines applicable to watercourses are: (1) the riparian and (2) the appropriation doctrines. Those applicable to ground water are: (1) the riparian doctrine, (2) the English or common-law doctrine of "absolute ownership," (3) the American doctrine of "reasonable use," (4) the correlative rights doctrine, and (5) the appropriation doctrine. We shall review each doctrine briefly.[1]

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[1]Beneficial Use of Water, op. cit., p. 24.

Surface Water Principles--The Riparian Doctrine

At common law, a riparian owner or proprietor was one who owned land contiguous to the banks of a river. Riparian rights were those rights of riparian owners that related to the adjoining lands. Arising through the significance of location they were regarded as natural rights.[1]

As an abstract rule, a riparian proprietor was entitled to the flow of the adjoining watercourse without diminution in quantity or alteration in quality as an inheritable incident to his rights in his adjoining land.[2] Where damages for flowage diversion were difficult to measure and the diverting party could return the flow to the natural channel without too much expense the right was protectable by injunction.[3] Since this right to the benefits of uninterrupted flowage rested upon location and not upon use, the owner could neither abandon it nor lose it by disuse. The courts merely considered it as one of the inherent property rights incident to land ownership. It was a real property interest,[4] passed with the conveyance of the land,[5] and was within the constitutional provisions prohibiting the taking

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[1]Kinney, op. cit., sec. 452, p. 763.

[2]Shamleffer v. Council Grove Peerless Mill Co., 18 Kan. 24 (1877).

[3]Atchison Topeka and Santa Fe Rld. Co. v. Long, 46 Kan. 70 (1891).

[4]Smith v. Miller, 147 Kan. 40 (1938).

[5]Shamleffer v. Council Grove Peerless Mill Co., 18 Kan. 24 (1877).

of private property for public use without compensation being first made.[1] Actions for its protection were actions for the determination of a right or interest in land.[2]

The right of one riparian owner to uninterrupted, unimpaired flowage as against another riparian owner carried with it, of necessity, the duty to refrain from diverting or substantially detaining the flowing water although one could rightfully change the channel of a stream flowing through his land as long as he returned the stream to its original channel before it reached the lower riparian owner's land.[3] This duty was correlative to the other riparian owner's right to the benefit from a like flow.[4]

Of necessity, the courts had to expand this concept of strict flowage rights to meet the need of the riparian owner to divert and consume water to sustain life. Hence at common law the riparian owner could use and consume water for his domestic purposes, that is, to supply his household and to water his livestock. In Kansas, he could even impound water for such purposes if he neither committed waste nor unreasonably diverted water from lower riparian owners.[5] The common law of Kansas, as elsewhere, expanded

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[1] Durkee v. Bourbon County Commissioners, 142 Kan. 690 (1935).

[2] Smith v. Miller, 147 Kan. 40 (1938).

[3] Missouri Pacific Rly. Co. v. Keys, 55 Kan. 205 (1895).

[4] Frizell v. Bindley, 144 Kan. 84 (1936).

[5] Heiss v. Schulz, 167 Kan. 34 (1949).

this riparian use concept to authorize a riparian proprietor to make reasonable use of the waters of a stream for irrigation purposes.[1] This right, however, was subject to the rights of the other riparian owners to a like reasonable use, the reasonableness of the use depending on the circumstances.[2] Further it was subject first to the satisfaction of all domestic needs of the other riparian owners.[3] Moreover, the use right was the right to use the water on the riparian lands only.[4] When a riparian owner made no beneficial use of water and wasted the amount diverted, a lower riparian owner might enjoin such a diversion.[5]

Two distinct approaches or theories, in part contradictory, underlie the riparian doctrine. The first is often called the "natural flow" theory. The second is termed the "reasonable use" theory.[6]

The "natural flow" theory. - Under this theory after the satisfaction of an upper owner's natural wants, the downstream owner is entitled to uninterrupted, unimpaired flowage. The upper owner's privilege to use water on his

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[1] Campbell v. Grimes, 62 Kan. 503 (1901).

[2] Clark v. Allaman, 71 Kan. 206 (1905).

[3] Frizzell v. Bindley, 144 Kan. 84 (1936).

[4] Crawford Co. v. Hathaway, 67 Neb. 325 (1903).

[5] Atchison Topeka and Santa Fe Rld. Co. v. Shriver, 101 Kan. 257 (1917).

[6] Campbell v. Grimes, 62 Kan. 503 (1901).

riparian land for artificial or extraordinary purposes, such as irrigation, was exercisable only as long as he did not substantially impair the quantity or quality of the flow.

The "reasonable use" theory. - Under this approach reasonable use, rather than pre-existing flowage, is the basis of riparian rights. Each owner may beneficially use the water for any purpose as long as this owner does not interfere with the like uses of other riparian owners.[1] Courts have followed one theory or the other in varying degrees, and some have used both without clearly distinguishing them.

The riparian doctrine of "natural flow" is reasonably definite and relatively easy to apply. While the riparian doctrine of "reasonable use" is less so, its emphasis upon water utility gives it greater recommendation. Taken as a whole, however, the riparian doctrine is subject to these criticisms:

1) The rights of the parties, resting upon reasonableness, are uncertain and vary with changing conditions.

2) The uncertainty of riparian owners as to their rights tends to discourage development of water resources.

3) In discouraging resource development, the application of the doctrine tends toward waste.

4) The doctrine does not take into account the water needs

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[1] Restatement of Torts, Vol. IV, sec. 849, pp. 342-346; Heise v. Schulz, 167 Kan. 34 (1949).

of nonriparian persons or the consumptive needs of society in general.

5) The doctrine is not well-suited to arid, semiarid, and heavily populated areas where consumptive use is of vital importance.[1]

In general, the "natural flow" theory discourages virtually all uses except those which are domestic in origin. The "reasonable use" theory would allow more water to all uses but they would be circumscribed by the rule of reasonableness.

Ground Water Principles

English and American courts have divided ground water into two broad categories: (1) subterranean flowing streams and (2) subterranean percolating waters. Notwithstanding scientific protest, the distinction persists, although the trend is away from it, and the courts have applied different rules to the two types of ground water.

If the existence and course of an underground stream was known or ascertainable (the presumption being against such existence), then, broadly, the rules applied to surface streams became applicable to ground streams. If, however, the ground water was percolating water or if the parties could not show that the water was part of a ground

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[1]Beneficial Use of Water, op. cit., p. 27.

stream, rules pertaining to percolating waters were applicable.[1]

The different rules peculiarly applicable to percolating water were: (1) the English or common-law doctrine of "absolute ownership," (2) the American doctrine of "reasonable use," and (3) the "correlative rights" doctrine.

Apart from contract and statute, the courts have announced two controlling principles in deciding the rights and duties of adjoining landowners on the question of the propriety of diverting percolating waters. These two principles afford the basis for the three different rules, exclusive of the appropriation doctrine, that different legislatures and courts have applied. The first principle is in terms of "absolute ownership"--"To whomsoever the soil belongs, he owns also to the sky and to the depths." The second emphasizes the concept that no right of use extends to the point that it includes injury to another--"Use your own property in such a manner as not to injure that of another."[2] Each principle has given mood, tone, and configuration to its overlying rules of decision.

The problems arising out of the diversion of percolating waters probably first arose in England.[3] The

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[1] 29 American Law Review, Annotated (2d ed. 1953) 1354, 1373-1374.

[2] Ibid., 1354 at 1358.

[3] Ibid., 1354.

English solution acquired the name of English or common-law rule. The modern trend, in purely common-law decisions, favors the American rule, which is based upon doctrines of "reasonable use" and "correlative rights."

The English (common-law) rule of "absolute ownership." - Under this rule, percolating water is an inherent part of the land through which it passes. The overlying owner's right to it while it is in or under his land is a property right in the corpus of the water.[1] Regarding such water as his property, some courts thought that the overlying owner might use any or all of it regardless of the effect on his neighbor.[2] The decisions do, however, show exceptions. The owner could not appropriate percolating water when such appropriation impaired the flow of a natural surface stream to the injury of the riparian owner.[3] Further, some courts determined that the lawful exercise of the overlying owner's property rights in percolating waters depended also upon the absence of malice and waste.[4] In many of the earlier cases the landowner was not using water consumptively. The diversions resulted from building, drainage, and the like--diversions merely incidental to

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[1]"Waters," American Jurisprudence, Vol. LVI, sec. 113, p. 595, cited in Beneficial Use of Water, op. cit., p. 29; Jobling v. Tuttle, 75 Kan. 351 (1907).

[2]Emporia v. Soden, 25 Kan. 566 (1881).

[3]Ibid.

[4]American Law Review, op. cit., p. 1354.

land use. Nevertheless, the courts applied the rule to diversions for consumptive use as well.[1]

Much of the language in the cases pertaining to "absolute ownership" is obiter dicta and completely unnecessary to the respective decisions. Moreover, ownership as a concept is often vague and denotes only certain rights of use against certain persons with respect to certain physical phenomena. Moreover in its operation, the English rule of "absolute ownership" is also subject to these additional objections:

1) It encourages depletion of water supplies and tends toward waste.

2) It recognizes strict ownership concepts although control, confinement, and management may be absolutely impossible.

3) It permits water to percolate into streams and flow out of the state, particularly if the overlying landowners choose not to develop and use the supplies and if the same rule is applied to surface water.

4) It might permit pollution without sanctioning compensation for resulting injuries and damages.[2]

This doctrine is reasonably certain, however, and easy to apply.

Like the riparian doctrines as to surface water, the "absolute ownership" rule applied to ground water would

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[1]Beneficial Use of Water, op. cit., p. 30.

[2]Ibid., pp. 30-31.

seem to retard certain uses of water (municipal, industrial, and recreational) while encouraging domestic and irrigation uses. For frequently the landowner is not making the fullest use of his water right. This right may be extremely valuable to other users but this landowner, wanting to retain his land holdings and fearing to sell his water right which he might later need, refuses any reasonable offer. Irrigation usage is possible, but is limited in that the overlying owner possesses virtual autonomy as to the water underlying his lands. Although he can sell the water, the water right itself under this rule is non-transferable if separated from the land under which it lies.

The American "reasonable use" and "correlative rights" doctrines. - In water law the terms "reasonable use" and "correlative use" are frequently used interchangeably.[1] It is apparently impossible, however, to find any pervading, distinguishing pattern in the various decisions between the so-called "reasonable use" doctrine and the "correlative rights" doctrine, except in California, where the "correlative rights" doctrine is well developed and distinctive.[2]

Hutchins says the chief features of the California doctrine of "correlative rights" are:

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[1] American Jurisprudence, op. cit., sec. 114, p. 598.

[2] Wells A. Hutchins, "Trends in the Statutory Law of Ground Water in the Western States," Texas Law Review, XXXIV (1955), pp. 157, 163.

> (1) Owners of all lands that overlie a common supply of percolating water have a co-equal right of reasonable beneficial use of water on or in connection with their overlying lands; (2) any surplus above their reasonable requirements may be appropriated for distant use, or for public utility use within the area, but simply by diversion and use and not under the procedure prescribed in the water code; (3) in the event of a shortage, the common supply may be apportioned among the overlying landowners in proportion to their reasonable needs; and (4) rights in percolating waters physically connected with a surface stream or other source of water--all of which sources are considered a common supply--are correlated with all other rights of use that pertain to the common supply. Clearly, all this involves is a substantial refinement and extension which has not been duplicated in any other western state.[1]

Consequently, except in California, "correlative use" has little meaning and little significance beyond the realm of "reasonable use."

Under the usual American or "reasonable use" rule, instead of an absolute, unlimited right to underlying percolating ground water, a landowner had a right to a reasonable, beneficial use upon his land of those waters that were in or under his land.[2] When an adjacent, "reasonable use" owner also wanted to use or was using water from the common source of supply, it was unreasonable for the first landowner to transport water for use away from the land just as it was unlawful for him to waste water.[3]

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[1] Ibid., p. 164.

[2] American Jurisprudence, op. cit., p. 597.

[3] "Trends in the Statutory Law of Ground Water in the Western States," op. cit., p. 162.

Some courts, however, placed no limitation upon the amount of water used upon the land as long as the use was reasonable in purpose and manner.[1] But if the common supply was insufficient to satisfy the needs of the various owners, regardless of whether they spoke in terms of "reasonable use" or of a "correlative use," the courts have usually felt that each landowner should have a fair and proportionate share.[2] It is, then, the idea of sharing a common supply for reasonable, beneficial purposes that distinguishes the "reasonable use" or "correlative use" from the English "absolute ownership" rule.

Although an advance over the English rule of "absolute ownership," the American "reasonable use" rule is justly subject to some criticism:

1) The rights of the parties are uncertain and subject to change as conditions change.

2) Here, too, it recognizes ownership concepts where the necessary ownership control may be entirely absent.[3]

The "reasonable use" rule as to ground water, similar to the "reasonable use" rule for surface water would seem to allow more uses and in greater quantity than its common-law companion, in this case the rule of "absolute

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[1]American Law Review, op. cit., p. 1354, 1364; American Jurisprudence, op. cit., p. 598, Kinney, op. cit., sec. 1192, pp. 2161-2162.

[2]American Jurisprudence, Ibid.

[3]Beneficial Use of Water, op. cit., p. 32.

ownership" concerning ground water, but again it is circumscribed by reasonableness. The California version of the "correlative rights" doctrine would seem to be still more elastic to new and greater water uses.

The Appropriation Doctrine

The doctrine of appropriation has developed from three general sources: (1) local custom and usage, (2) judicial decisions, and (3) legislative enactments. Arising in the arid and semiarid portions of our country, the doctrine is now in force in all seventeen western states. Although based on a different philosophical foundation than that underlying the common-law doctrines, the appropriation doctrine need not be, and seldom is, the exclusively controlling doctrine. In fact it is of exclusive control in but eight of the seventeen western states. Appropriation and riparian doctrines may both exist in the same state, each operating within its proper sphere and each limiting and modifying the other.[1] Notwithstanding this coexistence, the doctrines are continually clashing since they rest upon conflicting principles.[2]

Basically, the appropriation doctrine recognized the right of persons to divert water from natural channels and to apply that water to beneficial purposes. Some form of

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[1] Crawford Co. v. Hathaway, 67 Neb. 325 (1903).

[2] Kinney, op. cit., Vol. I, sec. 587, pp. 1009-1011.

notice was usually required. The appropriator was not restricted to use of the water on riparian lands as he was under the strict riparian doctrine. Moreover, the law protected the right to appropriate water, once perfected, in accordance with priority of appropriation.[1] If it turned out that there was only enough water to supply existing rights, the new appropriator would get none of the water and, in times of water shortage, the prior appropriator was entitled to the full amount of his appropriation even if such taking left no water for subsequent appropriators.[2]

Drawing from his examination of the various authorities, Samuel C. Wiel defined and characterized an appropriation right in these terms:

> A water-right of appropriation is real estate, independent of the ditch for carrying the water and independent of ownership or possession of any land and independent of place of use or mode of enjoyment, whereby the appropriator is granted by the government the exclusive use of the water anywhere so long as he applies it to any beneficial purpose; and it is an incorporeal hereditament, solely usufructuary, not conferring ownership in the corpus of the water or in the channel of the stream.[3]

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[1] Ibid., sec. 599, p. 1043.

[2] Lehi Irrigation Co. v. Jones, 202 Pac. 2d. 892 (1949); Wiel, Water Rights in the Western States, Vol. I, sec. 279 (3rd ed., n.d.), pp. 291-293, cited in Beneficial Use of Water, op. cit., p. 34.

[3] Wiel, op. cit., sec. 288, pp. 298-300.

Some states have recognized appropriation rights through court decisions wholly disassociated from statutory mandate. Other states have relied wholly upon statutory law to fix the existence, extent and limits of the right, usually providing for a permit system under the administration of the state engineer or similar official or governmental agency.[1]

Prior to 1886, when the Kansas legislature authorized the right to appropriate water from running streams for irrigation purposes,[2] our state had never recognized, either by statute or by court decision, the doctrine of prior appropriation.[3] Hence, the Kansas Supreme Court in Clark v. Allaman,[4] determined that the federal legislation of 1866 and 1870[5] had never sanctioned or protected any vested or accrued appropriation rights since the state had never recognized local customs based upon prior appropriation principles. In Frizzell v. Bindley, cited above, the Kansas Supreme Court held that, where titles to lands had vested prior to the 1886 statute, no appropriator under the statute could acquire rights superior to riparian rights that had vested under our common-law principles existing

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[1]Clark v. Allaman, 71 Kan. 206 (1905).

[2]Kansas, Laws (1886), c. 115, sec. 1.

[3]Clark v. Allaman, 71 Kan. 206 (1905).

[4]Ibid.

[5]Kansas, Revised Statutes (1875); sec. 2339-2340.

at the time of the acquisition of the title to the land.[1]

The Kansas Water Appropriation Act[2] sets out the principles that now control the acquisition of appropriation rights in Kansas. Under Section 2 of the Act,[3] all water within the state is "dedicated to the use of the people," subject to the control and regulation of the state. The following section[4] provides that all waters within the state may be appropriated for beneficial use. But it makes such appropriations subject to those vested rights[5] that are defined by the Act.

A potential appropriator, under the law, makes a written application to the chief engineer of the Division of Water Resources of the Kansas State Board of Agriculture. In it, he specifies the amount of water he intends to appropriate and the source from which he intends to obtain

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[1] State ex rel. Peterson v. Board of Agriculture, 158 Kan. 603 (1944).

[2] Kansas, Laws (1945), c. 390.

[3] Kansas, General Statutes (1949), 82a-702.

[4] Kansas, General Statutes (1949), 82a-703.

[5] A "vested right" is defined as

> "the right of a person under a common-law or statutory claim to continue the use of water having actually been applied to any beneficial use, including domestic use, on or before June 28, 1945, to the extent of the maximum quantity and rate of diversion for the beneficial use made thereof . . . "

(Kansas, General Statutes 1949 , 82a-701 d).

the water.[1] If the chief engineer approves the application,[2] the applicant is authorized to proceed with the diversion and the application of the water to a beneficial use.[3] The applicant is given a reasonable time period to complete his installation and perfect an appropriation right.[4] When the applicant finishes the construction of his diversion works and applies water to the proposed beneficial use, he is required to notify the chief engineer.[5] If, after an inspection, the chief engineer finds that the appropriation has been completed as authorized, he issues a permit in duplicate to appropriate water, one copy of which is recorded with the registrar of deeds in the county where the point of diversion is located, and the other copy of which stays on record in the office of the chief engineer.[6] The resulting right of the applicant is an appropriation right.

Kansas, by its 1945 Water Appropriation Act, provided that all waters might be appropriated for beneficial use, making no distinction between surface and ground water or

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[1]Kansas, General Statutes (1949), 82a-709.

[2]Kansas, General Statutes (1949), 82a-711.

[3]Kansas, General Statutes (1949), 82a-712.

[4]Kansas, General Statutes (1949), 82a-713.

[5]Kansas, General Statutes (1949), 82a-714.

[6]Ibid.

between ground streams and percolating water.[1] The only limitation it imposed was that such appropriations would be subject to vested rights.[2]

Although in effect in all the seventeen western states, the appropriation doctrine is no legal panacea. Some of the objections to the appropriation doctrine are:

1) It is difficult to apply and in some measure meaningless with regard to underground reservoirs with negligible recharge. (This is not to say that all of the other doctrines are any easier, or even as easy to apply.) The appropriation doctrine is somewhat meaningless with regard to underground reservoirs with negligible recharge because, unlike a surface stream with a relatively constant flow, the underground reservoir with negligible recharge is a stock resource and when one appropriator has a water right perfected to any amount of water in it, others are precluded from making any appropriation unless the reservoir's use is limited to a certain number of years or to a measurable fall in the level of the water table per year. Kansas is one of those western states where such a limitation does not exist by legislative act or court decision.[3]

2) In states previously recognizing common-law rights,

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[1]Kansas, General Statutes (1949), 82a-703.

[2]Ibid.

[3]These and other aspects of ground water "mining" were discussed more fully in Chapter IV, p. 63.

clashes necessarily occur between the common-law and appropriation doctrines. (Perhaps this is but another way of recognizing the incompleteness of the consolidation of individual legal rules, a consolidation never fully effected in any legal area.)[1]

On the other hand, the appropriation doctrine has many commendable aspects:

1) Based upon beneficial use and time priority rather than upon location or ownership, the doctrine assures development of water resources and tends to discourage water waste.

2) It insures necessary investment stability, spurring water-resource development and protecting the interests of those who develop.

3) It establishes the character, extent, and limits of water rights with greater clarity and certainty than the other doctrines.

4) It insures a more flexible regulatory foundation.

5) It encourages greater water distribution.

6) Perhaps most important of all, a sound appropriation doctrine stimulates a free-enterprise system of water resource development[2] as a sound doctrine allows for free marketability of water rights.

The appropriation doctrine would seem to foster

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[1]Beneficial Use of Water, op. cit., p. 37.

[2]Ibid.

optimum development of all uses of water (domestic, municipal, irrigation, industrial, recreational, and water power) when the water rights are freely marketable. During the seventeen years since the passage of the Water Appropriation Act, irrigation use has grown very quickly. Recreational, industrial, and municipal uses have also risen markedly. Domestic use of water shows a constant rise. These observations probably would have been similar under the "reasonable use" doctrines for ground and surface water as the Act is now enforced; though the Appropriation Act's definiteness and flexibility of regulatory administration probably made the acquisition of water rights easier. Undoubtedly the Appropriation Act allowed the development of all uses, relative to what would have existed under the common-law doctrines of "natural flow" applied to surface water and "absolute ownership" applied to ground water.

VIII. THE BEST SYSTEM OF WATER LAW FOR KANSAS

An additional question to which answers would be most welcome and about which some projections must in any case be made is the question of which water rights system will be best for the future of Kansas. The experience of 1945-1962 is but a limited period on which to base an evaluation of the law. It may be experiencing difficulties of a temporary character associated with the transition to the appropriation doctrine from the former system of the American riparian doctrine of "reasonable use" as applied to surface water and the common-law "absolute ownership" rule in regard to ground water in Kansas, as these laws had evolved in Kansas legal decisions prior to 1945. Also, conditions in the future may not be like those of the examination period, or circumstances of the period might be such that the law did not have an opportunity to be tested. The law may work better or worse under different conditions. For example, the period 1945-1962 might be one in which there is little scarcity of water in the sense that it is necessary to allocate water among competing uses or users. There is, after all, little need for property law unless two or more persons want to use the same resource in a

manner which interferes with each other's uses.[1]

Having discussed the strengths and weaknesses of the various alternative water rights laws in Chapter VII above, the writer concludes that the appropriation doctrine provides the best water rights system for the future of Kansas if: (1) problems arising under its provisions are remedied by amendments to the 1945 Act as was done by the legislature in 1957, (2) water rights are freely transferable, and (3) market forces are allowed to operate.

Statements have been made by various sources which detail the problems involved in discarding the appropriation doctrine for a substitute water law in Kansas. The Kansas Water Resources Board reports in 1956:

> Relying upon the 1945 Kansas Water Appropriation Act, many water users have acquired rights under it. Others have at least proceeded in accordance with its commands, some possibly declining development. A few court decisions have given stability to its direction and have strengthened its foundations. Any radical change in underlying philosophy would undoubtedly cause great confusion, would tend to unsettle acquired rights, foment new litigation, and postpone needed development of our water resources . . .
>
> It seems far sounder to build upon what we have than to start anew. After all, new starts usually encourage further new starts. One "false start" follows another, and no sound system of law can exist unless society permits its roots to go deep . . .[2]

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[1]Property law of a defensive nature which prevents one person from imposing something on another may also be needed. Disposal of excesses and waste water is an example in the case of water resources.

[2]Beneficial Use of Water, op. cit., p. 38.

Trelease, a leading authority on property law, makes this statement about the future of the appropriation doctrine in the western United States:

> Any recognition of the power to appropriate necessarily results in the derogation of riparian rights and the extinguishment of riparian claims, and there is a definite trend toward further extension of appropriation and a corresponding minimizing of riparian doctrines. This movement is toward the stabilization of riparian rights by protecting and confirming existing riparian uses, but eliminating riparian claims to unused waters, thus giving firmness and stability to water rights appropriated for new projects.
>
> This trend is inexorable, its course being determined by steadily increasing pressure as maximum development of water resources approaches. There are few places in the West today where substantial supplies of water are available without the expenditure of large sums of money, and an entrepreneur, public or private, who contemplates a new project for water use demands a secure legal basis for the water right that will be the foundation of the development . . .
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> Inevitably, the need for further development and for the maximum utilization of water resources will tend to shape the law in the appropriative pattern, and to stabilize riparian rights and quiet the titles of appropriators against riparian claims to unused waters.[1]

The economic strength of the prior appropriation doctrine lies in the fact that it encourages the development and use of available water resources by giving greater certainty of water rights to those who would make the necessary capital investment. The doctrine, though

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[1]Frank J. Trelease, "Coordination of Riparian and Appropriative Rights to the Use of Water," Texas Law Review, XXXIII (1954), p. 24.

imperfect in some respects, is regarded as best suited to the needs and conditions of the western states by most of the authorities on water resources. Unused water cannot wisely be held in perpetuity for a common-law owner who may never have use for it, without resulting in underdevelopment as an economic waste and loss of a valuable natural resource. Kansas is now one of the seventeen western states having established a firm system of water use under the appropriation doctrine. The incorporation of this doctrine in the Water Appropriation Act has gone far to encourage water use and development in this state and to reduce waste. A greater general economic development and stability within the state should follow.

IX. SUMMARY

Access to and use of water is now a major problem in the United States and will likely gain more importance in the future. Water demands in Kansas are increasing and water scarcities are imminent or present in some places. The older laws had been found wanting, and in 1945 Kansas undertook large-scale modification in its water rights laws. The Kansas water rights law of 1945 replaced the common-law doctrines of water rights with the appropriation doctrine. Kansas is one of the few states which fully recognizes the inter-relatedness of ground and surface water and applies the appropriation doctrine to both. The state has a diversity of water-supply conditions which provide an excellent testing ground for water rights doctrines.

After seventeen years experience with the Kansas law, it was desirable to appraise its economic effects on water allocation and to attempt to foresee what its future effects would be. The appraisal was also to provide information which it was believed would be helpful in improving Kansas resource policy and would aid other states which might be considering adoption of the appropriation doctrine.

The primary question to which an answer was sought in a study of the economic effects of a system of property

law was whether or not the system leads to the highest level of efficiency in the use of property.

In finding an answer to the above fundamental problem the following topics were discussed: (1) Development of Kansas water law; (2) Study of the actual uses of water in Kansas during the period 1945-1962; (3) Determining the extent of the influence of the Water Appropriation Act on the allocation of water in Kansas; (4) Ascertaining what would have been the best uses of water in Kansas during the period 1945-1962; (5) Comparison of the experience under the appropriation Act with what might have been expected had the pre-1945 water law remained in effect; (6) Comparison of the Appropriation Act with other types of water law which might have been adopted in place of the pre-1945 law of water rights; (7) The best system of water law for Kansas.

Development of Kansas water law. - Until 1945 Kansas water law was marked by an adherence to the common-law doctrine of riparian rights on the part of the Kansas Supreme Court, while the legislature and state administrative groups attempted to get recognition of the prior appropriation doctrine. The Kansas courts prior to the 1945 Appropriation Act applied the American "reasonable use" rule to surface water, the common-law "natural flow" theory having gradually evolved into this "reasonable use" rule about the turn of the century. The common-law "absolute ownership" rule was applied to underground water prior to

1945. Finally in 1945 the legislature passed the Kansas Water Appropriation Act and in 1949 the Kansas Supreme Court upheld the constitutionality of this legislation.

Study of the actual uses of water in Kansas during the period 1945-1962. - From an inspection of tables and graphs it was determined that by far the greatest number of applications received, active permits and certificates, and permits being perfected were to be found within the five year period 1952-1957. The probable reason for this might be the period of dry years experienced during this interval and a growing awareness of the Kansas law by users. The growth of water rights in the future will in all probability continue to be characterized by a leveling off of applications to appropriate water in wet years, and a sharp increase in number when drought conditions exist. The largest amounts of water have been appropriated for irrigation, next for industrial use, third for municipal use, and last for recreational purposes. All rights for water power purposes are vested rights. All uses, except water power, have expanded significantly since 1945. Municipal, industrial, and irrigation uses of water are expected to rise much more rapidly in the future than water appropriated for domestic or water power purposes. At present the water used for all purposes is far less than the unused net supplies.

Determining the extent of the influence of the water rights law on the allocation of water in Kansas. - 1) Vested

rights: There had been many transfers of ownership of vested rights. There had also been many changes in place of use, but few concerning purpose of use. No conflicts between vested right-holders had gone to court. There had been many abandonments of vested rights, but no forfeitures. There were 2,142 vested right orders issued as of January 1, 1963.

2) Appropriation rights: There had been 9,241 applications for a permit to appropriate water, 2,033 of these were perfected as of January 1, 1963. "Paper rights" had not been a problem. There were a few conflicts between vested and appropriation right-holders. Since beneficial use is not defined in the Act, the chief engineer merely allows the filing of any application on its face a beneficial use. The Division never turns down an application for the reason that water may be over-appropriated. Priorities of time and the scale of preferential use are available for protection of the public interest and to provide criteria of "impairment of right" in the approval of applications. As of January 1, 1963, only 16 of 2,033 appropriation rights perfected had been abandoned and terminated; 883 non-approved and 1,526 approved applications had been dismissed and their priority forfeited.

The chief engineer had not been appointed referee as yet in any water suits. Voluntary rotation of water between users is allowed under the Act, but no such

application has been made. Ground water "mining" is a problem in western Kansas. Other topics discussed in Chapter IV include the state water plan, and case study of water right conflicts.

Ascertaining what would have been the best uses of water in Kansas during the period 1945-1962. - The economic criterion of best use of water is maximization of aggregate discounted net returns.

In a forecast of future uses we found that irrigation, municipal, industrial and recreational uses of water were to expand much more rapidly than domestic and water power uses.

The present Kansas water law, encompassing the appropriation doctrine, appears to be superior to any present alternative in permitting the effective development of all water usages within the state under foreseeable conditions.

Comparison of the experience under the Appropriation Act with what might have been expected had the pre-1945 water law remained in effect. - Due to the absence of any extended period of drought, which would have brought individual water rights into conflict and due also to the practical approach to water problems and liberality of the Division of Water Resources both in the interpretation of the Appropriation Act and in the administration of applications to appropriate water, the development of water rights in Kansas does not appear to have been changed in any

appreciable way by the shift to the appropriation doctrine.

If in the future large numbers of individual rights come into conflict as needs for water increase, the results from the application of the appropriation doctrine may be quite significant in relation to what would have existed under the pre-1945 water laws.

Comparison of the Appropriation Act with other types of water law which might have been adopted in place of the pre-1945 law of water rights. - The appropriation doctrine would seem to foster optimum development of all uses of water (domestic, municipal, irrigation, industrial, recreational, and water power) when the water rights are freely marketable. During the seventeen years since the passage of the Water Appropriation Act, all uses have risen markedly. This result probably would have been similar under the "reasonable use" doctrines for ground and surface water as the Act is now enforced, though the Appropriation Act's definiteness and flexibility of regulatory and administration probably made the acquisition of water rights easier. Undoubtedly the Appropriation Act allowed the development of all uses relative to what would have existed under the common-law doctrines of "natural flow" applied to surface water and "absolute ownership" applied to percolating water.

The best system of water law for Kansas. - The appropriation doctrine provides the best water rights system for the future of Kansas: (1) if problems arising under its

provisions are remedied by amendments to the Act as was done by the legislature in 1957, (2) if water rights are freely transferable, and (3) if market forces are allowed to operate.

The incorporation of the appropriation doctrine in the Water Appropriation Act has gone far to encourage water use and development in Kansas and to reduce waste. A greater general economic development and stability within the state should follow.

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THE ECONOMIC EFFECTS OF THE KANSAS WATER APPROPRIATION ACT

by

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AN ABSTRACT OF A THESIS

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A study of the economic effects of the Kansas Water Appropriation Act for the period 1945-1962 is desirable for several reasons: (1) The demand for water in Kansas is increasing rapidly and scarcity of water supply is impending or present in some parts of the state. The common-law water right doctrines have been found to be inadequate, and in 1945 Kansas undertook a general modification in its water rights law. (2) The Kansas water rights law replaced the common-law doctrines of water rights with the appropriation doctrine. (3) Kansas, unlike most states which have adopted the prior appropriation doctrine, applies the appropriation doctrine to waters from all sources and it has a diversity of water-supply conditions which provide an excellent testing ground for water rights doctrines.

The purpose of the study is twofold:

(1) To appraise the economic effects of the experience with the appropriation doctrine in Kansas between 1945 and 1962.

(2) To provide information which it is believed will be helpful in improving Kansas water resource policy and also aid other states which may be considering the adoption of the appropriation doctrine.

The primary question to which an answer is sought in a study of the economic effects of a system of property law is

whether or not the system leads to the highest level of efficiency in the use of the property.

The steps taken in the study of the above problem are:

(1) Development of Kansas water law: a history of the evolution of surface and ground water principles in Kansas.

(2) Study of the actual uses of water in Kansas during the period 1945-1962: summary of the information obtained from an inquiry into the vested and appropriation right records of the Division of Water Resources.

(3) Determining the extent of the influence of the Water Appropriation Act on the allocation of water in Kansas.

(4) Ascertaining what would have been the best uses of water in Kansas during the period 1945-1962: encompassing criteria of best use and a forecast of future water uses.

(5) Comparison of the experience under the Appropriation Act with what might have been expected had the pre-1945 water law remained in effect.

(6) Comparison of the Appropriation Act with other types of water law which might have been adopted in place of the pre-1945 law of water rights.

(7) The best system of water law for Kansas.

A review of the history of water rights law in Kansas showed surface water to be subject to the common-law "natural flow" doctrine until about the turn of the century when the courts began to apply the "reasonable use" rule. Ground

water followed the common-law doctrine of "absolute ownership" throughout this same period. In 1945 the Kansas Water Appropriation Act made both surface and ground water subject to the prior appropriation doctrine.

The economic criterion of best use of water is maximization of the aggregate discounted net returns. The appropriation doctrine permits overlying owners and riparians to transfer their water rights to nonoverlying or nonriparian uses. Limitations on changes in the place and purpose of use and on methods and places of diversion are scarcely more present in the appropriation doctrine than with its competitors. The Kansas Appropriation Act favors uses at certain times over uses at other times as most of the other doctrines do, but it is not a necessary part of the appropriation doctrine. The Kansas Act does not have restrictions on the sale of water or water rights which frustrate the market function of directing property rights into the possession of those best qualified to exercise them. Kansas water law has a scale of preferential use which favors certain uses over others, but its effect has been reduced, and the law can be changed to remedy the situation as such preferences are not inherent in the appropriation doctrine. The appropriation doctrine is relatively free from any uncertainty regarding the supply of water available for use and from legal insecurity of the right to water. The appropriation doctrine's superiority in the development of water resources, investment stability, and certainty among

other factors counteract the cost of most detailed hydrological studies that may be needed in certain instances.

Due to the absence of any extended period of drought, which would have brought individual water rights into conflict and due also to the practical approach to water problems and liberality of the Division of Water Resources both in the interpretation of the Appropriation Act and in the administration of applications to appropriate water, the development of water use in Kansas does not appear to have been appreciably changed thus far by the shift to the appropriation doctrine.

The appropriation doctrine appears to be superior to any present alternative in fostering the optimum development of all water uses (domestic, municipal, irrigation, industrial, recreational, and water power) within the state under foreseeable conditions. During the seventeen years since the passage of the Water Appropriation Act, all uses have risen markedly. This result probably would have been similar under the "reasonable use" doctrines for ground and surface water as the Act is now enforced, though the Appropriation Act's definiteness and flexibility of regulatory administration probably made the acquisition of water rights easier. Undoubtedly the Appropriation Act allowed the development of all uses relative to what would have existed under the common-law doctrines of "natural flow" applied to surface water and "absolute ownership" applied to percolating water.