Colorado Needs Ground-Water Legislation

by

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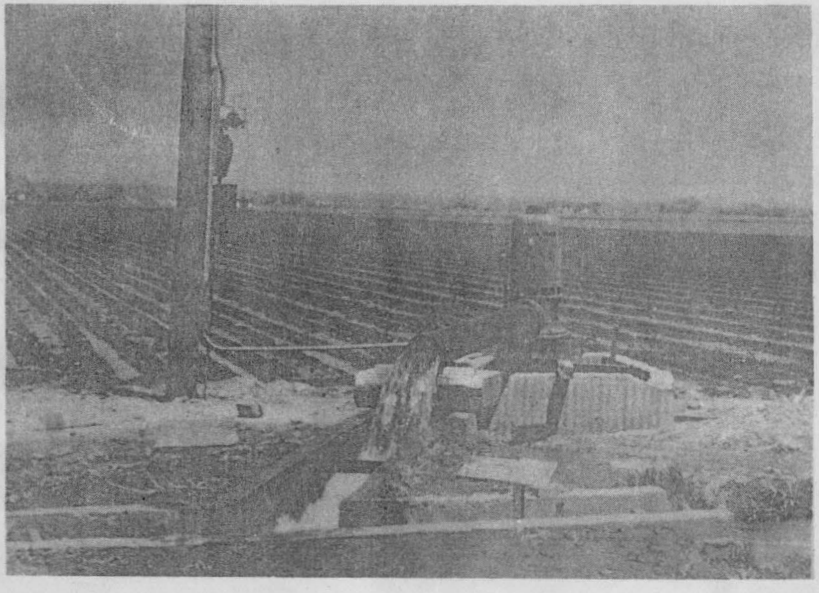

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In spite of its rather trite wage, the term life-blood as related to water, needs to be brought to the public attention continually. The chaos that follows the failure of a town's water supply has been forcibly drawn to our attention during this recent drought and other droughts not so long ago. Cities of large size of course can reach out a hundred miles for water and feel fortunate in acquiring a supply at even that distance. This is not always possible for individuals and small communities. Small towns dependent on ground-water supplies are very numerous throughout the West and this is equally true in the humid East. The continued availability of good quality ground water is a matter of great importance to the economy of such communities. Its flexibility with regard to increasing rate of use is a limit on population, industry and beautification.

The greatest use of ground water is in irrigation. California was the first state to make extensive use of ground water for this purpose followed by Arizona and New Mexico. Colorado's history of ground-water development starts about 1888, but was of no importance until about 1915. It has had a phenomenal growth since the drought of the 1930's. In Texas, according to the 1950 U. S. Census, the area irrigated from wells increased 1,680,000 acres between 1940 and 1950, placing it second in rank in irrigated area. California ranks first and Colorado, formerly second, now occupies third place in total irrigated area. Irrigation in the humid areas of the East is gaining in favor and it can be expected that ground water will be an important source for this purpose.

The increasing use of ground water throughout the West is phenomenal, in fact alarming. Texas has been mentioned as outstanding, other states, Nebraska and Arizona for instance, have shown remarkable gains in the last 10 years. According to the 1950 Census, Colorado had 654 pumped irrigation wells in 1930, 2,878 in 1940 and 4,988 in 1950. Of these in 1950, 827 were in the San Luis Valley,

739 in the Arkansas Valley and 3,335 in the South Platte Valley. The remaining few are in the high plains area. In addition to this agricultural demand, all the eastern municipalities in Colorado, except those along the base of the mountains, derive their water supplies from wells. It is quite obvious that this competition for water is likely to cause a disturbance of the water table, especially where it is concentrated.

This development has come about without regard to the adequacy of the supply. In fact, it probably would have made no difference if the safe yield could have been determined in advance. People will take what they conceive to be their share, a trait for which they cannot be blamed, but in numerous cases, this has resulted in a serious situation. These ground waters are much too important to Colorado's economy not to have full information on their location, the quality and nature of the geologic formations in which they occur. From such data, prospective purchaser of pumping plants may gain some knowledge of the probable security of their investments. The surface water supply of the State is carefully measured and apportioned among users according to their rights to use it. This has been a continuous activity on the part of our State Engineer since Colorado became a state. Adequate provisions were made in our constitution and in the body of laws that followed as to how the surface water would be apportioned. They have been reasonably satisfactory but it took a critical situation in the Cache la Poudre Valley in the early days to determine the manner in which this should be done. Similarly, there is a very definite need for information and legislative guidance on ground-water supplies.

The natural physical laws governing the flow of ground water are quite different than those for surface flows. A different approach is needed. The difficulty is that we can't see what is going on underground and must rely on general principles and assumptions to make quantitative determinations. This, the ground-water hydrologist can do with reasonably satisfactory results, but not with the same comparable accuracy as with surface streams. Given the financial means he can locate the bodies of water-bearing gravels, determine their extent, the direction of flow, the amount of water in storage and the quantity flowing past any particular section. He can locate the boundaries be-

tween ground-water areas which are frequently required because of the lack of similarity in geology and extent of use. This is basic information necessary to understand the capabilities of our ground-water supply, and to provide a proper foundation upon which any proposed legislation might be framed. Investigations of this character are most efficiently conducted as a relatively small but continuing project with modest annual appropriations rather than under a highly intensive program of short duration. In the past, appropriations by the legislature for cooperation with the Ground-Water Division of the U. S. Geological Survey have been too small to make desirable progress.

Colorado A and M College has been collecting data on water table fluctuations since 1929. These have proved very useful in determining what areas are stable and those which are declining. Long-time records are needed to determine stability or rate of decline. The College also has made investigations of the ground-water conditions in certain areas in the past. In 1945, the Ground-Water Division of the U.S.G.S. was invited to come into Colorado to carry on an investigational program under a fund-matching arrangement. To date the State has spent about $120,000 in this manner. Surveys were made of three large areas and of many local problems.* Funds have been inadequate to publish some of the reports on results of completed surveys. Colorado has spent less than any comparable western state on ground-water surveys.

Colorado Conditions

The greatest use of ground water in Colorado is in irrigation. However, the use by municipalities and individuals for domestic purposes is of equally great importance. Only those cities and towns near the east edge of the mountains have a surface-water supply. The remainder in the plains section depends on ground water. With the exception of a very few, these municipalities have had no serious difficulty in developing an adequate supply, however, the search for good quality water has complicated matters for some. All towns in the San Luis Valley are supplied with artesian water.

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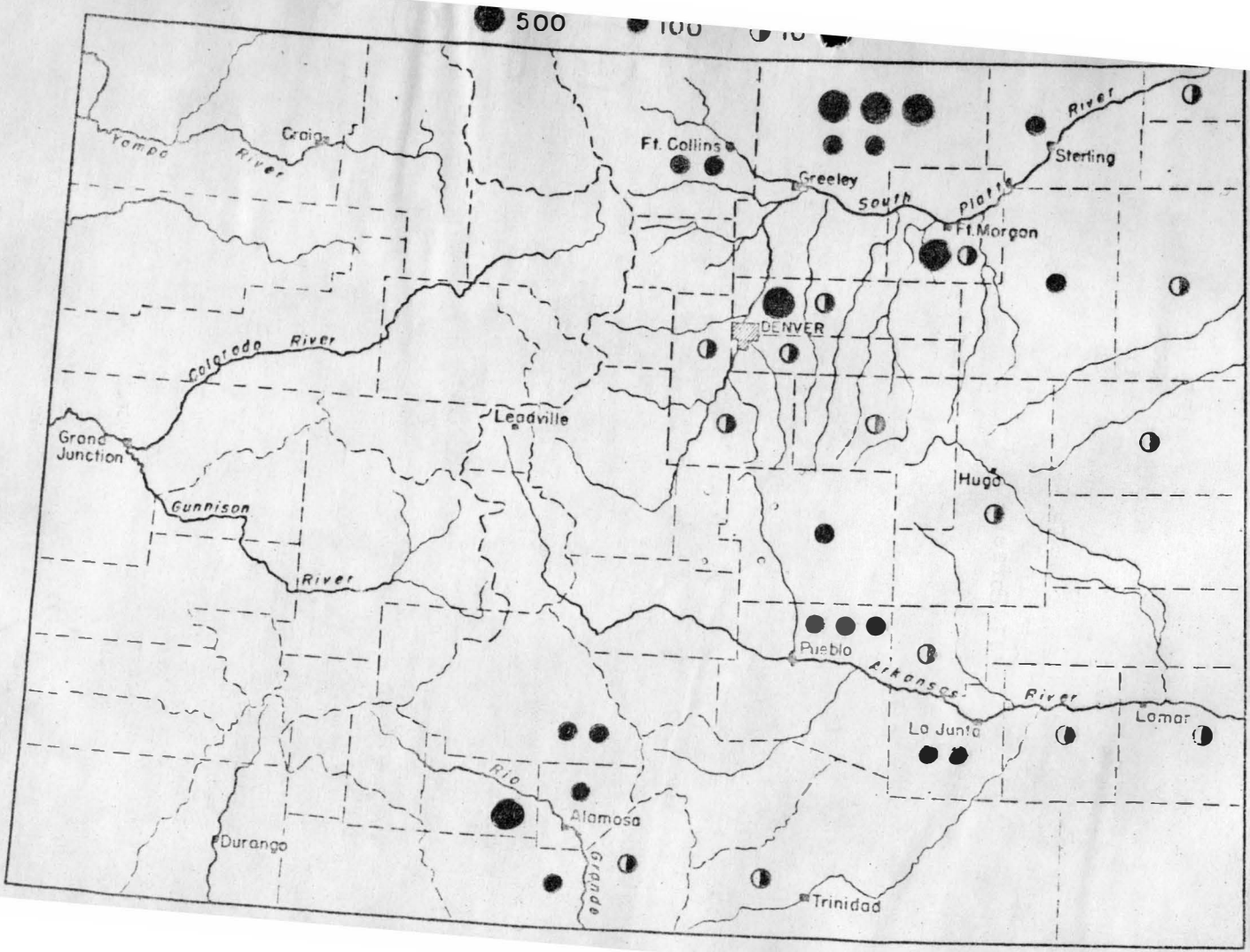
*The extent of accomplishments by the U.S.G.S. is available in mimeograph form from the Colorado Water Conservation Board.

The accompanying map of the state shows the distribution of the approximately 5,000 irrigation wells according to the 1950 Census. The preponderance of these wells is in areas already under irrigation from surface sources and they serve as a supplementary water supply. In the South Platte drainage there are about 3,400 such wells and it is estimated that in 1953 they produced easily enough water to twice fill Horsetooth Reservoir. This reservoir holds 140,000 acre-feet of water. Thus, one can visualize their great combined capacity and their tremendous value as an instantaneously available supply to balance out shortages.

There is quite a large proportion of the total number of wells located along the dry tributaries of both the South Platte and the Arkansas Rivers. These furnish the entire irrigation supply for the lands served. Also in the plains section of the area drained by the Republican River and its tributaries, there are some 200 irrigation wells. The most important of the South Platte tributary areas are on the Box Elder north of Watkins, the area around and south of Wiggins on the Bijou, and on Beaver Creek south of Brush in Morgan County. There are small ground-water developments in the upper parts of Big Sandy Valley and Black Squirrel Creek which drain into the Arkansas River. Except for the Republican, these tributaries have flows only after substantial storms and therefore they are of no value as a surface irrigation supply. It is in such areas where concentrated pumping has exceeded the normal replenishment and water tables have been receding regularly each year. Whereas pumping areas under canal irrigation have a very good potential for replenishment from canal losses, the areas along stream courses which carry water only occasionally have to depend on such flows as a means of replenishment of the ground-water reservoir. At the present time an area just north of Watkins along the Box Elder, the Bijou Valley from Wiggins south for about 20 miles, and in the vicinity of Gary on Beaver Creek are all showing the serious symptoms of a constantly declining water table.

It is necessary to point out a very significant difference between the pumped areas along the dry streams and those along the streams carrying appropriated water. In the second case it would require no great stretch of the imagination to concede that an irrigation well might inter-


500
100
Craig
Yampa River
Ft. Collins
Greeley
South Platte River
Sterling
Ft. Morgan
DENVER
Colorado River
Leadville
Grand Junction
Gunnison River
Hugo
Pueblo
Arkansas River
La Junta
Lamar
Rio Grande
Alamosa
Durango
Trinidad

cept water that would otherwise join the stream flow. The fact is well established that return flow is the result of the emergence of ground water flow at the ground surface. It is flowing towards those streams. An irrigation well operating within a mile of such an emergence conceivably might have an early and measurable effect upon that return flow.

Although the ground water in a normally dry surface tributary flows in the direction of and joins the ground water adjacent to the main stream in which there is appropriated water, there is a recognizable important difference in the opportunity for such a tributary flow to affect stream flow. The pumping areas along the tributaries are often many miles from the main stream. A reasonable velocity for ground-water movement would be three miles per year, hence, for a drop of water to move from a pumping field to a point of discharge into a stream would ordinarily be a matter of several years. During the elapsed time, losses from surface stream flow might make up for the loss in ground water storage due to pumping. Furthermore the normal net ground water contribution from tributaries to main stream surface flow is not very great. As an illustration, assume a ground-water flow two miles wide and 50 feet thick and having a slope of 20 feet per mile, then for an average character of gravel, the total discharge would be of the order of 10 cubic feet per second. Now if the water table is lowered 10 feet, the reduction in discharge would be about 1/5 of the total flow. In other words, the influence of remote up-stream pumping on main stream surface flow would be small indeed. The pumpers are removing water stored in the ground centuries ago and the lowering of the water table is of much more importance between themselves than between them and surface water users. The point that the author is endeavoring to make here is that any legislation on ground water should take into account these differing conditions of sources.

Besides the restricted valley areas on tributaries there is another condition of ground-water occurrence to be considered. It is that represented by the plains area of the State and the San Luis Valley. In these instances the water table exists as a broad sheet of water between drainage channels many miles apart, in some places as much as 50 miles apart. Although the same laws of hydraulics apply to these

waters, they are sometimes considered different legalistically than ground water confined to a valley. They may or may not be contributing water to living streams within the State.

Legal Concepts on Use of Ground water

Many of our basic laws are naturally taken from the English common law. Among them are the rules regarding water, more important, surface water, as in the early days there were no conflicting ground-water usages. These rules applied to land through which a stream ran or bordered. The owner had a riparian right and could insist that the stream flowing through his property continue undisturbed as to quantity or undefiled in quality. It gave to the owner of the surface right ownership of the ground waters. In climates where the problem was more that of getting rid of water, this rule was not seriously questioned. Under irrigation from surface streams obviously it was inapplicable, and Western United States early in its irrigation history abrogated the English law for the Roman law which more nearly fitted its needs. The rule now followed is that of prior appropriation and had its inception in the mining regions. This rule states that the first appropriation of water to beneficial use has the first right. It was perfected under the leadership of the State of Colorado. Only California has attempted to straddle the issue by trying to apply both rules. Actual ownership of water where the common law has been abrogated lies in the state or the public. An individual can acquire only the right to use water beneficially. This right can be like real property in Colorado because it can be deeded to another, sold or transferred to other lands or uses. In Wyoming, however, it is definitely attached to a specific parcel of land. Also rights may be lost because of abandonment or lack of due diligence in maintaining facilities.

The common law was early applied to ground water. This rule began to change to the so-called American rule of reasonable use as far back as 1862 by a court decision in New Hampshire. It requires the owner of the overlying land to so use the ground water as not to injure the rights of adjacent land owners. In California an extension of the American rule of reasonable use called the correlative right rule has been adopted. Under this rule each overlying prop-

erty owner shares equally in the common source according to his surface ownership. There is nothing to prevent eventual depletion of the supply and those most favorably situated both as to position geographically and financially are the only ones likely to survive. Whereas, the American rule is none too definite because of the difficulty of defining reasonable use, the correlative rule in California is definite in stating that the transportation of water to distant lands may be considered unreasonable in times of shortage. In Utah another view is held on transported water based on its overall best use.

The rule of priority of appropriation of ground water has been adopted by several Western states. In general, the rules adopted have been based on conceptions similar to those employed with surface waters but with numerous variations. Variations are to be expected because of the varying ground-water conditions, the temperament of the public and in some cases, constitutional provisions. It definitely can control the rate of withdrawal from a ground-water basin or district either through decisions by the administrator or by vote of the people. It can be employed in various ways to prevent an overdraft on the ground-water supply. It can be selective, that is, it need not be of equal force in all parts of the state. Pumping areas can be set up as districts with rules and regulations adopted which are not inconsistent with a basic state code.

Legal Situation in Colorado

Colorado, not having specific statutes on ground water to be guided by, has had to rely upon rules laid down by the courts in the past. One of these, a Supreme Court Decision of wide importance, held that all groundwaters, which if not intercepted, would reach and become a part of some natural stream either on or beneath the surface, and are governed by and controlled by the terms of the constitution and statutes relative to appropriation, the same as the surface waters of such stream. In a subsequent decision it appears that the burden of proof lies with the one who claims that ground water is not tributary to a stream, to establish that fact.

There have been recent court decisions based more or less on previous ones that can be considered important. One, Safranek vs. Town of Limon, a Supreme Court decision,

held that ground water flowing in the Big Sandy Valley was tributary to that stream and not percolating water and hence was subject to appropriation. It further held that "Colorado has departed from the common law as to ownership of percolating waters by surface owners- - - - ." A later District Court decision in 1953 had to do with interference between users of artesian waters in the San Luis Valley. In this case a number of artesian well owners claimed that the operation of an irrigation well tapping the artesian flow caused their wells to cease to flow. The Court found in favor of the defendant and dismissed the complaint of the plaintiffs. In his decision the judge avoided the doctrine of appropriation and based it upon the American rule of reasonable use. It would indeed have been unfortunate in this case had the decision been based upon prior appropriation or on maintenance of lift. Further agricultural use of this water would have been stopped even though water was available to the plaintiffs by means of pumping.

Most important decisions both by lower courts and the Supreme Court have been wise in character and have in no way restricted ground-water development. In this we have been most fortunate. Yet there are certain situations as to ground-water use that definitely need clarification since in the minds of many of the legal profession much of the ground water use is, in theory at least, antagonistic to surface-water rights.

The most recent action by a District Court was that of an adjudication of 459 irrigation wells in Water Districts 3 and 1. In essence, this adjudication has the effect of applying the appropriation doctrine as between ground-water users. The possible effect of pumping on vested rights in stream flow is not entirely ignored but the conflict is resolved by applying the reasonable-use rule. In each of the decrees this statement or a similar one occurs: "The source of supply from which water is drawn and diverted is a district source of underground or subterranean water in subsurface strata underlying lands owned by the claiments and others from which water is pumped to the surface from the irrigation well of John Doe . Said water is drawn from beneath clay strata of said land, is not tributary to or a part of any known or natural stream and would not in natural course if left undisturbed in its natural condition appreciably augment the flow of any natural stream, and,

except for that portion consumed by crops and evaporation, the water so released pumped and spread upon the land replenishes the water under said lands."

A surface appropriator, however, has recourse in the courts if he can show injury from pumping — a most difficult thing to do in most cases. An adjudicated water right of course places the right holder under the administration of the State Engineer, whereas, under past conditions he had no jurisdiction. The whole matter caused much uneasiness and indecision among attorneys and well owners as to whether to come in or stay out. The result was that only a part of the owners had their wells adjudicated. Both sides now wonder what their status is.

A discussion on this adjudication was held in the 1953 convention of the Colorado Bar Association and a member* is quoted in part:

> "Months of study were devoted by irrigation attorneys to the advisability of entering irrigation wells in this adjudication. Many hours were spent on research and thought. We have an accomplished fact in our District in the awarding of independent priorities to this underground water- - - - - - -
>
> "There being no specific legislation or statutory law in this state fixing relative rights by the appropriators of subterranean waters, it is felt that Judge Coffin has extended the Appropriation Doctrine to these wells, construing the law of reasonable use into it. Too many times perhaps we attorneys are 'against' something because there is no precedent. Our common law has been built up by what has been done and how a thing has been done. This Decree attempts to harmonize practices of long standing in our District with the Appropriation Doctrine. This has been done without the necessity of an extensive underground water code. During the early phase of development in a ground-water area, the problems are largely those of individuals or small groups. Later they become of community or even state-wide concern.

*John R. Clayton, Attorney at Law, Greeley, Colorado

"A water code applicable to an entire state would reach to state lines. There are many outstanding differences between surface waters and underground waters. The law applicable to surface waters is very easy of administration -- in any portion of the state one diverts by a dam and a headgate. The water is visible. On underground waters we have an entirely different situation. We have nothing visible; we do not know the extent of the amount of water available for pumping; we have little information regarding recharge — in other words, the study of underground water is a comparatively recent thing. Month by month we are by hydrological studies obtaining more information."

A decision is to be made by the people of Colorado whether to adopt a ground-water code or permit themselves to drift into a chaotic situation permitting a continuance of unresolved conflicts between users of both surface and ground water. Many other western states have already faced the problem and have adopted codes. Not always has this been a simple matter as for instance in the case of Arizona.

In 1948 the governor of Arizona kept the legislature in one special session after another until a code was adopted which later proved unsatisfactory. In 1953, their Supreme Court declared the code unconstitutional and a new one is to be considered in 1954. There is little doubt that the courts would welcome definite statutes to clarify the situation rather than depend upon previous decisions. The picture is a changing one. The tremendous investment made in the last 20 years in irrigation wells and the threa of exhaustion in some areas are potent factors calling for statutory definition of status and guidance for the courts.

Past and Present Colorado Legislation

The need for specific ground-water legislation in Colorado has been realized for some time. In 1935 a bill was passed prohibiting pumping of artesian water if such pumping interfered with domestic use. It was so drawn as to apply only to the San Luis Valley and was never enforced A comprehensive ground-water bill was prepared by the Colorado Bar Association in 1946. Since it did not have the unanimous support of the committee that prepared it and man outside the legal profession opposed it, the bill was not

offered for consideration by the legislature. In the light of subsequent developments any new bill drawn would likely be of quite different character.

In 1950 the State Agricultural Planning Committee became interested in ground-water legislation and appointed a chairman whose duty it was to organize a sub-committee to study the situation. The services of Judge Clifford H. Stone, then secretary of the State Water Conservation Board, were enlisted to help this committee. Members were chosen from various parts of the State representing diverse conditions and interests. In addition to this representation, there were hydrologists, engineers and members from the legal profession. This committee met a number of times in 1950, 51 and 52. It did not accomplish much more than provide a sounding board for those with ideas. There was a great diversity of opinion ranging from several kinds of rules of control to none at all. It accomplished one definite thing, however. It formulated a bill for an act to control the drilling of artesian wells. This appeared urgent to many in the San Luis Valley where recent wells of large capacity were being drilled into the artesian sands. Several were not properly constructed nor controlled. This bill was introduced in the 1952 session of the legislature but was defeated. It was again introduced in the 1953 session after some objectionable features were amended. This time it was seized upon and very extensively revised to contain certain features of ground-water control. There seemed to be no debate over it and it passed without difficulty. It has many defects and is considered entirely inadequate and undesirable by the legal profession and many other competent persons. Among other things it places administration in the Colorado State Water Conservation Board, which is a policy-making agency. The State Engineer's office is the administrative agency on all other water matters. An uncertain device was proposed to permit the formation of ground-water districts. No appropriation was made to enforce it.

Recognizing that the Agricultural Planning Committee's sub-committee had no official status, it was decided to form another committee under the direction of the State Water Conservation Board with the Board's Director as chairman. The membership of the new committee is similar to the first committee but its personnel is more uniformly repre-

sentative of the State's interests. This committee started functioning in 1952. A technical sub-committee composed of geologists, engineers and well drillers and a legal sub-committee composed of attorneys were appointed. The technical committee in 1952 submitted a report which described the occurrence of ground water in the state, its present and probable future development, and problems to face. The committee was fortunate in having good data of a general character and in a few places excellent special data to work with. Much of the State, however, is still lacking in specific information. This report was handed to the legal committee which, because of the death of Judge Stone did not begin deliberations until January of 1954. It is the ambition of the committee to prepare a bill, acquaint the public with its contents for its reaction, and have it in readiness for consideration of the 1955 General Assembly.

The task of the legal sub-committee will not be an easy one. It will need to compose the conflicting opinions that exist in the various parts of the State because of the varying conditions. There are those places in the valleys of the stream courses where ground-water replenishment is assured through losses from irrigation. There are other pumping areas removed from those having irrigation water supplies brought in from stream flow, that have inadequate replenishment and where the water table is receding. Ground-water conditions in Colorado for instance, are quite different from those in Arizona and California. There the water-bearing formations are of great thickness while in Colorado they are relatively thin and underlain with impervious shale. Deepening our wells to keep up with a falling water table is out of the question. The users under these two quite different conditions will naturally have differing viewpoints as to legislative needs. If priorities are to be adopted, those near stream channels will not wish to have such priorities connected with those in stream flow. In fact such users prefer the status quo in that under present conditions they have not been disturbed. The other group feels that control in some form is needed among users from a limited source. What character of legislation that seems best suited and yet be constitutional, will require the combined best thinking of this group of competent attorneys.

No ground-water code is complete without control over

the methods of constructing wells. The law of 1953 covered the construction of artesian wells fairly adequately and is very necessary to prevent waste and contamination. There is, however, room for improvement. It lacks control over domestic wells in general, most of which are not artesian in character. Proper methods of construction should fit into the requirements of the State Board of Health. Safeguards should be set up to prevent contamination of the ground-water from waste products and interchange between formations carrying good and poor quality water.

No ground water code is worth the paper it is written on unless there be funds appropriated to enforce it. It is hoped that this omission in the past will not be repeated. It would be most disheartening to those who are gratuitously giving of their time and talent, for their efforts to come to naught in this manner.