J99-27

Workshop on the Workshop 2
WOW
Bloomington, Indiana, June 9-13, 1999

PANEL 1-3
TH, JUNE 10

COLORADO WATER LAW AS CUSTOMARY LAW: THE SOUTH PLATTE AND ARKANSAS RIVER BASINS

by

Edella Schlager
University of Arizona

This research was supported by the National Science Foundation and U.S. Environmental Protection Agency, Grant Number R824781. Neither agency is responsible for the findings or conclusions reported herein. I would like to thank Vincent Ostrom for giving me the idea for this paper and for our many conversations. Also, I would like to thank Elinor Ostrom for her encouragement and many conversations, and Tanya Heikkila for reading a draft and providing timely and valuable feedback.

Introduction

This paper tells the story of a particular manifestation of customary law — the "Colorado Doctrine". The Colorado Doctrine is based on the principle of prior appropriation. Prior appropriation allocates water on the basis of first in time, first in right. The person making the first appropriation of water from a stream holds rights to a portion of the water senior to all subsequent appropriators. The next person in time to appropriate water from that same stream holds rights to a portion of the water senior to all subsequent appropriators, but not to the first appropriator. Under such an allocation rule, if water is scarce, appropriators do not equally share in reductions, instead, the rights of senior appropriators are satisfied and junior appropriators are foreclosed. The justification for this is that in times of shortage, if all were to share equally in reductions no one would receive sufficient water to serve their purposes. Instead, it is better that at least some be served. (Vranesh 1988:71).

Frank Trelease, an expert on water law in the western U.S., has referred to the prior appropriation doctrine as a system of water that emerged from the practices of the people (Trelease 1971:23). It is customary law. It is customary because it is developed, monitored, and enforced by the same people who are governed by it; it is centered on solving the day to day problems of people in ways that fit in and are complementary to their experiences and lives; and it emerges from a consensus building process (V. Ostrom, pers.comm.).

Even though the Colorado Doctrine emerged almost 150 years ago, it remains as customary law. Colorado has not followed the course of many of its neighbor states who use the prior appropriation rule to allocate water through state created administrative agencies that define, administer, monitor, and enforce water rules. In Colorado, appropriators bargain, negotiate, create, fight, monitor and enforce water rules among themselves in the shadow and the context of water courts. The difference between Colorado and its neighbors is striking. For

instance, if a person wants to acquire a water right in New Mexico, she must first gain permission to appropriate from the New Mexico State Engineer. The Engineer scrutinizes her plans, determines whether she will unduly interfere with the appropriations of others, provides a comment period for affected appropriators, and then either grants or denies a water permit. If the same individual were to attempt to acquire a water right in Colorado, she would first stake her claim to water by demonstrating intent to divert and by taking open steps to do so before entering into a water court to seek a conditional right. Once she notified the water court of her intent, the water court would notify all potentially affected appropriators. The water court, with fact-finding assistance provided by the State Engineer's Office, provides the context in which existing appropriators would negotiate the new claimant's rights. In New Mexico, a state administrative agency defines an appropriator's water rights. In Colorado, the state provides a well-structured institutional setting in which appropriators develop, change, and challenge water rights.

Coloradans have defined, allocated, monitored, and enforced their water rights for 150 years, however, crisis engulfed the system in the 1960s as conflict erupted between groundwater pumpers and surface water appropriators. Groundwater pumpers appropriated water rightfully belonging to senior surface water appropriators, yet the customary law of Colorado did not adequately encompass groundwater. After more than a decade of conflict, and with the prior appropriation system threatened, the State legislature, the State Engineer's Office, and the State Supreme Court, working with ground and surface water appropriators fashioned an approach that incorporated groundwater into the system. A decade later, this approach was challenged as conflict erupted between the states of Kansas and Colorado over the allocation of Arkansas River water. In the shadow of the U.S. Supreme Court, Colorado further refined and more fully incorporated groundwater into its prior appropriation system.

The intermittent groundwater pumping crises illustrate both the fragility and the resiliency of Colorado's customary water law system. The crises revealed the weaknesses of the system when confronted with widespread, intense conflict that could not be handled on a case by case basis. The crises also revealed the system's resiliency. Colorado's customary water law system, with the assistance of other state organizations, incorporated the governance of tributary groundwater. Groundwater, however, will continue to challenge a system best fitted for surface water. As water becomes increasingly scarce, citizens will want to access the millions of acre feet of groundwater tributary to the major rivers in Colorado in ways that are simply not possible under current laws and customs.

The Evolution of the Colorado Doctrine

The Physical Setting

As Colorado historians have often noted, "the state's natural environment has been the foundation on which settlers over the past century and a half have built a superstructure of human activities" (Abbott et al. 1994:11). Early European explorers of the area constituting eastern Colorado considered it a desert. In 1820, Stephen Long explored the area as part of the Louisiana Purchase, and he coined the term the Great American Desert. He stated "In regard to this extensive section of country, I do not hesitate in giving the opinion that it is almost wholly unfit for cultivation, and of course uninhabitable by a people depending upon agriculture for their subsistence."(quoted in Abbott et al. 1994:4). Horace Greeley, in 1859, as he made his way to Colorado stated, "We seem to have reached the acme of barrenness and desolation.. .Wood and water fail, and we are in a desert indeed", (quoted in Abbott et al. 1994:5). The high plains region of eastern Colorado receives between 12 and 16 inches of rainfall per year, which rightly categorizes it as desert (Whitney 1983). However, Long was mistaken when he claimed that it was unfit for cultivation. The soil, rich in nutrients from mountain runoffs, simply needed a

source of water to bring forth plentiful harvests. Unlike farmland in the eastern U.S., these lands would have to be irrigated.

The obvious sources of irrigation water, the rivers, were scarce and puny by eastern standards. (The groundwater basins tributary to the rivers had yet to be discovered). The Arkansas River, in the southeastern part of the state, on average, only carries 500,000 AF of water past Pueblo each year (Whitney 1983:47). During particularly dry years, it would dry up and cease to flow (Sherow 1990). The South Platte River, located in the northeastern part of the state, carries half the volume of the Arkansas River, and during summers flowed intermittently over some of its reaches (Huber 1993). These rivers were not like their eastern counterparts, flowing perennially within a single well-defined channel. Rather, they meandered over broad flood plains, regularly changing course, and often interspersed with broad sand bars (Huber 1993). The European settlers to the region described the Platte River as "a mile wide and an inch deep - too thin to plough and too thick to drink" (Huber 1993:15 5).

These rivers and their tributaries, with their inadequate flows of water, tied European settlers together. The rivers were the natural resource that everyone depended on and that everyone fought over. Almost as soon as permanent settlements developed along their reaches, conflicts emerged over access, use, and allocation of water (Mehls 1984).

The Community Setting

While the European settlers had no experience with irrigated agriculture, a number of them had experience with the resource that first attracted them to the area - gold. Colorado was simply a place to pass through or to avoid on the trek to the gold fields of California and Nevada in the 1840s (Smith 1992). As the far western gold fields played out, miners searched for new sources, bringing them to the eastern slopes of the Colorado Rockies. In 1858, gold was mined

from two small tributaries of the South Platte River, and a gold rush commenced in the spring and summer of 1859.

The '"59ers" quickly adopted forms of governance that had been developed during other gold rushes. As Smith (1992:8-9) explains:

> They turned to the traditional answers - mining districts, miners laws, and miners courts. They had sufficed in California, and they would do so here. These extralegal controls gave some semblance of order and exemplified frontier democracy at its most fundamental point. A meeting would be called ... a chairman elected, and opinions voiced about size of claims, water rights and other problems. Before they were finished, these fifty-niners defined district boundaries, limited the number and size of claims a miner could hold, specified the amount of work necessary to hold a claim, and designated procedures for settling disputes. The election of a district secretary to record claims and call future meetings as needed gave a semblance of permanence to this up-to-now transitory frontier.

The miners were not the only ones to quickly form self-governing arrangements. People who settled towns, such as Auraria and Denver, organized claims clubs that operated similarly to miners districts. Claims clubs adopted size limits and requirements for holding townsites, recorded claims, protected claims from newcomers, and provided juries to settle disputes. A number of claims clubs also developed people's courts to deal with criminal law (Abbott et al. 1994:61). Following claims clubs were cattlemen's associations that organized brand registries to limit cattle theft, conducted spring round ups of cattle, and engaged in predatory control (Mehls 1984:56).

Irrigated agriculture required an innovative form of governance - colonies. One of the more difficult constraints confronting agriculture was the necessity of funding, building,

managing and maintaining irrigation systems. Colonies addressed this challenge by pooling the resources of large numbers of people, and using those resources to acquire land and build irrigation systems. The most famous was the Union Colony, founded by Horace Greeley. It was a temperance colony based on a $ 155 membership fee. In exchange for the fee, an individual received a farm plot and a town lot (Abbott et al. 1994:161). In 1870, the colony purchased 12,000 acres along the Cache la Poudre River, a tributary of the South Platte River, and filed a preliminary claim to an additional 60,000 acres. Within one year the town of Greeley was created with hundreds of homes and a town hall, but no liquor stores, saloons, or billiard halls. By the end of the summer of 1870, a 10-mile canal was built that ran along the bottom lands of the Cache la Poudre River. By the end of the summer of 1871, a 25 mile long canal was completed that lifted water from the flood plain to the benchlands that irrigated 25,000 acres (Abott et al. 1994:161-162; Mehls 1984:67).

Spurred on by the success of the Union Colony, other colonies were quickly formed, some founded on temperance, some on religious principles, and others on greed. The Chicago Colony located on the St. Vrain, Left Hand and Boulder Creeks developed the town of Longmont. The Fort Collins Colony located itself upstream of Greeley and the Union Colony on the Cache La Poudre River (Mehls 1984).

Prior to Colorado becoming a state in 1876, its citizens had adopted and innovated numerous self-governing institutional arrangements for defining and enforcing property rights in minerals, land, cattle, timber, irrigation systems and water. Furthermore, they had developed a series of people's courts for settling conflicts and enforcing laws.

At about the same time citizens were developing local self-governing arrangements, others were attempting to organize either a territorial or a state government. In the spring of

1859, a constitutional convention was called in Denver to create the new state of Jefferson. The announcement for the convention included the following statement:

> government of some kind we must have, and the question narrows itself down to this point: Shall it be the government of the knife and the revolver, or shall we unite in forming here in our golden country ... a new and independent State? (Abbott et al. 1994:63).

This initial attempt at forming state government failed. The U.S. Congress was absorbed with the issue of slavery and secession. By 1861, however, Colorado was admitted into the union as a territory. The first acts of the territorial legislature were to lay out 17 counties, grant Denver a charter, organize courts, adopt a legal code, and recognize the rules and customs of the claims clubs, mining districts, and other local self-governing arrangements (Abbott 1994:66).

By the time Colorado was granted statehood in 1876, the Colorado Doctrine was firmly established. In 1864, the territorial legislature passed a law stating that prior appropriation was the means by which water was to be allocated in the territory of Colorado (Radosevich et al. 1976:24). In 1874, conflict erupted between the Union Colony and the Ft. Collins Colony. Ft. Collins diverted so much water from the Cache la Poudre River that it dried up Greeley's canals, even though Greeley was first in time. A settlement was worked out, based on the prior appropriation doctrine (Abbott et al. 1994:168). The State Constitution, adopted in 1876, expressly recognized and provided for prior appropriation. Article XVI, section 6 states, "The right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied". The Colorado Doctrine that the citizens of Colorado worked out among themselves was granted constitutional recognition and protection.

The Colorado Doctrine and Its Administration

An 1897 article on Colorado agriculture noted that the greatest struggle that farmers faced was not harsh environmental conditions, but creating and adapting new and appropriate institutional arrangements for mediating conflicts stemming from competition for scarce water:

> By far the most vexatious and expensive impediments to be removed have been those arising from the inapplicability of our laws and customs to the conditions prevailing within the arid region. Every instinct acquired through generations of life in a humid country seems to rebel against the methods of the irrigator and every tradition of law is in direct opposition to the proper employment of the natural waters. These instincts and traditions have had to be laboriously demolished, usually after severe struggle, and the series of contests appears a never-ending one." (quoted in Hafen 1947.Colorado and Its People, p. 122, as quoted in Radesovich, pp.5-6).

The tradition that farmers were familiar with was riparian law. Under riparian law, water rights resided in owners of land adjoining rivers, streams, and lakes. Riparian owners were required to make reasonable use of the water, which meant that the water could not be transported off of the land adjacent to the water source. During the rare times of water scarcity riparian owners were required to share the burden of scarcity and jointly reduce their water use.

The riparian approach was completely unsuitable for an arid climate with modest rivers and streams, where water scarcity was the norm, and where some of the most valuable resources, whether mineral veins or land, lay far from sources of water (Vranesh 1988:42). The Colorado Supreme Court, in its 1882 decision affirming prior appropriation as the means of allocating water in Colorado, best captured the desirability of prior appropriation:

> [We] think the latter [appropriation] doctrine has existed from the date of the earliest appropriations of water within the boundaries of the state. The climate is dry, and the soil, when moistened only by the usual rainfall, is arid and unproductive; except in a few

> favored sections, artificial irrigation for agriculture is an absolute necessity. Water in the various streams thus acquires a value unknown in moister climates. Instead of being a mere incident to the soil, it rises, when appropriated, to the dignity of a distinct usufructuary estate, or right of property. It has always been the policy of the national, as well as the territorial and state governments, to encourage the diversion and use of water in this country for agriculture; and vast expenditures of time and money have been made in reclaiming and fertilizing by irrigation portions of our unproductive territory. Houses have been built, and permanent improvements made … Deny the doctrine of priority or superiority of right by priority of appropriation, and a great part of the value of all this property is at once destroyed.… And we hold that, in the absence of express statutes to the contrary, the first appropriator of water from a natural stream for a beneficial purpose has, with the qualifications contained in the constitution, a prior right thereto, to the extent of appropriation. [Coffin v. Left Hand Ditch Co. (6 Colo. 443) 446-447]

Conceptually, the Colorado Doctrine, based on prior appropriation is quite simple: first in time, first in right. Practically, it requires several mechanisms to operate appropriately. First, appropriators need access to forums for defining and modifying water rights. Second, information gathering and dissemination is vital for developing a public record of individual water rights and priorities. Third, a means of coordinating among appropriators is necessary to ensure that junior appropriators are shutdown in the correct order so as to satisfy the water rights of senior appropriators. Fourth, monitoring of appropriators is required to ensure individuals take only their share and only when their rights are in priority. Fifth, appropriators must have recourse to sanctioning of rule violators.

While the State Constitution recognized prior appropriation as the law governing water allocation, citizens quickly realized the need for recognized and shared arrangements to carry it

out in practice. The need for more formal arrangements became especially acute during the irrigation boom of the 1870s prompting conflict to erupt among colonies, irrigation companies, and irrigation ditches. In 1878, a farmers convention developed legislation for the State Assembly (Abbott et al. 1994:168).

In 1879, the state legislature passed "An Act to Regulate the Use of Water for Irrigation, and Providing for Settling the Priority of Rights Thereto". The legislation allowed for the creation of water districts. A water commissioner who was to ensure that water rights were satisfied in the proper priority and to keep a record of water rights served each water district (Vranesh 1987:468). Adjudication was not necessary to appropriate water, but it was necessary if an appropriator wanted an enforceable priority date for a water right. To obtain a decreed water right, the 1879 legislation required that an appropriator file a claim in the county court of the water district within which his diversion was located (Vranesh 1986:379). If there had been no adjudication of rights in the district, then all appropriators would be included in the adjudication, and all parties appearing would have their rights adjudicated. If adjudication had already occurred, then only those appropriators whose rights were not adjudicated would be included. Owners of adjudicated rights were not included because already decreed rights were senior to those being adjudicated (Vranesh 1986:380).

A single river or stream would typically wind through several water districts. Coordination of water rights across districts quickly became a problem. In 1887, the state legislature followed up on legislation passed in 1881 that created a state engineer and water divisions that encompassed the districts located in each major river basin, to add division engineers. Division engineers, who reported to the State Engineer, were authorized to coordinate water rights across districts. Water commissioners were to follow the direction of the division engineer, as the division engineer shutdown diversions in one district to satisfy senior rights in

another district. Thus, by 1887 the institutional infrastructure existed for creating, administering, and enforcing the Colorado Doctrine.

Over a century later, the institutional setting remains essentially unchanged, except for occasional updating. For instance, in 1969, the legislature bolstered the court system by creating a single water court in each water division with exclusive jurisdiction over water matters. No longer would county district courts hear water matters. The State Supreme Court selects the water judge from among the county judges in each water division. Typically, the Supreme Court reappoints the same judge to hear water cases from year to year. A clerk and one or more referees assist water judges.

Substantial bargaining and negotiating among appropriators over water rights occurs prior to and during a court proceeding. The adjudicatory process encourages negotiated settlements. For instance, an irrigation association encompassing all irrigators exists within district one of division one — one of the first districts created. Members of the association negotiate and bargain with one another over developing new appropriations or changing existing water rights before entering water court for a formal decree. Irrigators are able to settle their differences with one another prior to entering court. In addition, the association monitors the activities of the Division One water court, ensuring that water rights of district one irrigators are not infringed by the activities of irrigators in other districts.

When an appropriator chooses to seek a decree, he files an application with the water clerk in the appropriate water court. The form generally requires a legal description of the source of water, the date of the initiation of the appropriation, the amount of water claimed, and the use made of the water. If the application involves a change in water right the applicant must also provide a map showing the location of historic uses of the right, and records of actual diversions, if they exist (Vranesh 1987:442). The water clerk notifies the state engineer and the division

engineer of the filing. Once a month, the water clerk creates a resume listing all applicants and the purposes of the applications. The resume is published in newspapers and is mailed to all parties who may be affected. Any person may oppose an application by filing a statement of opposition.

Once all filing deadlines have passed, the application is turned over to the water referee. The position of water referee was created under the 1969 Act. Many water rights issues do not require a trial before a judge. The referees, who are "nonlawyer, technically trained personnel", gather evidence and make initial determinations concerning water rights (Vranesh 1987:456). Referees were created to limit the authority and reach of the state engineer's office (Vranesh 1988:400). While the state and division engineers and their assistants possess the technical training to act as referees, appropriators did not want to extend the authority of the state engineer by giving that office the ability to determine water rights. Instead, the referees, who are employees of the water courts, call upon the state and division engineers to assist them in fact finding.

Referees investigate the claims made in the applications and in the protests. Often, referees conduct unstructured hearings in order to discuss the issues with the applicants and with any objectors. If the issue is relatively simple and free of conflict the referees will often ask the applicants to draft the appropriate decree (Vranesh 1987:444). The applicant bears the burden of demonstrating that his application will not injure any existing water right, and the referee can require the applicant to modify his application so as to avoid injury to existing appropriations. The referee may approve or disapprove any application in whole or in part, whether or not statements of opposition were filed. The referee issues a ruling. If within a certain time period the ruling is not appealed the water judge incorporates the ruling in a decree and a judgement is entered (Vranesh 1987:445).

The findings of fact or law of the referee does not bind the water judge. Thus, if a referee's ruling is appealed de novo hearings are held before the water judge. Such hearings are more formal than those before the referee, however, the rules of civil procedure are not guiding. Applicants bear the burden of proof demonstrating the absence of injury. The courts generally allow the parties to the case an opportunity to propose terms and conditions that would prevent injury, and the judges themselves may suggest such terms and conditions (Vranesh 1987:446-447). The Colorado Supreme Court is the exclusive appellate jurisdiction over water cases. Appeals are only allowed with respect to protested matters (Vranesh 1987:447).

The system of devising and revising water rights encourages appropriators to negotiate among themselves before bringing their claims before the court. Once before the court, the procedures followed encourage negotiated settlements. Only issues that cannot be settled among the appropriators go to trial before a judge, and even in those proceedings the focus is on crafting an agreement acceptable to all parties. Once a decree is entered, it must be administered, monitored, and enforced. Appropriators, water commissioners, division engineers, and courts participate in monitoring and enforcing water rights.

Before water commissioners were appointed to administer and monitor water rights, appropriators enforced their own rights. Appropriators engaged in a variety of enforcement activities. Appropriators would post signs announcing the date and amount of their appropriations. They would publicly threaten others they believed were infringing on their water rights. For instance, the members of the Greeley colony threatened to destroy the headworks and canals of the Fort Collins colony if Fort Collins did not abide by Greeley's water rights. Finally, appropriators would destroy diversion works that were taking water out of priority. For instance, the head of an irrigation company would organize a "midnight ride". Members of the company

would dynamite diversion works that they believed were infringing on their water rights (Sample, pers.com.).

The extra-legal activities of appropriators did not cease with the adoption of water commissioners. Initially, water commissioners faced few incentives to faithfully administer water decrees. However, over time as water commissioners' roles became better defined, and as their incentive structures were redesigned to encourage enforcement, appropriators came to rely more heavily on commissioners and courts for enforcement.

Water commissioners were appointed by the governor who selected from persons recommended by the county commissioners of the counties in which the district was located. Water commissioners were considered constables and had the power to arrest anyone interfering with their duties (Vranesh 1987:473). Water commissioners were patronage appointments under the control of county commissioners. Not only did county commissioners appoint them, but they also paid their salaries (Vranesh 1987:547). Furthermore, under the 1879 statute creating the position, commissioners were to work only when two or more ditch owners within in their districts requested their assistance and they were to cease working when so requested. Given their close ties to local officials, commissioners were reluctant, and often refused, to shutdown appropriators in their own districts in order to satisfy senior appropriators in other districts. Finally, the manner in which commissioners were paid discouraged accurate record keeping. Commissioners were paid on the basis of irrigated acres within their districts. More acres meant more pay. Commissioners would inflate the number of irrigated acres and the amount of water used on those acres. Poor or inaccurate record keeping caused problems in changing water rights as courts and appropriators attempted to determine actual water use.

While in some circumstances commissioners would refuse to carry out their duties, such as shutting down junior appropriations, in other circumstances they would act beyond their

authority, and attempt devise and revise water rights. Numerous early court cases repeatedly rebuked commissioners for acting inappropriately. For instance, an irrigation district built a new diversion structure and attempted unsuccessfully to get it decreed as a point of diversion for its water right. The water commissioner, however, allowed the district to divert water through the new structure. A party to the case sought an injunction against the commissioner. The commissioner claimed that he had not been a party to the case and thus was not bound by it. The Colorado Supreme Court stated:

> It is the duty of the water commissioner to distribute water to the Centennial ditch, at the point of diversion from the river, described in the original adjudication, in the absence of a court order directing a change...irrigation officials, in their public capacities, do not have to be made parties to statutory proceedings...The very purpose of their appointments, among other things, is to execute the orders of court" [79 Colo. 340, 245 P. 705(1926)].

In other cases, the court held that commissioners could not decide questions of abandonment, nor were they to become involved in the internal procedures of irrigation companies. They were to deliver decreed amounts of water to irrigation companies even if they disagreed with the management of such companies. Furthermore, water commissioners could not disregard orders of the division engineer, even if they thought the orders unnecessary. The Colorado Supreme Court has consistently directed water commissioners to faithfully administer water decrees, and to leave disputes among appropriators to the jurisdiction of courts.

Through the accretion of case law and through statutory changes, water commissioners have had their duties more clearly defined, and they have been brought within the state civil service system, appointed by the division engineer and approved by the state engineer, with their salaries paid by state funds (Vranesh 1987:547).

The state and division engineers play the role of coordinator and information gather and disseminator. The division engineers maintain and update lists of appropriation rights and priorities in each division. They determine the accuracy of statements made in water applications and protests. They measure water flows, determine who is in priority, and order junior appropriators shutdown. They inspect and monitor diversion works, reservoirs, and dams, ensuring safety and accurate measurement of diversions (Vranesh 1987:509). The state and division engineers provide the information and technical resources to appropriators, courts, and the state legislature allowing these actors to define, revise, administer, monitor and enforce water rights.

The substance of the Colorado Doctrine has emerged as appropriators have contested, bargained, and negotiated their rights within the context of water courts, water commissioners, and division and state engineers. While much of the Colorado Doctrine appears in statutory law, the state legislature has codified case law (Vranesh 1987). Two of the most critical issues addressed and developed within the Colorado institutional context have been what constitutes an appropriation and how a change in water right can occur.

In Colorado, two conditions must be met in order to initiate a water right. First, there must be a diversion of water. Second, the water must be applied to a beneficial use. A diversion occurs with the actual taking of water. Originally, a diversion may have been required because it "furnishes an open act or demonstration of intent to appropriate", thus putting existing appropriators on notice that a new appropriation is about to take place (Vranesh 1987:130).

Disputes have arisen when an obvious and direct diversion has not occurred. For instance, in the mid-1880s an individual developed an instream reservoir on public lands and sought a storage right for it. An appropriator objected, claiming that because water would be stored in the natural bed of the stream, no diversion occurred, and thus no appropriation. The

Colorado Supreme Court found that the storing of water sufficed to demonstrate an intent to appropriate. The court stated, "We think there may be a constitutional appropriation of water without its being at the instant taken from the bed of the stream". [Larimer County Reservoir Co.v. People 8Colo.614, 9 P. 794 (1886)].

Whether or not an appropriator must take steps to control the water prior to its application to a beneficial use is somewhat unclear. The court allowed a farmer to claim a water right even though the farmer never diverted water, rather the farmer watered his cattle from natural springs located on his land [Town of Genoa v. Westfall 141 Colo. 533,349 P.2d 370 (I960)]. Shortly thereafter, however, the court refused to grant the Colorado River Water Conservation District an appropriation to protect minimum stream flows for fish habitat, stating that an actual diversion from a stream must occur for an appropriation to take place [Colorado Water Conservation District v. Rocky Mountain Power Co. 158 Colo. 331,406 P.2d 798 (1965)].

While the requirements for a diversion are somewhat unclear, water must be applied to a beneficial use for an appropriation to occur (Vranesh 1987:141). There must be an actual application of water. The rationale is to discourage speculation and encourage actual use of water (Vranesh 1987:141). What constitutes a beneficial use has been determined on a case-by-case basis. In addition to domestic, agricultural, and manufacturing purposes, the court has recognized as a beneficial use power generation, fish culture for commercial sale, and general municipal uses (Vranesh 1987:145). The court has not sanctioned a nonconsumptive instream use, however, it has let stand a narrowly worded statute that allows the state of Colorado to appropriate nonappropriated water to maintain minimum stream flows [Colorado River Water Conservation District v Colorado Water Conservation Board 197 Colo. 469, 594 P.2d 570 (1979)]. Thus, in general for an appropriation to occur and a water right perfected an individual must divert water and put it to beneficial use.

Beneficial use becomes important when an appropriator seeks to change a water right. Rights can be transferred, and point of diversion and type of use can change, as long as other appropriators are not injured. The "no injury" rule protects "junior appropriators' rights to stream conditions as they existed at the time the juniors initiated their appropriations" (Vranesh 1987:72-73). To prevent injury, the amount that can actually be transferred, is the amount that was put to beneficial use, even if the decreed right was greater (Vranesh 1987:148). Historically, if an appropriator did not use the full amount of water decreed, the portion left unused remained in the stream. Eventually, others appropriated that water and acquired decreed rights in it. If, after a number of years, an appropriator were allowed to transfer an amount of water in excess of what he actually used (even though he possessed a decree for it), all appropriators junior to him would be harmed.

Courts generally did not require a specific accounting of every drop of water used. Instead, appropriators and courts developed the notion of "duty of water" to express the "amount of water necessary to meet reasonable needs"(Vranesh 1987:150). It was that amount of water that could be transferred. In irrigation, the amount of water placed on crops is only a portion of the water needed. Attention must be paid to maintaining an adequate flow to assure delivery of water. Furthermore, some water is lost to seepage and carriage. Finally, water needs vary by type of crop and by variations in weather. The concept of "duty of water" took these factors into account.

One of the clearest expositions of "duty of water" occurred in case in which the City of Golden, having acquired a water right, attempted to change its point of diversion and expand its use up to its original decreed amount. The court stated:

> Although the expression "Duty of Water", [sic] in the opinions of some present-day scholarly hydrologists and technical engineers, may be outmoded, provincial,

> unscientific, and otherwise objectionable, nevertheless it is a term well understood and accepted by every rancher and fanner who has had practical experience in the artificial irrigation of land for the production of crops. It is that measure of water, which, by careful management and use, without wastage, is reasonably required to be applied to any given tract of land for such period of time as may be adequate to produce therefrom a maximum amount of such crops as ordinarily are grown thereon. It is not a hard and fast unit of measurement, but is variable according to conditions... Land characteristics at the place of use are important; location; slope; depth of soil; whether it is loose or close; if underlain with gravel or imperious material...In fact, every element that concerns or affects the consumption of water in the particular case before the court is to be considered. In matters concerning change of point of diversion, it is the gauge by which volume of prior use is determined...The extent of needed use in original location is the criterion in considering change of point of diversion. This, of course, is premised upon the assumption that whatever of the decreed water was not properly used remained in the stream [Farmers Highline Canal & Reservoir Co. v. City of Golden, 129 Colo. 575, 272 P.2d 629 (1954)].

A change in a water right would be permitted as long as injury to junior appropriators is avoided. Using the "duty of water" to determine the amount of water that can be transferred is one means of preventing injury. The decree recognizing the change in water right must contain conditions that are proper for preventing injury. If reasonable conditions cannot prevent injury the change in water right is denied (Vranesh 1987:153).

The substance of the Colorado Doctrine was built on a case-by-case basis over a period of more than one hundred years. While it served to satisfactorily allocate surface water among competing appropriators, and to channel their conflict in relatively peaceful ways, it could not,

by itself, dampen and resolve a widespread and deeply contentious issue that emerged among appropriators in the 1960s.

The Tributary Groundwater Crises

The South Platte River is hydologically connected to a groundwater aquifer that is estimated to contain approximately 8 million acre feet of water (McDonnell 1988:585). Most of that water is inaccessible, not because of technological hurdles, but because of the prior appropriation doctrine. The prior appropriation doctrine is not well suited for governing groundwater. Drawing upon groundwater necessarily lowers the water table. Lowering the water table reduces surface water flows. The surface stream can disappear if the water table is sufficiently lowered. Drawing upon the groundwater basin injures senior surface water rights holders. Actively using the groundwater basin by drawing heavily upon it during times of drought and refilling it during times of abundance can completely deny surface water rights holders of their constitutionally protected rights in surface water flows. The tradeoff is clear. Protecting surface water rights holders forecloses access to much of the water in the aquifer. Actively using the aquifer decimates the rights of surface water appropriators.

The tradeoff emerged in the 1950s and became acute in the 1960s. Colorado suffered a sustained drought in the 1950s. Farmers drilled wells and pumped groundwater to irrigate their crops. For instance, in 1940, in the Arkansas River Basin an estimated 40 irrigation wells were in operation. By 1972,1,477 wells pumped 208,000 AF of water (McDonnell 1988:582). Noticeable effects on surface water flows appeared in the 1960s. Colorado courts had long recognized that tributary groundwater was appropriable water and governed by the prior appropriation system. Thus, the answer to the problem of pumping tributary groundwater seemed obvious. The groundwater pumpers' water rights are junior to those of surface water

appropriators. When a call goes onto the river, the appropriations of the most junior rights holders should cease until the senior appropriators' rights are satisfied. Wells should be shutdown.

Two issues prevented such a direct solution. First, the Colorado constitution, legislature, and supreme court advocated the development and use of the waters of the state to the greatest extent possible for the benefit of the citizens of the state. Foreclosing the timely use of tributary groundwater violated such intentions. Second, the concept of the futile call made it difficult, in practice, to shutdown well pumping. A futile call occurs when a senior appropriator's rights would not be satisfied even if appropriations junior to it were shutdown. In such a case, junior appropriators are allowed to continue to divert water. Shutting down wells to satisfy senior surface water calls is often futile because of a time lag between groundwater pumping and surface water flows. In most cases, shutting down wells will not have an appreciable effect on surface water flows for weeks or months. Even if a senior appropriator made a call, and wells were shutoff, the senior appropriator would not realize any water for his crops in many cases until the irrigation season was coming to a close.

In 1965, the Colorado Legislature passed legislation providing the State Engineer with the opportunity to directly address the conflict between surface water and tributary groundwater appropriations. The legislation stated in part:

> The State Engineer or his duly authorized representative shall execute and administer the laws of the state relative to the distribution of the surface waters of the state including the underground waters tributary thereto in accordance with the right of priority of appropriation, and he shall adopt such rules and regulations and issue such orders as are necessary for the performance of the foregoing duties. (Radosevich 1976:138).

In the summer of 1966, the Engineer exercised his new authority and ordered 39 wells in the Arkansas River Valley shutdown in order to satisfy senior rightsholders with appropriations dating to 1887 (Radosevich et al. 1976:139). This action triggered a decade of conflict culminating in tributary groundwater being incorporated within the prior appropriation system only in the South Platte River Basin. Not until 1992, after the U.S. Supreme Court found in favor of Kansas against Colorado in relation to the Arkansas River was tributary groundwater incorporated within the prior appropriation doctrine in the Arkansas River Basin.

Tributary Groundwater and the South Platte River Basin

After several attempted rulemakings, numerous lawsuits, threats by senior appropriators to abandon the prior appropriation doctrine if junior well pumpers were not regulated, and the passage of the 1969 Water Rights and Determination Act, agreement was reached on a set of rules for incorporating tributary groundwater into the prior appropriation system in the South Platte River Valley (Radosevich et al. 1976:148-149). These rules were hammered out among surface and ground water appropriators and the State Engineer's Office, in the context of the Division One Water Court (Radosevich, et al. 1976; Vranesh 1987).

The 1969 Act provided two mechanisms to ease the entry of well owners into the prior appropriation system. First, the act required that all tributary groundwater rights be adjudicated. Wellowners were provided an attractive incentive to firm up their water rights. If they adjudicated their wells prior to 1972, their priority would be fixed at the time they first pumped the well, and not at the time that they adjudicated their right, as was customary. Wellowners responded by adjudicating their rights. This helped to settle a severe information problem. Prior to these adjudications, the state engineer (including the water commissioners), the courts, and all other appropriators did not know the number, location, and volume of water pumped by wells,

nor their order of priority. Such information is central if water rights are to be administered in accordance with the laws.

Second, the Act provided a mechanism by which junior rightsholders could withdraw water out of priority. An augmentation plan "provides a highly flexible tool enabling new uses of water without strict regard for the priority system, so long as existing rights are not injuriously affected" (McDonnell 1988:589). In other words, junior appropriators, whether of surface water or of tributary groundwater, can protect their diversions from "calls" by senior appropriators by augmenting stream flow. A plan of augmentation for a well, or series of wells, involves determining the depletions to stream flows, or injury to the river, caused by well pumping, and identifying a source of water that will be made available to the river at the time and place of injury to senior appropriators.

The rules adopted for the South Platte River Basin are conceptually quite simple. First, the rules defined a time table for phasing out well pumping. Second, wells covered by a decreed plan of augmentation could continue to operate. Third, wells covered by a temporary plan of augmentation could continue to operate. Augmentation plans that allow out of priority depletions were key to incorporating tributary groundwater into the prior appropriation system.

Decreed Plans of Augmentation

In Division One, which encompasses the South Platte Basin, district one encompasses six major irrigation and ditch companies. Of those six, two, the Bijou Irrigation Company and the Fort Morgan Irrigation Company, have obtained decreed plans of augmentation to cover the out of priority pumping of their members' wells. Obtaining a decreed plan of augmentation is similar to obtaining a right to appropriate water. Appropriations of water for augmentation are placed within the priority system (McDonnell 1988:596). For instance, the Fort Morgan augmentation plan includes a list of each well to be covered, a list of each augmentation structure to be used to

recharge water to the aquifer and eventually the South Platte River, the methods for measuring well depletions and augmentation accretions, and a decreed right of 235 cfs for augmentation use with a priority date of May 19,1972.

The operation, administration, and monitoring of the augmentation plan is shared among the Fort Morgan Irrigation Company, the district one water commissioner, the Division One State Engineer's Office, and the Northern Colorado Water Conservation District, which owns and operates the Colorado—Big Thompson Project, the largest water project in Colorado. The irrigation company has incorporated its augmentation activities within its existing irrigation infrastructure. Augmentation structures consist of the Fort Morgan canal, several stretches of Badger Creek adjoining the canal, and several prairie "potholes" and ponds located adjacent to or at the end of the canal. During the non-irrigation season (October-March), Fort Morgan diverts water from the South Platte River under its augmentation decree. The water is run in the augmentation structures, seeps underground, slowly flows back to the river, and enhances the stream flow of the river primarily during the summer peak demand. Members' wells can continue to operate, even though they are drawing out of priority water, because of the replacement water to the South Platte River provided by the augmentation structures.

Each augmentation structure includes a headgate and a measuring device. Each week the water commissioner records the amount of water diverted into each augmentation structure. The NCWCD uses the water measurements, along with estimates of well pumping, to determine well pumping depletions and augmentation replacements to the South Platte River on a month by month basis during the irrigation season. NCWCD provides these reports to Fort Morgan, and Fort Morgan provides monthly updates of well pumping. Augmentation water in excess of that needed to cover out of priority well pumping can be carried over from one month to the following month to cover depletions. If augmentation water is inadequate to cover well pumping,

Fort Morgan is required to release water from its reservoir, or allow some of its October 18,1882 appropriation to remain in the river. Conversely, excess augmentation water can be sold or put to other uses. Both Fort Morgan and Bijou, the only two decreed augmentation plans in district one, produce augmentation water in excess of what is needed to cover their member wells. In both cases, augmentation credits are sold to industries and wellowner associations who need such credits to cover their wells.

Temporary Plans of Augmentation

Unlike the Fort Morgan and the Bijou Irrigation Companies, well-owners in the remaining four irrigation and ditch companies of district one are covered by a temporary plan of augmentation. A temporary plan of augmentation, or a substitute supply plan, is not adjudicated. Rather, it is reviewed, approved, and monitored by the State Engineer. To date, no water appropriators have mounted a court challenge to substitute supply plans.

In 1972, with the encouragement of the State Engineer, a group of well owners formed GASP, the Groundwater Appropriators of the South Platte, a nonprofit organization, to develop a portfolio of water to be used to cover members' out of priority depletions caused by well pumping. The organization agreed to provide a list of its members, a list of wells, an estimate of the amount of water to be pumped in the coming irrigation season, the actual amount of water pumped in the previous irrigation season, and an amount of water to be placed at the State Engineer's disposal to replace out of priority depletions and offset any injury to senior rights (McDonnell 1988:591). The State Engineer accepted the offer. The substitute supply plan must be approved on an annual basis.

GASP covers several thousand wells in the South Platte River Basin, primarily below Greeley. To become a member, a well owner must pay a fee equal to the cumulative annual fees charged by GASP since its inception in 1972. In addition, an annual fee must be paid, based on

the amount of water the well owner expects to pump during the year. For each 100AF, or portion thereof that is pumped, one unit of membership must be purchased. In 1972, the unit fee was $15, in 1986 it was $90, and in 1992 it was approximately $120 (McDonnell 1988:592; GASP no date).

One of the sources of water that GASP leases is augmentation credits. The four irrigation and ditch companies in district one operate augmentation structures and lease the credits to GASP. While none of the companies have a decreed augmentation plan, they have decreed their water appropriations and their augmentation structures. In other words, they possess decreed water rights and decreed methods for measuring augmentation credits. For instance, the Lower Platte & Beaver Irrigation Company operates its canal and four augmentation ponds for augmentation credits. However, it does not generate sufficient credits to cover its members' well pumping. Instead, it leases its augmentation credits to GASP and its members purchase units in GASP so that they can continue to pump their wells out of priority. GASP covers their wells. The goal of the Lower Platte & Beaver is to develop sufficient augmentation capacity to cover its members' wells and to obtain a decreed plan of augmentation. Once that occurs, the Lower Platte & Beaver intends to purchase units of GASP as an insurance policy. If, for some reason, it is unable to cover its members' wells according to its augmentation decree, its members' wells will still be covered under GASP (Wind, pers.com).

GASP is a controversial organization. It is controversial because it operates in apparent violation of the prior appropriation doctrine. The prior appropriation doctrine is based on the no injury rule. Appropriators can develop, change, and use their water rights, they can even take water out of priority, as long as no other appropriators are injured. Courts, in decreeing augmentation plans, have required that out of priority well pumping must be measured and

completely offset by a reliable source of water available at the time and at the point of injury. GASP does not completely offset it's well pumping.

"The GASP approach has been characterized as 'call management"'(McDonnell 1988:592). The GASP water portfolio is of a sufficient size and is strategically located so as "minimize the call on the lower portion of the South Platte River" (McDonnell 1988:612). Until very recently, GASP has been allowed to drill wells relatively close to the river, near the canals of the most senior appropriators. Instead of calling the river, GASP turns on its wells and diverts the water into the seniors' canals to satisfy their water demands. The wells' do not affect the river flow until winter when the South Platte River is free flowing. GASP supplements its well pumping by leasing augmentation credits and shares of reservoirs and ditch companies, making such water available to the State Engineer as he sees fit.

Call management violates the prior appropriation doctrine because it does not fully replace out of priority depletions to the river. Call management simply quiets the protests of the senior appropriators most likely to complain about well pumping. GASP has long maintained that it would be too complex and too costly to adjudicate an augmentation plan covering thousands of wells. However, the recent events in the Arkansas River Basin undercut this defense.

Tributary Groundwater and the Arkansas River Basin

Augmentation, as practiced in the Arkansas River Basin (Division Two), although engaged in for the same purposes as that of the South Platte Watershed (Division One), is executed in an entirely different manner. The well owners in Division Two have acted and responded differently than their Division One counterparts to the process of incorporating tributary groundwater into the prior appropriation system. These differences are driven partly by physical circumstances, and partly by institutional circumstances.

In the late 1960s and early 1970s, large well-owner associations were formed to defend their interests as the Division Engineer's Office attempted to incorporate well-owners into the prior appropriation system. When a call came on the River, the Engineer ordered a number of wells shutdown in order to satisfy the rights of senior appropriators. The well-owners filed suit against the Engineer. The well-owners prevailed. In 1968, the Colorado Supreme Court ruled that the Engineer did not have to demonstrate that the pumping of a specific well was causing an injury to a specific senior appropriator. In order to regulate wells, the Engineer would have to develop a plan through which to implement well regulation and the plan and its associated rules must lessen injury to senior appropriators. Also, the Engineer would have to explore alternatives to simply shutting down wells as a means of protecting senior appropriators (Fellhauer v. People, 167 Colo 320,447 P.2d 986).

By 1973, a set of rules regulating well-pumping was adopted in Division Two. The rules limited pumping to three days per week - Monday, Tuesday, and Wednesday. In 1974, the Division Engineer attempted to adopt the same well-pumping regulations as those in Division One - phasing out pumping over a three year period, unless the wells were part of an approved augmentation plan. Again, the pumpers challenged this rule, and again the Supreme Court sided with the pumpers, deciding that the Engineer did not demonstrate that such measures would make additional water available to senior appropriators (In re Arkansas River, 195 Colo. 557, 581, P. 2d 293,1978).

The 3-day a week rule did not limit pumping, in part because it was not enforced. Other mechanisms, however, did ensure an upper bound on pumping. Under the 1969 Water Rights and Administration Act, well owners adjudicated their wells, which placed upper limits on pumping. Each decree defined the volume of water that could be put to beneficial use.

Furthermore, through its well permitting authority, the Division Engineer did not permit any new irrigation wells.

This was the status quo until the mid-1980s, when Kansas filed suit against Colorado, claiming that Colorado did not maintain adequate Arkansas River flows across the stateline into Kansas, in violation of the Arkansas River Compact. The special master, appointed by the U.S. Supreme Court, sided with Kansas. Among other things, Colorado was directed to regulate well pumping in the Arkansas River Basin. The State of Colorado acted quickly to bring Division Two wells within the prior appropriation system so as to minimize the penalties the state will have to pay Kansas. Similar to what transpired in South Platte River Basin two decades before, the State and Division Engineers, the State Attorney General, and the well owners associations, within the context of the Division Two water court, devised a set of rules to regulate well pumping.

The rules created replacement plans, which are a cross between decreed plans of augmentation and temporary plans of augmentation. Replacement plans are similar to decreed plans in that they fully replace each out of priority depletion at the time and point of injury. Replacement plans are also similar to temporary plans in that they are not adjudicated, rather they are approved by the Division engineer each year. Each year, the well associations provide a list of wells by river reach; the amount of water each well expects to pump; and the actual water, by river reach, that the well association will make available to the Engineer to cover out of priority depletions. The Engineer's office collects monthly data on well-pumping, stream depletions, and stream replacements data. Each month the Engineer, the well-owner associations and a representative of the State of Kansas review the accounts to ensure that the out of priority stream depletions have been covered.

The replacement plans developed by the well-owner associations are in lieu recharge programs. Instead of directly recharging water into the aquifer, as do their counterparts in the South Platte Basin, they purchase or lease rights to surface water. The surface water is released to the stream over the course of the irrigation season so as to replace the water taken out of priority by well pumping. Sources of replacement water are surface storage and distribution projects developed by the Southeastern Colorado Water Conservancy District, the Cities of Pueblo and Colorado Springs, and the Bureau of Reclamation. In addition, well-owner associations have purchased shares of water of mutual ditch companies.

Well-owner associations along the Arkansas River have chosen to develop in lieu recharge programs because of the circumstances in which they find themselves. First, the tributary aquifer of the Arkansas River is narrower than that of the South Platte, and water tables are higher. There is very little room to recharge into the aquifer. Second, the Arkansas River is under a "call" year around. Only rarely would a very junior augmentation decree be in priority so that water could be drawn from the river and placed in recharge ponds. Third, cities located upstream of the well owners have developed surface storage systems whose volume currently exceeds their water needs. Cities have, and probably will have for the next 50 years, surplus surface water to lease.

Augmentation plans and replacement plans have softened the harshest edges of the prior appropriation doctrine. The prior appropriation doctrine, based on first in time, first in right, protects the earliest appropriations, forcing the burden of scarcity on to later appropriations. Augmentation plans allow junior appropriators to confront scarcity, not by shutting down their appropriations, but by developing and using additional sources of water to satisfy the water rights of senior appropriators. These plans have been particularly crucial in allowing for greater

use of groundwater resources than would have otherwise been the case if the prior appropriation doctrine had been strictly enforced.

Temporary augmentation plans, and some replacement plans, while allowing for extensive use of groundwater, are fragile. They are fragile because they have not been folly incorporated within the prior appropriation doctrine, leaving those who rely on them susceptible, especially during times of water shortage. For instance, some replacement plans in the Arkansas River basin are based exclusively on leased surplus surface water. During drought, surplus water may not be available, requiring the wells under the replacement plan to shutdown. More fragile, however, are the temporary plans of augmentation that unlike replacement plans do not cover all out of priority depletions to the South Platte River. During a drought, the more senior rights holders will almost certainly challenge such plans so as to avoid shutting down their own appropriations and instead force the shutdown of junior wells. The State Engineer's Office will then be confronted with an issue it has attempted to avoid. Will thousands of junior well owners, who are tapping into aquifers that hold millions of acre feet of water, be shutdown in order to satisfy the demands of senior surface water rights holders?

Conclusion

All states in the western U.S. rely on the prior appropriation doctrine to define property rights and allocate water. Only the prior appropriation doctrine as practiced in Colorado, however, may be considered customary law. First, the prior appropriation doctrine was born of conflict among miners, farmers, and ranchers as they struggled and competed to control and use scarce resources, especially the scarce resource of water. Miners, farmers, and ranchers devised a water rights system substantially different from the one developed and applied in the humid and wet eastern U.S. Prior appropriation is matched to the physical setting of the drier west — water may be diverted from and transported to productive lands far from the stream. Furthermore, all

appropriators do not equally bear the burden of scarcity. If that were case, no single appropriator would have adequate water to maintain productive activities during scarce times. Instead, those , who first developed the water are privileged, and are protected from scarcity.

Second, Colorado water appropriators continue to revise, change, contest, and enforce their rights among themselves within the context of water courts. The decision making process is not one of majority rule but rather of consensus building. Prior to entering court for an adjudication of a right, appropriators attempt to work out differences among themselves over proposed changes to or development of water rights. Even when an adjudication commences, the decision making process centers on consensus building. The water referee attempts to mediate conflict, if any, among the appropriators, while devising a change in water rights acceptable to all parties. If conflict remains, and the referee's decision is challenged, the water judge then attempts to mediate conflict and craft a decree acceptable to all parties. In unusual cases in which conflict remains, the case is heard by the Colorado Supreme Court, however, it only addresses the remaining points of contention. Thus, consensus decision making is built into the process at multiple points, and only as a last resort is conflict cutoff and a decision imposed.

Third, the consensus building process directs participants towards solving problems. Appropriators do not possess absolute and unconditional water rights that will be protected at all costs. Instead, new water rights and changes to current water rights will be accommodated to the greatest extent possible while preventing injury to existing appropriators. Individuals who initiate an adjudication bear the burden of protecting existing rights holders and demonstrating that their request will not injure others. Existing rights holders are required to accept reasonable accommodations that prevent injury to their rights. Thus, the problem that appropriators face is how to accommodate a new or changed use within the existing structure of rights.

While Colorado water law is a form of customary law, it is not fixed in time. Not only has the substance of the Colorado Doctrine evolved to address new circumstances, but so too has the administrative structure. The Colorado legislature, acting in its constitutional choice capacity has reconfigured the institutional setting. The occasional changes engendered by the legislature have been consistent in their purpose - promoting greater coordination among appropriators and among administrative actors. Before the state of Colorado was even five years old the legislature had created water commissioners, a state engineer, division engineers, and county district courts. Courts provided the forum in which appropriators decreed their water rights, while water commissioners and engineers coordinated the water diversions of appropriators. The legislature has substantially refined and specialized this system, particularly with the changes wrought by the 1969 Water Rights and Administration Act. Instead of each of several district courts in every water division hearing water cases, a single water court was created in each division. The position of water referee was created to make an initial, and in many cases, a final determination of each case. Thus, the single water judge was not overwhelmed with hundreds of cases. However, creating a single water court in each division allowed appropriators to track one another more carefully. Instead of monitoring the activities of several courts, only one court in each division need be monitored. Furthermore, the division engineers were authorized to create a single list of water rights in the order of their priority in each division. For the first time, appropriators could discover how they stood in relation to all other appropriators in their division.

Such changes clearly buttressed the customary law system and allowed for greater coordination among appropriators. Appropriators have jealously guarded their authorities and have consistently fought to ensure that other actors, particularly the State Engineer, are not granted powers at their expense. For instance, in 1965 the legislature granted the State Engineer

the authority to devise rules to incorporate tributary groundwater within the prior appropriation system. Never before had the State Engineer ever been given the power to make decisions concerning water rights. Those decisions had always been made among appropriators working with a court. When the State Engineer attempted to exercise his new rulemaking powers by regulating well pumping in the Arkansas River Basin, appropriators contested such authority in the context of the water courts/Eventually, the Colorado Supreme Court recognized the authority of the legislature to grant the State Engineer rulemaking powers, but the Court laid out a series of conditions guiding the rulemaking process (Fellhauer v. People, 167 Colo 320,447 P.2d 986).

Each time, however, when the State Engineer devised rules to regulate well pumping, appropriators challenged the rules in court, preventing their application until all issues could be heard. Finally, within the context of the Division One Water Court, appropriators and the State Engineer negotiated a set of rules for incorporating tributary groundwater and wells within the prior appropriation system. The parties stipulated to the facts of the situation in the South Platte River, but the appropriators reserved the right to challenge the rules on constitutional grounds (Radosevich, et al. 1976:148; Vranesh 1987). The rules were implemented. This set a precedent for rulemaking which was used twenty years later when a similar set of rules were negotiated for the Arkansas River Basin. Thus, while the State Engineer has rulemaking authority, appropriators within the context of the water courts oversee that authority.

The administration of the Colorado Doctrine has evolved to permit greater coordination among appropriators over time. One coordination issue that may never be satisfactorily resolved, however, is that of tributary groundwater. Trying to coordinate across two interconnected, but differently structured resources — groundwater and surface water — continues to generate conflict. Forcing tributary groundwater into the prior appropriation system forecloses access to substantial amounts of groundwater. To gain access to that groundwater would require substantial

modifications to the prior appropriation system. Appropriators, the Colorado Supreme Court, the Colorado legislature, and the State Engineer, have wrestled with this issue for more than three decades, achieving fragile solutions that allow for existing pumpers to continue to access groundwater. Once a sustained drought occurs in the South Platte Basin, however, such fragile agreements are likely to crumble as senior rights holders fight to protect their rights, and as junior rights holders fight to gain access to a large, but largely untapped source of water.

Bibliography

Abbott, Carl, Stephen J. Leonard, and David McComb. 1994. Colorado: A History of the Centennial State. 3d edition. Niwot, CO: University Press of Colorado.

Huber, Thomas. 1993. Colorado: The Place of Nature, The Nature of Place. Niwot, CO: University Press of Colorado.

MacDonnell, Lawerence. 1988. "Colorado's Law of 'Underground Water': A Look at the South Platte Basin and Beyond" University of Colorado Law Review 59(3):579-625.

Mehls, Steven. 1984. The New Empire of the Rockies: A History of Northeast Colorado. Denver: Bureau of Land Management.

Radosevich, G.E., K.C. Nobe, D. Allardice, and C. Kirkwood. 1976. Evolution and Administration of Colorado Water Law: 1876-1976. Fort Collins, CO: Water Resources Publications.

Smith, Duane. 1992. Rocky Mountain West: Colorado, Wyoming and Montana 1859-1915. Albuquerque: University of New Mexico Press.

Trelease, Frank 1971. Federal-State Relations in Water Law. National Water Commission Legal Study, No. 5.

Vranesh, George. 1987. Colorado Water Law. Volume 1.

Warner, James, Jon Altenhofen, and Jack Oder. 1994. Recharge as Augmentation in the South Platte Basin. Groundwater Program Technical Report #21. Fort Collins, CO: Colorado Water Resources Research Institute.

Whitney, Gleaves. 1983. Colorado Frontrange: A Landscape Divided. Boulder: Johnson Books.