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The Evolution of Water Rights

ABSTRACT

This article looks at the evolution of water rights since early medieval times in England, North America and Australia. Different water rights characteristics such as quality of title, exclusivity and transferability are traced. Bases of two water regimes-types are identified: riparian land ownership (community of users) and actual use of the streamwater (priority of use). We identify periods in which one or the other of these types of regimes prevailed and suggest a "twists and turns" pattern of alternation between them. Aspects common to all periods, such as prescription and seniority, are described. Finally, after looking at the dynamics of change from one base to another, we project into the future a new property regime which could respond to increased and more varied demands to use water, conserve it and protect the water shed.

PART I: INTRODUCTION

A water right can be widely defined as the right to use or enjoy the flowing water in a stream. It may emerge from a person's ownership of land on the banks of the stream ("riparian ownership"), or from a person's actual use of the stream. It may be administered and controlled by a government agency, or it may not be administered at all, and be subject to enforcement only in the courts. A water right can also be created indirectly through a contract with a rights holder.

Some water rights are quantitative, applying to a fixed amount of water, measured by rate of flow. Others set no limits so long as the holder does not reduce or pollute the flow available to other water right-holders on the stream. Some continue only as long as the holder continues his specific water use, while others continue whether he uses the water or not.

In different parts of the world, even among countries which have the same system of law (for example, the common law countries), and even

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within a single country, the regimes of water rights can be found to be very different. Demand and supply play a role here. Furthermore, over time, there have been "evolutions" of water rights. Comparative evolution is the theme of this study.

Two questions suggest themselves: (1) Is a water right a different type of right than a land right?; and (2) Is a water right a 'property' right? We answer both questions in the affirmative. An affirmative answer to the first question gives us a reason to look at water rights separately from land rights, and an affirmative answer to the second question gives us a basis for comparing them through the mechanism of their "characteristics."

The physical attribute of water in rivers and streams that distinguishes it most from land for the purpose of a study of rights is its fluidity. The individual drops of water flowing in a stream are always in motion, and travel from one right-holder's location to another's. Hence the holder's right is more than to identifiable drops—it extends to the *flow*, as represented by the stream's velocity, its level and its quality at any particular instant. This is a modern view of the water right; in early medieval times the law had tried to ignore the fluidity of water and to treat the right as if it were over land.

What finally sets off a water right from a freehold, leasehold, profit-à-prendre or any other type of land holding, is the fact that the exercise of the right has "external" effects beyond those felt by the right-holder himself. Conversely, his right is vulnerable to challenges by others on the stream, just "his" flow is vulnerable to variations caused by others' uses. This interdependence among water users, which has led economists to dub such a stream a "common property" is far, far greater than among landowners or land users. The "common property" feature means that a water right has far less exclusivity than has a land right. Certain land rights also lack some exclusivity, but water rights lack so much more exclusivity as to warrant separate study.

Is a water right a "property" right? A lawyer would say that only if the right derived directly from a grant of land, could it be called a "real property" right. Anything else would be a "personal right" and outside the scope of a study on natural resources property. An economist would not limit the definition in this way, but would call a property right any one which gave its holder powers to use, manage or alienate a thing or to drive profit from it. A contractual right regarding the use of land would therefore be a type of land property right in the eyes of an economist but not of a lawyer. What they would both have to agree on as a minimal requirement for a land property right, however, would be social recognition, enforcement and protection of the holder's powers given under the right. This minimal and broad definition gives us a basis of comparison of various water rights regimes. The points of comparison will be the extent of six "characteristics" of property rights:

duration or permanence;
 flexibility;
 exclusivity or specificity;
 quality of title or security;
 transferability or assignability; and
 divisibility.

The changing regulation of water-rights holders by statute and by the several branches of the common law: criminal, tort, property and contract, has worked to alter the amount of each of the six characteristics of their right. The ability of legislators and courts to make these changes has itself been subject to change according to the prevailing powers of Parliament and the forms of legal action in use at the time. Different forms of action had, for example, different requirements regarding 'standing' of a plaintiff to sue, and the burden of proof. In proposing a reconciliation of the ideas of economists and lawyers with regard to property rights, we have been guided by the following

1. If a person has a legal entitlement to something that can be enforced and protected, he has a "right."
2. If a person has no legal entitlement to do something, but others have no means of preventing or blocking him from his use or enjoyment of it, and he has the legal means of protecting his action from harm from others, what he has is tantamount to a "right." He can use the thing unimpugned and unhindered.
3. The corollary of 1 and 2: If a person has a legal or technical entitlement which the court will not enforce, then he does not, practically speaking, have a "right," for any other member of the public is in as good a position as he is with regard to the use and enjoyment of the thing.

The first statement is not controversial and would be accepted both in the courts and in economic analyses. Courts have parted from economists over the second statement. They have strenuously resisted calling what is "tantamount to a right" a legal entitlement, because the instances of it have no roots in land or water ownership but only in the power of an individual to prevent others from doing something.¹ Yet for hundreds of years these same courts protected, through their procedures, the quasi-legal

1. The authors gratefully acknowledge the assistance and comments they have received from many persons. Among them they would mention: Richard Campbell, Sandy Clark, Ronald Cummings, Anthony Dorsey, Mason Gaffney, David Getches, Mischa Gisser, Linda Hannah, Charles Howe, Elizabeth Kirk, Arthur Maass, Ben Marr, Mary McGregor, Christopher Mowlin, Peter H. Pearse, Christine Riek, Ruth Picha, Murray Rankin, Bernadette Stale, Jennifer Steward, Andrew Thompson, Stephen Wisenthal.

See *Mason v. Hill*, 110 Eng. Rep. 692 (K.B. 1833), discussed in Part III.C., *infra*.

right of "prior-use" water diversion which was founded on this precept formed the basis of a huge network of contracting and industrial development on the rivers of England.² The third statement may appear controversial, but was recognized by the courts in the eighteenth century case of *Ashby v. White*.³ In that case, which concerned voting rights, the court resolved that "want of right and want of remedy are reciprocal," or *without a remedy, there is no right*.⁴

Thus we propose as a further definition of a property right: "The ability to do something which is recognized directly or indirectly in law, to the extent that the law can be expected positively to protect that ability or negatively to prevent others from interfering with that ability."

An evolution in water rights has indeed taken place in the common law world, if one considers "rights" in the sense of the above broad definition. The rights have shown different types and amounts of "characteristics" over time and have been built on shifting foundations. We have noted the six characteristics above. As for the foundations, we will see that they are: land ownership and water use.

Our study has considered the following places and periods of time in which one or the other of the two foundations has acted as the basis for water law

- Medieval, post-Conquest period in England (1066-1600)
- Early industrial revolution in England (1600-1850)
- Mid and late industrial revolution in England (1851-1900)
- Industrial period in New England (Eastern United States) (1827-1900)
- Settlement and development period in Western United States (1850-1900)
- Modern period in United States and English (1900-present).

To the above we have added a short consideration of Roman law regarding water. Roman law was not merely a precursor of English water law; its principles and practices continued to form a backdrop in later periods, sometimes starkly visible and impossible to ignore.

What becomes evident in our comparative and evolutionary study is that from one of these periods to the next there is a pattern of alternation between the two foundations of the water right (land and use). We identify some of the factors which may have been associated with the changes and alternations.

Let us look briefly at the main features of the two types of water rights. The basic premises of land-based or riparian rights are the following

2. See *infra* part III.B.

3. *Ashby v. White*, 92 Eng. Rep. 126 (K.B. 1703).

4. *Id.* at 136.

- only the owner of the stream banks has rights in the flow;
- rights are to the undiminished, unaltered flow of the water;
- the owner may use the flow at any time, in any way, and in any quantity, provided he does not cause damage to other owners along the stream (that is, alter or diminish the flow to them);
- rights are relative and impose corresponding obligations amongst the riparian community. The rights and obligations of each riparian are equal, regardless of how much land he owns;
- full riparian rights can be transferred only by transferring title to the riparian land.

In contrast, in the alternating use-based periods, water rights have the following main features

- rights exist only as long as water use exists. Land ownership is not essential provided there is legal access to the river;
- rights are specific as to quantity and type of use;
- the first user has the strongest rights. A seniority system provides ranking of rights;
- Rights-holders (users) can enforce their rights only against those lower in seniority (later in time);
- the usufructuary rights are fully transferable to any person.⁵

A particular branch of the common law is called upon for enforcement of each of the two types of water law. The law of property protects land-owners and their land-based water rights to the flow through a riparian-rights action. The law of tort protects any individual using the flow through a personal, nuisance action. One might expect overlap for owners of riparian land who were also active users of the flow: they would have their choice of action and corresponding remedies. But we shall see that this was not always the case. For example, at certain times in history, while the law of tort flourished to protect water rights, the law of property was represented only by the cumbersome feudal actions and was virtually unused. At other times, the applicability of tort law to protect streamflow was greatly narrowed among users. It followed that riparian land owners who did not use the flow and users of the flow who were not riparian land owners were at different periods of time without remedies when the flow

5. Both types of water right are present today in North America in statutory form. The land-based right has become in many eastern North American jurisdictions a water-taking *permit*. The use-based right has, in many western states and provinces, become an *appropriative* right or license.

was altered. The structure of our work belies our attempt to understand this conundrum.

In Part II we detail our scheme of "characteristics" of water rights, criteria by which these rights can be measured and compared. We explain what these characteristics are and how they can apply to various water regimes. Before undertaking this study we expected to find that, in spite of the confusion created by the alternation of land-based and use-based principles, the characteristics of typical interests in water would become stronger over time.⁶ But water rights have not developed so smoothly. Instead, our examinations showed times of retrogression as well as times of progression in such key characteristics as exclusivity and transferability. We decided—perhaps discovered would be a better word—that as the foundations of the rights were alternating, the characteristics were fluctuating.

In Part III we present our overview of the evolution of water law, as outlined above, throughout Britain, Australia, New Zealand, and North America.⁷ Coincidentally, the image that we feel best describes the way water rights have developed is that of a typical river or stream. We see this as being neither purposive or teleological, nor aimless, for any river clearly has direction. Our evolutionary river ultimately winds its way toward a large, complex pool of water uses and users and a system of water rights that depends on a delicate balancing of land-based and use-based principles. (See Part VI.)

Moreover, we will employ the language of surface currents and undercurrents to emphasize what we see as the multi-layered structure of water law development. The visible, surface currents are reflected in the distinct, doctrinal changes that occur throughout water rights case law. As we will see, over the course of British and North American water law some doctrines recur and reassert themselves in response to deeper, more permanent obstacles that present themselves occasionally and perhaps unexpectedly from out of the river's bedrock. Technological developments which occurred during the Industrial Revolution, for example, brought about increased congestion of water users along English rivers and a return to a kind of land-based principle of water law similar to that which had governed water use in medieval England but which had become obsolete by the beginning of the seventeenth century. And following a period of

6. See Anthony Scott, *The Market for Characteristics of Property Rights*, in *The Competitive State* (Albert Breton et al., eds., 1990) (showing that such steady development can be shown to have happened with interests in land).

7. We have provided a diagram of this evolution at Appendix A. The pattern of alternation between the two foundations of the water right is represented in Figure 1 by an undulating curve. Our "estimate" of the proportion of total water rights which is use-based is depicted below the curve, while the proportion which is land-based is depicted above it.

rapid industrialization in the early nineteenth century, eastern United States, cattle ranchers and gold miners across the western United States instituted systems of appropriative water rights which resembled water law regimes practiced during pre-Industrial Revolution England. From a standpoint along the shores of the evolutionary river, these surface recurrences may appear as broad, backward swirling motions.

We want to emphasize that any legal regime attached to a river is infinitely more complex than the sum of private rights in water. A deep, strong, and persistent undercurrent is manifested by the endurance of two important legal principles—prescription and seniority. And a whole network of contracts, indeed a market in water rights, overlays the private rights system at any point, its importance determined primarily by the economic laws of supply and demand. Carried along with the flow are public rights, such as rights of navigation and fishing, and rights to the foreshore, and the government's right of expropriation. All of these rights together form the body of the "stream."

As ecological concerns grow, demand for such attributes as water quality has turned public attention to pollution of "private" land or water, subjecting its use to administrative and, in some instances, criminal sanctions. Market forces, as well as public controls and rights, are aspects of water regimes which control the flow of the evolutionary river. We shall touch on them only briefly in our discussion, but have not indulged in specifics.

Above we have described the tendency of one or the other (rather than both) forms of law (property or tort) to be used to enforce water rights. There was never, however, specialization of one type to the complete exclusion of the other at any time. This was because of two concepts which have endured throughout all phases: prescription and seniority. A discussion of the two concepts forms the basis of Part IV. Prescription is the result of the hardening of actual use into a right of use. This right becomes a right of the land next to which the water use takes place. Prescriptive water rights were recognized in all common law periods until abrogated by statute. Seniority, which gives chronological priority to rights based on use, was enforced by the remedy of damages for harm caused to a prior-user. It was never completely eradicated even in periods of strict land-based water law enforcement, although the group with access to the remedy was smaller during these times.

Prescription and seniority had an influence on water law almost regardless of the legal doctrine or set of principles being affirmed in the cases at any given time. The continuing importance given to seniority of use, and the accumulating domain of prescriptive titles had their effect mostly on the quality of rights-holders' titles (the sum of their "characteristics"), which could be said to have increased over time.

It is true that critics, especially American critics, have decried the

uncertainty that the latter-day common law doctrines of prescription and seniority imposed on water users. We discount this literature. First, we note that most of the legal authors seem to be carrying a brief for parties and interests in the recurring American debates about state systems of water law (common law vs. appropriative law). Second, we note the simplicity of their position drawn from elementary economics: uncertainty discourages new investment, and that is a bad thing. Our response is that the weight of seniority and increasing domain of prescriptive rights made court rulings on rights disputes predictable and certain. While water users under nineteenth and twentieth century common law have never had a 'quality of title' to equal that of freehold land users, their title has been found to be surprisingly robust. Evidence for this is found in the periodic reforms of water law in common law states and provinces. Whatever the main purpose of these reforms, it hardly ever seems to be to improve the security of title of the user.

Third, we believe that the criticisms ignore the general strengthening of the individual-ownership aspects in all branches of the English law of real property. By the beginning of the nineteenth century common ownership of land had been almost entirely replaced by freehold or leasehold titles. Feudal dues and tenures had become unimportant. These developments were conducive to accepting the idea of individual ownership of the use of other resources: watercourses, fisheries and game. In water law, the twists and turns of the evolutionary "river" hardly weakened the security of existing water users, who were also, after all, capitalist holders of freehold or leasehold rights to adjoining sites on land. The prevailing climate was that all such holding should be enforced by law.

The main body of literature on water rights does not acknowledge that a seniority system of water rights was in place throughout English history. This is because many writers assume that the single basis of English common law on water throughout time has been an equal right of all riparians to the "natural" flow of the water. Naturally, this theory of equal, land-based, property rights has seemed to them incompatible with any notion of *seniority of rights* among users. We submit, to the contrary, that a system of priority or seniority of water rights must have been recognized by law (either expressly or implicitly) throughout all the periods which are under discussion here, even in periods in which the equality of land-based water entitlements was being judicially emphasized.⁸ In the alternative individual-based periods, seniority was not only

8. Indeed, one of our chief motivating factors in writing this essay is to rectify the misapprehension articulated, for example, in Arthur Maass & H.B. Zobel, *Anglo-American Water Law: Who Appropriated the Riparian Doctrine?*, 10 Pub. Pol'y 109 (1960). In this influential article the authors deny that there were periods when English water law was based solely on seniority of use. They claim that there was and is no legal basis for any

recognized but reinforced by the law of nuisance and the concept of damage. To make this point we shall examine the persistence of priority and seniority within each land-based and use-based period outlined above.

In Part V we move further away from our river metaphor to look at the dynamics of change in water law through the forces of supply and demand. The suppliers of evolutionary change in water law are the courts and the legislatures. They respond in varying degrees of participation to the "derived demands" that is, to producer and business demand derived from, say, increases or decreases in the availability of new technologies or from new attributes of the river system.

Water draining a basin in a stream or lake can have many 'attributes.' These can provide opportunities for different "uses" or "purposes." The extent to which any person actually takes advantage of any opportunity is primarily an economic question. The attributes that are the subject of this essay are usually referred to as the "levels" and "flows" of a stream; they give rise to various possible uses, notably power production and irrigation. There are other watercourse attributes and these can provide opportunities for other specific uses, such as navigation, waste removal, fishing, wildlife habitat and landscaping.

At the Conclusion of Part V we summarize some of the features of each section along our evolutionary river and draw in an assessment of changed characteristics from one section to the next. We then attempt to explain the "why" of the evolutionary patterns and project our analysis into the future. This projection is then laid out in more detail in Part VI.

PART II: CHARACTERISTICS OF PROPERTY RIGHTS AS APPLIED TO WATER: A BASIS FOR COMPARISON BETWEEN REGIMES

1. Introduction

In comparing the different systems of water allocation at different times and places, it is useful to consider the property-like "characteristics" of the water rights central to each system. We have listed the various characteristics of "property" in the Introduction (Part I).⁹ We now offer a

English water law regime other than riparianism, which has always been the common law of water, and they make their point by pointing to prescription. Prescriptive rights require "adverse use" to the landowner's use so, according to their logic, the landowner must have had the water rights in the absence of adverse use.

9. See Alan Randall, *Property Rights and Social Microeconomics*, 15 Nat. Resources J. 729 (1975) (giving other treatments of the characteristics of property rights, or property systems).

brief outline of each as it applies to water. For our purposes, the most important characteristic and the one which most distinguishes water rights from land rights is "exclusivity." Our analysis of the development of modern water rights highlights the interplay between this characteristic and all the others: duration, divisibility, flexibility, and quality of title. It is important to note that "characteristics" are a quantitative, rather than a qualitative concept: one speaks of "increased" characteristics rather than "enhanced" or "strengthened" characteristics.

2. Explanation of the Characteristics

Exclusivity: Consider the two extremes of exclusivity in the rights of a water user at a particular time and place. Water rights are absolute if no action by others affects the owner's uses, plans, or profits. They are close to zero if independent use is impossible without multilateral control, agreement or combination, upstream and downstream. We may use these extreme conditions as the basis of a measure: the exclusivity of a stream user's rights at a time and place is expressed by the inverse of the number of other users with whom agreement must be reached to attain an *independent* regime of levels and flows. Of course, even complete exclusivity in the legal sense does not guarantee certainty to a user because levels and flows are also changed by seasonal and other natural changes in supply beyond the user's control.

One should not expect any water rights system to give great exclusivity to water users, for dependence on those upstream for flows and those downstream for levels is unavoidable. The word "spillover" as a popular synonym for "externality" catches one part, but only one part, of each user's dependence on others. Neither the English riparian nor the American appropriative systems of rights provide exclusivity to all holders all the time. Each system provides some exclusivity in the way it adjusts to changes in the natural flow (e.g., in periods of drought). The former assigns to all users undefined and variable "reasonable" shares of the existing flow. The latter assigns fixed amounts to some users and highly-variable shares

See also Eirik Furobotn & Svetozar Pejovich, *The Economics of Property Rights* (1974). There are several differences. Our lists differ as we classify the elements of property somewhat differently. Second, their lists are of the ideal or necessary aspects of property as deduced by thinking about the requisites of an efficient market system. Thus, "perfect exclusivity" is required not only to avoid the interdependence of overlapping ownership but also to avoid criticism of their listing that it is an all-or-nothing requirement. It provides no place for amounts, numbers, ratios, etc. It does not help in comparing property rights under actual alternative systems, since no actual system is ever ideal or complete; and it is uninformative and a waste of time just to proclaim that a system is incomplete or attenuated. The theory of the second best applies. Numbers are needed. *Natura non facit saltum*.

to others.

Transferability: In the literature of water law transferability has two meanings, and we must cope with this source of confusion. It can mean the rights of the holder of an interest in water to grant away some or all entitlements to use, divert, receive and sell water. This may be measured by the potential number of parties eligible to acquire such a right. Or, the same word can refer, more narrowly, to rights to physically transfer water away from its natural course, perhaps into another basin. The riparian and appropriative systems differ in both these senses, particularly in the second, for some versions of riparian law have seemed to ban out-of-basin transfers altogether. As a general rule, increased transferability of the water right decreases the exclusivity of the right in the stream-wide group of users. It does this by widening the user group and the *extent* of the various uses, thereby relinquishing some of the checks and boundaries. However, it frees up the value of the land by exposing it to the market forces of supply and demand.

Flexibility: The flexibility of the individual right in a particular system of water law refers to the extent to which the holder may change the mode or purpose of water use without forfeiting the right. Can a landowner, having water rights for domestic uses, begin to take water for intensive irrigation? Can a mill pond be converted into an urban water source? The flexibility of rights to permit these changes is often seen as an aspect of transferability: an inflexible right cannot easily be granted to a new kind of user.

Divisibility: The divisibility of a water system's rights can be measured by the individual's freedom to break an interest into several of its component rights with respect to ownership, share of rent, or extent of using the stream's various physical attributes. One of the problems of the riparian system is its almost excessive divisibility: when riparian land is subdivided, new water rights are automatically created. Appropriative and governmental systems differ in the extent to which amounts or uses can be split from the parent entitlement. The amount of this characteristic available in a system governs how automatically it adjusts to new economic and social circumstances. The divisibility of a right can increase *or reduce* the exclusivity of other users' rights because of its ability to change the available flow through the numbers of users of the right.

Duration: In each system of water law, the expected duration of an individual user's right is measurable in years or other temporal units. The permanence or shortness of rights can influence their transferability and value; sometimes the power to make a short water lease or loan is actually more valued than the right to grant it permanently.

The duration of a riparian right is indefinite, although the ability to use the right depends on how long and how frequently the natural flow is available. Under the riparian system all of a river's users are affected equally by freshets and droughts. Under the appropriative system the

holders of "senior" rights have longer seasons of use than "junior" water users. Under government license and permit systems, rights often have a specified span and a detailed method of rationing flows in dry periods.

Quality of title: This characteristic measures the ease or difficulty of establishing ownership for purposes of enforcing the other characteristics, or rights to income. Quality of title to water is always somewhat unsatisfactory because the levels and flows must inevitably be shared, are naturally variable and uncertain, are expensive or unfeasible to measure, and cannot be satisfactorily defined by relying on a spatial or territorial matrix. The common law riparian system attempts to solve this by linking the unmeasured water right to the adjoining visible and measurable land area. Only when coupled with the prescriptive process could this provide a type of water title robustly enforceable against all the world. The appropriative system's seniority concept ideally requires actual metering both of river flows and of individual claims. When coupled with a well-recorded registry, it too could provide a title good against the world.

Governmental systems of water rights can provide a quality of title better than or similar to that of the appropriative system, particularly when rights are regularly monitored by a dedicated bureau. On the other hand, such systems provide instruments of unpredictable government water-policy changes that can easily upset and erode the "quality" of individual licenses and permits.

Concluding Remarks: The orthodox view of the history of property has been that as a system of rights to any natural resource evolves, it tends to provide the individual right holder with more of each of the six characteristics. It is therefore generally assumed that this cumulative process is at work in systems of water rights. If so, however, it is painfully indirect and slow, and subject apparently to temporary reversal or variation, as we shall see.

The development of any system of rights to water faces this challenge: can the user be given a better quality (or more secure) title which reflects the previous levels of exclusivity while maintaining levels of the other four characteristics? On land, principles of territoriality and possession allow the user secure ownership without sacrificing exclusivity and the rest. But on water, security must be *traded* for other characteristics. For example, in any system of government water licensing, increasing individual ownership can mean reducing government protection of independent water use. In a system of common law rights, strengthening rights over the water flowing by a property has meant greater interdependence among riparians and thus less exclusivity. And, in a system of appropriative rights, strengthening the rights of diverters in order of seniority has meant reducing the exclusivity of the rights of junior diverters. In brief, the amounts of the various characteristics in any system have been negatively related. Increasing one of them has resulted

in reducing another.

This negative correlation of effective characteristics seems to be partly responsible for the undulating or cyclical development of systems reported below. In England and North America, the changes in the systems of water law have been the work of the courts and the legislatures. The courts, through their judgments about disputed rights to river levels and flows, have gradually amended existing versions of the system of water law. At the same time, governments (legislatures) through statutes, orders and the creation of regulatory bureaus, have gradually modified court-made property law, in some jurisdictions supplementing it with government ownership and control. Within the group of "court" providers of new characteristics of water rights, there has been a certain amount of competition in supply. Similarly, within the group of "legislative" and bureaucratic suppliers there has also been both specialization and rivalry. When we look back at the systems they have created, we see that none of them has succeeded in advancing any system steadily on all fronts. Instead, as each has been tinkered with by the courts and the legislators it has overtaken or been overtaken by other systems. This has not resulted in one system eventually overpowering the others: instead they seem to have alternated, in the manner of "twists and turns" to be described in the next Part.

PART III: THE TWISTS AND TURNS OF WATER LAW

A. ROMAN LAW

1. Introduction

By "Roman law" we are not referring to the Roman military occupation of Great Britain, which took place from 43-280 A.D. and in fact left little permanent mark on its civilization and character.¹⁰ The only traces of Roman law in English law which remain from the period of the invasion are those which were expressed in the traditions of the Church. The "Roman law" phase of water law refers, rather, to the continental system of law and philosophy which was in place before English feudalism. It saw brief expression in England in its early form and continued its independent evolution. Its importance in our study lies

10. Great Britain was not even considered by the Romans as an integral part of the Empire, but an "outpost." When, in the fourth century, the massive invasions of barbarians which had first cut Britain off from the rest of the Empire forced the departure of the Romans, Roman speech and customs vanished. See Theodore F.T. Plucknett, *A Concise History of the Common Law* 6 (5th ed. 1956). See also Frederic W. Maitland & Francis C. Montague, *Sketches of English Legal History* 21 (1915).

in the influence it had in shaping the common law.

2. Roman law Influence

Codifications of Roman law compiled after the period of British occupation by Rome (but before the English feudal period), such as the Corpus Juris Civilis, undoubtedly influenced the common law. Although they did not form the basis for the English legal system as they did for continental European systems, they gave it some structure. In all periods of English and American history, common law jurists have turned to the Roman or Civil law when they sought legal theory to fill a gap in their own legal reasoning, because the Corpus Juris Civilis was coherent and logical.

The common law was inherently neither coherent nor logical and was built on the concept of following legal precedents rather than legal theory in arriving at a judgment. Because of the common law philosophy that like cases had to be judged similarly, the system was very dependent on *procedures*. These were devised to ensure fairness in the application of precedent. They would specify which types of cases could be brought to court and how they had to be argued or pleaded before precedent could be applied. The common law was based on the precept that "the law had always been thus"; Roman law helped answer the question, "Why?"¹¹

The twelfth and thirteenth centuries show a great deal of influence. This was the period of two great English theorists, Glanvill and Bracton, who compiled treatises on the common law incorporating the customs of the country and the various legal procedures which were practiced in the English courts. They looked to Roman law to bring order to their works and to provide a unifying theory which was lacking or insufficient in their system. Seventeenth century writers such as Blackstone, seeking natural explanations for the law in its origins, looked

11. See Jackson's Machinery of Justice (J.R. Spencer ed., 8th ed. 1989) [hereinafter Jackson's Machinery of Justice] (explaining that judges have not always slavishly followed precedent, that initially there were no written records of cases and that later there was an unsophisticated, "bare bones" manner of reporting that often yielded conflicting versions of the same case by different reporters and that usually lacked any clear explanation of the legal reasoning.) See also Carleton K. Allen, *Case Law: An Unwarrantable Intervention*, 51 Law Q. Rev. 333, 333-34 (1935) (stating that the early view was "that precedent is evidence, the best possible evidence, of rules of law but *not more than that*; and that if the law which precedent purports to embody is erroneous, unreasonable or even intolerably inconvenient, the precedent may be disregarded.") See also Jackson's Machinery of Justice, *supra*, (saying that this attitude lasted until about the middle of the 19th century, when a further hardening took place and our courts adopted a theory of "absolutely binding precedent.") See also Harold J. Berman, *Law and Revolution* 132-64 (1983) (describing classical influences on legal reasoning). See also J.C. Smith, *Law, Language, and Philosophy* 217-18 (1968) (noting that "throughout the entire history of the development of the English legal system there was a continual borrowing from Roman Law, sometimes directly and sometimes indirectly.")

to Roman law along the way. The Americans also turned to Roman law after the Declaration of Independence in 1776, seeking to give coherence to the mass of scattered judicial opinions which constituted their early law. Canadian judges have also cited the civil or Roman law on several occasions.

Yet, as Lord Denman said in the famous English water law case of *Mason v. Hill*: ". . . Roman Law . . . however, is no authority in ours . . ."12 Roman law was not considered legal precedent; it merely filled in the spaces between precedent. But it is important to recognize that a philosophy or rationale can change the way a judge *interprets* a precedent-setting case, as can the economic, social or political conditions of the time. These interpretations then become precedent. Thus Roman law, with its early origins, can be seen as a part of the common law, having influenced thinking at various later stages.

Roman law has had some direct influence in North American water law, independent of its transmission through the common law. While this influence was strongest in mainland European countries, in North America it spread to Mexico with the Spanish discoverers in the sixteenth and seventeenth centuries. It later found its way directly into the southern or southwestern United States, finally achieving expression in the "prior appropriation" doctrine.¹³

3. Roman Water Law

Because the Roman law was created at the time when the Roman Empire was rapidly expanding (although its compilation under Justinian was in the period of decline), it was initially directed towards newly conquered territories. For this reason, there is a noticeable focus on *personal* property, possessions and agreements, and much less of a focus on privately-owned real property (land).¹⁴ It is not surprising to see that in Roman law, all "perennial" rivers were considered *res publici* ("things" owned by the public) but subject to the authority of a centralized administration.¹⁵ The "universitatis", or state, owned the bed of the river

12. *Mason v. Hill*, 110 Eng. Rep. 692, 701 (K.B. 1833).

13. See Norman K. Johnson & Charles T. DuMars; *A Survey of the Evolution of Western Water Law in Response to Changing Economic and Public Interest Demands*, 29 *Nat. Resources J.* 347-49 (1989); Wells A. Hutchins, *The Community Acequia: Its Origins and Development*, 31 *Sw. Hist. Q.* 261, 261 (1928).

14. Later refinements did adjust the focus, but never entirely changed it.

15. Roman Law distinguished between rivers which flowed perennially and "torrential" streams; i.e. freshets which flowed only in periods of high rainfall or thaw. The latter were considered privately owned by the persons whose land they crossed. If a freshet formed the boundary between two pieces of property, the owners of the land "owned" it to its midway

as well as its banks, and public rights of navigation, fishing and access were emphasized. The right to divert water was also available to the public, subject to state regulations. Nevertheless, a private right could be acquired from the public domain, which resembled somewhat the later English "prescriptive" right (a "squatter-like" property right acquired after prolonged, unchallenged use). Individuals diverting water with this right of "*usucapio*" could not be prevented by the state, after a certain period of time, from continuing to do so as long as they did not change the flow of the river from that of "the previous summer."

An "Interdict" or prohibition from the "Praetor" or governor laid down the rules regarding water diversion, with the penalty of "restitution" for disobeying them.¹⁶ Because the diversion of water in perennially flowing streams was open to the public, and because the banks of these streams were publicly owned but the land behind them was not, "praedial servitudes" were also recognized. These were private rights, comparable to "easements" in land, by which a person had a "way" through the land of another. The servitude of "aqueductus" was, as its name suggests, a right to lay a conduit over the land of another to bring water from the river to one's own land.

In the overall classification of "Things," flowing water itself was viewed differently from publicly-owned or privately-owned streams. It was said to be *res communes*, a thing which, by its very nature, could not be the subject of ownership. As Glenn MacGrady has explained, all flowing water, whether in private or public rivers, is by its physical nature *res communes*, because it is incapable of ownership. As soon as one user finishes his use, the water is released back into what is called the "negative community," to be used by someone else.¹⁷ For the short period of its use, then, flowing water belonged to the person who was using it, then it returned to a kind of "communal pool." In things classified as *res communes*, therefore, there could only be usufructuary rights.

All users of water were required to respect a "good neighbor" principle of land use. They could not use it in such a way as to inflict damage on someone else's use or on someone else's property. A general damage law, the *Lex Aquilian*, and its equivalent in the later Institutes of Justinian, provided for compensation to those who had suffered damage

mark. The state or public had no claim to "the banks" of these private rivers, which were probably not well defined in any event.

16. Presumably this meant that the right was forfeited and the diversion had to stop.

17. Glenn J. MacGrady, *The Navigability Concept in Civil and Common Law: Historical Development, Current Importance, and Some Doctrines that Don't Hold Water*, 3 Fla. St. U.L. Rev. 511, 517-34 (1975), citing R. Photier, *Traité du Droit de Propriété* (circa 1762), translated in *Geer v. Connecticut*, 161 U.S. 519 (1895).

at the hands of others.¹⁸

4. Recap of Roman Water Law

The important features of Roman water law for the purposes of our analysis are the following:

- a) All "perennial" rivers (other than freshets) were publicly owned and administered by the state;
- b) The banks of such perennial rivers were publicly owned, as was the riverbed;
- c) Running water itself belonged to no-one and to everyone, and the only interest a person could acquire in it was a temporary usufructuary right which lasted only as long as the specific use continued. The right was irrespective of an individual's ownership of land. To experience it, however, he would have to have, or acquire, legal access to the banks;
- d) Damage law stated that one must not impede another's use of the water, nor harm his property. Existing uses, therefore, took precedence over later uses;
- e) A "prescriptive" right to divert a certain quantity of water from one year to the next could be acquired by prolonged and unchallenged action over a period of years. After this time, the state could no longer challenge the right as long as it remained the same;
- f) It was permissible to transport water out of the stream inland. The law recognized "easements" ("servitudes") whereby a person granted another the right to lay pipes across his land to access the river and draw out water;
- g) Rights to divert in a temporary or "torrential" river were private, belonging to those who owned the land on either side. The owners were considered to own the streambed to its midway mark. They also owned the river banks.

B. THE MEDIEVAL PERIOD OF WATER LAW: 1066-1600

1. Introduction

In our study Roman law is a phase of influence rather than practice. The first of our water law regimes to actually take place in England is the Medieval regime. We date it from the Norman Conquest of 1066 up to the eclipse of the feudal system at the end of the sixteenth

18. *De Legge Aquilia*, in *The Institutes of Justinian* 492 (Thomas C. Sanders ed., 5th ed. 1876).

century. This is a very long period in which many changes took place, both in the law courts, and in society.¹⁹

2. Context for the Medieval Law of Water: The Feudal System and the Importance of Land

The years following the Conquest in Norman England were characterized by a pervading sense of the threat of overthrow by invaders. Loyalty of the subjects to William I was crucial for the defense of the realm but was far from guaranteed, for there existed among the conquered Anglo-Saxons strong animosity towards the Normans and resentment of the new language and customs imposed upon them by the conquerors.

The King found a way to resolve this problem in the system of land tenure. He seized nearly all the land previously owned by the Anglo-Saxons for himself, and then proceeded to divide it among his lords and barons in exchange for their loyalty and for military service when required. The lords and barons in turn divided their land among vassals and others lower in the social hierarchy, who may have done likewise. All land-owners owed duties, not only to their immediate lords and their overlords but also to the King.²⁰

The resulting hierarchy of land tenures was characterized, then, by obligations for taxes, and by military and social duties locked to rights in land. In spite of the strong emphasis on military strength, society was largely agrarian, with most farming being on the "common" fields and pastures of manors. Incidental to agriculture were limited manorial rights to use the rivers' attributes for ferries, navigation, fishing and water power. The few water mills there were operated mainly to saw wood, to grind corn, to full yarn, or to pound ore and metal.

19. The knowledge we have of the water right, particularly in the earlier part of the period, is imperfect, and has been patched together from an appreciation of the system of land ownership or "tenure" as well as a study of the various competing courts and the remedies they offered. We have also mentioned that during the period Glanville and Bracton wrote on the common law, and that they incorporated some of the elements of Roman Law into a reporting of somewhat scattered precedents from all levels of courts. They created a "doctrine" of the common law, complete with flaws that later centuries would have to address and resolve. See Ranulf de Glanville, *The Treatise on the Laws and Customs of the Realm of England Commonly Called Glanville* (G.D.G. Hall ed. & trans., 1993); Henry de Bracton, *On the Laws and Customs of England* (Samuel E. Thorne trans., 1968).

20. This process of progressive division and conditional granting of land is now called "subinfeudation." It continued until the King's statute *Quia Emptores* of 1290 authorized the free alienation of land.

3. Early Water Law: the Focus on Suitable Sites

There are not many medieval records of disputes between stream users. Presumably, competing uses were few, the demand for water being easily satisfied by the abundant flows. It was users' claims of navigation and fishing that gave rise to the earliest known disputes. Nevertheless, it is entirely possible that competing power cases also arose during this time, even without the large scale diversions and impoundments that characterized the later industrial period. The number of mills on a stream was not high, but there must have been rivalry or conflict over *sites* that would place as few demands as possible on the early technology and limited transportation system. Prime locations would have been near or in boroughs, or by falls. New mills may easily have crowded existing ones and reduced their power.²¹ The documentary evidence of legal redress is sparse. Within the manor the court over which the lord presided did rough justice, with no written record made or surviving. As between neighboring localities, in the larger feudal or King's courts, the early reporting of cases was also very informal, often done by students rather than professionals, and yielding scant and often conflicting accounts of the legal reasoning and results. A report from the Year Books gives an example:

"The assize comes to recognize if Nicholas Sonka has unjustly and without judgment diverted a certain watercourse in Crowlas . . . to the damage of the free tenement of Gervase Blohicu in the same town within the assize. The jurors say that [Nicholas] has diverted it. Judgment: Let Gervase have seisin, and Nicholas is in mercy. Damages, two shillings."²²

The "assize" or traveling court came to town to hear the plaintiff, Gervase Blohicu's case. The case is that the defendant, Nicholas Sonka has diverted a watercourse in Crowlas and deprived the plaintiff of water. The plaintiff is a freeholder or landowner. The defendant presumably is not, for he has no justification for the diversion. The twelve "jurors", after examining the situation, swear that the diversion has taken place, that the plaintiff has been "disseised" or dispossessed of the right to the watercourse, and that it is he who has the better right; therefore his possession or "seisin" is to be *restored*. The defendant must cease his diversion activity and pay damages to the plaintiff.²³

21. 1 Selden Society, *Select Civil Pleas*, A.D. 1200-1203, at 82 (William P. Baildon ed., 1890).

22. *Id.*

23. Gervase Blohicu's case is especially relevant to our analysis to the extent that it illustrates the general importance of the possessory right of seisin throughout the evolution of water rights. Paraphrasing Maitland, Berman, *supra*, note 12, at 313, states, "seisin was,

4. The Concepts behind Water Rights

As can be seen in the case above, the medieval common law conceptualized a stream as it would land—as static. Rights were not attached to a thing flowing by land, but were a feature of land. In relation to the owner's vertical cylinder of land, stretching from the center of the earth to the heavens,²⁴ water was like a pond "situate" on the surface like a wood or field. The landowner "owned" the watercourse, or his portion of it, and technically had full rights to do with the water what he wished. If the river formed a boundary of his land, he owned one-half of the bed (to the mid-way mark of the stream), the owner of land on the opposite banks owning the other half. Thus the miller who constructed an upstream diversion and deprived a downstream mill of its water or power, took away the downstream landowner's property, or, in feudal terms, "disseised" him of his property. The land-based water right, then, was initially based upon ownership of the bed of the river. It was not defined in terms of flow, so it did not have relevance to the banks of the stream except that in private rivers, the owner of the bed was, naturally, also the owner of the banks.

As early as 1215 with the *Magna Carta*, a distinction was made between private and public rivers, based on the presence of tidal influence. King John dedicated to the public all rights of fishing in public rivers as in the seas and estuaries. Even though the banks of these public rivers may have been privately owned, the Crown owned and never granted their bed, and riparians had no rights over the public rights to the river or the river water.

Moreover, the concept of personal damage overlapped with "land ownership" at these times. We have seen that as early as 1200, courts were awarding indemnification to injured, successful plaintiffs for unjustly caused harm, as well as restoration of the right of which the plaintiff had been deprived. As the medieval phase progressed, the old feudal land rights faded, but the duty not to cause "damages" to land took on greater significance in the courts and achieved increased

in effect, a legal right to continue in a factual situation, which right was derived from previously having been in that factual situation." See also Frederic W. Maitland, *The Mystery of Seisin*, 2 Law Q. Rev. 181 (1886). It was a right of possession independent both of ownership and contract—a concept unknown either to Germanic law or to the older Roman law. This idea of "possessory right"—not possession but right of possession—has persisted in all Western legal systems to this day. It is particularly strong in English and American law. Berman, *supra* note 12 at 313, explains that "[the] concept of seisin was a product partly of the feudal concept of divided ownership and partly of the canonist concept of due process of law, with its antipathy to force and self-help. A person seised of land, goods, or rights could not be ousted by force even by the true owners."

24. The commonly used phrase to describe this was the Latin maxim: *cujus est solum ejus est usque ad coelum et ad infernum*.

articulation in English theory books.²⁵

The right corresponding to this duty—that is, the right to the integrity of one's land—was a "natural" right which accompanied land ownership. The "assize" or traveling court enforced it. If one was not already a freeholder one could not bring action for harm caused to one's land or water use, and one had no means of enforcing an individual usufructuary right except by a claim of prescription.

5. Prescription and the Prescriptive Easement to Use the Water

a) Prescription

Prescription is an ancient doctrine which creates a property right from long-term unchallenged use. The doctrine has undergone refinement since its early beginnings but it has retained to this day its central theme of "adverse possession clothing fact with right" except where abolished by statute.

To the outside observer, prescription is a form of "squatting," where persons maintain possession of property not originally theirs for long enough that they are acknowledged as legally owning it. Their ownership is in spite of the fact that the original owner has not granted the property to them and although they were originally intruders.

In technical terms, the basis of the modern prescriptive title is the presumed acquiescence of the owner of property to a newcomer's occupation or use of it. The owner's acquiescence is presumed from the time that he knew (or could be expected to have known) of the other's adverse use (against his interests), and could have stopped it, yet did not do so. It is important to make the distinction between presumed acquiescence and consent. If the owner consents to the occupation, his consent reinforces his own ownership under the law. But if he merely fails to object, the law is able to infer that he may have granted away his rights long ago. Later, if a dispute about ownership between the "squatter" and the original owner comes before the court, evidence to show unchallenged use for the period of time required under the common law or under statute will lead the court to confer upon a newcomer a legal right to continue his occupation. It is then the original owner who is ousted.

The prescriptive right may be challenged or "traversed" by

25. Bracton, in his major work *Legibus et Consuetudinibus Angliae* of 1230, was one of the first to explain the concept of damages as being a "servitude" or obligation of each freeholder not to harm another's land or impede his use of land. This philosophy was a carry-over from Roman law: *sic utere tuo ut alienum non laedas* was the phrase used most often to describe the right and obligation regarding harm.

proving that it was not acquired in the lawful way—that is, one of the necessary conditions was not fulfilled or the conditions were such that a grant could not possibly have been made, as, for example, in the case where someone else possessed and exercised the right. The main conditions in England were that the use be uninterrupted and unchallenged for the required number of years and that it be "nec vi nec clam, nec precario" (from Roman law: not by force, secrecy or permission but as of right). A British statute of 1832 formalized the law of prescriptive rights and set the period of continuous use necessary for their establishment at twenty years.²⁶ Between twenty and forty years of use could be challenged in court, but once the user had forty years of unchallenged use, his right became absolute unless someone could give written proof of past consent.²⁷

Indeed, the user's claim to a prescriptive title became increasingly difficult to challenge the longer the use continued uninterrupted, because with the passage of time, evidence of original ownership or occupation became more elusive. Once established, the title gave the holder virtual freedom from legal action by others and also allowed him to sue any other parties who interfered with it successfully. It is not surprising that Judge Tindal said in 1840: "Immemorial enjoyment is the most solid of all titles."²⁸

As we shall see, since the early nineteenth century, prescriptive rights have been cut back considerably by statute law on the one hand and by private systems of water allocation on the other. While in some jurisdictions they have been abolished altogether, in many they still survive and have even been facilitated by the shortening of the required period.

b) Prescriptive Easement to Use Water

The right to use water, established by prescription, has been called the "prescriptive easement." The term is misleading, because this type of easement is much more comprehensive than a land easement and in fact gives the holder a higher quality of title (or greater security) than any other formal interest he might hope to achieve by grant, contract or license. This is because it may be asserted against "the whole world"—not

26. Prescription Act, 1832, 2 & 3 Will. 4, Ch. 71 (Eng.).

27. Some writers claim that the drafting of the English Prescription Act, *supra* note 27, which had been intended to clarify and codify the common law, created new confusion. See Sir William S. Holdsworth, *A History of English Law* 338, 343-49, 352 (photo. reprint 1966) (1956); Theodore E. Lauer, *The Riparian Law as Property*, in *Water Resources and the Law* 131 (1958); Robert Megarry & Henry W.R. Wade, *The Law of Real Property* (5th ed. 1984).

28. *In re. Serjeants at Law*, 133 Eng. Rep. 93, 94 (C.P. 1840).

just between the grantor and grantee. The scope of the right extends not only to the acquiescing owner (equivalent to grantor) and his successors in title but to all other users of the streamflow, upstream or downstream, past, present, or future. It applies to a certain quantity of water, although the exact location of the diversion on the property and the specific installation and mode of use have been held to be somewhat flexible.²⁹

The prescriptive easement has certain things in common with a land easement: the right goes with the land from which it is exercised, not with the particular user.³⁰ It is transferable with that piece of land. Unlike a land easement it is not taken away from another property. It is capable of becoming extinguished by deemed intentional non-use over a period of time (usually the same period is needed as to acquire it). Although there is no grant to evidence the right, the law presumes a grant, presumes it has merely been lost, and acts accordingly.

The early prescriptive easements to use the water were of a different nature than their later counterparts. They were purely usufructuary rights, granted by a lord to his tenant (e.g. to use the stream to turn a mill). After a certain number of years of granting the rights, the lord was no longer entitled to withdraw them. From a relationship between two parties the prescriptive easement expanded to be effective against the other stream users. An explanation for this evolution may be found in the court procedures of the times. In the seventeenth century, landowners who had established a prescriptive use of streamwater would enforce their water rights on the basis of prescriptive use in the King's courts rather than on the basis of disseisin of property before the Assize. The action was cheaper and easier to plead, because it threw the burden of proof on the challenging party. As a result of the increasing dependence on prescriptive entitlement to enforce water use rights, the usufructuary right (established by long unchallenged action) often superimposed itself upon the right of ownership of the stream (by virtue of, at that time, ownership of the bed). This caused some confusion in the reasoning of the courts. Further confusion was to follow with the increasing popularity of personal legal actions for damage to riverside land, and, by extension, to water use. To have standing in such an action, the plaintiff did not have to be a landowner. It was enough if he could assert a prior-use to the defendant's use, and this was often in the form of a prescriptive easement. The old prescription as between lord and tenant was scarcely heard of after 1650, this relationship becoming increasingly covered by

29. *Hale v. Oldroyd*, 153 Eng. Rep. 694 (Ex. 1845).

30. In the doctrine's early days, before the law regarding easements was refined, it would seem that individual users who did not own land (for example, lessees) could also acquire prescriptive rights. Lessees or tenants for life could not "grant" them, however—the original right had to have come from a landowner.

the expanding law of contract, as the feudal system faded into obscurity.

6. Growth of the "Action on the Case"

In the middle of the thirteenth century a crucial development in the law took place with the introduction in the King's Court of the personal action in "trespass."³¹ Although the subject of some trespass cases may have concerned damage to property, their early focus was the actions and interactions of individuals which caused public disturbances. The remedy was compensation to the victim for the wrong, and possibly a punishment of fine and/or imprisonment as well for the disturbance.

To institute legal action, a person whose land had been damaged by the entry upon it of strangers, had the sheriff issue a "writ" requiring the defendant to explain in court "whereby he had used force" (against the "King's peace") in encroaching on the plaintiff's land. When the alleged trespass was connected to a dispute about land ownership, the subsequent inquiry into the trespass would also reveal who had a better claim to the land. This latter inquiry had been the function of the feudal Assize.

Actions of trespass became common in the early fifteenth century because they were cheap and quick. Some of the writs became standardized but others needed to be drafted specifically to accord with particular circumstances. These detailed writs were described as being "on the case," and included circumstances outside the typical trespass action, such as situations where the damage had originated on property other than that of the victim, without any direct encroachment onto the victim's property and without any disruption or violence. Actions "on the case" were well suited to cases in which the plaintiff's water use had been interfered with by an upstream neighbor, or in which his land had been flooded by a downstream neighbor. In such cases, a successful action would lead to an award of damages for lost income or repair, rather than to arrest or outlawdom, as in earlier trespass actions. It would not give the award of restoration of property or abatement of the nuisance-causing action as would the successful Assize action. Actions on the case were grounded on the precept: "thou shalt compensate thy neighbor for damage thou hast caused him." Any relationship to "land" was secondary.³² The action on the case as it applied to water law was, then, a type of hybrid action combining elements of property law and personal law. As such, it was used with increasing frequency over the old feudal Assize for disseisin and for "trying title." We shall go into possible reasons for this increasing

31. The Writ of Trespass was first seen around 1253. Cecil H.S. Fifoot, *History and Sources of the Common Law: Tort and Contract* 54 (1949).

32. Actions on the case were the forerunners of the modern tort actions in nuisance.

popularity in the next section.³³

The next two hundred years saw a gradual increase of use of the "action on the case" for unwarranted water diversion. By the beginning of the seventeenth century, any user of the water could bring legal action this way if he had legal entitlement to occupy land or use water. Rights were enforced as between persons, and were translated into rights of non-interference with use. The concept of the *flow* of the river, coming from another property, and able to be impeded from another property, became the backdrop for the rights. This was a shift from the seisin concept of the *presence* of the water on land owned. It set the stage for a shift away from the land-based water right into an entirely use-based, individual water right.

7. Actions on the Case Supersede Real (Feudal) Actions

It is easy to see why the action on the case as a mechanism of enforcing land and water rights grew in popularity towards the end of the medieval phase to the point where it had virtually replaced the feudal "real" actions. Not only was it simpler for the courts to dispense, it was cheaper and quicker for the litigants and brought in a wider variety of litigants (leaseholders as well as freeholders). Sheer numbers of cases made for further efficiencies in operation, decreasing the courts' costs further, and increasing the courts' profits. Everyone benefited.

Plaintiffs found the new action a cheaper means of enforcing their rights than the old Assize. There are several reasons for this. First, transaction costs of bringing legal action were lower. Plaintiffs needed only to have a "writ" filed in order to initiate action. There was no need, as with the Assize, to locate and assemble a twelve man "jury" to do fact finding and to establish who had the better right to possession and non-interference. Now the onus was on the *defendant* to justify his disruptive actions. The cost implications of this factor alone could have easily explained the new popularity of such actions.

Other transaction costs of rights enforcement were lower with actions on the case. These were indirect, having to do with speed of the action, and the efficiency of providing remedies. The Assize was slow. Formality required that the "jury" determine the questions of entitlement, factual allegations, and assessment of damages before any judgment would be given. Litigants wishing a quick determination of their title to

33. The "real" or land-based assize for seisin of a stream continued to be also available to freeholders until 1833, when Parliament abolished it in the Real Property Limitation Act, 3 & 4 Will. 4, ch. 27 (1833) (Eng.). See Frederic W. Maitland, *The Forms of Action at Common Law, A Course of Lectures* (1909). But it was very rarely used. We have found no evidence of its use after 1600.

the water would often waive damages just to speed up the process of gaining possession or a declaration from the court. The action on the case did not involve a jury but usually a lone judge or sometimes a panel of judges. It looked into the question of damages first, the right to possession being inferred from the resolution of this question. Because judgment and damages were awarded together in the King's court, plaintiffs were more likely to receive their compensation quickly. This appears to have been an incentive to this form of action.

The apparent disadvantage of the action on the case, that is, of not awarding a remedy of "rights restoration" (e.g. an order for the defendant to cease his activity), was clearly not a deterrent to litigants. But why wasn't this limitation the subject of complaints from established millowners? It would seem to have allowed a new mill to capture water from an old mill merely at the cost of paying "actual damages." The answer must lie in the amount of the expected damage award. If we imagine a newcomer comparing this expected penalty with the cost of developing an equivalent site elsewhere, the former must have been so much higher than the latter as to prevent his interfering with the established mill. One can guess at the reasons for this. First, the cost of new sites may have been relatively low. We have no evidence about this, nor about the extent of the technical changes that were apparently making it possible to enlarge mills on old sites rather than increase the number of developed sites. Second, "damages" may have implied repeated suits by the plaintiff, and multiple damages. This suggestion would be more credible to the extent that the transactions (litigation) costs for repeated or follow-up suits were low; certainly proving the case would be easier (and cheaper) each time.

The action on the case was available to enforce various forms of land use and enjoyment, not only land ownership. Its ability to "try title" indirectly was functionally less important than its ability to award compensation for damage suffered. This meant that leaseholders, an increasing group of water users, could now directly enforce their rights against the perpetrators of the harm, instead of being able to enforce them only against their lessors. Clearly this was an advantage that would attract litigants to the action on the case. Increasingly, millers had become tenants on lease.³⁴

History books are replete with anecdotes about competition between the various courts in England. We know that the more "business" a court had, the more power it had, and the more money poured into the coffers of its establishing authority. We have seen that through

34. We do not know how leasing of water rights had increased relative to other rights, but there was an absolute increase. See John Langdon, *Watermills and Windmills in the West Midlands, 1086-1500*, 44 *Econ. Hist. Rev.* 424, 438 (1991) (providing trends).

the process of subinfeudation, barons and overlords came to be very powerful and to distance the King from his people to a degree, both in finances and in general allegiance. The King was struggling through this period to keep his finances afloat. Feudal courts had meant that it was the lords (not the King) who were dispensing justice and making determinations on land ownership. In addition, the King had obtained financial results of this justice only in the indirect and lesser form of taxes from the lords.³⁵ He therefore had incentive, especially where land use enforcement was concerned, to use the court system in his rivalry with the barons for jurisdiction, power and money.³⁶ Here, his subjects were offered cheaper forms of action and superior remedies, and the privileges of "royal justice" were extended to as many as possible. The "action on the case" was a powerful tool for the King, which brought handsome results. It was encouraged: its use was facilitated and expanded.

In addition to offering quicker judgments on actions on the case the King began to offer litigants an alternative quite outside the common law. He began systematically to accept petitions for his personal intervention, especially from poor peasants. The Chancellor, a high cleric at court, was authorized to hear these petitions and to make binding decisions in the King's name.³⁷

8. The Impact of the Increasing Demand for Water

As long as the court system required ownership of land in order for a plaintiff to have standing in court (as was the case under the

35. The Magna Carta of 1215 was an example of the tension between the lords and the King from the increasing power of the barons.

36. Although the "real actions", including the assize, were offered by the King, they were administered on a local level in the context of the feudal system which was strongly controlled by the lords or barons. Trespass and actions on the case were directly controlled by the King.

37. The Chancellor dealt with petitions on an ad hoc, personal basis—as questions of conscience. His only remedies were personal: for example, he could not restore land, but could punish a party severely for not restoring it himself. Because the Chancellor was an ecclesiastic, he had a broad knowledge of Canon or Church law, which he frequently applied in reaching decisions. And as we have said previously in our discussion of Roman law, Canon law contained some of the Roman ideas of personal obligations. Through the Chancellor, the morality of using one's property in such a way so as not to damage one's neighbour's property crept back into the English law of property and tort. The Chancery became the later Court of Equity, one of the most powerful and popular courts in the country. Equitable principles evolved with the advent of reporting in the late fifteenth and early sixteenth centuries. In 1873 Equity was merged with the Common Law under the Supreme Court of Judicature Act, 1873, 36 & 37 Vict. ch. 66 (Eng.). In 1875 a companion act, also called "The Supreme Court of Judicature Act," provided that where the rules of Equity were inconsistent with those of Common Law, Equity would prevail.

Assize), enforcement of water use rights was limited to the few landowners along the banks of the private (non-tidal) rivers. The recognition of prescriptive rights (though attached to land) broadened the scope of those with enforceable rights to include very long-term users. The personal actions broadened it even more, to include leaseholders or contractees.

The widening scope of persons with enforceable water rights was, without a doubt, a reflection of the quickly growing demand for water in this early Industrial Revolution period and of the very limited water supply. Landowners constituted a small minority of the water-using community. The lords of the large estates rarely broke their land up by selling portions off to wealthy industrialists but rather leased or made other, often lucrative, arrangements regarding the water. The law adapted to protect the growing body of those in mere occupation of land (or with mere water rights, e.g. prescriptive), sheltering their industrial investments. The developmental pressure meant that enforceable water rights could no longer be restricted to the few who owned land, as had been the case in the days of the Assize.

Moreover, we have seen that medieval property law, with its emphasis on seisin and land, did not encompass the idea of running water. As long as the focus was on available sites for mills, the feudal law could handle disputes which arose between landowners. But when the lease became more prevalent, as rivers became more intensely used for growing industry, the focus of water rights shifted to *use* rights.³⁸ Static land law, or land law devoted to sites and areas, was incompatible with the new notions of flow. The remedy of restoration of property, provided by the Assize, was too inflexible to accommodate the great variety of uses of the water held by prescriptive title and the notion of competition between uses. This problem became more acute as competition intensified in early Industrial Revolution years and the feudal laws began to disappear from lack of use.

9. Recap of Medieval Water Law

In the preceding pages, we have been discussing the gradual transition from a purely land-based phase of water rights to a purely use-based phase, and have been giving some plausible explanations for the shift. Before proceeding to the next phase, it is important to recap the salient features of the medieval phase, so that we can better compare it to subsequent phases.

The medieval phase of water law, then, was characterized by the

38. See Richard Holt, *The Mills of Medieval England* (1988) (estimating that there had been about 12,000 mills in England around 1300, most of them corn and fulling mills on or near manors). See also Langdon, *supra* note 35.

following features:

- a) Non-tidal rivers were "private" rivers, capable of "ownership" by lords, or by others to whom the lords "granted" land;
- b) Persons who owned land by a river "owned the watercourse" to its midway mark. If the river crossed their land, they owned all that portion of the watercourse on their land;
- c) "Owning the watercourse" meant they could use it as they pleased and had the right to have it continue to flow through their property as before;
- d) In spite of his "ownership of the watercourse," a freeholder was vulnerable to legal action if he caused damage to another freeholder's water use;
- e) Freeholders (landowners) had the right to sue a person who had "disseised" them (i.e. impeded their use of property, for example, by interrupting or diverting the flow). They sued them at the Assize;
- f) Leaseholders and others with contractual rights to the water, did not have *enforceable rights* to their continued use of the water as against freeholders who were impeding it, because they were not entitled to bring action at the Assize. They could take action only against their lessors or other contracting parties under the lease or contract;
- g) Freeholders who were successful at the Assize received restoration of their right of full use of the water (an order issuing for the defendant to stop his harmful activity) and damages for harm caused;
- h) Freeholders and leaseholders could obtain "prescriptive easements" to continue using a certain quantity of flow after unchallenged use "since time immemorial." The easement was a part of the rights of the piece of land.

10. Changes in the Law

At this stage in the evolution of water law, we can pause and look at the medieval "phase" as it passed into a new regime, and compare the old law with what was emerging. There were two major differences. The first was that under the new regime water users would not be able to avail themselves of the action on the case to enforce a water right which was not being exploited. The fact of riparian ownership, or "ownership of the watercourse" alone, would not enable them to enforce their *future* right to the use of the flow or their right to the mere continuance of it. They would have to have suffered damage to an existing use of the water in order to bring action unless they wished to

go back centuries to the long and cumbersome route of the Assize. Their predecessors, of course, had had the absolute advantage of "ownership" of the water rights forever. Moreover, where "damage" had constituted a part of the *remedy* during the medieval phase, we shall see that it was to become the *precondition* for enforcing water rights. *Previous entitlement* to the flow by virtue of ownership of riparian land or prescription would no longer be required in order to bring suit.

The second difference, which was to flow from the first, was that under the new regime all rightful users could be awarded compensation for damage by suing the perpetrator directly. The remedy would give a new right to non-riparians: the enforceable usufructuary right to the water's flow. Leaseholders and other outsiders obtained a defendable "title" to the use of the water, and the opportunity to challenge riparian owners or other users interfering with that title, put them as it were, on equal ground.

C. THE PRIOR-USE PERIOD OF WATER RIGHTS: 1600 to 1850

1. Introduction

To mark the beginning of this new phase, we have drawn an indefinite line at the year 1600. That is when the "action on the case" had been clearly established as the manner of enforcing water rights in court, replacing the old feudal forms of property actions. The new phase was characterized by an almost exclusive reliance on the law of torts, and in particular, in cases about water, on the law of nuisance.³⁹ The remedy the courts offered was compensation for being hindered in one's use of water rather than confirmation of one's title to water or land. With this, seniority became all-important, because the plaintiff had to have been using the water before the defendant in order to bring a legal suit.⁴⁰

During the tort law phase, which we shall call the prior-use period, the court forms of action procedures which directly enforced property rights in the land were technically still available. However,

39. See Plucknett, *supra* note 11. In the general history of the common law the emergence of actions on the case has been generally linked to damage resulting from a defendant's omissions or neglect, including neglect of a duty to do something. The history of water law, however, is less bound up with "negligence" in these senses than with "nuisance," such as doing something which causes harm elsewhere.

40. To begin any action on the case, the plaintiff first had to show that he had sustained damage to property or to use of property. One's use of the water cannot be hurt unless it has already been taking place, otherwise one would have been assumed to have accepted damage or the risk of damage. *Bealey v. Shaw*, 102 Eng. Rep. 1266 (K.B. 1805). Damages are, at least until the last years of the prior-use phase, the only remedy available by this action.

because of their cost, slowness, and procedural obligations, they were virtually abandoned, especially for water cases.⁴¹

2. The Historical Context: the Industrial Revolution and the growing demand for running water

The new phase established itself in England's age of expanding trade, production and technical change, featuring an explosive export demand for corn and textiles such as wool and cotton.⁴² Population, also growing rapidly, tended to concentrate in newly-industrialized urban areas and milltown districts. Energy and heat were provided by wood and even coal, but to a large and growing extent running water provided mechanical energy to blow air into mines, and for lead and iron-smelting processes,⁴³ as well as to turn mill wheels. Mill after mill was set up on "private" or non-tidal streams at suitable sites, such as near a fall. The competition between mills in some places along the crowded streams was intense. Disputes and litigation regarding water in the seventeenth and eighteenth centuries were almost all about diversion, and mills competing for the flow.⁴⁴

3. Clarification of Prescriptive Rights: Recognition of Prior Rights

We have said that the old Assize had not fitted well with the phenomenon of flowing water, because its goal was to restore seisin, and seisin was not a usufructuary right. When it came to water power, mill owners and others sought to have their rights of use rather than their ownership protected in the courts, and the courts attempted to adapt to

41. See Christopher Hill, *The Pelican Economic History of Britain, Vol.2, 1530-1780: Reformation to Industrial Revolution* 146 (1975). By an act of Charles II in 1660, feudal tenures had been abolished and land previously held in "seisin" was now held in "freehold" with no duties or obligations to the King and Lord attached to it. In addition, freeholders could acquire written title to their land, good against any other party. Copyholders were not included in the freeing of the land—they still were completely dependent on their landlords.

42. See G.D. Ramsay, *The Wiltshire Woollen Industry*, 22 (1965) (writing that "[t]he remarkable expansion of the market for English cloth in the Netherlands and Germany during the fifteenth and sixteenth centuries led to an extension of the frontier of the industrial broadcloth area at home; it advanced down the Wylde valley and in the course of the sixteenth it finally engulfed Salisbury. As a potential centre of the broadcloth industry Salisbury and its neighbourhood had many advantages to offer—there was a plentiful supply of water-power and a large population versed in spinning and weaving . . .").

43. See John R. Harris, *The British Iron Industry 1700-1850* (1988) (explaining that such processes included blowing air into bloomeries through bellows, hammering impure iron, and heating blast furnaces through bellows).

44. See G.N. von Tunzelmann, *Steam Power and British Industrialization to 1860* (1978) (pointing out that after 1780, industries increasingly used water for steam power).

the demand.⁴⁵

The *prescriptive* right was both a right of use and a right of ownership. In this period, the courts began the clarification of what it was and how it came into being. In their process of definition they also came to recognize the lesser but significant personal right, the prior-use right, as establishing a basis for a plaintiff's action. This was a right based solely on use of the water for any period longer than the opposing party's.

Specific cases highlight some of the steps the law took towards definition of the prescriptive right and separate recognition of the prior right:

*Shury v. Piggot*⁴⁶ is perhaps the most frequently cited water rights case of its time.⁴⁷ It has been interpreted in very different ways, some scholars even claiming that it is authority for a land-based, riparian right to riverflow.⁴⁸ The case concerned itself with explaining the difference between kinds of easement. A right to use water, called a prescriptive easement, was found not to be the same as an easement of passage on land (called "a way" in the case). Therefore, the rules applying to the latter did not apply to the former. What is interesting in this case is the reasoning of the various judges: a main point in common was that water ought to continue its flow. In our view this sets the stage for a rule that the prior-user's right was to continue to have water *as before*.

Piggot, the defendant, had built a wall which cut off the flow of a stream into a pond at which the plaintiff had been watering his cattle. The plaintiff sought damages for the interruption of the flow. The defendant argued that the plaintiff's "right to the flow" consisted merely of an easement which, under the law of easements, had been automatically extinguished when the plaintiff had come into possession both of the pond and the property now held by the defendant.⁴⁹ None of the judges

45. Many seventeenth century cases about water diversion dealt with procedural requirements and the standing of plaintiffs to plead actions on the case. This preoccupation with correctness, sometimes at the expense of justice between the parties, is, we suggest, testimony to the shift from feudal land law to the newer King's law.

46. *Shury v. Piggott*, 81 Eng. Rep. 280 (1625).

47. In the earlier *Luttrell's Case*, 76 Eng. Rep. 1065 (1625), an owner of two fulling mills with prescriptive rights to water replaced them with two corn mills. The court held his prescriptive rights were still valid as long as the alternation to the mills did not substantially affect the stream or further affect another user. The case defined the prescriptive right as quantitative.

48. See *Maass & Zobel*, *supra* note 9.

49. Where two adjoining properties, one with an easement across the land of the other, come under the same possession or ownership, the easement is no longer considered necessary and so is, by law, extinguished. As one of the judges in the case said, "the greater benefit (ownership of the whole land) shall drown the less (ownership of the easement)."

agreed with the defendant's submission. Instead, they said, *because the water once flowed it should continue to flow*. The phenomenon of flowing water came from nature ("*ex jure naturae*"); therefore it made no sense that the right to use it should be extinguished simply because of some technical rule applying to easements over land. Justice Whitlock said:

. . . [A] water-course doth not begin by prescription, nor yet by assent [i.e. grant], but the same doth begin *ex jure naturae*, having taken this course naturally, and cannot be averted.⁵⁰

And Justice Jones remarked:

This water-course is not extinct by the unity of possession, the same being a thing which ariseth out of the land, and no interest at all, by this claimed in the land, but *quod currere solebat* this way, and so to have continuance of this.⁵¹

In our opinion, because neither land ownership nor prescriptive rights⁵² are mentioned as necessary ingredients by the judges, this case does not establish or re-affirm a land-based or riparian right to water. Instead, it establishes a seniority right: in a dispute, earlier *enjoyment* or use of the river gives the better right. This finding was to assist in establishing precedent in the courts of prior-use as the main basis for asserting or defending a right to the water.⁵³

In two *Anonymous* cases a few years later, the plaintiffs did not plead a prescriptive right to divert water, but merely that they had already been diverting it and that another user had cut off the flow. In both cases, the court decided in the plaintiff's favor. The year after that, in a case called *Sands v. Trefuses*⁵⁴ the plaintiff was unable to show any entitlement at all to use the water (prescriptive or otherwise), but the court said it was enough that he be "lawfully" using it.

In 1673 the case of *Cox v. Matthews*⁵⁵ gave an opportunity for

Shury, 81 Eng. Rep. at 281.

50. *Id.* at 281.

51. *Id.*

52. It had been the practice at this time, in court, to plead a prescriptive right to divert water as the basis for an action or a defense.

53. The landowners' right to the river flow was not to a pristine state unchanged by any uses whatever, but to a maintained state of the river's levels and flows *as the owner found them* when he became owner of the banks—that is, to the river *with its existing uses* maintained. Because the "ancient river" was very little affected by its few uses, these two standards were in most cases the same. Two statements referred to the same thing: "A's" new upstream works reduced the flow at "B's" mill from its natural level; A's new works reduced the flow that B used before A's arrival. Either way, disputes were few and the superior rights of an existing user (prior-use rights) were assumed.

54. 79 Eng. Rep. 1084 (1638).

55. 86 Eng. Rep. 159 (1673).

a judicial statement by one of the great theorists of his time, Sir Matthew Hale.⁵⁶ In a case about the stopping of light, he gave the analogy of a watercourse, saying that an action for diversion might be brought by a mill-owner without pleading an "ancient mill" (*antiquum molendinum*)—i.e. prescriptive rights, and the only defense to it could be that the defendant was using the water *before the plaintiff*. Even if the plaintiff had a new mill (i.e. arrived later than the defendant), unless the defendant was already using the water himself, he had no justification for cutting off the miller's flow.⁵⁷

This series of early cases demonstrates the emerging recognition in the courts that a person who is "in possession" of the water (i.e. who is using or diverting it) may sue someone who interferes with its flow and does him damage, and he does not have to plead that he has a prescriptive right to use the flow or that he owns land by the river. He need merely plead that he was using the water first, and that he had legal access to the river.⁵⁸ The new, purely possessory or usufructuary right, articulated above, was only a relative right: as between two users, the one who had used the water first would win. In the resulting regime of water rights the seniority rights are anchored to the land only by the occasional prescriptive usufructuary right originally acquired from a landowner.

4. *Blackstone and ownership of the river*

It is curious that during the eighteenth century, a time of rapidly increasing congestion and expansion of use of English rivers there are few recorded court cases to document how the new possessory or prior right was working. This is probably a testimony to its success. Records show that arbitrators could in most cases find a compromise or solution between the parties without the dispute going to court. We know from economic studies of river systems that there was a great deal of contracting or negotiating for privileges in water, and that these were built upon original possessory or usufructuary rights as well as on prescriptive rights.

Although the water regime of prior-use seems to have worked,

56. *Id.*

57. The fact that the law cited in this case is both hypothetical and ambiguous has meant that it has been used to support both the old land-based law and the new "prior-use" law. Our view is that Lord Hale's analogy with sunlight supports the view of *interference*—i.e. the miller could succeed in a lawsuit because his prior-use was interfered with and not because the defendant had merely diminished the flow.

58. We already know that the action on the case did not require him to be a freeholder of land in order to sue.

as a system of entitlement it lacked theoretical foundation. Of course, Bracton's thirteenth century Roman idea about the "good neighbor principle" of land use (*sic utere tuo ut alienum non laedas*) still applied as between persons. But was this principle the foundation of a property right? One of the greatest legal theorists, Sir William Blackstone, seeking in his treatise the origins of property, looked at water as one of the elements of nature which, like the air, was incapable of private ownership, and capable only of temporary "appropriation." Appropriation was open to all persons. Blackstone reached back into Roman law, where flowing water had been "*res communis*" (a thing owned by all), subject to personal law respecting the first comer, and observed:

But after all there are some few things which notwithstanding the general introduction and continuance of property must still unavoidably remain in common, being such wherein nothing but a usufructuary property is capable of being had and they still belong to the first occupant during the time he holds possession of them and no longer. Such (among others) are the elements of light, air and water which a man may occupy by means of his . . . mills . . .⁵⁹

All these streams so long as they remain in possession every man has a right to enjoy without disturbance, but if once they escape from his custody and he voluntarily abandons the use of them, they return to the common stock and any man else has an equal right to seize and enjoy them afterwards.⁶⁰

Blackstone's work was published in 1789. There followed a period of 40-50 years when judges probably continued to apply the principles of this natural law (recognizing the prior right) to the growing number of cases on diversion. Few were recorded, however, for various reasons.

One of the significant recorded cases that was seen to espouse the prior-use theory of water law is *Bealey v. Shaw*.⁶¹ Briefly stated, the facts of this case were that "A," an *upstream* riparian, built a mill and diverted water for it for over twenty years (thereby gaining a prescriptive right to continue doing so). "B" later built a mill *downstream* and used most of the surplus water from "A's" mill for it, for a period of less than twenty years. "A" then enlarged his mill and diverted more water, depriving "B" of the necessary flow. The court held that "B" had established a right to the surplus water (although not a prescriptive right) and that "A" could not now deprive him of it and hinder his existing operations. This right came from "B's" priority of use of the surplus water. Lord Ellenborough, the leading judge in the panel of five judges, gave an explanation of the

59. 2 William Blackstone, Commentaries on the Laws of England Book 14 (1789).

60. *Id.*

61. 102 Eng. Rep. 1266 (1805).

law as he saw it:

The general rule of law as applied to this subject is, that, independent of any particular enjoyment used to be had by another, every man has a right to have the advantage of a flow of water in his own land without diminution or alteration. But an adverse right may exist founded on the *occupation* of another [If] the occupation of the party so taking or using it have [sic] existed for so long time as may raise the presumption of a grant, the other party, whose land is below must take the stream, subject to such adverse right.⁶²

It is important to note that while the above quote by Lord Ellenborough is about prescriptive rights, the case was about the surplus water to which neither "A" nor "B" had prescriptive rights. Both had rights to the flow based on their riparian ownership. But no property action was available to either "A" or "B" to sue on this basis other than an old feudal action of disseisin, by now out of the questions. "B" prevailed over "A" because he had standing in tort law to sue "A", being the prior user of the surplus water and having sustained damage. Attempts at giving a legal foundation for the prior right were made in two cases which took place some thirty years after Blackstone published his *Commentaries*. The first was *Williams v. Moreland*,⁶³ where the usufructuary prior rights in water were said to be "public rights" in that anyone could acquire them subject only to the rights of those already using the water. Judge Bayley referred this time directly to Roman law as he said:

Flowing water is originally *publici juris*. So soon as it is appropriated by *an individual* his right is co-extensive with the beneficial use to which he appropriates it. Subject to that right all the rest of the water remains *publici juris*.⁶⁴

Seven years later, this rationale was again recognized in a reported case, *Liggins v. Inge*,⁶⁵ wherein Lord Chief Justice Tindal said:

Water flowing in a stream, it is well settled, by the law of England, is *publici juris*. By the Roman law, running water, light, and air were considered as some of those things which had the name of *res communes* and which were defined "things, the property of which belongs to no person, but the use to all." And, by the law of England, the *person* who first appropriates any part of the water flowing through his land to

62. *Id.* at 1269 (emphasis added).

63. 107 Eng. Rep. 620 (1824) (emphasis added).

64. *Id.* at 621.

65. 131 Eng. Rep. 263 (1831).

his own use, has the right to the use of so much as he thus appropriates, against any other.⁶⁶

A fallacy in these cases, conflation of the concepts *publici juris* and *res communes*, glosses over the distinction between private and public rights to flowing water. In common law England, non-tidal rivers were not *res publicae*, in the Roman law sense. Where "private rights" to waterflow were concerned, prior-use principles could not be supported by reference to the notion of *res publicae*. *Res communes* was the better term and it harkened back to the natural law discussions of Blackstone.

5. Privileges and Contracting for Water

We know that parties have contracted or made other arrangements to create water privileges of some sort since earliest times, and that the tendency increases. In medieval times, contracting as it was known later was rare, for water and mill sites were plentiful and demand was modest. A miller who wished to turn his mill would generally have other methods of procuring a water right than buying one from the owner of the land by the river, methods which would be compatible with the system of subinfeudation of manors. In any event, the common law had not yet evolved to enforce the personal obligation. In the fifteenth and sixteenth centuries, however, as the feudal system waned into obscurity, the *leasehold* became an increasingly popular method of holding a site and using the adjacent river water. This interest combined elements of both property and contract law.

In the seventeenth and eighteenth centuries the rapid increase in commerce increased the demand both for agricultural products and for water power. As the number of unused sites (especially for power, where the question was one of levels as well as flow) diminished, the price of the water right increased. With the increase came an increase in the use of contracts and other arrangements between owners of water rights and those who wished to acquire all or part of them.

Thus, in the period of the Industrial Revolution water rights achieved high values and increased the level of contracting. The contract proved a way of expanding use while protecting original titles. Industrialists anxious to acquire water privileges became willing to pay both the seller's price and the high transaction costs (of measurement, verification, renewal of contract, et cetera). Often they could not purchase the water right by purchasing land, because the land was tied up in large estates. Many landowners did not wish to break up their estates, whose size was a measure of their importance. Moreover, entail and primogeniture, and

66. *Id.* at 268 (emphasis added).

later strict settlement, the common methods of bequeathing, obliged them to keep their land in the family from one generation to the next. This meant they were relatively short of capital. A contract for water rights was almost as good as a lease of land with water attached. Since both could be time limited and subject to various conditions and covenants, both provided a good solution for all parties.⁶⁷ They kept the land with its seniority of water right intact for reversion to the owner and economized on both the landlords' and the industrialists' capital. A statement by one of the judges in an 1866 case shows just how important the system of water privileges (actual or supposed rights) had become:

The application and use of flowing water to work machinery is as old as the law. Corn mills have existed from time immemorial, and it appears, from old legal authorities, that fulling and other mills worked by water for the purpose of manufacture are of a very ancient date. Until the last century, steam as a power was, if known, not much in use; and until it was introduced, water power was very generally used, and it is still the cheapest when available. The mill is sometimes situated upon the bank of the natural stream, but more usually at some little distance from it; the water is conveyed to it by a goit or artificial cut, leading from the stream, and then, after turning the wheel of the mill, flows away in what is commonly called the tail goit. So, also, water was and is very frequently conveyed from the natural stream in the same manner for purposes of irrigation. And it is not too much to say, that the

67. Indeed, written judgments in water cases often described the plight of water users who could not meet such conditions as occupying a riparian site, and/or being the first user on a river, and/or having acquired a prescriptive easement, in extremely pessimistic terms. They were seen as cut off from water use and in a desperate situation. However, it was rarely so serious. Consider, for example, users who lost water rights suits. Having failed to acquire or hold rights to use water without payment, they were now required to look around for another source. If they were lucky, they might find a location, unoccupied, which they could buy from the present riparian or user. In this way they would have adjusted to the adversity of water law. Furthermore, if a user could not find or buy a site, they could contract with the holder of a valid water right for the diversion or transfer of the desired amount. The contractual rights gained thereby might not be valid against the world (as we will see in Part III.D.I), depending on how secure and exclusive the holder's right was and how robust the license, lease or easement he contracted to the user. In general, the more secure a holder's right was found to be, the more anxious would a user be to acquire a water "privilege" from him. Thus a change in the judicial theory did not necessarily change who could use water but, first, who got water free and who must pay for it, and second, the procedures and transaction costs of getting it and keeping it against other users or riparians. In this respect stability was given to water use and even to user's rights by the possibility of contracting. The existence of a kind of water market means that the changes in water rights should be seen as leading to changes in who had powers to receive rent-like incomes rather than to changes in how the river's attributes were used or in who made actual use of them.

value of actual or supposed water rights of this character throughout England may be estimated by hundreds of thousands, perhaps millions. The law has been supposed to be well settled

[T]he law favours the exercise of such a right; it is at once beneficial to the owner and to the Commonwealth.⁶⁸

In addition to their benefits to the parties, contracts and leases provided a mechanism whereby new industries could be introduced on the streams and larger mills could replace smaller or less efficient ones.

The demand for water was probably at its highest around the year 1800, before steam power (which used less water) had become generalized. It is not surprising, considering the large quantities of water required, that contracting for water privileges was also most prevalent at this time. The level of contracting is shown not by court cases—most disputes were resolved by arbitrators or between the parties without going to court—but by economic and other historical accounts of interactions during this period.⁶⁹

It was likely that the high level of contracting and leasing contributed to the stability in the system of water use: the "quality of title" of the water user was good. This was mainly because the existing seniority system remained intact and, together with prescriptive rights, provided a foundation for the network of uses. Prior-use rights were quantifiable and moderately transferable. As long as the particular use at a given site remained constant with regard to its impact on the level and flow, any number of successive users could avail themselves of it without losing priority over later uses of the water at other sites. An industrialist wishing to construct a new mill larger than any existing ones might have to buy privileges from more than one existing user in order to accommodate it. But if he could afford that, the law presented no special problem. His water rights became as secure as those of their original owners had been.⁷⁰

68. *Nuttall v. Bracewell*, 2 Exch. 1, 9-10 (Eng. 1866).

69. See Von Tunzelman, *supra* note 45, at 136-3. See also Richard L. Hills, *Power in the Industrial Revolution* (1970).

70. After 1800, the variety of ways of getting and holding water increased. In particular, the government, restricting and even expropriating riparian owners' rights in favour of public uses, had recourse to water supply statutes and canal and railway incorporations. As we shall see in Part D below, the courts restricted the scope of contracting, perhaps to return to themselves the discretion to handle the swollen demand for water. Over the 19th century they gradually formulated a concept of "community of the river." This approach tended to exclude (at least for enforcement of their rights against proprietor-riparians), those parties who merely contracted for water. Perhaps under these discouragements the level of contracting decreased. Economic studies do speak of fewer, larger water works and

At this point it is important to note that although there may not have been a direct causal relationship between the regime of water law which enforced mere individual or use-based water rights, and the intense level of personal contracting of streamwater which took place in the Industrial Revolution, the two facilitated and enhanced each other. The emergence and expansion of the contractual water right enabled the riverwater to be allocated to a wider group of users. It made reliance on the old clumsy forms of action in land law unlikely by necessitating efficiencies of operation. The new streamlined forms of action thereby indirectly brought equilibrium to the rivers and wealth to the country, by keeping pace with industry.

6. Challenging the Prior-Use Principle

The invention of the steam engine in the mid-eighteenth century, of course, accelerated the already rapidly rising use of the English rivers.⁷¹ Some of the mills on the river which had been using water power converted to steam power, which was often more economical and certainly allowed for much greater production. Many expanded. Large new factories sprang up, employing hundreds of people. Often these were located a short distance from the river. The water to run them no longer needed to be contiguous; it could now be piped inland via "goits" to the factories and returned, used, often in a heated condition, to the river a short distance downstream from the intake point. Arrangements for the necessary water "privileges" would, of course, be made with the riparian proprietor whose land the pipes crossed and, through him, with others on the stream who had priority rights to the water. While the number of mills located directly on the river may not have grown in proportion to the increase in overall industry, use of the rivers became more intense. The stakes were higher.

By the first quarter of the nineteenth century, the fierce competition for available water was translating itself into a large increase in the number of cases coming before the courts. It is during this period that we see the first indication in some of the judicial decisions that some form of control was required. The existing "law," made up of priority arrangements, had not been severely questioned because it had kept peace on the river. Now, because of overcrowding along the rivers, judges were forced to take a closer look at the legal basis of the law. By

enterprises, many of them government-owned, rather than a multitude of small private ones. Perhaps this concentration is in turn partly explained by the judicial attitude.

71. See Pat Hudson, *The Genesis of Industrial Capital: A Study of the West Riding Wool Textile Industry 139-40* (1979) (suggesting that steam engines were in regular use as early as the 1790s).

probing into the judicial reasoning of some of the old water law decisions and, in some cases, by reinterpreting those cases, they revealed a perceived need for a new water regime. *Wright v. Howard*,⁷² an 1823 case with unusual facts, paved the way for this questioning.

In the year 1823 users of water who had established their use earlier than their neighbor's could be confident of winning damages if a dispute between the two went to court. *Wright v. Howard* arose in the Court of Equity regarding a water lease, however, and had nothing to do with damage.⁷³ The defendant, Howard, the prospective purchaser, had planned to build a cotton mill, for which he would need to divert the streamflow, and had found a suitable site along a little-used river in a rural district. The price of the site included a 99-year water lease from a downstream proprietor, giving him consent to make the necessary diversion. But upon investigation, the would-be purchaser found that there were two other parties downstream on the river who had not given (or sold) their consent and who, he feared, might later sue him if he diverted their streamflow.⁷⁴ To justify his not wanting to proceed with the purchase of the site, he argued that since there was no guarantee he could in the future make the diversion without facing legal action, the value of the land was only worth one third of what it would be worth with a secure water right.

Blackstone's teaching would probably have been that once the defendant had constructed his mill and made the necessary diversion, downstream parties who were not using the water themselves would not have any legal redress. The defendant would have become regarded as a prior-user, his right to continue to use the water would be secure and so he would have no excuse now for not carrying out the leasing agreement. But the Vice-Chancellor, Sir John Leach, judge in the case, agreed with the defendant and made a statement which was to "shake up" the common law of water. He attributed ownership of property rights to the waterflow to all of the riparian proprietors (those downstream as well as the defendant if he purchased the land) *whether or not they used the water*. Although he thereby identified a land-based water right, he did agree that only those riparian proprietors who had suffered damage could sue to enforce it. He was thereby recognizing a distinction between black-letter law and enforceable rights:

"The right to the use of water rests on clear and settled

72. 57 Eng. Rep. 76 (1823).

73. The plaintiff was asking the court to oblige the defendant to go through with the deal. He brought the case in Equity because he sought "specific performance," a remedy that was not then available in the common law courts.

74. We do not know if the three parties were using the water or not.

principles. *Prima facie*, the proprietor of each bank of a stream is the proprietor of half the land covered by the stream, but there is no property in the water. Every proprietor has an equal right to use the water which flows in the stream, and consequently no proprietor can have the right to use the water to the prejudice of any other proprietor. Without the consent of the other proprietors, who may be affected by his operations, no proprietor can either diminish the quantity of water, which would otherwise descend to the proprietors below, nor throw the water back upon the proprietors above . . . It appears to me that no action will lie for diverting or throwing back water, except by a person who sustains an actual injury

. . . "75

The new principle implied in this case was later to be called the "natural flow" principle. Applied strictly, it could mean that any use of the streamflow which changes its quality, quantity or manner of flow (except a prescriptive use) is wrongful without consent from riparians who *might* be affected by it, although only actionable by those riparians who *have* actually suffered damage to an existing use. It defined water rights uniquely in terms of land ownership. Although it did not specifically deny that persons other than property owners could acquire rights in the water, there was simply no room for them in the statement. "Equality of right" amongst riparians certainly seems to exclude any idea of "priority of right" amongst mere users. This case is said to demonstrate how desperately the courts were seeking a solution to the problem of excessive water use at that time. Lauer,⁷⁶ for example, mentions that the courts were unhappy about the extent to which both prescriptive and prior-use rights were being pressed into service to settle disputes arising when mills were enlarged. Prior use could protect a downstream user against increased obstruction upstream. But how much would the concept have to be stretched to protect the upstream user against increased flooding by a raised downstream dam? Would not a prescriptive right be necessary? There seemed no criterion by which to limit the application of the priority idea. Lauer obviously believes that the judges must have been worried that without such a limit, prior-use could "bring to a standstill" the development of water resources by new entrants.⁷⁷

Lauer's treatment, otherwise excellent, seems to give far too little weight to the opportunities for the two parties to contract, once prior-use had been established as an exclusive right.

75. *Wright*, 57 Eng. Rep. at 82.

76. Theodore E. Lauer, *The Common Law Background of the Riparian*, 28 Mo. L. Rev. 60, 99-104 (1963).

77. *Id. passim*.

For the moment, few judges seemed to notice the conundrum illustrated by the reasoning in this case. *Wright v. Howard*, being in the court of Equity, was not binding in the common law courts. And since it had nothing to do with actual damage, it was different from the vast majority of cases which came before them. It was completely ignored in England until ten years later. Thus until 1832 at least, water users relied on their prior-use or prescriptive rights and contracted on these bases. They sued in tort, and if successful they got damages. Despite *Wright v. Howard* the prior-use phase continued.

As the system was working well, there was no reason to change and to curb transferability of the water right by "attaching" it conceptually to the land . . . that is until industry had increased so much that all users were adversely affected by the overburdened and polluted rivers. When that happened, judges reached back to 1823 and *Wright* for a way to discontinue the prior-use principle and to justify recourse anew to land-based riparian rights. This was the only alternative on offer. Not until later would they reach across the Atlantic to Rhode Island and the American courts for judicial reasoning which would make the new, more restrictive and absolute rights work.

7. Lord Denman and a new interpretation of "precedent" cases

We have seen that at the heart of the common law is the rule of "precedent"—judges are to be bound by higher court decisions and strongly persuaded by court decisions at the same level of court, in cases which have similar facts to the case being tried. Because they must follow those decisions, the common law has both permanence and internal consistency. Yet the common law has, by incremental changes, adapted to new social and economic conditions without the assistance of legislation. A single judge may, in some instances, effect a change in the law even when faced with seemingly binding precedent, by a number of techniques,⁷⁸ often presented in the argument of one of the litigant's lawyers. Some of these techniques are noted here in connection with *Mason v. Hill*,⁷⁹ one of the most influential cases of water law history. It arose in the "challenge" period between the prior-use phase and the subsequent riparian-rights phase. A well-respected judge of the King's Bench court confronted and set aside a fairly large body of case law which up to then had been accepted as stating the law on prior-use water rights. In so doing, he paved the way for later courts to apply an enforceable land-based water law in the place of the former, individual-

78. Some of these are noted below.

79. 110 Eng. Rep. 692 (1833).

based law. In four pages of the decision Lord Denman went through a careful process to show that the early law was "misconceived," and that cases which had reflected the misconception should no longer be followed.⁸⁰

The facts of the extremely complicated *Mason v. Hill* case which are relevant to this discussion are the following: the plaintiff was a downstream riparian owner ("A") who had been using the streamwater for more than 20 years, although for different purposes and in varying quantities. His upstream neighbor ("B") moved onto the stream and began using the water after him, with A's permission, and A used the surplus from B's operations. This was at first sufficient for A's purposes. Part of B's use of the water, however, had been to divert water from certain springs, which would have drained into the stream, into a reservoir. This B did without A's permission. When A increased his operations, he did not have enough clear water, and disputed, amongst other things, B's right to divert the water.⁸¹

The crucial question in this decision was whether B had a right to divert part of the stream and deprive A of streamwater which he would later need, by virtue of using this streamwater. Lord Denman emphatically found that B did *not* have the right to do so. In so finding, he challenged the legal assumptions which had formed the law in the previous centuries, that priority of use created rights in all the circumstances. Some of the techniques he used in this challenge to precedent were the following:

- i) Finding another basis for the precedent decision, on factual circumstances of the case other than those which up to then were assumed critical;
- ii) Distinguishing a precedent case by showing that the facts were not the same as those in the case being considered. Narrowing the principles of the precedent case to its particular facts and holding the principles not applicable to a broader or different fact pattern;
- iii) Interpreting what were once considered "*dicta*" (judicial commentary not necessary for the decision and therefore not binding) as relevant and explanatory rationale;
- (iv) Interpreting what was formerly considered "*rationale*" as unnecessary "*dicta*" and no longer to be relied on in

80. *Id.* at 698-701.

81. "A" was able to prove "damage" (which gave him standing to bring his case to court) because B had thermally polluted the stream with subsequent additions to his (B's) mill (water was returned to the stream in a heated condition), and this had a negative impact on A's existing operations. If it had not been for this proven damage, A would not have had standing to come to court with only the above complaint, because he had increased his operations *after* B had already diverted the spring water.

the decision;

(v) Showing that because a judge relied on a certain case for a certain broad principle which is now disputed or narrowed, he must have *intended* to limit the application of the principle to a narrow set of facts (even though he may have stated it broadly), and that these narrow facts are not relevant to the present case;

(vi) Showing that because a subsequent case relied erroneously on a broad principle which *should* have been limited to its facts, the case itself cannot now constitute precedent at all;

(vii) Providing a plausible contextual rationale for the new interpretation.

The lawyer for the defendant, (B), cited a body of precedent to support his argument that priority of use gave rights of continued use. This included *Cox v. Mathews*,⁸² *Williams v. Morland*,⁸³ *Liggins v. Inge*,⁸⁴ and *Bealey v. Shaw*.⁸⁵ Of these, the strongest was *Bealey v. Shaw*.

As already mentioned, *Bealey* has been frequently referred to as espousing the "prior-use" theory of water law.⁸⁶ A leading encyclopedia of the day, *Digest of the Laws of England*,⁸⁷ said the following under the rubric of "River":

Semble, that the right to the use of the water of rivers is an easement to lands contiguous to rivers, is a right of occupancy. The first settler may use as much as he please; but, having taken a certain quantity by a channel of a certain dimension, and other person having settled lower down the stream, and taken the use of water subject to the then definite use of the water by the first settler, the latter is entitled to enjoy as much as he can so occupy in a similarly definite manner, and though the prior settler might have previously used all the water, he cannot then abridge the use of the second settler and occupant.⁸⁸

In *Mason*, Lord Denman set out to destroy this formulation. He first distinguished *Bealey* on its facts, because in *Bealey* the prior-user was the party who had been damaged, while in *Mason* the prior-user was the party doing damage and preventing further use by his downstream neighbor. He limited the principle of priority rights in *Bealey* to the right

82. 86 Eng. Rep. 159 (1673).

83. 107 Eng. Rep. 620 (1824).

84. 131 Eng. Rep. 263 (1831).

85. 102 Eng. Rep. 1266 (1805).

86. See Section 4 of this Part.

87. John Comyns, *Digest of the Laws of England* (1st ed. 1762).

88. The reference is to *Bealey*, 102 Eng. Rep. at 1266.

not to suffer damage, rather than the right to inflict it. He also took *dicta* in Lord Ellenborough's quote above (because the case was not decided on the basis of prescription) and called them important rationale to support riparian and prescriptive rights. More importantly, he emphasized a different basis for the rights, A's ownership of riparian land and B's lack of prescriptive title. Given such treatment, *Bealey v. Shaw* no longer had any precedent value for supporting prior-use rights in general. A quote from Lord Denman's judgment is illustrative:

"This decision [*Bealey v. Shaw*] is in exact accordance with the proposition contended for by the plaintiff, that the owner of the land through which the stream flows may, as soon as he has converted it to a purpose producing benefit to himself, maintain an action against the owner of the land above, for a subsequent act, by which that benefit is diminished; and it does not in any degree support the position, that the first occupant of a stream of water has a right to it against the proprietor of land below."⁸⁹

Cox v. Matthews was given similar treatment. *Williams v. Moreland* was confined to its particular facts (plaintiff's ability to prove damage to the riverbanks from an upstream use which altered the flow of the river), and all broad reasoning supportive of prior rights was called "dicta." *Liggins v. Inge* was interpreted narrowly, and Lord Tindal was said to have intended to express himself this way, even though he stated broad principles. *Saunders v. Newman*⁹⁰ was discounted as being inapplicable.

A logical reason was given by Lord Denman for not recognizing prior rights to divert or use water. He stated:

But it is a very different question, whether he [the prior-user] can take away from the owner of the land below, one of its natural advantages, which is capable of being applied to profitable purposes, and generally increases the fertility of the soil, even when unapplied; and deprive him of it altogether by anticipating him in its application to a useful purpose. If this be so, a considerable part of the value of an estate, which, in manufacturing districts particularly, is much enhanced by the existence of an unappropriated stream of water with a fall, within its limits, might at any time be taken away⁹¹

Mason made severe inroads into the theory of prior rights from a technical and logical point of view. Lord Denman went further than this,

89. *Mason*, 110 Eng. Rep. at 699 (emphasis added).

90. 106 Eng. Rep. 95 (1818). This was a case on prescription which also discussed prior rights, relying on *Bealey v. Shaw*, 102 Eng. Rep. 1266.

91. *Mason*, 110 Eng. Rep. at 698-99.

however, and went on to attack the philosophical underpinnings of "prior-use" law—namely, the public's use of river water.

This analysis began with a reinterpretation of Roman law. Lord Denman first limited the Roman law principle (*res communes*) that the water in streams belonged to everyone and to no-one (ideas reiterated by Blackstone), to find that only water which is used for domestic purposes was "public."⁹² Then, to be safe, he firmly announced that, in any event, Roman law did not constitute binding precedent for English common law. These findings were so crucial to the development of water law in later years that we quote them in full:

It appears to us also, that the doctrine of Blackstone and the dicta of learned Judges, both in some of those cases [*Bealey v. Shaw, Saunders v. Newman, Williams v. Moreland*], and in that of *Cox v. Matthews* . . . have been misconceived . . .⁹³

From these authorities, it seems that the Roman law considered running water, not as a *bonum vacans*, in which any one might acquire a property, but as public or common *in this sense only*, that all might drink it, or apply it, to the necessary purposes of supporting life; and that no one had any property in the water itself, except in that particular portion, which he might have abstracted from the stream, and of which he had the possession; and during the time of such possession only.

We think that no other interpretation ought to be put upon the passage in Blackstone, and that the dicta of the learned Judges above referred to, in which water is said to be *publici juris*, are not to be understood in any other than this sense; and it appears to us there is no authority in our law, nor, as far as we know, in the Roman law (*which, however, is no authority in ours*), that the first occupant (though he may be the proprietor of the land above) has any right, by diverting the stream, to deprive the owner of the land below, of the special benefit and advantage of the natural flow of water therein.⁹⁴

Finally, Lord Denman supported his reasoning by referring to the "luminous judgment" of the Master of the Rolls in the Equity case, *Wright v. Howard*.⁹⁵

What prompted Lord Denman to reverse the "public rights" theory of water law and to say that earlier pivotal cases on prior rights had been "misconceived?" Certainly a concern for justice in the particular

92. We will see (in Section D.I.5 of this Part) that this idea resurfaces in later periods and other regimes in the form of permitted "domestic" or "ordinary" use of river water, which is also usually protected.

93. *Mason*, 110 Eng. Rep. 692 at 699.

94. *Id.* at 701 (emphasis added).

95. 57 Eng. Rep. 76 (V.C. 1823).

case. There may have also been a broader, societal factor which the judge considered. A clue comes in a case many years later, *Ormerod v. Todmorden Joint Stock Mill Co.*,⁹⁶ wherein Justice Cave in a lower court said the following:

Owing, however, to the greater demand for water for manufacturing purposes, it has been found necessary in our law to limit the right to running water, and as is pointed out in *Mason v. Hill*, running water can *no longer* be said to be *publici juris* in the original sense of those words.⁹⁷

8. *The Transition to Reasonable-Use*

Lord Denman's judgment in *Mason v. Hill* began the transition to what would be a new regime of water rights: the "reasonable-use" regime, centered on land-based rights to water and a whole new philosophy of the river. In it, as before, a plaintiff who had sustained damage by diversion and thermal pollution caused by the defendant, had standing to take his case to court. But Lord Denman, in advocating and supporting a land-based water right, recognized that there may be cases where a riparian proprietor would be powerless to sue. If the riparian had not used the river he could not have sustained any damage to his use, and therefore could not enforce his rights to the river's "natural flow." Lord Denman commented that damage ought not to be necessary to bring legal action. He saw that procedures in the law were not in accordance with the land-based right he was espousing.

This comment was not determinative in the case and so did not constitute binding authority for later courts. Nevertheless, it did not go unnoticed in the judicial community and was reiterated in some later cases. For example, in *Bower v. Hill*,⁹⁸ Chief Justice Tindal found that the plaintiff had indeed suffered damage to an easement through permanent obstruction of it, but proceeded to say that even if he hadn't, he should still have standing to sue because *failure to do so would enable a prescriptive right to accrue in the defendant, and this would give the defendant an unfair advantage*. Moreover, the obstruction impacted on the value of the plaintiff's land. Chief Justice Tindal stated:

But, independently of this narrower ground of decision, we think the erection of the tunnel is in the nature of, and, until removed, is to be considered as, a permanent obstruction to the Plaintiff's right, and therefore an injury to the Plaintiff,

96. 11 Q.B.D. 155 (Eng. 1883).

97. *Id.* at 160 (emphasis added).

98. 131 Eng. Rep. 1229 (C.P. 1835).

even though he receive no immediate damage thereby. The right of the Plaintiff to this way is injured, if there is an obstruction in its nature permanent. *If acquiesced in for twenty years, it would become evidence of a renunciation and abandonment of the right of way.* That is the ground upon which a reversioner is allowed to bring his action for an obstruction, apparently permanent The Plaintiff's premises would sell for less whilst the tunnel is in existence, if now put up to sale.⁹⁹

The idea of suing to prevent prescriptive rights from accruing was generally adopted as an "exception" to the otherwise strict requirement of proving actual damage in the action on the case, and smoothed the way for the theory that all riparians had an equal right to a natural flow.¹⁰⁰

Fourteen years later the Court of the Exchequer picked up the idea articulated in *Bower v. Hill* of "damage to right" (to receive the natural flow of the river), and applied it to a pollution case. In *Wood v. Waud*¹⁰¹ Chief Baron Pollock spoke of "damage-in-law" as opposed to "damage-in-fact" (actual damage).¹⁰² From it, he said, the court *would presume* that damage in fact, caused by the defendant, had been suffered. An important thing about this reasoning was that it circumvented the causation problem encountered under tort law in a case of pollution; i.e., how to prove that the defendant, in particular, had caused the damage when many others were also contributing towards it?

These two judgments, *Bower v. Hill* and *Wood v. Waud*, and others that followed them,¹⁰³ helped to open the way for a full rehabilitation of the law of riparian rights. The cornerstone was the procedural ability for riparians to sue *without* having suffered (actual) damage-in-fact, and without having used the water at all, so that the priority of the other party was now, for this purpose, irrelevant.

9. Main Features of Prior-Use Water Law

We conclude by noting the main features of rights in the prior-use phase.¹⁰⁴

99. *Id.* at 1231 (emphasis added).

100. It could also be compared with an early action against a trespasser in which it would not be necessary to prove actual damage, only that the person was on the land without permission.

101. 154 Eng. Rep. 1047 (Exch. 1849).

102. Damage in law was damage to the right.

103. See *Sampson v. Hoddinott*, 140 Eng. Rep. 242 (C.P. 1857); *Pennington v. Brinsop Hall Coal Co.*, 5 Ch. D. 769 (Eng. 1877).

104. Not all of these were mentioned in the sections above.

- a) Water rights were derived from the potentiality of a successful nuisance action for a conflicting use or user (a modernized action on the case);
- b) The right to abstract or use water from the private rivers was not limited to riparian owners but was open to all who had legal access to the river;
- c) Legal access could be granted in the form of contracts or easements, and non-riparians thereby permitted to take streamwater inland across riparian lands and return it by artificial channels;
- d) The only requirement of all water users was that they not damage an existing use. If they did, they too were liable for damages;
- e) Because the requirement of not damaging existing uses was the basis for all legal action regarding competing uses, river titles existed on the basis of strict seniority of use, and there was no basis for proportionate sharing of the water in a drought;
- f) Seniority was not specific to a single user but to a quantity and method of water used at a specific location and to the effect of the use on other users. A senior "right" was transferable to new users;
- g) Prescriptive titles to water remained the most important form of water title, because they had the highest seniority and were explicitly attached to the land;
- h) Until the transaction were denied in *Bower v. Hill*, riparian owners who did not use the water but wished to preserve the continuance of the flow (possibly for future use) had no means of legal redress against non-riparian users who decreased the flow.

10. Who Gained in the Prior-Use Phase?

The extent of the swing to new categories of water users can be gauged by examining how riparian proprietors were to gain from non-riparians when the law was to move into its next phases of natural-flow and reasonable-use. Even those not using the water would now be able to enforce a right to a continued flow, subject of course to the relevant tort or general damage law, including nuisance, that applied to riparians and non-riparians alike. And although riparians would not themselves have a right to obstruct others, they would gain the power to prevent major diversions, obstruction and pollution. Riparians also would not have to show in court that any use by them had been impeded. Non-riparians, on the other hand, would lose the power given by seniority to enforce their water use against others except as against a riparian with whom they had a stream-access or other contract. To the

extent that their water rights depended on property law they would be excluded from the seniority system, which would now be confined to riparians. And, like other users, many of them would lose their opportunities to acquire the coveted prescriptive rights, for non-using riparians could now take legal action to interrupt the prescriptive period. These changes were to result from replacing a basis in use with a basis in land ownership, as we shall see in the next Section.

D. THE REASONABLE-USE PERIOD OF WATER RIGHTS

I. *The Modern Doctrine Of "Riparian Rights" In England: 1851*

1. *Introduction*

We have set the beginning of the reasonable-use regime of water law in England at the year 1851 because in that year a case was decided which made first mention of the concept of "reasonableness" in the context of water rights. That case was *Embrey v. Owen*.¹⁰⁵ In the earlier part of the century, English courts had begun to recognize land-based water rights according to a "natural flow" theory, wherein every owner of land by a private river had equal rights not to its *continued* flow (this was the prior rights theory) but to its *natural* (unused) flow.¹⁰⁶ The natural flow theory may have appeared attractive for the purposes of reducing pollution. However, it was never actually applied in England to cases of water abstraction. It was simply not workable since, at best, it would take rights away from those who previously had held them in the prior-use phase and would put a new burden on an old industry—the cost of "buying out" the right to sue of all other affected riparians on the stream. But it did form the basis for a new theory which was workable. The new theory, a softening of the earlier one, would protect the ordinary citizens' rights to domestic water, protect those holding under a seniority system, clean up the rivers, yet allow achievement of the English version of the "reasonable" industrial uses to continue and even to grow. This was the "reasonable-use" theory.

105. 155 Eng. Rep. 579 (Exch. 1851).

106. If by "natural flow," Sir John Leach in *Wright v. Howard* had meant the river in its *continuing* state, the implications would have been impossible. In this case, all existing uses would be respected but no further uses would be allowed. This would create a hopeless muddle of different water rights which conflicted with one another. Indeed, it is important to note that the natural flow theory, for all its severity, still recognized the prescriptive rights of users of the water. Such users did not have to be riparians to maintain their rights, and the number of these rights was not inconsiderable. Prescriptive rights holders were immune from *any* legal action regarding their particular use of water, as long as it remained unchanged.

The leadership given by the English cases changed with the 1827 American case of *Tyler v. Wilkinson*.¹⁰⁷ This case introduced concepts of "reasonable-use" in water rights, well before they were accepted in England. Some twenty-five years later in *Embrey v. Owen*,¹⁰⁸ English law made an exceptional gesture. It followed, or at least cited as part of its reasoning, the American precedent. One must acknowledge the fact that, because conditions in New England were different from those in England around the same time (the problem of pollution was not nearly as severe), the American courts' discarding of prior-use rights in favor of land-based rights was for a different reason—namely, competing *types* of uses. As a result, the water rights which came out of this period under the name of "reasonable-use" showed some differences in the two countries, which we shall expand upon in Section D.II, in a separate analysis of the American experience.

2. Context for the Reasonable-Use Period in England: Population Explosion, Heavy Industry and Pollution;

By the second quarter of the nineteenth century, industry in England had crowded the rivers to their capacity. Cities, led by their manufacturing districts, doubled their population in as short a time as ten years. Demands on agriculture and even on irrigation increased with the population. Where drinking and washing had once been small-scale, direct uses of the water, there were now massive reservoirs and canals to meet the demand. Where there had been goits, there were now pipelines, diverting huge amounts of water out of the riverbeds. Mills were larger, wheels were larger. Water was carried longer distances from diversions. The use of steam for power modified dependence on water-power sites, so that location became less important than the ability to abstract water. On falling rivers, or near towns, however, industrial sites continued to be packed together. More and more, any mill's change in level, impoundment and releases could significantly affect several other establishments below and above.

On the pollution side of things, the waterways of England had become a dumping ground for wastes. Industry emitted new chemicals and its steam power created thermal pollution. Sewage was routinely dumped into rivers at the outskirts of the cities, towns and villages. So serious was river pollution, and so extensive were the diversions, that the small farms and other properties alongside the rivers were now effectively deprived of the "benefit and advantage of the natural flow of

107. 24 F. Cas. 472 (C.C.D.R.I. 1827).

108. 155 Eng. Rep. 579 (Exch. 1851).

water" by their property.¹⁰⁹

3. Early Reasonable-Use Doctrine: Reasonable Damage;

In the 1851 English case *Embrey v. Owen*,¹¹⁰ Baron Parkes pronounced that "the law as to flowing water [was] now put on its right footing." This case followed American precedent regarding water use and water rights, emphasizing both exploitation and protection from damage.¹¹¹ It also referred to recent developments in English law which had relaxed the damage requirement for standing in court. The judgment proceeded along these lines: riparians were entitled to receive the natural flow of the rivers, and to sue to protect those rights even if they had suffered no actual damage because of an upstream or downstream diversion or alteration of the flow. But if they had not suffered damage, or had suffered only minimal damage, they might not win their suit. This was because of a new emphasis on the rule that the law will not redress trivialities: "*de minimis non curat lex*."¹¹² It followed, from the point of view of users of the water, that diversion (and presumably pollution) might proceed if it causes only minimal damage.

The theory explicitly protected industrial exploitation of the rivers to a certain "reasonable" extent. The extent, said Baron Parke, was entirely a question of degree and depended on the facts of each case, including the size of the river. Thus, while the emphasis in natural flow doctrine had been on a riparian's passive right to continue to receive the flow in its "natural" state, it now shifted more to protect the riparian user's active right to divert a reasonable amount of water. Contemporary cases would restate the importance of economic exploitation of property, as the

109. See Ruth Hatch, *Social Studies*, *Globe & Mail*, Sept. 16, 1991, at A18 (stating that Charles Dickens in 1849 sent an article entitled "Dreadful Hardships" to *Punch* magazine about the scandalous state of London's water supply); see also John Ruskin, *Fors Clavigera*, in *The Works of John Ruskin* 21-29 (E.T. Cook & A. Wedderburn eds., 1970) (1871-84); John Ruskin, *Praeterita*, in *The Works of John Ruskin* 35 (E.T. Cook & A. Wedderburn eds., 1908) (1885-89) (commenting upon the air and water pollutant effects of modern industry in England).

110. 155 Eng. Rep. 579 (Exch. 1851).

111. See *Tyler v. Wilkinson*, 24 F. Cas. 472 (C.C.D.R.I. 1827) (No. 14,312); see also our discussion in Part D.II.5.

112. *De minimis non curat lex* was the old Latin tag which purported to state the threshold of legal action: "the law does not cure minimal damage." The *de minimis* principle was clearly stated in *Embrey v. Owen*, 155 Eng. Rep. 579, 587. Once the requirement of minimal damage was cited by the courts, the riparian right to a natural flow in cases of diversion became a dead letter. As we have said on previous occasions, the only way a person can sustain physical damage to his use is if he has established it before the damaging party arrives on the scene. Any form of legal action based on damage protects the prior-user. Property actions had the same outcome as tort actions in this respect.

following quotations illustrate:

The law favors the exercise of dominion by every one upon his own land, and his using it for the most beneficial purpose to himself.¹¹³ and The great interests of society require that the cultivation of every man's land should be encouraged.¹¹⁴

The reasonable-use theory articulated in *Embrey v. Owen* was compatible with the cautious encouragement of industry and agriculture: its parent, natural flow, principle had no particular economic outcome. Yet because of the requirement that *some damage* be suffered under the "de minimis" rule, the seniority system was still protected and so was the riparian whose rights had been substantially infringed.

5. *The Balancing of Interests: What is "Reasonable?"*;

Embrey v. Owen and *Tyler v. Wilkinson* were cases about water diversion, and they addressed part of the problem in the English and American streams, which was to determine which uses were "reasonable," given the *size* of the river. However, they did not really take into account the question of how much *pollution* was reasonable.¹¹⁵ And they did not protect the small landowners by the stream who were merely using the water in a "domestic" way, such as for drinking or washing or feeding cattle.

The interests of these parties were addressed specifically in *Miner v. Gilmour*,¹¹⁶ a Canadian case brought to the English Privy Council. Lord Kingsdown, in words which were to be quoted many times afterwards as the "riparian rights doctrine" said:

By the general law applicable to running streams, every riparian proprietor has a right to what may be called the *ordinary* use of the water flowing past his land; for instance, to the reasonable-use of the water for his domestic purposes and for his cattle, and this without regard to the effect which such use may have, in case of a deficiency, upon proprietors lower down the stream. But, further, he has a right to the use of it for any purpose, or what may be deemed the *extraordinary* use of it, provided that he does not thereby interfere with the rights of other proprietors, either above or below him. Subject to this condition, he may dam up the stream for the purpose of a mill, or divert the water for the purpose of irrigation. But, he has no right to interrupt the regular flow of the stream, if

113. *Bonomi v. Backhouse*, 120 Eng. Rep. 643 (Exch. 1859).

114. *Chasmore v. Richards*, 11 Eng. Rep. 140 (H.L. 1859).

115. Except, that is, to the degree that amount of flow influences pollution.

116. 14 Eng. Rep. 861 (P.C. 1858).

he thereby interferes with the lawful use of the water by other proprietors, and inflicts upon them a sensible injury.¹¹⁷

What is interesting in this statement is that it gives "ordinary" users an almost absolute right *to their use*, regardless of the effect it has on others. It suggests that "ordinary" use is, *per se*, "reasonable." This came to be one of the main tenets of the reasonable-use doctrine.

The right is, nevertheless, subject to the level of the streamflow. This means that in times of low flow the ordinary users lower down on the stream may not be able to fulfill all their requirements because of upstream ordinary users. They will have no legal redress against upstream ordinary users.

The idea of protecting the ordinary user in his domestic use of the water was not new. It had been referred to ten years previously in the case of *Wood v. Waud*, in a common sense remark:

[I]f the stream were only used by the riparian proprietor and his family, by drinking it, or for the supply for domestic purposes, no action would lie for the ordinary use of it; and it may be conceived, that if a field be covered by houses, the ordinary use by the inhabitants might sensibly diminish the stream, yet no action would, we apprehend, lie, any more than if the air was rendered less pure and healthy by the increase of inhabitants in the neighborhood, and by the smoke issuing from the chimneys of an increased number of houses.

Tort law, designed to protect individuals from damage or harm, continued as before, although the degree of overlap with property law decreased. Riparians who intended to use the rivers in some way, but had not yet begun to do so, were blocked under a general damage law (such as nuisance law), from suing existing users in tort. Although under early reasonable-use doctrine riparians could bring an action because of damage to their riparian right, their action would have few prospects of success unless they could show they had suffered damage to their *use* which was more than trivial. Had the law reverted to its prior-use stage? In *Sampson v. Hoddinott* the court made it clear that conceptually, at least, it had not. It said:

[A]ll persons having lands on the margin of a flowing stream have, by nature, certain rights to use the water of that stream, *whether they exercise those rights or not*; and they may begin to exercise them whenever they will.¹¹⁸

117. *Id.* at 870 (emphasis added).

118. *Sampson v. Hoddinott*, 140 Eng. Rep. 242, 251 (C.P. 1857) (emphasis added).

And the court in *Holker v. Porritt*¹¹⁹ reiterated these thoughts 18 years later:

It is established by many authorities, which are collected in and confirmed by *Mason v. Hill* [110 E.R. 692], that as soon as the owner of land on a stream has appropriated the water to a beneficial use he may sue for the injury done to him in respect of such a new use.¹²⁰

Nevertheless, vexatious or spiteful actions were strongly discouraged. These sentiments were expressed at the Privy Council in a Scottish case, *Orr Ewing v. Colquoun*.¹²¹

It would require strong authorities to lead me to believe that the law of *Scotland* does give the proprietors on the banks of the stream a right to act the part of the dog in the manger to such an extent as to hinder this.¹²²

Miner v. Gilmour had explained that "extraordinary" (not "ordinary") users of the flow would be subject to a requirement of reasonableness; i.e. they would not be permitted to cause damage or hinder any other riparian's reasonable-use of the flow.

It remained a fact, however, that certain uses were, by their very nature, clearly detrimental or wasteful uses of the river—either they destroyed its quality, killing the fish, or they failed to return the water after it had been diverted, or they were merely unnecessary. The common law moved swiftly to combine with the growing volume of statute law discouraging these uses of water, by defining "per se unreasonable" uses.¹²³ Examples were polluting uses,¹²⁴ wasteful or merely ornamen-

119. *Holker v. Porritt*, 10 Exch. 59, 62 (Eng. 1875).

120. *Id.*

121. 2 App. Cas. 839 (1877).

122. *Id.* at 856. The practical implications of this case and the "dog in the manger" objection were far-reaching to the extent that legal actions regarding diversion, brought by non-user riparians against users to enforce the "natural flow", were never actually attempted except perhaps in earlier cases such as *Wright v. Howard*, 57 Eng. Rep. 76 (V.C. 1823), where there were very few users on the stream. At a time when water was highly demanded, however, it was illogical to expect that all users would be able to contain their use so that it did not affect the passing by the property of any other riparians, or that one riparian owner might sue all existing users on the river, just to obtain his share of streamflow, whether or not he used it. The latter kind of behaviour would be seen as vexatious and frivolous, and we have not found a single case in which it was allowed. In this respect the prior-user reaped the benefit of the court's scrutiny.

123. This did not mean that they were unlawful, not being proscribed by statute, but that at the suit of another riparian, they would lose out, regardless of whether damage had been proven.

124. *Attorney General v. Birmingham Borough Council*, 70 Eng. Rep. 220 (Ch. 1858); *Pennington v. Brinson*, 5 Ch. D. 769 (Eng. 1877). We shall discuss these further separately.

tal uses,¹²⁵ and uses which took the water out of the river basin or off the "riparian tenement."¹²⁶ A riparian who was engaged in such uses was vulnerable to legal action (which would likely be successful) by any other riparian at any time. In the first two instances, for example, he could not justify harm or damage caused by a socially useful purpose. Nor could he justify potential harm among other downstream users (not only the plaintiff) in the third instance. Damage was assumed.

This new criterion further reduced the categories of uses left to the English courts' discretion. But here the process stopped. None of the other "extraordinary" or non-domestic uses were actionable as unreasonable unless they caused damage to other riparians. In the category of extraordinary-use it was necessary to fall back on seniority principles. These continued to be applied.¹²⁷

There was one more recourse. The ordinary-use category might be expanded. A few non-domestic uses were found customary or publicly necessary in certain districts. There is authority to suggest that, as the law had discouraged certain detrimental extraordinary uses by calling them "per se unreasonable," so it encouraged and protected these necessary uses by calling them "ordinary." The case of *Ormerod v. Todmorden Joint Stock Mill Co.* offers the following comment:

The question whether the use of a river is ordinary or extraordinary use depends upon the development of trade in its neighborhood, and upon the use to which it is put by adjoining owners.¹²⁸

Apart from this suggestion that flexibility may have been exercised in the definition of "ordinary" uses of the water to give protection to certain necessary uses, it is clear that by *defining* detrimental uses as "per se unreasonable" the English courts were attempting to narrow the scope of their discretion. This contrasts with the direction of American courts which, as we shall see in the next section, were carving out for themselves a role as agents of the society's interest by enlarging the scope of their discretion.

125. Lord Norbury v. Kitchin, 176 Eng. Rep. 132 (Cr. Cir. 1862).

126. Wilts and Berks Canal Navigation Co. v. Swindon Waterworks Co., 20 W.R. 353 (Ch. 1872); McCartney v. Londonderry & Lough Swilly Railway Co., 1904 App. Cas. 301 (appeal taken from Ir.).

127. Indeed, this reasonable-use innovation did not affect either the majority of water users or the majority of river water used. Prior-use governed here. The reasonableness of the other extraordinary uses was judged according to their impact elsewhere on the stream. If they caused damage, the court would, as in the past, order the diverter to modify or stop his activity or pay those who suffered from it. So the concept of damage, and the protection of prior-users, continued to play a major role in the law. English reasonable-use judgments did little to disrupt the security inherent in the system for most existing users and most of the existing water.

128. Ormerod v. Todmorden Joint Stock Mill Co., 11 Q.B. 155, 167 (Eng. 1883).

Standards of reasonableness, as they applied to the finding of actual damage, meanwhile, could be more clearly seen in pure nuisance or *tort* cases. In particular, the increasing number of air pollution cases in which damage was not strictly quantifiable brought new attempts to define standards against which to measure actionable nuisance. An 1851 case considered general and minimal standards of comfort and enjoyment, which were defined as being:

"not merely according to elegant or dainty modes and habits of living, but according to plain and sober and simple notions among the English people."¹²⁹

A later case suggested how the economic or social importance of the activity, and the manner and location in which it was carried on, influenced the standard:

"It may be that for the sake of trade in towns, or for the public benefit, a nuisance is sometimes justified"¹³⁰

A subsequent case which reached the level of the House of Lords, *St. Helen's Smelting Co. v. Tipping*,¹³¹ refined the standard further, placing a greater onus on industry. Here the plaintiff was suing a copper smelting factory to recover damages for substantial personal discomfort (air pollution) and for injury to trees, hedges, fruit and cattle on his property. He won on the aspect of physical injuries, but personal discomfort was considered a "trifling and small inconvenience" and not actionable. Lord Wensleydale said:

"the law does not regard trifling and small inconvenience, but only regards sensible inconveniences, injuries which sensibly diminish the comfort, enjoyment or value of the property which is affected."¹³²

It is certain that judges sitting on riparian rights cases were not unmindful of the parallel trends in negligence and nuisance law towards "reasonableness," and that a spillover effect into water law occurred in the definition of *damage*.¹³³

129. *Walter v. Selfe*, 64 Eng. Rep. 849, 852 (Ch. 1851).

130. *Bamford v. Turnley*, 122 Eng. Rep. 27 (Exch. 1862).

131. 11 Eng. Rep. 1483 (H.L. 1865).

132. *St. Helen's Smelting Co. v. Tipping*, 11 Eng. Rep. 1483 (H.L. 1865).

133. That the two, English and U.S. water law, had more than the word "reasonable" in common, and that both were pointed toward some extreme goal such as minimum damage or maximum benefit, can be readily seen by considering an *unreasonable-use*. In America, an *unreasonable-use* would be one that was less productive than its rivals. In England it would be one that came low on the *preference* scale, such as manufacturing, unless it were trivial (meaning a small user or the cause of small damage). To be unreasonable, yet trivial, meant that the judge had to look at how trivial a use was. Thus the English judge would

It is important to note, however, that even while there were forces attacking pure damage concepts in property actions and countervailing forces mitigating their effects, nuisance actions continued as before, untouched, throughout this period of land-based water rights. These actions were available to all persons who had been interfered with in their legal use or enjoyment of land outside of ownership. A riparian owner had the option of suing either in property, on the basis of his rights as owner of riverside land, or in tort, on the basis of his rights of use or occupation. The fact that nuisance actions persisted is evidence of their popularity, and of damage concepts, and with them, prior-use concepts. In every period of English law, protection of property from actionable damage at the hands of others has been recognized by law. As we will see, even Justice Story in *Tyler v. Wilkinson*,¹³⁴ the 1827 American case which is said to have introduced the concept of "reasonable-use" into the common law, agreed that "*sic utere tuo ut alienum non laedas*" ("use your land without harming your neighbor's") has always been part of it.

6. Pollution: Advantages of Natural Flow Theory;

Although natural-flow theory (no tolerance for any change in the river) was unworkable in cases of diversion, requiring the application of reasonable-use principles, it was used successfully in cases of pollution. Here, the right to a clean river grounded the right of action and the focus was on conservation rather than exploitation. Polluting uses, it will be remembered, were deemed "per se unreasonable" under reasonable-use doctrine. In the area of pollution, the two doctrines brought identical legal consequences to a polluter. They had potential for sweeping clean the fouled rivers of England in a way that tort or nuisance law simply did not. We suggest that although diversion cases were the first to articulate the new land-based theory of water rights, the main reason for its ultimate success in England was that it could be used for curbing pollution.

In his well-known article on nuisance law and the Industrial Revolution, John McLaren reviews in detail the heavily polluted conditions which prevailed in streams in the large industrial cities of England in the early nineteenth century.¹³⁵ From Frederick Engels' "The Condition of the Working Class in England," he quotes:

be looking for the same sort of comparative evidence as his U.S. colleagues, driven perhaps to a similar type of compromise judgment. See, e.g., *Tyler v. Wilkinson*, 24 F. Cas. 472 (C.C.D.R.I. 1827) (No. 14,312).

134. 24 F. Cas. 472 (C.C.D.R.I. 1827) (No. 14,312).

135. John P.S. McLaren, *Nuisance Law and the Industrial Revolution—Some Lessons from Social History*, in *Issues in Tort Law* 313 (Freda M. Steel & Sanda Rodgers Magnet, eds. 1983).

The view from this bridge . . . is characteristic for the whole district. At the bottom flows, or rather stagnates, the Irk, a narrow, coal black, foul smelling stream full of debris and refuse, which it deposits on the shallower right bank. In dry weather, a long string of the most disgusting, blackish green, slime pools are left standing on this bank, from the depths of which bubbles of miasmatic gas constantly arise and give forth a stench unendurable even on the bridge forty or fifty feet above the surface of the stream. But besides this, the stream itself is checked every few paces by high weirs, behind which the slime and refuse accumulate and rot in thick masses. Above the bridge are tanneries, bone mills and gas works, from which all drains and refuse find their way into the Irk, which receives further the contents of all the neighboring sewers and privies. It may easily be imagined, therefore, what sort of residue the stream deposits.¹³⁶

In the first half of the nineteenth century, when conditions were their most deplorable, the available legal control of pollution lay in the law of nuisance. Victims sued waste dischargers for damages. But nuisance law information and enforcement were alarmingly costly and difficult. For example, to establish that a certain party had caused specific damage was almost impossible when fifty or so other polluters were also contributing to the river's pollution. In addition, it was almost impossible to set a value to clean water unless a plaintiff could measure it by the yardstick of its deleterious effect on his own water use. How much were living organisms, fish, et cetera, worth to a riparian who did not operate a fishing business? As a result, under nuisance law alone, only wealthy industrialists could push a legal action through to a successful conclusion. Ordinary users or landowners had virtually no redress.¹³⁷

Natural-flow theory said all riparian landowners had equal rights to clean water. For a person aggrieved, it provided a stronger, cheaper and easier alternative to a nuisance action. The landowner could sue, in a riparian rights action, any one of the many polluters and would not have to show that this particular polluter was responsible for the specific damage, nor would he have to quantify any damage, because the damage was deemed to his riparian *rights*. It would then be up to the defendant to prove that he had *not* caused the stated damage. The burden of proof was thus shifted away from the riparian plaintiff, at the same time

136. *Id.* at 324.

137. See generally McLaren (showing the effective inaccessibility of nuisance law in the mid-19th century to small landowning water users); see also Joel F. Brenner, *Nuisance Law and the Industrial Revolution*, 3 J. Legal Stud. 403 (1973); Morton J. Horwitz, *The Transformation of American Law, 1780-1860* (1977).

decreasing his costs of action and increasing his likelihood of success.

Riparians were further assisted by a powerful remedy which had been developed by the courts at the turn of the century: the *injunction*. This discretionary remedy enabled the court to order an impugned activity cease. It was an alternative to a remedy of damages, which would be awarded if it was deemed "sufficient" to redress the harm done. Injunctions were most frequently awarded to avoid plaintiff's having to bring repeated damage actions against defendants who continued their harmful operations. To determine which remedy to award, the court would weigh the "balance of convenience"—that is, the benefit that awarding an injunction would give to plaintiff against the detriment it would give to the defendant. In pollution cases, the injunction would invariably be awarded against the user-polluter defendant. Defendants who wished at all costs to continue their operations could always try to buy out the plaintiff—some did so, usually paying the plaintiff considerably more than he would have received in a damage action.

Individuals now had some power against rich and powerful corporations and cities, and were on equal footing with them in litigation. No accommodation was made for the "reasonableness" of pollution except perhaps in the form of delaying the injunction to allow for some negotiation between the parties. For example, in the well-known case of *Attorney General v. Birmingham Borough Council*,¹³⁸ the plaintiff individuals were seeking (via the intermediary of the Attorney General's office) for an injunction to stop the City from carrying out drainage operations which had the effect of killing the fish and preventing cattle from drinking the water seven miles downstream. The City argued that if the injunction were granted, an overflow of sewage would result and cause pestilence by which 250,000 people would suffer. The court was unmoved, and did not hesitate to grant the injunction, saying:

"[I]t is a matter of almost absolute indifference whether the decision will affect a population of 25,000 or a single individual carrying on a manufactory for his own benefit

Now the Plaintiff's rights are these: He has a clear right to enjoy the river, which, before the Defendants' operations flowed unpolluted—or, at all events, so far unpolluted that fish could live in the stream and cattle would drink of it—through his grounds . . . in exactly the same condition in which it flowed formerly

If, after all possible experiments, they cannot drain Birmingham without invading the Plaintiff's private rights, they must apply to Parliament for power to invade his rights;

138. 70 Eng. Rep. 220 (Ch. 1858). This was a public nuisance action.

and if the case be one of such magnitude as it is represented to be, Parliament, no doubt, will take measures accordingly, and the Plaintiff will protect himself as best he may."¹³⁹

In *Pennington v. Brinsop Hall Coal Co.*¹⁴⁰ the plaintiffs were owners of a cotton mill and were suing a large colliery because it had dumped sulfuric acid into the river, corroding the iron in their machinery. The defendants argued that they had neutralized the acid as far as technology allowed, and that the only way of preventing any acid in the water would be to close the colliery, thereby losing £190,000 in capital and 500 jobs. The plaintiffs had suffered "a mere scintilla of damage," precisely £100 which it would cost to clean their machinery. But the court granted the injunction.

It is striking that cases such as the two above would probably not have been brought to court if the only remedy had been damages. Thanks to the injunction, they were successful in shutting down the offending industry or activity.

7. Pollution Law as applied to Diversion;

Such important and precedent-setting pollution cases dominated the courts in mid-nineteenth century England.¹⁴¹ Pollution, however, is not our subject. Our point is that the courts in their unconcealed efforts to remake pollution law inevitably remade water diversion law as well.

Up to 1851, diversion cases in England had continued to be argued on the basis of damage. We suggest that about this time the American ideas about reasonableness and balance in water-diversion cases, as they became known in pollution-ridden England, fell on receptive ears. The American courts had declared that a balance must be struck between the plaintiff's suffering and the defendant's exploitation, and that society's good should be a factor to consider. Natural-flow theory, which had been successfully used in cases of pollution, was too severe where abstraction was necessary for diversions that provided drinking water for cities, and for other beneficial social activities. The idea that polluters must stop pollution made sense. The notion that abstractors must behave more "reasonably" appealed to everyone.

While the English courts adopted the idea of "reasonable-use" in water diversion largely from the American case of *Tyler v. Wilkinson*, they

139. *Id.* at 225-26.

140. 5 Ch. D. 769 (Eng. 1877). This was a riparian rights case.

141. See, e.g., *Walter v. Selfe*, 64 Eng. Rep. 849, (Ch. 1851); *Hole v. Barlow*, 140 Eng. Rep. 1113 (C.P. 1858). See also, *Brenner, supra*, note 139, at 410 (making it clear that competition between the courts for supplying a new right or rule regarding pollution continued to be active); *McLaren, supra* note 137, at 319.

did not apply it in exactly the same way. Because they were addressing what was now seen as an imbalance in the previous law which had resulted in clear detriment to public welfare, they placed more weight on the interests of persons who had been harmed than their American counterparts. As will be seen in the next Part (D.II), the Americans had been most concerned with maximizing the benefits from the rivers by arriving at a compromise blend of the uses proposed by disputing industrialists. But the English courts' oblique test of reasonableness, which involved classifying a disputed use as ordinary or extraordinary, can be seen as another approach to the American test—that is, whether a particular use was better or worse than the *alternative*.

8. *Licensing or Contracting of the Riparian Right;*

We have noted that in all phases of water law, contracting formed an important part of the overall picture of water use. In the prior-use phase, it had been particularly prevalent, encouraged by the system of rights enforcement which consisted of a personal action in nuisance.¹⁴² It continued throughout the reasonable-use phase, but was cut back somewhat by developments which strongly favored the status of riparians over that of non-riparian contractors.

When the law recognized a land-based right to the flow, it recognized rights and obligations of the group of riparians toward each other. Contractors were not part of this privileged "community" and were not protected by riparian law. Nevertheless, land-locked industrialists did continue to use the water through contractual arrangements with riparians. And these contractors did have some rights over total strangers. They could still sue, in a nuisance action, outsiders who interfered with their water supply.¹⁴³ They could use streamwater: i.e. it was permissible to contract for it and even to direct and use it off the immediate riparian land, although not out of the watershed.¹⁴⁴ But they were not entitled to benefit from the reasonable-use rule which applied to riparians, and they had no recourse to a riparian rights action. This limitation affected the quality of their title in two ways: first, they did not have the right themselves to use streamwater "reasonably." This meant

142. In the prior-use phase of water law, contractors had assumed the seniority of those from whom they contracted. If they suffered damage they could sue others less senior in use, whether or not they were riparians. In contrast, riparians had no advantage over other users other than legal access to the water by virtue of their physical position on the stream.

143. *Laing v. Whaley*, 157 Eng. Rep. 639 (Exch. 1857), however, laid down the rule that they had to first establish their own entitlement to the flow. A mere parole license would not suffice in this regard.

144. *Kensit v. Great Eastern Railway*, 27 Ch. D. 122 (Eng. 1884).

they could take it, but if they changed the flow in any appreciable way they were vulnerable to suit by any riparian. Not changing the flow meant returning the water to the stream before it left the property from which they had abstracted it, in the same condition as they took it. This was often a "tall order."¹⁴⁵ Second, the contractors could not sue riparians for causing them damage, even those who had used the water unreasonably. They could sue only their contracting partner/riparian for not delivering under the contract, thereby having to sue an 'unreasonable' riparian indirectly through, and in the name of, their partner. The case of *Stockport Waterworks Co. v. Potter*,¹⁴⁶ set forth these newly defined and limited rights in the most complete way. It held:

There seems to be no authority for contending that a riparian proprietor can keep the land abutting on the river the possession of which gives him his water rights, and at the same time transfer those rights or any of them, and thus create a right in gross [personal right independent of land] by assigning a portion of his rights appurtenant [land rights]. It seems to us clear that the rights which a riparian proprietor has with respect to the water are entirely derived from his possession of land abutting on the river. If he grants any portion of his land so abutting, then the grantee becomes a riparian proprietor and has similar rights. But if he grants away a portion of his estate not abutting on the river, then clearly the grantee of the land would have no water rights by virtue merely of his occupation. Can he have them by express grant? It seems to us that the true answer is that *he can have them against the grantor* but not so as to sue other persons in his own name for an infringement of them.¹⁴⁷

The above case shows that contractors of water rights, with the exception of lessees of riparian land, were now in a very different position from that of riparian owners who used the water. It was now clear that a riparian could not transfer his full riparian right to them unless he transferred his riparian land. He could not, in fact, even

145. In *Ormerod v. Todmorden Joint Stock Mill Co.*, 11 Q.B.D. 155, 170 (Eng. 1883), where the contractors had returned the water slightly heated, Brett, M.R. said with regard to reasonable-use, "[t]he law as to flowing water is part of the common law of England; but it only exists as between riparian owners; it does not extend to those whose lands do not abut on streams and rivers."

The obligation of contractors not to diminish or alter the flow at all is consistent with an obligation of riparians not to take river water out of the watershed.

146. 159 Eng. Rep. 545 (Exch. 1864).

147. *Id.* at 556 (emphasis added). In the case of *Holker v. Porritt*, 10 Exch. 59 (Eng. 1875), an exception to this rule was made for *lessees* of the entire estate, who assumed the riparian rights of the lessor for the duration of the lease.

transfer part of the right (e.g. the right to divert water) or "deduct," as it were, any property rights from his riparian "bundle" because this bundle was shared exclusively with the riparian community. He could, however, *authorize* an inland party to draw water from the stream by giving that party legal access. He would still retain full abstraction rights for himself to the level of "reasonableness." His contracting partner would acquire none of his rights to the flow vis-a-vis other riparians but only rights under the contract. The riparian was confined, nonetheless, by his own onerous obligations towards the rest of the riparian community, in addition to the obligations he owed to his contractual partner.

Recall that the legal title of the inland contractor in the prior-use phase had been very different. By the mere virtue of using the water, he could bring a nuisance action against anyone who later interfered with the use and caused him damage. He had needed only to establish his priority in time, as his "quasi-right" equaled that of any of the stream's other users in its enforceability. The fact that the courts, often at a high level, now found it necessary time and again to redefine and limit the contractual "right" to streamwater, is testimony that the basis of the right must have shifted. The contrast with the prior-use phase is stark. Then we found no court cases at all on the subject. They were not necessary because any user had the same basic right. Now, they abounded.

Clarification by the courts of the riparian right and its transferability inevitably devalued the contracted water right. The contractor could not buy as much security and other water rights characteristics as in the previous phase. In addition, his transaction costs increased. To gain any security in the continuance of the flow a contractor would want a covenant inserted into the contract requiring the grantor to join the grantee in a suit against another riparian to restore an interrupted or altered flow. The riparian partner would also want to limit *his* risk by insisting on a covenant whereby the contractor held him harmless against flow interruption by other riparians, or took full legal responsibility for his own actionable alteration of the flow. The costs associated with such contractual safeguards could well have increased contracting costs above the level of profitability, but we do not know that it actually resulted in a decreased absolute number of contracts. It *did* result in more control of the streamwater by riparians vis-a-vis non-riparians. This was, no doubt, good enough for those whose demands were catered to in the making of water law. For by the third quarter of the nineteenth century, the English version of the reasonable-use theory was well established and widely accepted. Its application was now much narrower than that of the water law of the previous century.

Water power, its chief beneficiary, was increasingly yielding to steam power. Other water uses, city water supply, and transportation and sewage removal, were being placed under special statutory systems of

charters. In particular, the courts which, it had seemed, were about to be forced to develop new doctrines relating to water quality and river pollution, were relieved of most of this responsibility by Parliamentary regulation.¹⁴⁸

Consequently, there were few new river users. Existing users could defend their rights to particular water uses as being prescriptive, or as based on survivals of prior-use or natural-flow theories, or as being clearly "reasonable" according to categories of English judges. They and those with whom they contracted were content and the English version of reasonable-use remains essentially unchanged into the twentieth century.¹⁴⁹

9. Recap of Reasonable-Use Rights in England;

The period just described of reasonable-use rights in English water law can be summarized by listing the following rights which had emerged by the end of it:

- a) Riparians, by virtue of their ownership of land by a river, had the right to use or divert the flow, provided they did so in a reasonable manner;
- b) Riparians also had the right to continue to *receive* the flow even though they were not using or diverting it. They could not enforce this right aggressively or obstructively unless they began a use of the water and then sued for impediment to it. They might also sue for damages to their "right" to a continued flow by a "sensible diminution" (a question for the jury); this

148. The British government was eventually induced to curb *private* rights to pollute. It did so by enacting *The Alkali Act*, 26 & 27 Vjct. c.124 (Eng. 1863). But see McLaren, *supra* note 137 (noting that this was only after every public figure and party had concluded that private rights to use the river for waste disposal, and the seniority of these rights, could never be used as the basis for private and public transactions to clean up water pollution). When it was passed, *The Alkali Act* was impressive in principle but weak in effect. Seniority of rights took priority over public legislation.

149. In the twentieth century, government regulation and ownership displaced, almost entirely, individual water rights under judge-made law. The U.K. gradually introduced a system of regional water authorities, taking in not only the granting and monitoring of individual rights but also the provision of city water and sewage services. The role of government thus expanded enormously. See Lyle E. Craine, *Water Management Innovations in England* (1969) (describing developments before and just after the Second World War). See W.R. Derrick Sewell & Lorna R. Barr, *Evolution in the British Institutional Framework for Water Management*, 17 Nat. Resources J. 395 (1977) (describing later developments). Sewell and various co-authors have written extensively in this area. See Harold D. Foster & W.R. Derrick Sewell, *Water: The Emerging Crisis in Canada* (1981) (giving a good bibliography). In the late 1980s, the British government has denationalized many of the functions of these authorities.

strategy would place the burden on the defendant, to prove he had *not* caused the diminution or damage against existing users. They could, however, begin to use the water at any time and sue for impediment to this new use.;

- c) In most cases, a riparian could not sue an "extraordinary" (commercial or industrial) user unless the riparian had suffered more than trivial damage because of him or unless the "defendant" (user) were otherwise using the water in a manner deemed "unreasonable." Seniority rights continued to operate as between riparians to some extent;
- d) "Ordinary" users of the river could take as much water as they needed for domestic purposes without having regard to the effect of their abstraction on others downstream. This meant that in times of water shortage the ordinary user upstream might take all the flow without having to share with other riparians and was immune from legal action;
- e) Certain uses of the water (other than domestic or "ordinary" uses) were deemed "unreasonable" whether or not they caused actual damage. Examples were polluting uses, uses which carried water off riparian lands and out of the river basin, and uses which were of no utility, such as ornamental or wasteful uses;
- f) Any use might be made of the water until the user was sued. Enforcement of the riparian "law" could be made only by riparians, not the state;
- g) Non-riparians could abstract stream water if they had legal access to the river. But neither this nor a contract with riparians now gave them any right as against other riparians to alter or diminish the flow appreciably; for example, they had no standing to sue an upstream riparian for reducing the flow they used. Their rights were now only against their contractual partners, or, under the old tort law, against "wrongdoing" outsiders who had neither riparian nor contractual rights.

SECTION D.II: REASONABLE-USE IN THE UNITED STATES

1. Introduction;

In this section we discuss how the reasonable-use doctrine developed in the United States. Our purpose is to amplify what we have written above by contrasting the English common law version of reasonable-use with that doctrine in America.

At the beginning, we should make clear that our division of the

development of England's common law of water use into various periods runs counter to the ideas of many American writers. To several American writers, England never got beyond the second stage: namely, natural-flow. These writers regard such a rule-of-thumb distinction as ordinary vs. extraordinary-use as necessary in England, just to make the natural-flow principle operational. But they do not regard it as a separate stage of the law. American practice has continued to reject non-damaging use to maintain an action.

2. History and Context of nineteenth century Water Law;

Throughout the Atlantic states, eighteenth century water law was applied in the wake of early settlement requirements for grist mills and saw mills. These were seen less as forms of industrialization than as adjuncts to local settlement, making ordinary rather than extraordinary use of stream flow.¹⁵⁰ However, as industrialization took place along the rivers best suited to the large-scale generation of water-power, the magnitude of conflicts before the courts and appeals to the legislatures increased. Mills were larger, requiring dams and diversions. There were significant daily streamflow interruptions. These interfered not only with other mills' use of water-power upstream and downstream, but also with farmers' and homeowners' riparian uses. Furthermore, the mills were no longer simple extensions of local land improvement, but enclaves of industrialization where textiles, metals and wood were broken down, concentrated, smelted and refined. They now were located less to serve the local community than to take advantage of waterpower sites. In effect, the waterpower itself became the localized staple that attracted raw materials from outside and so transformed the fall-line and valley economies.¹⁵¹ In each valley a user or group of users assembled flows and storage and traded water-use "privileges." Owners, operators of these privileges, and local employers and suppliers, had much to gain by being both political and litigious about water law.

In New England, during the Industrial Revolution, large users appear to have reduced security and transaction costs by assembling riparian rights by land purchase, or by leasing prescriptive rights and works with prior-use rights, contracting and licensing and building and operating their own dams, canals and pipelines to form complexes that

150. *Weston v. Alden*, 8 Mass. 135 (1811); *Anthony v. Lapham*, 22 Mass. (5 Pick.) 175 (1827). See Maass & Zobel, *supra* note 9, at 139; Horwitz, *supra* note 139, at 42. See Sandford D. Clark & Ian A. Renard, *The Riparian Doctrine and Australian Legislation*, 7 Melbourne U. L. Rev. 475 (1969-70) (providing a similar view, from Australia).

151. Douglass C. North, *The Economic Growth of the United States, 1790-1860*, at 156-76 (1966).

would guarantee to the owners that along some miles of the stream they could move or impound water as though they owned the stream itself. The word "privilege" was used here, sometimes to refer to the whole assembly of rights, sometimes to one local user's proportionate share in the total water consumed or water-power delivered.¹⁵² These shares were assignable.

3. Political Intervention;

In water policy, as with taxation and road building, the legislatures' aims reflected their constituents' high priority for the promotion of settlement, investment and industrialization. The various localities feared that if their governments did not pitch in and help economic development, it would never happen, or would happen elsewhere. This was a different outlook from that in England where the government took a detached, *laissez-faire* view of the industrial allocation of water. Parliament rarely intervened except to assist with private bills on such massive infra-structure projects as canal building.

We have said that Americans also perceived different obstacles to their aims. This can be briefly explained by a rather sweeping generalization about the chronology of river development. On American rivers the original disputes were between water power and *other uses* of the river: between mills and farms. Later, the main American issue became conflict between adjoining water power uses. In Britain, as we have seen, things happened the other way around. The developers of mills and water power seem first, and for centuries, to have been struggling with the owners of similar mills projects to make similar uses of the rivers. Only later did the conflict with other water uses emerge.

152. See Charles H. Shinn, *Mining Camps—A Study in American Frontier Government* (R.W. Paul, ed. 1965) (New York, Scribners 1884) (explaining that there was a year or so during which miners cooperated on diggings rather than developing systems of individual claims). See also John Umbeck, *A Theory of Contract Choice and the California Gold Rush*, 20 *J.L. & Econ.* 421 (1977); Gary D. Libecap, *The Evolution of Private Mineral Rights: Nevada's Comstock Lode* (1977). It seems likely that miners also cooperated on ditch companies. If so, these would have been a fairly precise western equivalent of the eastern joint water privilege. In particular, individual water users would have held *contractual* water rights, good against the company and other customers or shareholders. They would not have held individual appropriative water rights good against the world. This had been the norm with the holders of water-power or water privileges. The ditch companies survived longer than cooperative mining. "In 1855 the miners [of California's Columbia camp] were anxious to aid the progress of a water-company's ditch; and three hundred or more of them took their picks, and gave several weeks' work to the four miles of canal and fluming, and supplied twenty-five square miles of mining ground." Shinn, *supra* at 246. In the 1850s in British Columbia, ordinances implementing California water and mining law also made special provisions for ditch companies.

That conflict centered on the use of the river to carry away water versus the use of the river to provide urban water. This difference has not been developed elsewhere.

Thus, when the eighteenth century English courts continued to preside over law suits between mills that were injuring each other, their judge-made law did little to help the agricultural obstacles to industrialization on the rivers of America. The main American problem was flowage, the flooding of upstream land and the creation of a still pond by the construction of a dam for storage and head. To avoid the damages payable under English nuisance or tort law, it became imperative for a dam builder to compensate upstream landowners for loss of flowage.¹⁵³ Indeed, on a slowly-falling river he might have to compensate a large number of them. As any one of them could hold out for high compensation, the dam-builder's problem was similar to that of any road or canal building assembling land for a right of way.

When the costly solution to his problem was seen as a deterrent to economic development, it evoked a helpful response from government. As early as 1713 the states had begun to legislate the mill, or milldam, acts. These had encouraged the building of grist mills for local farmers by giving millers power to expropriate upstream flowage very similar to powers then being given to road and canal projects.¹⁵⁴ Later, through to the mid-nineteenth century, these mill laws were applied to assist not just locally-needed grist mills, but large industrial mills.¹⁵⁵

As Scheiber says in a referenced study, the states gave these investors the status of public utilities to arm them with the "power to expropriate some of America's choicest water-power sites, such as those on the Connecticut River, the Delaware, and the Merrimac."¹⁵⁶ The laws were defended as preventing old riparians from blocking new industries. They did that and more, transferring much of the economic rent of river locations from landowners to the new mill builders.

153. The original remedy was damages. Later, injunctions became available. See generally, Earl F. Murphy, *A Short Course on Water Law for the Eastern United States*, 1961 Wash. U. L.Q. 93, 111-14 (1961); Horwitz, *supra* note 139, at 47-54.

154. Harry N. Scheiber, *Property Law, Expropriation, and Resource Allocation by Government: 1789-1910*, 33 J. Econ. Hist. 232 (1973), reprinted in *American Law and the Constitutional Order* 132 (L.M. Friedman & Harry N. Scheiber, eds. 1988).

155. See Jamie Benidickson, *Private Rights and Public Purposes in the Lakes, Rivers and Streams of Ontario 1870-1930*, in 2 *Essays in the History of Canadian Law* 365, 369 (noting that a mill law was also proposed to Ontario, or Canada West, in 1859, as a matter of public importance).

156. Scheiber, *supra* note 156, at 136.

4. *Disputes Between Mills: Prior-Use Rights Principle in America;*

In our view of the chronology, the early conflicts *between* mill developers were frequent but not serious. They were satisfactorily resolved by the English common law, combining prescriptive rights with prior-use rights. We believe that the rivers were sufficiently numerous and large to provide sites for all. A short stretch could provide the power needed by several users. This view is consistent with the observation that when the new natural-flow theories arrived from England, they were hardly needed. The disputes were such that natural-flow principles and prior-use principles seemed to point to the same decision. Settlement and industrialization leapt across the landscape, and neighboring river sites were quickly chosen by new arrivals. When these were in conflict, the downstream party often had the stronger claim. The downstream riparian could claim actual damage or violation of a prior-use right, or invasion by the upstream party of a property right to the natural flow. Here is an 1837 Vermont judgment in which prior-use rights and natural-flow principles are seen to mean much the same thing:

The common law of England seems to be that each land owner, through whose land a stream of water flows, has a right to the water in its natural course, and any diversion of the same to his injury, gives him a right of action . . . Should this principle be adopted here, its effect would be to let the man who should first erect mills upon a small river or brook, control the whole and defeat all the mill privileges from his mills [up to] the source.¹⁵⁷

It is striking that such judgments, and later writings, all assume that if a law or judgment denies water rights to a new use, the use thereby becomes defeated. Judges wrote that the flowage rights of riparians to use the water entailed the power to exclude new uses. That the riparian could then sell or rent a "privilege" is implicitly denied. Under the powerful stimulus of the growth of textile milling, Horwitz says the judges believed that economic development embodying water-powered plants could not proceed without displacing older uses and so must hurt the users. Indeed, Horwitz apparently accepts their idea that capitalism offered no alternative but losses to the original owners. Under this way of thinking only the courts, not the markets, can bring about the re-allocation of sites to more profitable uses. Horwitz states:

157. *Martin v. Bigelow*, 2 Aik. 184, 187, (1827). See Horwitz, *supra* note 139, at 276 (citing *Martin* and saying that the mill's right to a natural flow would allow it to interfere with the natural flow, perhaps to the detriment of those downstream—thus, the natural flow rule would permit the first mill to control stream use not only up but also down, and so "control the whole").

The increasing frequency with which courts appealed to the idea of *damnum absque injuria* [damage without legal injury] seems to have occurred in direct proportion to their recognition that conflicting and injurious uses of property were essential to economic improvement.¹⁵⁸

In practice, as in England, prior rights, the right to press nuisance actions, and the trade in water privileges continued together. As late as 1821, the Massachusetts Supreme Court clearly adopted a rule of priority of occupation. Chancellor Kent, although he was very soon after to be the first to expound the reasonable-use principle, wrote of this decision that the long-duration aspects of the prior-appropriation principle were necessary to justify an owners' investing in a (durable) mill.¹⁵⁹

Presumably, the late eighteenth century American courts' veneration of Blackstone would have strengthened their belief in prior-use water rights,¹⁶⁰ although this support must have been sorely tested by the common belief that the priority rule stood in the way of new industries. We suspect that this belief was publicized by some demanders to persuade the states or the courts to free them from paying the price generated in an active water-privileges market.

5. *Tyler v. Wilkinson: The Advent of Reasonable-Use;*

To finish our discussion of prior-use rights, we should briefly state that there were cases which foreshadowed their rejection. Maass and Zobel pinpoint three New York cases that denied a prior occupant of a water-power site necessarily had a superior right.¹⁶¹ Both parties were entitled to the natural flow. This entitlement was referred to in one of them as a "common right," and doubtless was the first of many cases in which the American courts were to respond to conflict by increasing the extent of common use rather than the extent of exclusivity. These cases

158. Horwitz, *supra* note 139, at 40. Horwitz does not attribute his evidence for this increasing frequency, although his footnotes show that he has examined numerous cases. Possibly he deduced it from Joseph K. Angell, author of two editions of *Watercourses*, in 1824 and 1833. For a later edition see Joseph K. Angell, *A Treatise on the Law of Watercourses* (5th ed. 1854).

159. See Horwitz, *supra* note 139, at 274 (describing how in 1793 a Connecticut court illustrated the confusion that the "first" user might merely be the user upstream, because there the flowing water came first). See also *Hatch v. Dwight*, 17 Mass. 288 (1821), cited in Horwitz, *supra* note 139, at 279.

160. For example, prior occupancy by a reasonable-user gives a prior title to such use against later comers. See, e.g., *Cary v. Daniels*, 49 Mass. (8 Met.) 466 (1844).

161. Maass & Zobel, *supra* note 9, at 142. The three cases cited are *Palmer v. Mulligan*, 3 Cai. Cas. 307 (1805), *Platt v. Johnson*, 15 Johns. R. 213 (1818), and *Merritt v. Brinkerhoff*, 17 Johns. R. 306 (1820).

set the course for the reasonable-use criteria to be introduced by Justice Story in *Tyler v. Wilkinson*¹⁶² in 1827.

It is difficult to date the advent of the reasonable-use stage in the United States. Some state courts continued to enforce the old prior-use and natural-flow principles even after *Tyler v. Wilkinson*. Indeed, Story's own 1827 judgment cites approvingly several conflicting cases, such as *Wright v. Howard* and *Williams v. Moreland*. Like *Bealey v. Shaw* in England, *Tyler v. Wilkinson* was later used to support divergent judgments.¹⁶³ Story's judgment was disseminated the very next year in James Kent's *Commentaries*.¹⁶⁴ American judges, already having some of the same ideas, began soon to conform. As we have seen, the judgment made its way with some ten years' lag into English decisions, notably *Embrey v. Owen*, which picked up Story's quote of Kent's remark: "Streams are for the use of man" [and so not to be left in an unused state]. Nevertheless, it was some time after this that the American reasonable-use phase began to cast doubts on existing users' individual water entitlements and privileges.

Tyler v. Wilkinson could as well have been decided on prior-use or on natural-flow grounds. One party, the plaintiff, had a dam. This did not divert water, but allowed him to store and release water so as to create a current for mills further downstream. The defendants had for some time diverted a certain amount of this released water into their canal (ditch) just below the dam. The plaintiff sued when the defendants increased their diversion sharply, so injuring the plaintiff's milling business. Justice Story found for the plaintiffs. His reasoning has since proven to be more influential than his finding.

Story rejected the plaintiff's *mere priority of appropriation*, which he distinguished from the more significant priority of occupancy or possession that in frontier America would justify one's taking empty unowned land. Water, especially this water-flow, was not unowned, although the running water itself could not be possessed but only the channel and the right to enjoy the flow. Since the right to enjoy the flow in the channel is an incident of the riparian land, every owner of the riparian land must own a right to use the flow. This is the source of ownership, rather than prior-use. Ownership of the flow is conceptually possible only if all riparian owners are considered to own it in common.

Next, Story rejected the idea that either the plaintiff or the defendant was entitled to the *natural flow* of the river. Since any use of the river entails some degree of retardation, acceleration, or diminution

162. 24 F. Cas. 472 (C.C.D.R.I. 1827) (No. 14,312).

163. See Lauer, *supra* note 77 (analyzing Story's judgment).

164. James Kent, *Commentaries* (1st ed. 1828).

of the flow, to the injury of others, the test must be the extent of injury that can be tolerated. Story held that the amount of the flow that can be tolerably diverted or interfered with is an amount that is indispensable to the general and valuable use of the water; at any rate not diminishing the value of the common right. A person must not be prevented from making a valuable good or an enjoyment of the flow merely because of a trifling cost or inconvenience to another. Thus the "golden rule," *sic utere tuo ut alienum non laedas*, applies. To an economist's eyes, Story's explanation is consistent with a utilitarian "greatest good" maxim. Let water be used so that each person gains much while imposing little, or less, injury. Note that following the "golden rule" is a perfect ethical idea. Following it makes the sum of the gains to public convenience or general good more than the sum of the inconveniences or losses.¹⁶⁵

Story's treatment, almost like an economic analysis, is impressive. Although writers have often cited isolated passages to suggest that Story was confusedly supporting all previous authorities and contending doctrines at once, his development of the above diagnosis clearly deserved the attention it instantly obtained.

6. Brief Examination of Reasonable-Use Procedure in the United States;

To conclude this description of the reasonable-use phase in America, we briefly examine now what went on in an American state court where a plaintiff sued a defendant for diverting water. Since under the Story theory, "reasonable" could mean "more productive than the alternative," *both parties' uses* came under scrutiny for their legality with respect to riparian status and over-riding navigability requirements.¹⁶⁶

The plaintiff had to be aggrieved, but his argument need not be only prior-use rights as in England. It could also be over an apprehension that his water use would suffer actual damages if the defendant's less reasonable-use continued. The court determined whether or not the defendant's use was the cause of the injury, and whether it was justified by, for example, a prescriptive right validly acquired. Prior use was not often explicitly accepted as a justification (though Trelease has emphasized that *in practice* American courts rarely found for a new defendant

165. In our suggested economic argument, it is assumed that Story assumed that private gain was also a public gain or convenience.

166. The definition of riparian status was the subject of much argument. Reserves and transfers of water rights to non-riparian parcels or uses had been unfamiliar in English cases. Also to be settled was whether riparian status required that the claimant owned the streambed or its bank. Often these had been reserved.

whose reasonable-use was junior to the plaintiff's prior-use right).¹⁶⁷ The court would also ascertain whether the defendant's use was preferred to the plaintiff's by reason of being ordinary or natural.

This brings us to the problem of showing that the defendant's use was unreasonable in the circumstances.¹⁶⁸ This test committed the United States courts to examinations of water uses by both parties more searching (and less predictable) than in England.

In trial courts throughout more than twenty states, different judges have instructed juries on what a defendant might reasonably do in the local circumstances. These, mentioned in leading cases in different states, indicate that reasonableness has been interpreted in many ways. One example is as follows:

In determining what is a reasonable-use, regard must be had to the subject-matter of the use; the occasion and manner of its application; the object, extent, necessity and duration of the use; the nature and size of the stream; the kind of business to which it is subservient; the importance and necessity of the use claimed by one party, and the extent of the injury to the other party; the state of improvement of the country in regard to mills and machinery, and the use of water as a propelling power; the general and established usage of the country in similar cases; and all the other and every-varying circumstances in each particular case, bearing upon the question of the fitness and propriety of the use of the water under consideration.¹⁶⁹

The affected United States jurisdictions have accepted and used these classes or scales of reasonableness, which according to Powell and Hanks are reducible to four: reasonableness of purpose, destination, quantity and pollution.¹⁷⁰

7. *Balancing of Interests;*

Balancing of interests meant something different in America than in England. Under English procedure the court would more or less have

167. See Frank J. Trelease, *Water Law, Cases and Materials* 325 (3d. ed. 1979) (saying "in some of the . . . cases, the court [used] natural flow language, some [spoke] of reasonable use and some of non-riparian use, but regardless of the form of statement, the downstream plaintiff with the priority receives protection.")

168. Surveys have been done to attempt to find the meaning of reasonableness. See Theodore E. Lauer, *Reflections on Riparianism*, 35 Mo. L. Rev. 1, 10 (1970) (classifying meanings of reasonableness).

169. *Red River Roller Mills v. Wright*, 30 Minn. 24, 15 N.W. 167, 169 (1883). A similar listing is published in the Restatement (Second) of Torts, ch. 41.

170. Richard Powell, *Real Property* 371-74 (1968); Eva M. Hanks, *The Law of Water in New Jersey*, 22 Rutgers L. Rev. 621, 630, reprinted in Charles J. Meyers & A. Dan Tarlock, *Water Resource Management* 51 (2d. ed. 1980).

been conducting a search for evidence of one of several kinds of unreasonableness in the defendant's use of the natural flow. This evidence could be the fact that the defendant had caused damage to another riparian user, that he had prevented an "ordinary user" from enjoying his domestic uses of the water, or that his use was unreasonable *per se* (such as a polluting use), any of which findings would routinely justify a finding against the defendant. Only now could the English court exercise discretion in determining what was "reasonable" and in providing a remedy. To determine whether to exercise the equitable remedy of an injunction or to merely award damages, it would consider the interests of both parties, weighing the reasonableness of the plaintiff's own water uses and behavior in the balance.

In the American procedure, while the remedy would of course be arrived at in the end, consideration of the reasonableness of the plaintiff's actions would come much earlier in the proceedings. If both plaintiff and defendant were found to be acting reasonably and if the plaintiff was harmed by the defendant's actual or proposed water use, the American reasonable-use procedure called for a decision that would balance the gains. It is understood that the plaintiff's injury alone was not sufficient for such a finding. In particular, an inquiry essentially comparing the benefits and costs of acceding to the plaintiff's claims would be made to determine who should win the case. If paying for compliance would greatly exceed the plaintiff's injury, then the court would tend to find that the disputed rights to use the flow belonged to the defendant. The balance of harm would determine the ownership of the interest in water. Only then, in determining the remedy to award, could the court, including a jury, moderate its finding. For example, a court might find that one party was diverting an unreasonable amount of the stream. It could then order that the diversion be fixed at a given reasonable amount.¹⁷¹

In this respect the victory of the right of the prior-user in the United States was less complete during this regime than that of the prior-user in England. This was to be expected for, as we have just seen, the reasonable-use principles in the two countries were not the same. Some American courts held that prior-use was one of the factors but not the only factor to consider in the court's determination of "reasonableness" as between riparians (other factors were the utility of the use, size of the river, *et cetera*). Nevertheless, in almost all states the fact that a sizable investment in the water-using activity had already been made had some weight in the determination of reasonableness as between liti-

171. See, e.g., *Prather v. Hoberg*, 24 Cal. 2d 549, 150 P.2d 405 (1944), discussed in Trelease, *supra* note 169, at 312-13.

gants.¹⁷² Furthermore, the American constitutional protection of vested property rights worked to protect a prior-user. This perhaps explains the Americans' resort to the courts to determine "reasonableness" on a piecemeal basis determined by a multitude of factors, only one of which is prior-use.¹⁷³

Another way of explaining the process that courts engaged in while balancing interests is that they searched for a *compromise solution* which would generate the maximum net gain to society. Hence, the result was rarely one of a party winning or losing the right to the flow, but of *sharing* it. This manner of proceeding also gave local courts the advantage of avoiding alienation of plaintiffs or defendants by unpopular rulings heavily on one side or the other.¹⁷⁴ Because pollution was not a problem of the magnitude on the American rivers as it was in England, the question of "damage" could be resolved more as a question of allocation of resources and less as a question of pure compensation. This enabled the courts to take a conciliatory rather than a fault-seeking approach towards the parties to an action. The role of the judge was to make peace on the rivers and at the same time establish the best use for their waters. A finding for one party alone, in this case, would be an extreme form of water sharing. From an economic point of view the process did not constitute a *final step* in resource allocation. The court's division of "ownership" merely laid the way open for the litigants to adjust their respective flow entitlements by contracting with each other.

8. Explaining the Differences between England and the United States;

Why did England and the United States use the reasonable-use system of water rights differently when the foundations (i.e. rights derived from riverside land ownership) were the same? We have already suggested some probable reasons in an earlier part of this discussion. They include the fact that at this point in history, industrial pollution was not at such a critical point in the United States as it was in England, where streamwater was no longer potable nor ecosystems supportable. Also, uses in the United States tended to be on a larger scale than in England, and rivers tended to be longer and wider. Population density was not nearly as high in America, and the problems of providing drinking water for cities did not have the same magnitude, nor did the

172. The influential case of *Cary v. Daniels*, Mass. (8 Met.) 466 (1844), favoured the prior-user or occupant of a river site; but later some state courts began to play down the role of prior-use in the balancing of factors contributing to reasonableness.

173. See *Restatement (Second) of Torts*, ch. 41.

174. In England, the royal courts were more "distanced" from their subjects and were not as concerned about the effect of unpopular decisions on the respect of the court.

problems of sewage disposal. These economic, geographic, and demographic factors explain why pollution was taken so seriously in England, and hence why the English courts adopted only some elements of the American "reasonable-use" approach. All of these elements were badly needed in America, but not in England.

In America, the development of the river valleys had proceeded very quickly. No sooner was a colony or territory opened to settlement than local flour and saw mills were being erected. With their attached dams, canals, ponds and log-driving chutes, the operation of mills conflicted almost at once with farm and town water systems, with each other and with navigation and fisheries. As the courts were addressing such problems the frontier pushed west, and new river valleys calling for changed technologies led to litigation not fully covered by English or American precedents. On top of all this hasty original exploitation came, around 1800, the age of textiles and heavy-industry water power. Waves of investment re-opened old questions about the water rights in the original colonies, now with much more at stake.

The courts could not respond to these concerns with the law at hand. English principles, derisively said to have been forged for bucolic, seasonal activities, worked less acceptably when applied to highly capitalized dams, diversion canals, lakes and year-round users. Nor could American users as easily settle the disputes outside the courts. Rejection of any system of prior-use rights undermined some private sales, leases or contracts. This led the owners of the new mills to try to capture the rights they had so recently established. To do this they relied partially on the arguments referred to in Justice Story's landmark decision of 1827.¹⁷⁵ Many concepts were flung into the cases by litigants, regarding not only the traditional prior rights/public rights principles established by Blackstone, but also nuisance law, and natural-flow rights, as well as Roman and French law. Finally, from negligence law, the standard of "the reasonable man" was thrown in. In the hands of the American courts it proved to be familiar enough to be widely applicable, robust enough to threaten well-entrenched old users, yet flexible enough to be applied differently in different circumstances. Furthermore, where waterpower was scarce, it provided for compromise and sharing of the water resource, and kept the peace.

9. Update: Statutory Permits Superimposed on Riparianism;

East of the 100th parallel the American states and the Canadian

175. *Tyler v. Wilkinson*, 24 F. Cas. 472 (C.C.D.R.I. 1827) (No. 14,312), discussed *supra*, Section V.D.II.5.

provinces have stayed, generally, with the reasonable-use version of riparian law for over one hundred years. However, it has been changed. Some states have used their statutory powers to blend the system with features of western appropriative water rights (see next Section), both systems working at once on the same river. These have been dubbed the "hybrid-law" states. Furthermore, all jurisdictions have modified water-using rights with statutory rules. Many of these are concerned with determinations of "priority" or other rationing of water when water levels are low. We shall call these the "permit" jurisdictions. There are about thirteen of them in the United States as well as the province of Ontario in Canada.

All accounts agree that American and Canadian water law was quiescent in the late nineteenth and early twentieth centuries. In that era legislatures took some problems away from the courts and the common law: water-supply, irrigation projects, fishing and pollution. But in their remaining applications the common law reasonable-use rules, under the courts, were left undisturbed. To most people "water policy" meant western streams and big-dam projects, or the equivalent Tennessee Valley Authority (TVA) and Ontario Hydro, hotly debated by left and right and inland and coast. It was apparently not until the 1950s that the riparian-law jurisdictions became aware that their "humid" environments had not always enough water to go around for small-scale industry and other local uses. Was this because of the system of water law? Their inspection of the western states quickly revealed the fragility of provisions for droughts in riparian law compared to the robust structure of those under the western appropriative law. When droughts, pollution or dam-building were issues, reasonable-use riparian law offered users in the Atlantic, southern and mid-western states no priorities and no flows for public, as opposed to private, uses. The tangible results of water shortage discussions among states in the 1950s were state decisions to take what they called a "planning" role in river-basin management. New agencies got varying powers to deal with water supplies and with pollution. Among these powers was the introduction of water-taking "permits."¹⁷⁶

176. This sketch of the history of permit systems is confirmed by research into the history of the Ontario system. Around 1960 that province was introducing new water institutions to deal with flooding, with city sewage disposal and with water pollution. There had been proposals to introduce a type of water-taking permit to reinforce these. But they were upstaged by the need to deal with a different problem: drought in the tobacco counties of western Ontario. We hypothesize that this drought led to a very hasty adoption of the permit system then being installed in neighbouring American states. In consequence of the haste the permit system scarcely fits with other Ontario administrative water systems or pollution systems. Its administration does provide information, and officials paid to use their judgment in emergency low-flow rationing. We are grateful to Professor Dan Shrubsole of the University of Western Ontario for access to his studies of the history of these Ontario

Under the permit statutes, users were allowed to continue their use and were provided with permits that limited it to certain sites and amounts. New users had to apply to an agency under a director, who commonly also could adjudicate disputes, approve transfers, and cancel unused or misused permits. Permits had a limited life, but were renewable. The agency tended to be dominated by riparian law, but was not limited to reasonable-use criteria, some agencies being given a scale of priorities for new applicants. Otherwise, prior-uses were respected, as one would anyway expect in bureaucratic decision-making. Transfers of water to other locations or river basins were not precluded. Shortages and droughts were addressed by legislative provisions which, during a water emergency, the director might invoke to suspend water permits. He was then supposed to follow a different scale of priorities provided by legislation, or by the director and commission. The agencies in the humid east have rarely been called on to make tough decisions on such matters.¹⁷⁷

Most states exempted domestic and certain other water uses from permit requirements. From the administrative-cost point of view, this was sensible, but it deprived those states' agencies of a complete list of water users. This was serious because at best eastern "permit systems [functioned] less to allocate water than to provide systematic information for state water planning. It is thus not surprising that they [failed] to clarify the status of persons and rights in a time of shortage."¹⁷⁸

Most users in the permit states and Ontario have not had their common law rights extinguished, nor have the legislatures claimed to have done so. Should water-power or water-supply demands again tax the capacity of the rivers, it is likely that the present laws and their bureaucracies will not be robust enough to stand up to all the challenges. Unless statutes are changed, users are governed by a lumpy mixture of reasonable-use, natural-flow and administrative rules. Under permanent increased scarcity, many conflicts will again find their way to the courts for resolution, and these will continue to generate decisions, precedents and new characteristics of common law rights. Surely the rights or permits will be strengthened to allow transfers and contracting.

But these recent permit-state developments are of little consequence to most North American users of river levels and flows. Since the middle of the nineteenth century, these users have held their rights under a radically different system. In the 1850s, when reasonable-use doctrines were surfacing for the first time in England, and when variations of them

institutions, and to Professor Bruce Mitchell for comments on the period.

177. There was a tendency to instruct the agency to base its decisions on the public interest, a directive familiar to public utility and other administrative commissions.

178. See Meyers & Tarlock, *supra* note 172, at 196-97.

had been in place for some twenty years in the United States, new rights had emerged. This development was revolutionary, more dramatic than any previous change in water titles. In the western states the new rights were called appropriative rights, and in the next Section we shall call this new regime the "prior appropriation period." During this period water-use rights resembled a return to those in the eighteenth century—that is, to personal, individual, use-based rights, and to seniority as the guiding principle in allocating or distributing rights to streamwater use.

E. THE PRIOR-APPROPRIATION PHASE: THE UNITED STATES INTRODUCTION OF INDIVIDUAL AND USE-BASED WATER RIGHTS IN 1850

1. Introduction and Geography;

The evolution of water rights in the prior-appropriation period was quite different from the process in England and New England. The lands and rivers being largely untouched in the western United States, early developments did not lead to major disputes or conflicts. Consequently, litigation was comparatively rare, and judges were not often called on to make crucial decisions about water law and individual water rights. Instead, the water rights were first demanded from what we called, in an earlier chapter, "customary" procedures. These are something akin to those medieval procedures from which the rules governing the holding and use of rights over common land emerged, to be accepted and reinforced by the royal courts.

However, our description of these informal western procedures will show important differences from what one supposes were the leisurely workings of medieval manorial society. First, the processes were rushed, as they were called on to produce water law for transient gold miners and impatient settlers. Second, those who participated in the customary procedures could, and did, back themselves up by demanding political support; where necessary even inventing jurisdictions, legislatures, administrative bureau and law courts all at once. For many of them, the shaping of water rights, or Congressional homesteading or timber policies, was not a major goal. It was only one element in their tireless promotions of land sales, church and community establishment, trading-center development or railway financing. Third, the local rules and rights that these hasty processes produced were not left in their original profusion but were rather quickly made uniform by the forces of migratory competition among users and by the rationalizing activities of legislative committees and higher courts.

The results of this hasty improvisation and rationalization are

visible on an American map. The eastern states have systems of reasonable-use, riparian water rights, most of these recently supplemented by a system of statutory water permits.¹⁷⁹ The 100th meridian roughly divides these states from the prior-appropriation states to the west. Eight of those, the mountain states of Idaho, Montana, Wyoming, Nevada, Utah, Colorado, Arizona and New Mexico, have only appropriative rights. Nine other western states, on the Pacific Coast or in the Great Plains (Washington, Oregon, California, North Dakota, Nebraska, Kansas, Texas and Oklahoma) have "mixed" systems of appropriative and riparian rights.¹⁸⁰ Irrigation is the chief explanatory variable. In agriculture in the high, dry mountain states, irrigation is the rule, even on extensive cattle ranches, but in the coastal states there are regions where irrigation is not practiced.

In Canada, the central and eastern provinces have common law, reasonable-use water rights systems which in Ontario are modified by a permit system. The Yukon and four western provinces have appropriative-rights systems very similar to those in the United States, although the users are issued administrative water-use permits rather than holding property-type rights in water.

All the Australian states have a roughly similarly administered system. It is built to serve irrigation and has been flushed free of most riparian-law remnants, but it differs in many details from the North American systems.¹⁸¹ New Zealand has a mixed system, some elements of riparian law having given way before a regional system with individual quotas like appropriative rights.¹⁸² Both countries use devices other than seniority as a source of priority or precedence in dry periods.

To follow these developments, we must shift again the location of our historical study. Eastern United States water law had already left behind, years in advance of English water law, the long phase of individual or use-based prior rights and had entered on a water law

179. Under these systems individuals are given a right to use a set volume of water for a set purpose for a given period of time. A change in volume required or use will usually result in the need for a further permit. See our discussion of water permits in Section D.II.9.

180. Which of the seven appropriative states chose "pure" water right systems and which "administrative" licenses seems to have obeyed no geographic rule. See discussion of California and Oregon in Section E.5 below.

181. See Alfred L. Birch & R. Bruce MacLock, *Water Conservation and Transferable Water Rights: Australia and Alberta*, 17 *Canadian Water Resources J.* 214 (1992) (describing Australian rights). See also Clark & Renard, *supra* note 152; Joseph M. Powell, *Environmental Management in Australia, 1788-1914* (1976); Andrew K. Dragun & Victor Gleeson, *From Water Law to Transferability in New South Wales*, 29 *Nat. Resources J.* 645 (1989).

182. B.M. Sharp, *Tradable Water Permits in New Zealand* (1989) (unpublished manuscript, Department of Economics, University of Auckland). See also N.J. Allison, *Transferable Property Rights to Water: The New Zealand Experience* (1988).

regime recognizing and enforcing the concept of reasonable-use.¹⁸³ By 1850 this was well entrenched, especially in New England, and with the rest of the common law was filtering westward with the settlers.

It was around this time that prior-appropriation rights began to be established and enforced in California.¹⁸⁴ In many of the states where prior appropriation later came to be recognized, there was as yet no prevalent system of water rights in place, either because the newly created states had not yet formally received the common law of England as their law or simply because the land alongside rivers had not yet been acquired by settlers from the federal government. In other states, prior-appropriation rights were acquired alongside the recognized riparian rights of individuals to whom government *had* granted riverside lands.¹⁸⁵ As vested property rights, these early riparian water rights were protected by the United States Constitution. Consequently, early appropriative rights were subject to them. Although the two systems of allocation might seem to have been conceptually incompatible, their co-existence seems not to have created serious conflicts as long as the rivers were not "fully appropriated."¹⁸⁶ In mixed-system states prior appropriators who encroached on common law water users were protected by state courts,¹⁸⁷ but in general, prior appropriation did not entirely replace riparian law until legislation selected the new system. Perhaps, however, the choice was in spite of the common law, or in ignorance of it, because the new system was familiar and worked. The co-existence of the two systems is the subject of Section E.5.b below.

Why had the tracts of public land alongside western rivers not yet been alienated? Most were awaiting transfer to individual ownership by sale, preemption, homesteading or by direct grant via one of the states

183. Recall that *Tyler v. Wilkinson*, 24 F. Cas. 472 (C.C.D.R.I. 1827) (No. 14,312) was one of the first cases to describe "reasonable" riparian rights while its English counterpart, *Embrey v. Owen*, 155 Eng. Rep. 579 (Exch. 1851) was not pronounced until 1851.

184. We shall see this was another individual and use-based system, not one based on property.

185. The percentage of such land was very small in most of the western states. In some states (e.g. Idaho and Utah) the Federal Government still owns almost two thirds of the land, whereas on a country-wide basis, it owns one third of the land.

186. Wells A. Hutchins, *The Common Law Riparian Doctrine in Oregon: Legislative and Judicial Modification*, 36 Or. L. Rev. 193 (1957). Later, in states where neighbours might hold rights under different systems of law, terrific political debates and legal battles attempted to win the rivers for one system or the other. See *Lux v. Haggin*, 10 P. 674 (Cal. 1886), where the Supreme Court of California upheld the riparian rights of downstream users to certain, natural overflows of the Kern River, as against the statutorily derived appropriative rights of upstream users. In jurisdictions where water rights had been acquired before 1850 under common law, champions debated switching the whole state or province over to the newer system. We discuss the aftermath of this case further in E.2 below.

187. See *Coffin v. Left Hand Ditch Co.*, 6 Colo. 443 (1882).

or the land-grant railways. One reason was that settlers had not yet arrived. More important, much of the land in question was (and remains) unattractive to settlement, being mountainous and/or dry. Even in modern Nevada and Utah less than three per cent of the area is cultivated.¹⁸⁸ In these regions the first water users were not settlers or even cattle ranchers but placer miners who, from 1849, worked up the creeks in search of gold. Many soon rushed off to new discoveries in Colorado and to Australia in 1851, and Canada (the Fraser River) in 1858-59, when California gold became scarcer. Even if the miners had wished to settle, they could not have acquired riparian land easily. In the crucial period in the United States, 1847-49, the western American resources lay where land-granting offices, courts, assemblies and police had yet to appear.

2. *A Parade of Claimants to Prior Appropriations of Western Waters*

Thus it was that, because settlers and other land users were slow to arrive, there were no proprietors to claim riparian rights in the western states. But others did appear, and they did use water and did make claims to the ownership of rights to it. Historians have looked to three groups/persons in their search for the true forerunners of the present water rights holders. The best known are first, the California gold miners and second, the mountain-state open-country settlers and ranchers. A third group, related, was land developers and governments, who should be regarded as regional boosters and promoters—perhaps speculators—rather than as farmers and settlers. Just as they invested in land and built irrigation systems to attract newcomers, so they also arranged an appropriate water law for their clientele. Some historians identify, as a fourth source of water law, the Spanish, Mexican and Indian irrigators in the southwestern states. All four evidently set the stage for modern western irrigation farmers in "arid" and "desert" regions. Sometimes the experts and litigants dealing with modern water law write about these earlier groups as rivals, for a distinct spirit or purpose in water law can be attributed to each originating group.

a) Mining Camps in California

A very generally accepted theory about the choice of a prior-appropriation system in the western United States is that it was all a gold rush "self-help" measure introduced by miners.¹⁸⁹ These, it is said,

188. James H. Backman, *Public Land Law Reform—Reflections from Western Water Law*, 1 B.Y.U. L. Rev. 1 (1982).

189. See Hutchins, *supra* note 188; Wells A. Hutchins, *Water Rights Law in the Nineteen*

assembled in their camps, devised, agreed on, and enforced a new mining law. Their social contract also included provisions about a new water-rights system. Because water rights were parallel and incident to mining claims, they would be implemented and enforced in the same way: by recognizing seniority of "active" claims and by applying force to defend them.¹⁹⁰ It is widely agreed also that the use of threat or force was influential in the making of rules by the camps.

These simplifications mask a diversity in water use and water law.¹⁹¹ It is doubtful that water rights got established in the first months of the California boom. At that time the placer miners were few, and they spread up and down along the creeks. They used the running water for pans, rockers and long toms or sluice boxes. Their diversions were therefore small in relation to the flow and did not call for the appropriation of water. Indeed it seems likely that riparian law suited their needs.¹⁹²

It is significant that California took no steps to disavow riparian law. In 1848 the military authority had ordained that Mexican mining law did not apply.¹⁹³ In 1850 the new legislature embraced common law. It did not accept common law water rights, which it could easily have done. In 1854 it enacted a new water code somewhat along the appropriative-rights lines accepted in other irrigation states and territories, referred to below. But the mining counties were excepted.

Appropriative water law probably was first recognized around 1850, when waves of miners were excluded by the first comers from creek-side claims. This second group of placer miners took up claims

Western States (1971), [hereinafter Hutchins, Water Rights Law].

190. The leading contemporary source is Shinn, *supra* note 154. An influential legal study was Samuel C. Wiel, *Water Rights in the Western States* (3d ed. 1911). Many histories and legal treatises enlarge on these. Economists are indebted to papers by Umbeck, *supra* note 154.

191. The next three paragraphs are much influenced by the rationalization of California water-rights history by Pisani, especially his refreshing emphasis on the ditch companies. Donald J. Pisani, *Federalism, Water Law, and the American West, 1886-1928*, in *Perspectives on Federalism* 117 (Harry N. Scheiber ed., 1986). This group is often neglected in histories of the mining boom in California and other places, especially by first-hand observers. Laying emphasis on the miners themselves and their colorful camp life, they included little about the entrepreneurs whose water use transcended the single camp location. This is also true of the Yukon gold rush.

192. See also Anthony Scott, *British Columbia's Water Rights: Their Impact on the Sustainable Development of the Fraser Basin*, in *Perspectives on Sustainable Development in Water Management* 341, 355 (A.H.J. Dorsey ed., 1991) (explaining why the first (1859) gold-mining proclamation in British Columbia referred to water rights in a way that sounds like they were being assigned to riparian leases).

193. Donald Pisani, *To Reclaim a Divided West: Water, Law, and Public Policy 1848-1902*, at 13 (1992).

higher up the banks, called dry diggings. Needing water to wash the gold out of their dry gravel, they had a choice between taking the gravel to the water or taking the water to the gravel, by ditching hillside or mountain sources near their claims. To the extent they chose ditching, there was a choice between digging their own dams and ditches or taking water from a ditch company. It seems that the rulings governing these companies were the ancestors of appropriative water law amongst the miners.¹⁹⁴

Rulings were necessary not because the miners were illegally diverting streams and carrying the flows over the heights into other "watersheds," but of the intensity of the ditch companies competition with each other. There were problems of definitions of amounts when the creeks and other sources alternated between flood and drought, their ditches could carry more water than was available. The rules of seniority were apparently first applied here.¹⁹⁵

Pisani explains how the ditch companies also conflicted with a third group of water users: the driers or drainers. Holding claims on and under the stream, they dried the creek bed by temporarily diverting it into a flume or ditch. One massive 1850 diversion turned the Feather River out of its natural channel for forty miles. This called for cooperative organization, to raise money, get the work done and deal with holdouts or free riders. These ventures seem to have faded away as sources of mining law, perhaps to reappear in state laws for dredging creek beds. But they created a great commotion at the time. Pisani says:

Most of the violence in 1850 arose because miners who turned streams either deprived other miners of water or gave them too much [for example, miners were submerged by bursting flumes]. All too frequently, unsuccessful negotiations, during which the injured parties were usually asked to join the company, culminated in attempts to tear down dams and flumes. Miners disagreed over which water rights were stronger: those senior in time, those used on land closest to the water, or those whose holders had invested the greatest amounts of money developing their claims.¹⁹⁶

These three classes of water users fought, argued and litigated until the legislature was ready to pass a law. Only the second, the ditch

194. It is not clear how one mining camp could rule on the priority of a ditch company that served several camps.

195. See Hutchins, *Water Rights Law*, *supra* note 191, at 254 (saying that early rights to appropriate water in California were derived in part from "local customs formulated and applied in the mining camps of the Sierra Nevada foothills.") This observation suggests that water works were staked like mining claims.

196. Pisani, *supra* note 195, at 19-20.

companies, would seem to have made urgent use of the prior-appropriation rule. The others needed something else. Anyway, the best evidence seems to be that influence of alluvial mining on California's water law was temporary.¹⁹⁷

b) Homesteaders

Other modern writers accept the gold miners' role, but credit current water law to the reaction of early farmers to the mountainous topography and dry climate of western agricultural lands. These farmers, to win land under the land laws and Homestead Act, were required to cultivate it. In many regions, that meant bringing water onto the land. The water law, therefore, was not sought to provide rules for users seeking water privileges for a mill or factory, as in the east. Neither milling, manufacturing, nor even mining were dominant or frequent water users in the west. Irrigation was to become by far the greatest use of water. The common law would have allowed only riparians to withdraw water, in small amounts. It would have denied them rights to carry water beyond their boundaries, to consume it, and/or to return it at another point. As few settlers planned to farm beside the high mountain creeks from which piped water was withdrawn, the law would not have applied to their water uses anyway.

There was another problem. Even if they had thought the common law did apply, the settlers could not have turned to it to resolve disputes about water rights, for common law courts were not available. It followed that litigation and the common law process could not play a role in adapting English water law to local circumstances. Instead, like the miners in other regions, the settlers developed their own rule. Just as homesteaded land was acquired by the first to claim it, so necessary amounts of water were assigned to the first to divert them. This, it is claimed, was the basis of the Mormon "tradition" of enforcing the exclusive rights of the settlers who found water and first put it to use.¹⁹⁸ The Mormons arrived in Utah just before the gold rush in California, and were to have great influence in developing irrigation institutions outside their own communities. From the first, Mormon institutions tended to divide water equally. As populations slowly

197. *But see* T.L. Anderson & P.J. Hill, *The Evolution of Property Rights: A Study of the American West*, 18 J.L. & Econ. 163 (1975) (working on this presumption and arguing that early farmers and ranchers, already investing in water storage and control, borrowed the miner's water property system).

198. *See* George Thomas, *The Development of Institutions Under Irrigation, with Special Reference to Early Utah Conditions* 29-57, 274 (1920); Robert G. Dunbar, *Forging New Rights in Western Waters* 9-17 (1983).

increased, the amounts available for each holding began to fall. By 1880, the pressure of the bishops on the legislatures to turn from subsistence for all to commercial production by a few became irresistible, and a rough transition to the typical individualistic riparian system of other states was quickly negotiated.¹⁹⁹ At least one Canadian scholar, Percy, is of the opinion that "no doubt" the Alberta Mormons carried the revised Utah system to Alberta where it was influential in formulating Canadian territorial law.²⁰⁰

In the other states farmer irrigation developments followed soon after the miners in the 1850s. Dunbar notes, "the farmers' first ditches were short and small, constructed to irrigate the bottom lands bordering the streams. Sometimes they were dug by individual farmers, sometimes by groups of farmers tending to be "crooked, steep and subject to erosion."²⁰¹ These groups may have given way to, or evolved into, the ditch and canal companies, mutual irrigation companies, and irrigation districts reviewed in Section E.7 below. Soon they were the most numerous class of right holders. The essential basis for their rights was prior-appropriation.

A common theory which attempts to explain why appropriation rights were introduced stresses the beneficial-use requirement of the rights, rather than the consumptive use intentions of the farmers. Where industry and government were both pressing for rapid development in the face of a relative scarcity of water, a use-based individual right was more attractive than a land-based right because it gave access to more potential developers and settlers.

The theory is that developers and promoters exploited the appropriative rights doctrine for their own gain. They amplified the "public outcry"²⁰² against the riparian rights system. Note that it was they, and not actual upland settlers who, it was said, went without water. Developers and promoters could not dispose of such land without it, and could not get it without obtaining it from the earlier arriving ranchers, pre-empters and squatters who had taken all the best locations on the bottom land along the streams. Instead of contracting with these first-comers for their land and water, the developers were more likely, in keeping with their populist practice, to have urged the appropriative doctrine, coupled with a stringent beneficial-use condition. This would bring about the intensive land use they desired. In any case, many argued that a water right with a beneficial-use requirement and easy

199. Arthur Maass & Raymond L. Anderson, . . . And the Desert Shall Rejoice: Conflict, Growth, and Justice in Arid Environments 325 (1978).

200. David Percy, *The Framework of Water Rights Legislation in Canada* 281 (1988).

201. Dunbar, *supra* note 200, at 19.

202. Percy, *supra* note 202.

marketability was a helpful instrument for dynamic development. It helped prevent a speculative overhang of unsold land from depressing land prices. In the process, it created an incentive to obtain water not fully used.

c) *Continuance of older regional water laws*

A third theory is that western water users adapted locally-existing customs and traditions until they became modern appropriative law. For example in 1881 the California Supreme Court declared that the City of Los Angeles had succeeded to all the rights of the pueblo of Los Angeles, including those to all the waters of the Los Angeles River, granted by Spanish royal decree in 1781. Therefore it held that the city had "... the paramount right to the use of the waters of the rivers."²⁰³ A pueblo right, according to Wells Hutchins, was a distinct category under Spanish law, a common property for domestic use, irrigation, and other purposes under regulations administered by the town officials.²⁰⁴ A modern dispute about entitlement to surplus water turns on whether the pueblo was entitled to floodwaters.²⁰⁵

Other historians have described instances which appear to lend credibility to this third theory but Pisani has more recently rejected it outright.²⁰⁶

These three views of the origin of western United States appropriative rights may seem to present westerners deliberately turning from an outdated eastern riparian water right to find a system with better features. Although vivid, however, the portrayal reflects hindsight reasoning and ignores the nineteenth century reality. The fact was that

203. William Blomquist, *Dividing the Waters: Governing Groundwater in Southern California* 198 (1992).

204. Wells Hutchins, *The California Law of Water Rights* 67 (1956).

205. Blomquist, *supra* note 205, at 198.

206. See Johnson & DuMars, *supra* note 14, at 349 (saying that native Americans dug community ditches for agricultural purposes, and that some of these ditches were later used by northern Spanish military outposts and missions). In this sense the Spanish and the Mexicans in the southwest appeared to be well ahead of American miners, ranchers or settlers in using a prior-appropriation system for water. See also Trelease, *supra* note 169, at 22-23 (providing references which suggest that specific legal grants of water diverted onto lands in Mexican or Spanish territories later ceded to the United States). These grants had some of the characteristics of appropriative rights. Hutchins, *supra* note 14, at 261 (also supporting the above theory); T. Glick, *The Old World Background to the Irrigation System of San Antonio, Texas* (1972) (discussing these issues generally); Michael C. Meyer, *Water in the Hispanic Southwest: A Social and Legal History 1550-1850* (1984) (also discussing these issues generally). But see Pisani, *supra* note 195, at 39 (stating "[a] few western historians have mistakenly argued that prior appropriation was a legacy from Mexico. Nothing could be further than the truth.")

the common law of water was not outdated. It had been keeping up with the times, changing very rapidly for at least one hundred years, remarkably transforming itself from one ruling principle to another.²⁰⁷ But the actual, riparian law of their day, with its frequent changes brought on by the revolution in milling, textile and metal industries, must have been utterly unknown to the young pioneers who are now thought of as the inventors of the prior-appropriation system. As water users they were merely following a self-help experimental approach in *organizing* their respective rights and obligations in a new land as best they could.

Consider the first western politicians to whom the miners, settlers and irrigators entrusted their immediate property problems. They must have given little attention to comparing with the older alternative the long-term merits of the new appropriative water rights system which the pioneers were implicitly designing. As politicians they were concerned with law and order, and with the How and Who of public land, mineral and water disposal. If any had realized that the application of a system of common law water rights based on riparian land ownership would have required even more complete and rapid land sales, they would have been struck by the irrelevance of this circuitous procedure to their short-term water problems. As newly-arrived placer miners, ranchers on the open range and irrigators getting along well without occupying much land, they would have questioned a political requirement that to get water they must become riparian land owners.

Furthermore, they would have run into an ethical question: *should* the first distribution of water be incidental to a prior distribution of land ownership? The politicians acquiesced in the miners' and ranchers' own water principles: first-come first-served and use-it-or-lose-it.

d) From California to Colonies

Did the new appropriative system of water rights emerge because there were no governments to enforce the common law system? This is a possible explanation, strengthened somewhat by the survival of common law riparian rights, alongside appropriative rights, wherever in the western states there were established courts and governments to enforce them.²⁰⁸

The explanation is subjected to a different kind of test in the British colonies of Victoria and New South Wales, Australia,²⁰⁹ and

207. See Pisani, *supra* note 195, at 24 (saying of Californian miners in 1850 that "riparian rights were honored in many districts, although they varied from place to place," and illustrating three kinds of qualified riparian systems).

208. See Section E.5.b.ii below.

209. See Clark & Renard, *supra* note 152; Sandford D. Clark & Ian A. Renard, *The*

British Columbia, Canada.²¹⁰ These regions were on the frontier of settlement by Europeans. Their lands were mostly owned by the Crown or government. They also experienced gold-mining booms in the 1850s, and they witnessed a rapid progression in agriculture from extensive grazing and ranching to dry farming and on to intensive irrigation. They also abandoned the common law rules regarding water, but differently for, unlike California and Utah, they were not without governments and courts. They were under tight colonial rein from the beginning, and their internal affairs were under responsible elected governments from the 1860s or 1870s.

British Columbia, with its 1858 Fraser gold rush, borrowed both the California mining "law" and the California miners' water customs.²¹¹ However, having a riparian law already in effect on the sister colony of Vancouver Island, its first "proclamation" in 1859 was ambiguous, linking water rights to land leases and mining claims, as we have seen happened in California. But later the same year, the official gold mining ordinance (codifying some of the California mining rules) set out that ditch or water privileges could be applied without being on riparian land or appurtenant to any property.²¹²

Water law rules were strictly an extension of Crown mineral disposal law until 1875. After that, they broadened periodically to recognize domestic and agricultural uses, and continued to have a public-lands disposal flavor. In 1892 a government declaration placed all water under Crown ownership. Licenses that were the lineal descendant of miners' water rights were to be issued for any use, and some attempt was made to give administrators a priority ordering.²¹³ The resulting

Framework of Australian Water Legislation and Private Rights (1972) [hereinafter Clark and Renard, Framework]; Sandford D. Clark & Ian A. Renard, *Constitutional, Legal and Administrative Problems in The Murray Waters* (H. Frith & G. Sawyer eds., 1974).

210. See Scott, *supra* note 194.

211. See *id.* at 355. See also Percy, *supra* note 202, at 289.

212. There is much documentation to show that the new British Columbia mining law was drawn up on Colonial Office advice based on Australian experience, but the parts dealing with water were confusing, and lacked generality. This suggests to us that neither the Fraser miners (many from California) nor the Australian law had any clear model of a water right *system* in mind. At different places the rules were completely *ad hoc* and unsuitable for expansion into water law.

213. See H.W. Grunsky, *Water Legislation and Administration in British Columbia*, in Report of the Minister of Lands D117 (1913) (noting that legislation directed to irrigation arrangements had to wait until the Water Act of 1909). See also Kenneth W. Wilson, *Irrigating the Okanagan: 1860-1920*, at 22 (1989) (unpublished M.A. thesis, University of British Columbia) (suggesting that irrigation legislation lagged because, compared to mining and water works, government received little or no revenue from early irrigation projects). See also R. Farrow, *Water Rights in British Columbia*, in Transactions of the Second Resources Conference 42, 44 (1949). See also Scott, *supra* note 194.

system had and has many California-like features: prior appropriation, seniority, beneficial-use, and effective transferability. Nevertheless it is a paternalistic administrative system, in some ways more akin to the system of tree-cutting rights on Crown land than to California's water property system.²¹⁴

In Australia a system of riparian rights was already applied in Victoria and New South Wales. It was not abandoned during the gold rush, though the government did introduce long-term water licenses allowing reservoirs and ditches, as well as water to put into them.²¹⁵ As soon as the gold rush was over the government dusted off riparian rights; at the same time it introduced the first of a series of statutes to permit and regulate city waterworks and mining and agriculture water system. By 1865 riparian rights still existed, but government-sponsored irrigation systems were clearly in the ascendant.²¹⁶ There was no trace of a United States-style appropriative-rights system.

A commission from Victoria inspected the California system in 1880. It liked its escape from riparian rights but not its legalistic costs and uncertainties. In 1886 it opted instead for tight state government control of all water uses and the issuing of non-transferable rights appurtenant to land, without precedence by seniority.

The Canadian prairie region, while its lands and resources were still under federal ownership and control, was settled in the 1880s and early 1890s mostly under riparian water law. In 1892 this system was hastily dropped, replaced by an administrative license system that reflected the irrigation-influenced water laws of Utah and the northern tier of American states. Australian irrigation law was also considered.²¹⁷

Not until the age of widespread irrigation were the American states, followed by the British regions, to see individual water rights as a component in a whole system of procuring, using, sharing, storing and recycling water. Indeed the Australian states made government storage and irrigation projects, with equal user rights, central to their irrigation laws. These were to use the practice of United States irrigation institutions, rather than state laws, as a model. This would have been impossible without strong, well-entrenched governments.

The Canadian prairie provinces' eventual water laws also relied

214. Alastair R. Lucas, *Security of Title in Canadian Water Rights* (1990).

215. Mining Statute, §§ 5, 25, 36, 71 (Austl. 1865), cited in Clark & Renard, *Framework*, *supra* note 211, at 153.

216. Clark & Renard, *supra* note 211, at 154, 157.

217. Percy, *supra* note 202, documents the U.S. influence in the drafting of western Canadian law. The earlier British Columbia water law was largely ignored. Indeed the implicit competition between the regions for settlers probably induced British Columbia to follow Alberta and Saskatchewan in copying features of U.S. water law suitable for creating irrigated acreage.

more heavily on administrators even than American states with administrative appropriative systems. Rules for irrigation institutions were built right into the law. Although their retention of seniority and beneficial use, and their willingness to allow transfers of licenses, did mimic the United States laws, they would seem to have been deliberately shaped by government, and not developed by users.

e) Debates in the Age of Irrigation

In the 1880s and 1890s, American debates about water law were not about government licensing versus private rights. Little attention was paid to this dichotomy. Instead, politicians were subjected to disputes regarding the virtues of common law water rights versus appropriative rights. Holders of water rights, fearful of losing them, were subjected to explanations of what the two systems consisted of. Politicians, like such experts and scholars as Wiel, held a brief for one of their two "schools."²¹⁸ To make their points, writers jobbed backward forty years or more, imputing their current arguments to the pioneers of the appropriative system.

In their works, these writers greatly exaggerated the power and rigidity of any system of water law. They affected to believe that had the system of appropriative rights not been introduced, western resources would not have been developed. It was not in their interest to attempt a balanced with-and-without comparison, in which both systems of law are seen as capable of change and development as requirements for water change. Even today some authors writing for law-school books write as though retention of the common law would have absolutely prevented the spread of mining and irrigation and the growth of the American west, western Canada and most of the states of Australia. So what is the system which was adopted?

3. The Original Individual Prior-Appropriation Right and the Administrative license

The substance of the individual's water right developed as the result of the interaction of two main principles of prior appropriation,

218. See Wiel, *supra* note 192 (providing among the first investigations of the legal origins of western water law and fiercely propounding Wiel's belief in the appropriative system). See also Samuel C. Wiel, *Origin and Comparative Development of the Law of Watercourses in the Common Law and in the Civil Law*, 6 Cal. L. Rev. 245 (1918); Samuel C. Wiel, *Waters American Law and French Authority*, 33 Harv. L. Rev. 133 (1919); Samuel C. Wiel, *Fifty Years of Water Law*, 50 Harv. L. Rev. 252 (1936) (in this last title, taking a more neutral position). See also Maass & Zobel, *supra* note 9 (referring several times to Wiel's work).

namely seniority and beneficial-use, and the idea of location and its changeability.

a) *Seniority*

Priority or precedence by seniority meant that whoever had used the water first had the better title.²¹⁹ Any member of the public could appropriate water in this sense. Subsequent appropriators acquired "junior" rights subject to existing "senior" rights.

While seniority had been only implicit in the prior-use regime discussed earlier, it was magnified to the status of a basic principle after 1850 in appropriative-rights jurisdictions. In the absence of government regulation, the holder of a water right was protected against the claim or suit of another so long as he could show that his use was the earlier use, and that it was beneficial. As such rights became increasingly transferable, priority or seniority drifted from the holder to his right. The original diversion and its date became irrelevant as only a matter of history, for the current right-holder.

As regards the origin of seniority, we suggest that the earliest miners and settlers could easily have gotten the idea of seniority as a criterion for the better title from existing water law. For example, as we shall see below, it was implicit in much of the common law of water as well as being a principle of Mexican, Spanish and earlier Roman law. It may also have been transferred from frontier land law. For example, the rules for acquiring public preemption and homesteading holdings gave preference to the first comer. The new mining laws, and traditional forest licensing laws, also favored the first user.

Moreover, when government water-use regulation and ownership became widespread, seniority was retained. In the American southwest, there was never any doubt that seniority was to be central to the system. So far as we have been able to tell, no other concept was ever entertained. This was natural, for, as just mentioned, governments were already presiding over several systems of resource alienation in which seniority played a major role. This was particularly important when scarce water was to be allocated in dry periods. Had they not been able to allocate water according to seniority, officials would have had to invent and enforce some other basis of sharing—that is, of wealth distribution. We believe this task would have been so far beyond their powers that the legislatures would never have consented to the idea of administrative water rights.

219. The Latin maxim which explained the new system was "*qui prior est in tempore, potior est in jure*" (the person first in time is the stronger in law).

b) Beneficial Use

The principle of beneficial use meant that the right was good only as long as the water was in continuous use. Typically the beneficial uses were specified, such as domestic, irrigation or mining. The two principles together meant that rights to use the flow of water in a stream were *quantitative*. In times of normal flow they did not conflict, but were mutually exclusive.

c) Location and Changeability

Another important principle had to do with location and its changeability. Unlike a riparian right, an appropriative right allowed its holder to take water from a stream and carry it anywhere. However, each right had two addresses: the specific location of the intake on a specific stream (necessary to establish the seniority in the order of precedence) and very often the specific place of use to which the water was carried, or to which it was "appurtenant."²²⁰ With approval, both of these points could be changed.

To enforce his right the holder initiated court action, claiming that the other user had a right that was not "senior" to his, that he was using a volume of water that he was not entitled to, or that he was not using the water beneficially. His own seniority was established by proof, as originally there was no register of water rights apart from court records. The volume of his entitlement was also established by proof, often relying on the user's irrigable acreage. That his use was beneficial was established by determination of the court, often relying on evidence of his expenditure on diversions or ditches.

In the twentieth century, in many American jurisdictions, the original appropriative right has become an administrative permit. Where previously the holder held his water right, like his right to his farm, as an interest good against the government and all the world, he now held it of an administrative agency on behalf of the government, which typically claimed powers to control rights of ownership over all waters in its jurisdiction. The Australian and Canadian governments had worked on this theory from the 1850s on, and on the new American states' systems. Usually there is a Water Act and a senior controller or engineer heading an agency that awards permits or licenses, records them, and attempts to keep track of seniority, volumes appropriated, flows yet

220. However, an appropriative right is not "appurtenant" as firmly as, under the common law, an easement is annexed to a piece of land. A water right was attached to one piece of land until it was attached to another.

unappropriated, and beneficial use.²²¹

In some of these jurisdictions the licenses are as exclusive, transferable and secure as under the original system. But in others the licensee's entitlement is subject to discretionary interpretation. Protection, approval and enforcement of rights is largely transferred from the courts and made subject to administrative rulings, with appeals to quasi-judicial committees, boards and tribunals.²²² In all except the Australian system, the principles of seniority and beneficial use have been continued from the original system and applied similarly.

4. Economic Characteristics Underlying the Appropriative System

We have just seen that the new system had three features not found in the earlier common law system: precedence by seniority; the requirement of beneficial use; and a locational arrangement which was conducive to transferability. In this section we associate each of these three features with one of the fundamental "characteristics" of any property right. We shall associate seniority with the exclusivity characteristic; beneficial use with the quality of title or security characteristic; and the transferability feature with the transferability characteristic. The mapping is not perfect, for the seniority feature provides security of title as well as exclusivity; the transferability feature provides both transferability and divisibility; and the details of the beneficial-use feature determine both duration and flexibility of title. Nevertheless, it is a fair association, considering that a water right, merely an interest in using a flowing liquid in a common pool, is quite unlike the right to possess and hold rural land from which our system of property rights has emerged.

221. Some of the Acts and the agencies are also responsible for ground water licensing. Their regimes differ widely. Some are confined to surface water.

222. See Trelease, *supra* note 196, at 401-15 (comparing American states). See also Victor S. Clark, *History of Manufactures in the United States* (1916); David H. Getches, *Water Law in a Nutshell* (1984). See Birch & MacLock, *supra* note 183 (comparing American states with Canadian provinces). See also Martin Zimmerman, *Inter-Provincial Water Use Law in Canada: Suggestions and Comparisons*, in 2 *Constitutional Aspects of Waste Management* (D. Gibson ed., 1969); Scott, *supra* note 194. See W.H. Ellis, *Legal Constraints on Alberta Water Management* (1914) (giving sketches of Canadian water right systems). See also Gerard V. LaForest, *Water Law in Canada—The Atlantic Provinces* (1973); Lucas, *supra* note 216; 2 *Alberta Department of Environment, Water Resources in Alberta Vol. 2: Water Rights 1-24* (1991); Percy, *supra* note 202. See Birch & Maclock, *supra* note 182 (describing Australian water rights). See also Clark & Renard, *supra* note 152; Powell, *supra* note 183; Dragun & Gleeson, *supra* note 183; A. Ian Randall, *Property Entitlements and Pricing Policies for a Maturing Water Economy*, 25 *Australian J. Agric. Econ.* 195 (1981). See Sharp, *supra* note 184 (describing New Zealand water rights). See also Allison, *supra* note 184.

a) *Beneficial use and quality of title*

Once the new holder of a water right had complied with the rules of acquisition and registry, and had established the seniority of his right, the continuance or security of his entitlement within the system²²³ depended only on the continuance of his beneficial use of the water. It could not otherwise be forfeited or declared abandoned, although in times of water scarcity it might not be fulfilled. Lack of water did not mean the unused right would be deemed abandoned.

The requirement has two kinds of effect. The intended effect was that underemployed water would pass towards higher and more productive employment. The unintended effect is that water is put to work too early on too lavish a scale. The law compels a water right holder to use the water beneficially, but not as efficiently as possible.²²⁴ The market did the rest.

How intensively the water was used depended on how the state courts of the day defined "beneficial." Originally their interpretations differed widely, much as the common law courts were differing on the meaning of "reasonable-use." Later, consistent definitions were introduced by higher courts, legislation, and the license-issuing administrative agencies. These typically relied on the premise that to make beneficial use of irrigation water the right holder should have made an expenditure on diversion and delivery works, and should subsequently maintain them so that all corners of the appurtenant area could be irrigated.

But this was not good enough to many. That a farmer was visibly using his water did not prove that he was not, like many others, merely going through the motions, marking time, his real purpose being not to produce but to hold his right speculatively for an increase in its value.²²⁵ An obsolete irrigation enterprise would actually tend to increase the amount he claimed.²²⁶ The opportunity and cash costs of taking it would be small. In other words the enforcement of the beneficial-use requirement was just as likely to induce waste as to

223. It might be challenged from outside the system, by claimants of riparian rights and of rights of foreigners or aboriginal peoples.

224. This remark of Mason Gaffney is said to be in Mason Gaffney, *Water Law and Economic Transfers of Water: A Reply*, 44 J. Farm Econ. 427 (1968), but we cannot find the precise citation. The user is said, in effect, to be stockpiling as much as the law will allow of his ownership of a property-like asset that is increasing in value without carrying costs.

225. See Mason Gaffney, *Economic Aspects of Water Resource Policy*, 28 Am. J. Econ. & Soc. 131 (1969) (discussing this and criticism of the opponents of speculation). See also Mason Gaffney, *The Taxable Surplus in Water Resources*, 10 Contemp. Pol'y Issues, 74-82 (1992).

226. Until recently, the irrigator's quantitative claim to water would be expressed in terms of the number of acres of a certain crop. This custom tended to induce the irrigator to exaggerate the necessary amount of water per acre (*duty of water*) for his enterprise.

prevent it.

This somewhat theoretical allocation complaint was aggravated in actual disputes between applicants for water rights. A party would argue that his adversary's proposed water use did not come within the current definition of "beneficial."²²⁷ One author cites a recent illustration in which a Colorado water judge ruled that using water for dust control or land reclamation would not be beneficial, using it for cooling might be beneficial, and using it for slurry in pipelines would be beneficial.²²⁸

To deal with the conflicts exacerbated by these ambiguities, some legislatures augmented the benefit requirement with a *preference ordering*. This upset the original requirement by recognizing that all users were not making equally beneficial use of water, and by actually suggesting that in cases of conflict, some should yield water to others. A typical ordering might run down from most-preferred home and farm uses, through manufacturing, to power and mining uses. Compared to precedence by seniority, however, precedence by preference ordering has had few effects on the water rights system. It had tended to strengthen the claim of domestic users, with or without rights or permits. It has been available to help resolve rare disputes between new applicants for permits with the same seniority.²²⁹ And it, or a special version of it, can serve as the basis for expropriating old low-value use rights to make way for new higher-value uses,²³⁰ or to return water to a river to encourage in-stream uses of the kinds discussed in a later section.²³¹

These extensions of the beneficial-use requirement do augment the flexibility characteristics in the system, but at the price of reducing the quality of title and exclusivity it offers to a right-holder. On balance, it seems likely that quality of title has been weakened. As water has become valuable, it has become less costly for challengers to directly attack existing titles in the courts and tribunals and indirectly in legislative committees and administrative agencies. Users are now

227. Definitions are arbitrary. Nevada and Utah treated conserved or stored water as "unappropriated." But California classifies storage as a beneficial use.

228. T.D. Tregarthen, *Water in Colorado: Fear and Loathing of the Market Place, in Water Rights: Scarce Resource Allocation, Bureaucracy, and the Environment* 119, 124 (Terry L. Anderson ed., 1983). The author cites Southeastern Colorado Water Conservancy District v. Huston, 593 P. 2d, 1347 (Colo. 1979).

229. See Lucas, *supra* note 216 (describing this phenomenon in four Canadian provinces).

230. See Trelease, *supra* note 169, at 221-22 (noting that the legislature may have to juggle the state preference ordering to empower a new user (city or utility) to take water from old agricultural uses).

231. See Johnson and DuMars, *supra* note 14, at 356-61 (describing typical legislation). Granting a permit in "the public interest" as determined by a continued pre-existing preference ordering, however, is probably an infrequent approach to catering to demands for instream water, which we discuss in Section F.4.

vulnerable to legal reductions in their entitlement which would have been unthinkable in the past.

b) Seniority and exclusivity

Seniority constrains a water-user's rights more than the flexible beneficial-use principle. It is most in evidence where stream flows are widely variable, and even normally compatible water rights come, under dryer conditions, into conflict. A sharp-edged rule, ranking the quality of rights' titles by their dates of issue, it prevents disputes and reduces bargaining costs drastically by saying the most senior user gets *all* his water before the next gets any. Consequently, the more junior a holder's right, the longer the expected periods without any water, the more uncertainty about when these periods will occur, and the lower the market value of the right.

As water rights become divisible and marketable, having a junior right need not bring unavoidable hardship. A user can now ideally combine fractions of cheaper, riskier, low-flow junior rights with dearer, safer, high-flow senior rights to create a "portfolio" that is just as optimal for him as an investor's portfolio of securities. His success depends on the transaction costs of trading in rights of different seniorities. However, such costs will be too high for the small-scale water user holding only a junior right. In default of assembling a "portfolio" of seniorities, the small-scale user has three less attractive recourses: go in for dry farming or ranching; invest in water storage; sell out altogether and/or buy a more senior right.²³²

Another track for users who seek a larger share or their "full entitlement" in dry periods has been to demand relief from the seniority principle in new legislation. For example, where a senior raises an injunctive action, a court may qualify the injunctive, permitting the junior to continue its use while providing practical protection for the plaintiff seniors. As the costs of accommodation are placed on the junior, the process amounts to a compulsory transfer, part sale and part gift. Or, the government can force a senior user to make a transfer to a junior. For example, as seen above, New Mexico's administrative law gives a junior user a "right of replacement" to expropriate part or all of a senior right if the junior's proposed use is preferred to that now made by the senior.²³³ Most forced exchanges do not involve such a permanent and

232. See Pisani, *supra* note 193, at 12 (saying that miners and small "user-companies" in Placer County, California elected this latter option, and discussing how these groups "sold out to rival [water] companies far more than they took their grievances to court" because of the "mere threat" of lengthy lawsuits and bankruptcy).

233. William C. Schaab, *Prior Appropriation, Impairment, Replacements, Models and Markets*, .

drastic transfer of rights. Information is skimpy but it seems that under practices in some American states shortages are shared proportionately and even low-preference users are entitled to some water.²³⁴ In most of the administered water systems of the Australian states, equal sharing is the rule, with sometimes an extra apportionment being made to water users with the most water-sensitive crops.²³⁵ In Alberta and probably other Canadian provinces, shortages are shared equally according to a negotiated procedure, even though it ". . . is not in accordance with the Alberta Water Resources Act and thus leaves the government open to legal challenge."²³⁶

Other relief is possible. Nevertheless, there is no doubt that everywhere senior rights are still in a strong position. Most governments usually will not actually do much for junior rights-holders in times of shortage, except assist in procedures by which they can gain recourse to the market, buy senior rights and so indemnify their owners. The water shortage sharing procedures in American riparian-law states²³⁷ have no equivalent in appropriative-rights jurisdictions. Even in the worst water shortages, in terms of acre-feet of water diverted, they do almost nothing to force holders of senior rights to share with junior holders.

The seniority principle is an ingenious way of giving high exclusivity to some rights holders even when water availability fluctuates widely. The resolute retention of this principle in rights systems means that the exclusivity characteristic has not declined. Indeed, rights may be more exclusive and secure than originally. This is because stream-adjudication procedures, flow records, and seniority registrations have made each right increasingly quantitatively specific. Consequently, in spite of more serious variability in climate and natural flows, each holder is increasingly independent of the decisions or actions of other users.

23 Nat. Resources J. 41 (1983). The word "replacement" refers to a computer simulation of water availability and net expected withdrawals. The junior's proposed withdrawals replace the senior's. This compulsory-purchase procedure can lead to the same result as reasonable-use procedure. *Id.* at 42.

234. See Maass & Anderson, *supra* note 201, at 337 (mentioning Utah). Jack Hirschleifer et al., *Water Supply*, 236 (1960) (mentioning Colorado, Idaho and Nebraska as states where in dry seasons domestic and farm uses are preferred but low preference users must be "accommodated").

235. Randall, *supra* note 224. See also Dep't of Water Resources, *Water L. Rev.* 22-24 (1986) (Victoria); Dep't of Water Resources, *Water Law and the Individual* (1986) (Victoria); Birch & MacLock, *supra* note 183.

236. Birch & MacLock, *supra* note 183, at 221. *But cf.* Percy, *supra* note 202 (not mentioning the existence of this discretionary practice in Alberta). See also Lucas, *supra* note 216.

237. See Section D.II.

c) *Transferability of prior-appropriation rights*

Since water is a standard chemical compound and since appropriative rights are quantitative and exclusive, we would expect to find water being traded between rights-holders. One incentive is the profit margin between the worth of the water to the seller and its worth to the buyer. Another is the pressure from the beneficial-use requirement. And there are indeed many recorded transfers, particularly where water is valuable. According to a 1986 survey by the Western States Water Council, "[v]ery few transfers of appropriative rights occur in North Dakota, Alaska, Nebraska and South Dakota. At the other extreme, water rights are bought and sold frequently in other states. Colorado, Idaho, Nevada, New Mexico, Utah, Washington and Wyoming reported that 50 or more transfers occur annually. Colorado, Nevada and Utah reported that more than 300 transfers occur each year."²³⁸ In these latter three states and in California this transferability allows water-rights holders to participate in organized water markets. These markets are by no means perfect, the lots of water on offer being restricted in various ways by duration, security, seniority, region and quality. Nevertheless arbitrage and speculation tend to cause divergent local prices to converge, and local markets to coalesce into one wider regional water market.²³⁹ But in the other mountain and south west states water transfers, sales and exchanges are more fragmented, so that a single market-wide price does not exist.

Nevertheless, sales of water rights separately from the land to which they have been appurtenant are less frequent relative to holdings than, say, the sales of used cars. There are obvious reasons. Owners who sell water lose the value of improvements they have made in their real estate. As well, they may find physical transfer is costly, or impractical. Finally, they may be holding on for the capital gain implicit in rising water prices. The importance of these is hard to evaluate. In addition to them, there are at least three explicit obstacles to owners' water sales that demand separate attention.

(i) *Legal protection of third parties.* The chief reason for the scarcity of complete or partial transfers is that they are discouraged by the law and by procedures. Transfers require the approval of a court or a government agency. The procedure is usually relatively simple if the transfer is to keep the water appurtenant to the same land, or if it is

238. Johnson & DuMars, *supra* note 14, at 373. How much was transferred is another question.

239. See Steven J. Shupe et al., *Western Water Rights: The Era of Reallocation*, 29 Nat. Resources J. 414 (1989) (surveying these markets from a water-broker's point of view).

temporary, as with a lease or rental.²⁴⁰ But if the transferred water is to be appurtenant to a new location, or/and diverted at a new point, the administrative agency or the court must usually consider the extent to which the transfer injures third-party water users, and hear their protests. If the water right corresponds to a share in an irrigation company, the transfer may be simple, but for large or distant transfers both the company and the government may have to agree.²⁴¹

What third-party injuries are caused by transfers? One group may be called extra social or community costs. These arise because a long-distance water transfer can take families and business activities away from a community. Then the remaining population in irrigation districts, water companies and local municipalities lose scale economies and tax bases, not to mention social cohesion, political viability and culture. Such districts and communities have complained. In sympathy, politicians have reduced the transferability of water rights,²⁴² and have supported irrigation companies that have resisted the transferability of their shares.

A second group of injuries is caused by water-right spillovers. They arise because a water transfer can reduce external economies, such as downstream water-taking from return flows or water tables. Then downstream users and rights holders suffer loss of income and property value. These third parties have also vigorously opposed water transfers and induced politicians and administrators to institute procedures to preserve the quality of their water title.²⁴³

A third group of injuries is caused by any water expropriation or transfer that reduces stream flows and so damages public uses, such as navigation, recreation, wildlife habitat or water quality. These effects are inducing politicians to act directly by setting standards that transfer-approving procedures must respect. They are also inducing interest groups and organizations to seek standing before the courts and hearings in order to oppose transfers and to protect or enhance public water uses.²⁴⁴

240. Some large users, such as cities, may assemble a portfolio of permanent and temporary water rights, from different sources. *Id.* at 417-22 (providing a revealing American survey).

241. See Michael Rosen, *The Political Economy of Water Markets*, AERE Newsletter 10-14 (Nov. 1990) (reporting on the incentive by members of irrigation districts to approve capital expenditures rather than the internal redistribution of water).

242. Maass & Anderson, *supra* note 201.

243. See George A. Gould, *Transfer of Water Rights*, 29 Nat. Resources J. 457 (1989).

244. See Joseph L. Sax, *The Constitution, Property Rights and the Future of Water Law*, 61 U. Colo. L. Rev. 257 (1990) (describing how the American states these groups have argued that the government must play a formal "public trust" role under the constitution to protect navigable waters). See also Joseph L. Sax & Robert H. Abrams, *Legal Control of Water Resources* (1986). Such public uses are protected in Canada and Australia by statutory arrangements that over-ride individual licenses.

The procedures and rules introduced to slow down transfers are aimed at verifying and reducing or removing these sources of injury. In some jurisdictions the courts may, after a painstaking hearing, enjoin the holder from transferring the water right. In most jurisdictions, the courts have been replaced by agencies which more informally hear applications for an administrative transfer of the water right or license. The court or the agency may refuse consent; may attach conditions; may require that a part of the volume of water in the right not be transferred, or may insist on a settlement or compensation. But financial compensation is not an infallible remedy. True, it can win the consent of objecting groups. But the price or settlement they demand may capture all the seller's profits, and more. Furthermore, their consent may be contractual and temporary, requiring costly renewal if the water is to be transferred again.

The traditional remedy for this has been compulsory purchase of third parties' rights, as was discussed earlier.²⁴⁵ There we saw that under the regime of prior-use rights the English parliamentary canal charters assigned rights to divert water compulsorily to canals, and the Massachusetts mill acts assigned water flooding privileges to mills, in return for court-awarded payments. Analogous procedures are used to transfer water under the current appropriative-rights regime. Holders of key water rights may be compelled to sell not only to irrigation and ditch projects, but also to favored manufacturing.

(ii) *Transaction costs as obstacles.* The payment for third parties' consent is only part of the expense of making a water transfer. On top of it, perhaps exceeding it, is the cost of undertaking the settlement or conveyance by industries. But such compulsory procedures can hardly form the basis for an active market in water rights. Informal committee-like procedures are *more likely* to loosen up water rights now tied down to their original appurtenances.

Transaction costs include negotiation, contracting, bargaining, litigation, mediation, political action and rent-seeking. These can consume what the literature refers to as the time and trouble of the "obstacles" or "difficulties" of transfer. In general, incurring transaction costs also means spending money for the information on which transactions can be based and for after-transaction monitoring, verification and enforcement activities. Of all these, the information costs can be the most serious.

Information may be needed with respect to the following questions: First, what is the hydrology of the river and what facilities are available to transfer water? Second, who is a possible trading partner and what is the best strategy of dealing with him? Third, is the quality of title adequate? What is its seniority or priority? Fourth, who might protest

245. See Section E.4(b).

and how are they affected by a transfer with a change of diversion?

The hydrology of the river may be a matter of public record, or available from an administrative agency. Otherwise, the parties will have to invest in their own studies. It is an error to believe that large investors now depend entirely on government studies.

Finding and selecting a trading partner has not been easy, and especially if the proposed transfer is over a long distance, may require advertising and a real-estate-agent-like intermediary. Organized water exchanges are now reducing some of the costs.

Third, determining whether the seller's quality of title is adequate could be the source of some long-run real cost. This is because agency informality and discretion (that Howe *et al* found reduced information costs in New Mexico)²⁴⁶ is made possible by keeping legislation permissive and general. Hence, as Lucas found in western Canada, licenses (to large industrial water users) may be granted on conditions that were not specifically provided for in an Act.²⁴⁷ If these licenses were to be transferred again later, the agency's decision about whether to transfer the non-statutory conditions could be a source of later costs for renewed bargaining, serious contention, litigation and/or political action.

Finally, finding who might protest and studying the validity of their claims is the most costly of the four information procedures. In some American states litigating parties must go through a judge's adjudication of the rights at all sites along a stretch of the river.²⁴⁸ In places with administrative water systems (such as New Mexico, the Canadian provinces and the Australian states) an official routine may be easier. But there are inevitable costs, which the agencies do not handle for nothing, especially if the parties do not accept the data from the agencies' initial investigations.²⁴⁹

In summary, the transferability characteristic to be found in an appropriative right has probably increased. When water was less valuable, there were fewer channels for profitable trade. Few agricultural water users were disposed to sell any part of their water separately from the land they had developed, and to which it was regarded as being firmly appurtenant. The lack of pipelines and other means of transportation also reduced general interest in water trading.

246. See Charles W. Howe et al., *Transaction Costs as Determinants of Water Transfers*, 61 U. Colo. L. Rev. 393 (1990) (finding reduced information costs in New Mexico).

247. See Lucas, *supra* note 216 at 61-91 (providing Alberta case studies).

248. See Victor Brajer et al., *The Strengths and Weaknesses of Water Markets as they Affect Water Scarcity and Sovereignty Interests in the West*, 29 Nat. Resources J. 489, 502 (1989) (analyzing litigation costs).

249. See Howe et al., *supra* note 248 at 20 (analyzing costs under administrative agencies).

The increase in the value of water has uncovered economies of scale in the transferability characteristic. The laws have been tested in detail in the courts and many routes to water sale discovered. At the same time, politicians see themselves less in the roles of protectors of existing uses and communities and more as activists in the search for new water sources, including transfers from old uses. The result is that there are fewer legal obstacles and more ways to transfer and divide water: short-term; long-term and so on.

Transaction costs are potentially lower too, especially in the fields of enforcement and information. But it must be admitted that some transfers which would have been simple and informal before—especially contractual and temporary divisions and rentals—have become more complicated, calling on more experts and lawyers to handle the protests of interests potentially harmed by changes in diversions and appurtenances. These professionals have become well versed in blocking procedures, and versatile in combining activities in the media and legislatures with procedures in the courts and administrative agencies.

d) Flexibility of appropriative rights

The flexibility of a water right is measured by the extent to which it can continue to give a holder a secure and transferable interest in water use even when the economy has changed the kind of use that is in demand. For example, common law land-based rights showed themselves to be fairly flexible when there was a technical changeover from run-of-the-river flour milling to river-obstructing water storage and release for large-scale textile mills.

Have appropriative rights been flexible in this sense? The answer must be yes, if the user is regarded as seeking only to *divert* water. Water can be diverted and stored for almost any purpose, proving that the right that was developed for mining and ranching can remain as a robust legal interest for city water supply, electric power development, and even long-distance water imports or exports.

However, if a new user wishes to make other uses, especially those in-stream uses that call for security in the river's depth, quality or rate of flow, the appropriative right is turning out to be less flexible. It may be too specialized to resolve conflicts among *different* types of use, and in more populated regions it would seem to be inappropriate for non-diversion uses, a matter we discuss further below.

5. The Legal Basis of the Prior-Appropriation Right: Comparison of the English Prior-use Regime with the New World Prior-Appropriation Regime

There is a debate about the legal basis of appropriative rights, just as there was with the rights held by users in the tort-law phase. We have referred to appropriative rights as the latest in the succession of use-based legal regimes, likening them to their seventeenth and eighteenth century forerunners. But this view has been contested. As we stated in the Introduction to this essay, Maass and Zobel were particularly influential in rejecting the notion that there ever was a phase when English water law was based solely on seniority of use.²⁵⁰ Such denial echoes similar contentions in early nineteenth century judgments. In introducing the natural-flow theory, and ushering out the prior-use regime, the English courts had asserted that to be a property right in water, an entitlement must trace its roots back to some grant of ownership. They said it was not enough to show that the prior-use right arose from some tort-law-begotten factual ability to continue some water use or action immune to legal challenge.²⁵¹

In this Section we shall take this matter up by examining directly the legitimacy of American appropriative rights. Following this discussion we examine challenges to this legitimacy in states where two systems have survived together. Two other challenges to the water right are its relationship to ownerships and quotas within an irrigation organization, and its capacity to cater to demands for in-stream and non-diversionary water uses. We discuss these as items (c) and (d) below.

(a) The Legitimacy of American Appropriative Rights

The concept of an original land grant as the basis for water rights raises questions about the legitimacy of American appropriative systems. It emerged at a time and place in which, as we have said earlier, there was a pronounced "absence of land ownership." So where was the legal basis for a prior appropriative right? Was it enough for the new legislatures to legitimize the appropriative procedure, or could a root or connection to earlier land and water ownership be found? For example, was it satisfactory to explain that the original landowner—the federal government—severed its riparian water rights from its treaty-derived land rights and granted or transferred them to whoever claimed by appropriation? It could be argued that, although unformed or undocu-

250. Maass & Zobel, *supra*, note 9.

251. See generally *Mason v. Hill*, 110 Eng. Rep. 692 (K.B. 1833).

mented in the early nineteenth century, such a partial transfer with implicit retention of land rights *must* have taken place. Otherwise, according to this legal way of thinking, appropriative rights would have no original owner and so would be illegitimate or invalid.

While a rationalization of ownership is conceptually satisfying, envisaging an original holder of each property right in order to establish a legal root for it is not necessary for our description or comparison of systems of rights. In both the prior-use regime and in the system of prior-appropriation rights (the two systems based on actual use), rights were implicitly recognized by their enforceability and transferability, regardless of whether one could identify original ownership of the water within the original land-based system. They were usufructuary, "belonging" or attributed to individuals. Today's lawyers would call them "personal" rights in the same way that economists oriented toward legal foundations of markets would call them "property" rights, the designation they give to contractual rights. Regardless of the nomenclature, they are rights to water.

Does our analysis stop here? Not really. We must recall from the Introduction, the eighteenth century case of *Ashby v. White*.²⁵² This is known for an often quoted concept in law: there is no right without a remedy.²⁵³ When there is no legal means of enforcing a "property right," *there is no right in law*. Ability to defend and enforce rights *is the measure* of rights. Applying this reasoning, riparian rights which could not be enforced after the medieval period ceased to be rights. A lawyer might conclude, strictly, that our "twists and turns" sequence should contain a long gap from this period until prior-use doctrine was reaffirmed by the courts. But, as prior-use rights *remained enforceable* throughout this period, such a conclusion would be mistaken.

Prior-use and appropriative rights could be enforced in a common law "private river" (meaning, in England, beyond the influence of the tide and, in the United States, not navigable) whether the banks of the river were publicly owned or whether they were privately owned by a different person. Ownership of the river banks was irrelevant, since legal access to the river was considered a different matter from water rights.²⁵⁴ Public ownership of the banks in both the prior-use and appropriative systems, therefore, merely facilitated river access and blurred the old distinction between common law "private" and "public" rivers. It has even been used in Australia and Canada to prevent riparian

252. *Ashbey v. White*, 92 Eng. Rep. 126, 136 (K.B. 1904).

253. *Id.*

254. In the English prior-use phase, the land on both sides of the river was privately owned by individuals. In the prior-appropriation phase, much of it was still in the government's hands as "public land."

rights from ever being claimed. Availability of legal enforcement mechanisms directly between *de facto* usufructuary "property" rights in the users obviated the necessity to search for a "transfer" from private riparian rights as a legal basis, as in the western United States

Courts in nineteenth century England were not prepared, however, to make this argument. While Lord Denman recognized in *Mason v. Hill* that damage law had always been the law of England, he vehemently denied that senior users had a *right* to damage junior users' entitlements simply because the juniors could not enforce their entitlements against seniors.²⁵⁵ Those who followed in his footsteps said that the seniority system alone did not constitute a legal basis for a water right, and turned first to natural-flow theory and later to reasonable-use theory as the English law of water.

American courts, faced with the similar problem of tracing a legal foundation for the miners' and settlers' prior-appropriation system, settled the problem a different way: by protecting the new system. They turned to the legislature for statutory recognition of prior-appropriation rights. The English courts could have taken a similar path in 1851, but instead reached back to the past to salvage the old feudal system of law without its hierarchical trappings.²⁵⁶ Then they provided new mechanisms for its enforcement in the doctrines of reasonable-use.

(b) Co-existence, or repugnance, between appropriative and riparian rights systems?

Which differences between common law, land-based riparian and appropriative rights are important? The approach we have taken so far, followed in law journals, has dwelt on the differences which first surfaced in the excitement of litigation and lobbying in California during the late nineteenth century. There, holders of rights under the two contending systems battled to see their own rights prevail. In later waves the same battle spread to other American states and sympathetic battles were fought abroad. While the comparisons then made shed much light on the two systems, they were sometimes distorted by the rent-seekers' needs to support one system on an all-or-nothing basis.

Our approach in this section will examine what happens when the two systems exist in the same conditions. In particular, we will ask what happens when *the same jurisdiction* has both kinds of rights? When water is scarce there is a serious likelihood that a claim for flows made by a holder under riparian law will clash with claims to the same water

255. *Mason v. Hill*, 110 Eng. Rep. 692 (K.B. 1833).

256. See Lucas, *supra* note 216 (making similar remarks, about the opportunity missed). See also Clark & Renard, *supra* note 211, at 82.

by holders under the appropriation system. Is it true that riparianism cannot tolerate such a clash and must fade away?

i) Canada and Australia

In western Canada and the Australian states the lesson has been that, given the historical circumstances of the two areas, riparianism may well survive but can also be contained. It is difficult for parliamentary drafts persons to foresee every new situation that may provide an entry for a riparian argument.

A potentially serious clash occurred in British Columbia. By 1897 all Crown-granted riparian common law rights had been effectively transferred back to the Crown, clearing the way for the Province's system of administrative water licenses.²⁵⁷ These did not apply in the "railway belt," however, where the Dominion supported instead the riparian rights of loggers to whom timber berths had been issued.²⁵⁸ Pursuant to an inter-governmental agreement, a Board spent a decade reconciling the riparian rights of some users with the recorded water licenses of others.²⁵⁹ As in many North American jurisdictions, no limitation had been placed on the number of licenses issued, the seniority system being relied on to sort out conflicts. This was not the case, however, for riparian rights. Somehow the Board muddled through the inconsistency and gave precedence and appurtenancy to new licenses issued to the former riparian rights holders.²⁶⁰

This crisis, combined with irrigators' fears that riparian rights would call for water to be prorated during low-flow seasons, induced all western Canadian legislatures to improve users' quality of title. Surviving riparian rights had to be terminated and the appropriative system had to become universal.²⁶¹

257. See *Cook v. Vancouver Corporation*, A.C. 1077 (P.C. 1914) (appeal taken from B.C.); *Pasco v. Canadian National Railway Co.*, 34 B.C.L.R. 2d 344 (1989) (considering *Cook*, *id.*).

258. These riparian rights were confirmed by the Privy Council in 1911 in *Burrard Power Co. v. R.*, A.C. 87 (P.C. 1910) (appeal taken from Can.). See also Robert E. Cail, *Land, Man, and the Law* 116-24 (1974); Scott, *supra* note 194, at 357-58.

259. Cail, *supra* note 260.

260. We believe the reconciliation worked because the riparians were loggers with temporary berths who, moving on, lost interest in their water rights.

261. See Lucas, *supra* note 216, at 92 (noting the irrigators' fear of prorating). Riparian rights could be eliminated more easily here than in the American states because property is not protected under the Canadian Constitution. The provinces could take all private water rights by merely passing legislation to that effect. Provinces had the jurisdiction under the Federal/provincial division of powers in the Constitution to legislate over property regulation, civil rights, and lands.

But there have been several survivors of riparianism. Legislators have been unwilling to impose a license requirement on domestic and stock users.²⁶² The acts and their administration in all western provinces allow such users, usually small farmers, to take water even in time of drought.²⁶³ This survival has not created serious disputes.²⁶⁴ Perhaps the explanation is that nearly all western Canadian streamflows are divided so slackly that the small volumes taken by this class of user are not politically significant. The practice worries some legal scholars, however, because it constitutes an admission that the riparian ideology is still acceptable modern water law.²⁶⁵

Another survivor is a common law right to water quality.²⁶⁶ The natural-flow version of the right of downstream riparians to receive water undiminished in quality still exists. A downstream victim's natural-flow rights to quality do not depend on "use," and therefore are independent of his water license, if any. They are similar to his rights not to be injured or hindered in his use or enjoyment of *land*, which are enforceable by the law of nuisance. However, all provinces and the federal government have water pollution legislation that since the 1960s has dominated individual attempts to rely on either riparian law or nuisance law.²⁶⁷

In Australia the early co-existence of common law rights and statutory rights has been well chronicled by Clark and Renard.²⁶⁸ Although, as we have mentioned, in the gold rush water had come under an administrative licensing system, riparian rights continued to be respected in urban and rural areas.²⁶⁹ Subsequent legislation providing for waterworks, sewage, and irrigation districts did not change this, for

262. See Water Act, R.S.B.C., ch. 429, § 42(2) (Can. 1979) (making specific provision for domestic uses, even in British Columbia where it has been said that riparianism has been completely extinguished: "It is not an offense for a person to divert unrecorded water for domestic purpose or for prospecting for minerals but in a prosecution under this Act the person diverting the water must prove that the water is unrecorded."). See also Zimmerman, *supra* note 224.

263. Percy, *supra* note 202, at 17-19; Lucas, *supra* note 216, at 21-22. In British Columbia prospectors have also been able to divert without a license.

264. See Johnson v. Anderson, 1 W.W.R. 245 (O.B.C.S.C. 1937) (holding that a dispute having arisen—the right to use water for domestic and stock purposes still existed and still gave right to a remedy against unlawful diversions).

265. See Lucas, *supra* note 216, at 49-51; Percy, *supra* note 202, at 17-22.

266. See Lucas, *supra* note 216, at 52 (commenting that Canadian water rights systems still have scope for common law rights with respect to (a) the drainage of riparian properties and (b) groundwater). *Id.*

267. See M.T. Rankin, *Despoiling a River: Can the Law Help to Sustain the Fraser River?*, in *Perspectives on Sustainable Development in Water Management* (A.H.J. Dorsey ed., 1991) (discussing alternative statutory approaches but failing, surprisingly, to mention possible common law approaches).

268. See Clark & Renard, *supra* note 211, at 140-271 (concentrating on the state of Victoria).

269. *Id.* at 163.

it provided for injured riparians to be compensated. Not until 1886, with Alfred Deakin's *Irrigation Act*,²⁷⁰ was the right to the use of all water vested in the Crown, new riparian rights forestalled, and the possibility of obtaining permanent water rights by prescription removed.

By then a significant group of riparian owners existed. Clark and Renard claim that after 1905 the "vast majority" of users held licenses.²⁷¹ This was partly because the Lands Offices had reserved stream-side strips of land for the Crown to forestall settlers' grants from being, technically, riparian properties. However, many lands evidently held under grants made before this policy began often sub-divided, and remain as an irritant in the universality of the system in Victoria.

Deakin and his Australian contemporaries were religiously converted to state provision of irrigation works. Why were they so determined to stamp out riparian rights? To an outsider, it seems that they could have co-existed. Perhaps social class came in: old riparian rights were held by the wealthy "squatters" with their huge holdings, while irrigation was to bring water to a new class of smaller farmers.

Clark and Renard provide a more technical explanation. They remark:

it seemed to be the opinion of Deakin that, in order both to confer adequate powers on government, and, at the same time, to discourage the wasteful private litigation which plagued the Western United States, it was necessary to abolish all private rights to water. To his mind, the concept of administrative apportionment of resources was mutually inconsistent with the continued existence of private rights of action between individual water users. This attitude persists . . .²⁷²

The phrase "apportionment of resources" is not quite accurate: state irrigation policy increasingly committed the state to providing water to everyone in selected state irrigation regions. The water legislation, therefore, was framed to bring about an administrative apportionment of *the benefits of public investments*.

270. *Irrigation Act*, (Vict. 1886).

271. Clark & Renard, *supra* note 211, at 186.

272. Clark & Renard, *supra* note 211, 196-97. Deakin was not yet thirty when the legislation was introduced. He was immensely influential in Victoria, bringing in such social legislation as the factory and arbitration acts. In the 1890s he devoted himself to the federation of the colonies, and became second prime minister in 1903. C.M. H. Clark, *A Short History of Australia* 179 (1979). All Deakin's delegation and other Australian visitors to the United States seem to have been over-impressed by the volume of litigation, especially in Colorado. Later Victoria governments brought Elwood Mead, designer of the Wyoming version of the irrigation district to design legislation. The resulting legislation reinforced the water-sharing idea instead of seniority, an idea Mead had pushed within irrigation districts. Powell, *supra* note 183 at 135-40.

ii) *American states*

In the American states where the two systems of water right coexist, riparianism is on the decline. This is in spite of the Constitutional guarantee to property, and the historical precedence, in some states, of riparian law.

In the mixed-system states²⁷³ the following question has arisen: if the Constitution's protection of property prevented riparian users from being evicted, could it tolerate a change of system wherein their use and volume became accountable to the community of water takers, rather than to the community of riparians? How did the appropriative system win the day?²⁷⁴

Oregon

In Oregon, the trick was accomplished *in the courts* through the judicial reinterpretation of old statutes, and legislation grandfathering riparian rights in place prior to the statute while qualifying newer rights under the guise of regulation. In *Hough v. Porter*²⁷⁵ the Oregon Supreme Court interpreted the federal *Desert Land Act* of 1877 as meaning that the federal government had dedicated to the public all of the waters then in the public domain, thereby abrogating riparian rights on lands settled afterwards. This interpretation considerably reduced the number of riparian rights holders.²⁷⁶

The Oregon water code of 1909 went farther. While recognizing

273. We will look specifically at two mixed-system states, namely Oregon and California. Both of the water law systems of these states are modelled after the "California doctrine," whereas the exclusively appropriative systems of other states are modelled after what is called the "Colorado doctrine." See Pisani, *supra* note 195, at 35 (further elaborating on this distinction).

274. Our skeptical tone here arises from our belief that the informed few who advocated appropriative rights did not admit to ranchers and politicians that alternatives existed. There was an exaggeration of the gains and losses to be derived from the opposing systems because of the polarization of views arising from the upset of *Lux v. Haggin*, 10 P. 674 (Cal. 1886). Even today most American law histories read as though the system of common law could not conceivably have been further modified to encourage consumptive or inland water use. In doing this they deny the facts of development of older water-using industries in the United States and England. Of course transactions costs under an adapted riparian system could have been higher than under most appropriative rights systems. But that is a subject few historians and law professors have explored or mentioned. Pisani, *supra* note 195, does address this idea, specifically with respect to 19th century Western U.S. water law. Others write as though they believed that common law would have *prevented* today's irrigation, surely an effect beyond the power of any property-right variant in western society.

275. 98 P. 1083 (Or. 1909).

276. A federal court case which adopted "beneficial-use" as the test of the riparian right was *Eastern Oregon Land Co. v. Willow River Land and Irrigation Co.*, 187 F. 466 (D. Or. 1910).

old riparian rights, it limited them to those under which beneficial use had been made of the water prior to the passage of the legislation, and to the quantity of water beneficially used. It also provided for stream adjudications to determine the relative rights of claimants to water. In *California-Oregon Power Co. v. Beaver Portland Cement Co.*, the majority of the United States 9th Circuit Court of Appeals upheld the constitutional validity of the legislation, maintaining that the water code did not destroy the usufructuary privileges of riparians, but only *changed the conditions under which they could be exercised*.²⁷⁷ In other words, it confirmed the idea that even vested rights are subject to reasonable regulation by the state.²⁷⁸

Those riparian land owners who also held some appropriative rights to the same water could not assert both riparian and appropriative rights, hoping to get "the best of both worlds."²⁷⁹ The court held that such owners must choose which right to claim and must forfeit the other. If they attempted to assert both, the court would choose for them from the language of their claim. Any mention of specific quantities of water would result in a deeming that they had elected to hold only an appropriative right.

This judicial and legislative onslaught failed to remove totally remove the advantages of holding on to riparian rights to water. In particular, in a conflict with another holder of riparian rights, a user might be better off with a riparian than with an appropriative right. Another advantage would be that a riparian owner's "ordinary" uses of water for stock and domestic purposes would be completely protected. Finally, a right holder might find a postponed future use better protected by a riparian right because of the possibility of obtaining, on request, declaratory judgments or decrees.²⁸⁰

California

277. See *California-Oregon Power Co. v. Beaver Portland Cement Co.*, 73 F.2d 555, 568-69 (9th Cir. 1934). See Hutchins, *supra* note 188, at 210. The effect of the U.S. Court of Appeals decision in *California-Oregon Power Co.* was also to uphold the interpretation given to the water code by the majority of the Oregon Supreme Court in *In re Hood River*, 227 P. 1065 (Or. 1924). See also Hutchins, *supra* note 188, at 207 (footnote omitted) (stating that "the Oregon Supreme Court . . . construed the water code as having validly abrogated the common-law riparian rule as to the 'continuous flow' of a stream except where the water had been actually applied to beneficial use").

hs was also the earlier view of the Oregon Supreme Court in *In re Willow Creek*, 144 P. 505 (Ore. 1914). See also Hutchins, *supra* note 188, at 206. Exception was made in the 1909 water code for those with works in progress, the amount of the right being limited to the quantity of water used a reasonable time after the passage of the act .

279. For example, an appropriator, unlike a riparian, has no right to surplus water.

280. In Washington and other states, however, the riparian must prove he will use water within a reasonable time.

Unlike Oregon's drastic curtailing of riparian rights, California upheld riparian rights which had been claimed even after the *Desert Land Act* and even where they conflicted with appropriative rights.²⁸¹ Appropriative rights were limited to public lands *not federally reserved*. This decision had the effect of reintroducing a system of water rights believed by many to be inappropriate for California's dry, mountainous land and reducing the scope of the system that had worked.

The constitutional rights of the riparians prevented the legislature from taking the kind of action we have seen in Australia, replacing the riparian system with an administrative system. There were fears that riparians, by exercising a kind of natural-flow right, would now prevent any water from reaching the state's irrigated fields away from the streams. The courts too would be powerless to protect the appropriative system. Their role would be narrowed to the application of reasonable-use law among disputing riparian proprietors.

In desperation, the legislature began to encourage holders of appropriative rights to take up *prescriptive rights*. Statutes shortened the prescriptive period to a mere five years. The courts helped this by interpreting the "adverse" requirements of the prescriptive process so as to burden riparian owners not yet using the water.²⁸²

This was helpful in creating new rights, because often "large diversions in rivers were made near the point of emergence of the streams from the mountains. The riparian lands that would be seriously affected were so far downstream that the diversions frequently provoked no immediate opposition, and sometimes they ripened into prescriptive rights before they were opposed."²⁸³

Once obtained, the Californian prescriptive right was very similar to its common law cousins in other jurisdictions. A "hybrid," partly land-based, partly use-based, it became a third type of water right and a corrective force in a state where withholding of water could quickly result in a desert.²⁸⁴

281. *Lux v. Haggin*, 10 P. 674 (Cal. 1886).

282. Adverse use" was held to mean use of which the riparian (who, if not using the water, would not be otherwise "adversely" affected) had the *means* of knowing. See Maass & Anderson, *supra* note 201, at 229 (stating "[t]he courts held that the actual appropriation of water, followed by open, continuous and exclusive possession for the prescriptive term, gave the right").

283. *Id.* at 229.

284. See *id.* at 227 quoting T.S. Harding, who gives an account of the Anti-Riparian Organization of California, eloquently making the case for appropriative rights in the preamble to its articles:

"Whereas, attempts are now being made to resurrect the English common law doctrine of riparian rights from the grave to which the will of the people long since consigned it, and to impress it upon the jurisprudence

Another way California mitigated the impact of riparian rights was to allow, by legislation, the transfer of water out of the "riparian tenement," although not out of the watershed. This modification of the riparian system detached the water right from the riparian land yet recognized the principle of not depriving other riparians in the basin of continuing flows. It had the unexpected effect of allowing upstream irrigators, albeit at the increased cost of pumping and long diversions, to use water from downstream locations without harming riparians along the way.²⁸⁵

iii) Conflict of law

Another type of mixed system is found in boundary streams where users in the two jurisdictions hold rights under different governments or courts. Are either riparian or appropriative rights good against users in the other jurisdiction? What happens when the other jurisdiction has the opposite system of water rights? These boundary questions crop up in the law of nations and also in the laws governing federal states.²⁸⁶

It would seem that, in principle, a boundary would provide few problems for the recognition of riparian rights. Each riparian's water rights stem from his land proprietorship. Riparians still have the same rights and responsibilities as members of the "community of the river" as judged on either the natural-flow or the reasonable-use theory. These rights and responsibilities are not created by governments and need not terminate at frontiers.

of the State; and, Whereas, such attempts if successful, mean the desolation of thousands of homes; mean [sic] the desert shall invade vineyard, orchard and field; that the grape shall parch upon the vine, the fruit wither on the tree, and the meadow be cursed with drought; mean that silence shall fall upon our busy colonies, and their people shall flee from the thirsty and unwatered lands; mean [sic] that the cities built upon commerce irrigation has created, shall decay, and that in all this region the pillars of civilization shall fall, and the unprofitable flocks and herds shall graze the scant herbage where once there was a land of corn and wine, flowing with milk and honey. . . ."

285. See Eric T. Freyfogle, *Context and Accommodation in Modern Property Law*, 41 Stan. L. Rev. 1529 (1989) (showing his gratitude for such features of the riparian system in action).

286. We distinguish between cross-boundary water disputes among governments and those among individuals. The former are concerned with the international and constitutional law, the latter with the conflict of law. See Anthony Scott, *Individual Water Rights in an International Water Market*, in *Water Export: Should Canada's Water Be Sold?* 141-81 (J. Windsor, ed. 1993). See also Joel A. Gallob, *Birth of the North American Environmental Transboundary Plaintiff*, 15 Harv. Envtl. L. Rev. 85 (1991); *Managing Natural Resources in a Federal State* (John Owen Saunders, ed. 1986); Pisani, *supra* note 195.

What the frontier does terminate is the jurisdiction of the complainant's court. Enforcement now requires either inter-state agreements about court jurisdiction or an appeal procedure to a tougher federal court. In a 1931 case an upstream state, Massachusetts, threatened to divert water that would otherwise flow by riparian lands in Connecticut.²⁸⁷ The latter sought an injunction from the United States Supreme Court. The court did mention the downstream state's claim to an uninterrupted flow but, in the absence of evidence of actual damage or of detriment to navigation, it refused to act. It preferred a reasonable-use criterion to a primitive natural-flow right.²⁸⁸ The Court stuck to land-based riparian law and demonstrated how what is "reasonable" depends on the bench from which the alternatives are viewed. A Connecticut court applying reasonable-use theory probably would have given Connecticut its injunction.

In an appropriative rights regime, when a river is entirely within one state, a user's right stems from prior appropriation, recognized by custom and validated by state legislation. When the river flows between states, will a user's right be recognized across the frontier? Answering this question takes us back to the legal basis of the appropriative right, as discussed above.

One theory is that a user's right is merely a regulatory permit. Hence its validity runs only where the province or state's legislation is enforceable. That is to say, it is a property right only because the state sees to its enforcement.²⁸⁹ If so, it is obvious that the answer to the question, "Is the use-based right granted or issued in one state robust enough to be enforceable in another?" will be no. Absent reciprocal inter-state legislation, a right will not be respected in the adjoining state.

287. *Connecticut v. Massachusetts*, 282 U.S. 660, 669-70 (1931).

288. *Id.* See also *New Jersey v. New York*, 283 U.S. 336 (1931). "Reasonable-use" is our terminology. In the United States (in default of a contract or compact or agreement between the states) a dividing of water by the Supreme Court is referred to as application of the principle of "equitable apportionment."

Increasingly the Court has balanced the benefits or damages in alternative schemes of division, leading to recent decisions to allow old uses to be replaced by new uses of higher value. In our discussion of the reasonable-use phase of water rights we identified this kind of balancing as a process of utilitarian maximization of benefits from a given river. Our interpretation coincides with that in Richard A. Simms, *Equitable Apportionment—Priorities and New Users*, 29 *Nat. Resources J.* 549, 550 (1989). See George W. Sherb, *Equitable Apportionment after Vermejo: The Demise of a Doctrine*, 29 *Nat. Resources J.* 565 (1989) (giving a recent chronology of equitable apportionment cases). See also Helsinki Rules on the Uses of the Waters of International Rivers, art. 4 (1967) (showing, through widespread acceptance, the presence of this principle in international law).

289. A complication is that appropriative rights do not remove some riparian rights to sue when injured by pollution.

The above theory blends in with a second one—namely, that a user's water right is based on the states' and provinces' declarations that all rights to use flows of water are vested in the people, the Crown or the government. These rights would otherwise belong to others; to riparians, in fact.

The results of this approach in the United States differ from those in Canada and Australia. Most American courts treat water rights, even those issued as "permits" by administrators, as transferable property, usually real property rights. State declarations of vesting or ownership had long been discounted, and in 1982 they were described by the United States Supreme Court as a fiction: in inter-state commerce, water rights were likened to a commodity.²⁹⁰ This judgment did not pronounce on the basis of individual rights except to recognize that they existed. As the states were not the ultimate owners the rights were not merely administrative devices. On this basis, individual water rights should be respected outside the state and individuals can trade them up and down the river, subject to legitimate state aims.²⁹¹

In Canada the provinces' claims to ownership or possessory rights have been more successful. The provinces' rights stemming from their original land ownership, their vesting in the provincial Crown of "property" and of various riparian rights, their further constitutional rights to make laws concerning their public lands, and concerning property and civil rights generally have all tended to deprive any Federal (formerly Exchequer) court of any role at all in connection with the allocation of water or recognition of individual provincial water rights.

The conclusion for Canada is a complicated one. The users hold water rights issued by the province. Their permits are not necessarily compatible in volume, benefit or seniority. The same water may easily be appropriated in two or more provinces. Hence, interference with or lack of recognition of a water right outside a province requires reconciliation or adjudication, not individual litigation.

Taking a larger perspective gives the following analysis: the vesting of water rights in the provincial Crown is a form of riparian ownership,²⁹² because it is confined to watercourses and also because it was created by abolishing and taking individual riparian rights. Therefore, the relationship of the provinces to one another are those of adjoining riparians.

290. See *Colorado v. New Mexico*, 459 U.S. 176 at 181 (1982). See also A. Dan Tarlock, *The Law of Equitable Apportionment Revised, Updated and Restated*, 56 U. Colo. L. Rev. 381 (1985).

291. Richard Ausness, *Water Rights Legislation in the East: A Program for Reform*, 24 Wm. & Mary L. Rev. 547 (1983).

292. In contrast to the appropriative rights of the actual users.

There is no scope for the Federal or Supreme Court of Canada to deal with riparian law, damages or interference as between the provinces. Hence there is no scope for a federal court to become involved in making judgments where the concepts of reasonable-use or equitable apportionment would lead to the maximization of benefit from a river from a national point of view. The provinces' points of view are all that matter. Consequently, various authorities have urged that the provinces proceed by negotiated "cooperative" management²⁹³ and have pronounced or predicted that the final basis for litigation or for mediation across provincial boundaries is common law.²⁹⁴ All these conditions are internal to each province's system of water licensing. And, so far as we are aware, no interprovincial cases have yet arisen.

In Australia the best known instance of conflict of rights or of ownership is that in what is now the Murray-Darling system. The River Murray Agreement between three states and the new Commonwealth (1915), which among other goals reconciled navigation with irrigation, was settled by joint developments of storage, locks, weirs and the provisions in dividing irrigation waters. No other interstate stream has comparable importance.²⁹⁵ This engineering approach to conflict has been said to be a forerunner of the TVA and the St. Lawrence waterway schemes, and a few other "whole-basin-planning" examples.

(c) *Water storage organizations*

Water law and water rights have been modified to accommodate irrigation organizations from whom most farmers now obtain irrigation water. Since in dry regions wet-season water must be carried and stored, the capital expense proved to be more than the typical irrigating farmer could handle alone. The first settlers chose stream-side locations where rough diversions would be adequate. Riparian law could have been tailored to suit the needs of many of them. But higher and remoter benches required dams and canals, as well as constant maintenance. The

293. See, e.g., Barry Barton, *Cooperative Management of Interprovincial Water Resources, in Managing Natural Resources in a Federal State* 235 (John Owen Saunders, ed. 1986). See also *Water Law and Policy Issues in Canada* (H.R. Thompson, eds. 1984) (writing that Canadian courts would not substitute their own opinions for the negotiated agreements between the provinces).

294. See, e.g., Percy, *supra* note 202 (suggesting that the Supreme Court will eventually be faced with suits on a sort of interprovincial riparian right to clean water). See Zimmerman, *supra* note 224 (predicting that common law riparian rules will govern in interprovincial affairs). But see Dale Gibson, *The Constitutional Context of Canadian Water Planning*, 7 *Alta. L. Rev.* 77 (1968-69) (favouring federal jurisdiction over interprovincial waters). See also Barton, *supra* note 296, at 236 (describing the legal uncertainty in the area).

295. Powell, *supra* note 183, at 139-40.

Mormons showed the way, with their cooperative colonies of water users. Some later settlers followed them, but most became the customers of commercial ditch and canal companies. Not a few of these were linked to land-development companies, who promised water to potential suppliers. As a result, many users found themselves tied by geographical isolation, as well as by lease or contract, to monopoly sellers who could be predicted to seek to capture the rents of water use. Disputes over quantities and price were a commonplace.

There resulted three institutional forms. First, in the courts and the legislature the farmers sought to prevent the ditch companies from obtaining title to the water. For example, some states had decided that water left in storage was being used "beneficially." This had helped the irrigation firms.²⁹⁶ Now some states decided that water was not used "beneficially" until it was distributed to the fields—hence the ditch company could not appropriate it before the farmer. As well, it was decided that a water right must be appurtenant to the farmer's address, not to the ditch company's point of diversion.²⁹⁷

Second, the farmers tended to take over from the ditch companies. This was partly because of the new rules (above) but mainly because there was little money to be made in many locations. The companies' assets wound up in the farmers' hands, the favored institutional form being the cooperative or the mutual irrigation company. It was essentially a non-profit partnership. Each share gave the member a unit water entitlement, and also a share in expenses, work and debt. There was no volume charge, but a member could sell or rent water to a fellow member. In the United States these organizations eventually gained complete tax exemption from all levels of government.²⁹⁸

Third, around the turn of the century, a move toward public irrigation districts began to dominate. These had similarities to local government organizations. Each acre (not each share) gave a unit water entitlement. Expenses were not divided evenly among shares but split between a property tax (an acreage charge) and a water charge. Economic analysis suggests that in a district created out of a mutual company, the power to finance by a property tax will result in intensive water users getting a water-price subsidy from their neighbors.²⁹⁹ The district provided a useful vehicle for distribution of water from senior govern-

296. Stephen F. Williams, *The Requirement of Beneficial Use as a Cause of Waste in Water Resources Development*, 23 *Nat. Resources J.* 7 (1983).

297. Dunbar, *supra* note 200, at 103-5.

298. Maass & Anderson, *supra* note 201.

299. Rodney T. Smith, *The Economic Determinants and Consequences of Private and Public Ownership of Local Irrigation Facilities*, in *Water Rights, Scarce Resource Allocation, Bureaucracy, and the Environment* (T.L. Anderson ed., 1983).

ments' high-dam projects, in the United States, Canada and Australia.³⁰⁰

Whether water is distributed by the gallon, the share purchase or the acre-unit, all users are essentially being provided with a fixed percentage share of the total amount available to the organization in a given period, this total amount being based on one or more appropriative water rights, senior or junior, held by the organization for its members.³⁰¹

Are the members' entitlements equivalent to a water right? They depend on overall compliance with an irrigation-organization law, not water law. They are perhaps less secure than a water permit or right, for the organization can fail financially. The entitlements' individual transferability depends on the legislation, and also on the decisions or by-laws of the particular organization. At one extreme there are organizations where memberships and/or acres can be sold to anyone so that the attached water rights can be transferred outside to another user whose position can be compared to that of the non-resident holder of a commoner's right in an English manor. The right was tangible enough but the manor, or water district, was being deserted. At the other extreme are organizations whose original formation wiped out any idea of further transferability. The water was dedicated to the area of the irrigation organization in perpetuity. In between are organizations where the member cannot sell his water right or share of stock but can sell his water for a season or less.³⁰²

If these semi-transferable shares are regarded as a kind of water right, the question of the origin of water rights becomes a question about

300. See Clark & Renard, *supra* note 152, at 164-69 (describing how the first Australian equivalent to districts were trusts which were given ownership of whole streams with the purpose of providing for their proper administration, and which were then replaced by a water commission which oversaw all the trusts).

301. See E. Schlager et al., *Mobile Flows, Storage, and Self-Organized Institutions for Governing Common-Pool Resources*, in 70 *Land Economics* 22-33 (1994) (organizing their research into the institutional implications of storage for certain kinds of common-pool resources, and concluding that users "of cell 1 types of resources [fisheries with no storage, some irrigation systems with no storage], in many instances, do not attempt to directly manage the mobile flows, since such flows are often unpredictable, and what benefits users would produce may be captured by others who also have access to those flows. Users of cell 2 [grazing areas with no storage], 3 [some irrigation systems with storage], and 4 [groundwater basins with storage] types of resources, because of storage and/or stationary flows, however, can exert direct control over the flow units, and do, as is exhibited by the types of allocation rules that such users adopt. Instead of allocating access to flow units through time slots, access may be achieved by granting fixed or proportionate shares of the flow units to each resource user. For instance, in each of the California groundwater basins examined, except for one, pumpers owned transferable shares of water"). See also Maass & Anderson, *supra* note 201, at 379-81 (providing for the value of storage in all sharing systems).

302. Frank J. Trelease, *Trelease, the Model Water Code, the Wise Administrator and the Goddam Bureaucrat*, 14 *Nat. Resources J.* 207 (1974).

the origin of irrigation organizations. Is there a *general* model explaining how these get started? This question has fascinated many historians and social scientists. To the anthropologist Wittfogel, the creation of irrigation organizations led to the development of different types of political systems.³⁰³ To the irrigation enthusiast Elwood Mead, irrigation districts should be regarded as though built out of the pooling of *existing* water rights.³⁰⁴ To Eleanor Ostrom, water district organization is a form of common-pool resource management that *precedes* and explains collective management and may even explain the appearance of government itself.³⁰⁵ Beyond mentioning the breadth of these approaches, the details of the connection of water organization of larger institutions are too complex to be taken up here. The story is bypassed in much of the property law literature because the share is not, legally, a water right.³⁰⁶ It is important to us here because increasing water scarcity is leading to increasing investment in storage and delivery systems. Thus an increasing proportion of water users hold water contracts, leases or shares issued by an organization rather than official water rights. Lawyers neglect this because the shares are not legal rights, but we should note it because it may point to a future reshaping of appropriative rights. Note that, as with Australia's state systems, these storage organization rights dispense with the idea of seniority or precedence. In general, all users share surpluses or shortages equally.³⁰⁷

(d) *In-stream Uses: Appropriative vs. Riparian*

The question of difference between appropriation and riparian rights systems arises again when one considers in-stream uses. The laws of most states and provinces using the appropriative system *require* a diversion as a condition for obtaining and keeping a water license. This requirement has incidental administrative advantages: the diversion works show that the applicant or appropriator is serious, and it serves to provide a measurement of the volume being appropriated.

The total utility of a stream is much more, however, than the sum of the individual diversions or abstractions along its banks. For example, a navigable stream provides a multitude of more general uses besides

303. Karl A. Wittfogel, *Oriental Despotism* (1957).

304. Elwood Mead, *Irrigation Institutions* (1903). On Mead see James R. Kluger, *Turning Water with a Shovel: The Career of Elwood Mead* (1992), especially pages 21-22.

305. Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (1990).

306. See Trelease, *supra* note 169, at 603-6.

307. See Maass & Anderson, *supra* note 201, at 375-79 (showing that actually there are seven systems available, of which equal sharing is only one).

navigation: drainage, transportation, wildlife habitat, fish habitat and migration, fishing, recreation and water quality, together with the converse use of monitored water pollution. To these are added more abstract uses having to do with protection of the ecological chain and biological diversity, conservation and restoration of the natural environment of the watercourse and the landscape through which it threads. These tie in with the goals of global sustainable development of water as a resource. All of the above uses of the river have in common that they rely on a required level of water being *left in the stream*. They are the "in-stream" or "natural-state"³⁰⁸ uses.

Formally, rights under the appropriative system can be used to allocate water for such purposes. Legislation and regulations do make provision for issuing regular permits or rights so that the water would be appropriated by being left in the stream. Some have done so to a greater extent than others.³⁰⁹ An alternative is to place an in-stream flow requirement or reserve on the conditions of other diversion or consumption licenses. However, in-stream purposes are almost universally served instead by customary, constitutional or statutory regulations, some imposed and administered under the powers of a senior or federal government, others under the powers of provincial or state politicians and their agencies.

While such applications of appropriative rights to stream levels may begin with a formal application, or in older jurisdictions with the market purchase of a diversion right, they are never treated as routine transfers. In some jurisdictions they are handled entirely administratively, and in the rest there are procedures and guidelines that give little scope to market-wide trading. These modifications reflect a political reluctance, almost unwillingness, to see water taken from "productive" uses. This is not surprising, for the original idea in many users' and politicians' minds, as evidenced by seniority and beneficial use principles, was that *all* the water in a stream ought to be diverted to irrigation or other uses such as mining, without "waste." Allocating it now to in-stream uses represents an almost shocking reversal of that original attitude.

In our opinion, the trend since the 1970s to providing appropriated water for in-stream uses signifies more than an evolutionary replacement of an old by a new beneficial use. The old uses remain, and water is in simultaneous demand for stocks and flows for *an increasing number*

308. "Natural state" is the expression that appears in the Alberta Water Resources Act, R.S.A., ch. W-5 (Can. 1980).

309. See Johnson & DuMars, *supra* note 14, at 361-67 (neatly summarizing American procedures). See also Water Resources Act § 11(1)(c), (authorizing the issuing of a water license for conservation, recreation or the propagation of fish or wildlife or any like purpose).

of uses. Hence, the provinces' and states' machinery for transferring appropriative rights have come under pressure to deal with *multiple purposes* through the exchange and marketing of transferable rights, raising questions about whether the appropriative right will ultimately prove to be an appropriate interest in using streams and watercourses. Even with the greatest of flexibility in the transferability, divisibility and modification of diversion rights, a pure appropriative rights system may be inadequate to accommodate increasing demands for in-stream or natural uses in its portfolio of water applications, because the primary focus of the appropriative rights system, from its very origins, is on "actual use."

Can a riparian system cope with multiple use? To the extent that in-stream uses take priority over diversion to consumptive uses, a riparian rights system might actually provide a more efficient method of stream management. The reader will recall that the nineteenth century system of land-based rights took as one of its points of departure the legal obligation of each riparian user to maintain the level and flow of the stream, providing "natural" flow, "natural" quality, et cetera, to the other riparians.³¹⁰ This concept could be revived and restructured or redefined, as once happened in California and Oregon, to provide now for "natural state" as one of its multiple uses.³¹¹

Although the natural level and flow concept could protect the non-exploitation of a river by subjecting all uses to level and flow maintenance, riparian rights are limited by awkwardness and impreciseness regarding the more active river uses, in particular their transferability, divisibility and certainty. With increasing world populations, and increasing demands for water, non-use of the rivers cannot just take precedence over use. What will be important is a system which best allows for the increasingly difficult act of balancing the two.

310. To the extent that statutory flow laws rather than individual rights are providing for instream uses, the new approach represents a reappearance of mixed systems where water must again flow in its "accustomed channel." See Dunbar, *supra* note 200, at 217 (providing references).

311. American streams fall into two legal categories. Those that are not navigable are subject to state water law. Those that are navigable are subject to federal powers to regulate commerce, but nevertheless the title to the bed of federal streams passes to the state. Typically, if the stream was navigable, a state and not the riparian owner or the water appropriator continued to hold the bed. The state could not and cannot easily grant the bed for a private use, for since 1892 the courts have held that it is owned subject to a public trust to use the river for public purposes. At one time the main public purpose was navigation. But today, decisions such as *National Audubon Society v. Superior Court of Alpine County*, 658 P.2d 709 (Cal. 1983), call on states to exercise the trust in their administration of prior-appropriative rights to assure instream flows for what are essentially environmental purposes.

6. Recap

The prior appropriation systems we have described above can be summarized as follows. There are two versions: the first is strictly in accordance with principles of seniority and beneficial-use and is enforced in the courts; the second incorporates other statutory refinements and is enforced by administrative agencies.

The original version appeared in California as a by-product of the system of mining rights developed at the same time; and in other states as a means of allotting water in dry-land ranching and perhaps irrigation. The second version, which appeared later in various American jurisdictions, has not been explained. Its appearance in Canada and Australia is a direct result of the decisions of colonial officials coping with spillovers of the gold rush; its changes in form are due to its use by governments as an instrument to assist and promote development.

In its original, court-enforced version, the appropriative rights system had the following features:

- a) Persons acquire a right to use or divert the flow of the stream by the act of doing so;
- b) The right is to a specific volume of water taken at a specific location on the stream, but is not appurtenant to the land;
- c) The right is not dependent on the user owning land on a stream;
- d) Stream adjudications are often made of all rights on a stream;
- e) Appropriative rights can coexist on streams with riparian rights, with help from legislation and administrators, provided there is plenty of water for all rights to be satisfied. Administrative ordering between various rights establishes seniority between them;
- f) In principle, appropriative rights are highly transferable. Legislation and administrative procedures restrict this to protect return-flow users and for other policy reasons;
- g) The right is subject to the right of prior-users on the stream. A right's seniority is established by the date at which a recognized use begins;
- h) In times of water shortage, the senior quotas are fully satisfied before juniors are allowed any water at all;
- i) A senior user can enforce his right against a junior right by proving seniority of use;
- j) A junior user can establish his use against a senior user by showing that the senior user is not making beneficial use of the water;
- k) The right is deemed abandoned if the user fails to continuously make "beneficial use" of the amount of

- water he is entitled to use or divert;
- l) Damage suits are not used to enforce either seniority or beneficial use;
 - m) Storage of water was not originally considered a "beneficial use." Members of storage and irrigation organizations pool their rights and by formula share the organizations' total available water. A share is not a divided appropriative right, but may be regarded as one;
 - n) Appropriative rights were originally held only for water diversion. Now some are being acquired for in-stream or natural state purposes. In administrative systems licenses or permits can be issued for water power storage and other interferences with flow;
 - o) Pollution matters and groundwater allocation are handled outside the system by statutory systems, or, in mixed systems, by riparian rights law.

The changing economic characteristics of the system cannot be so briefly outlined:

- p) The duration of a water right, in both the original and the administrative system, remains long, or perpetual in most places;
- q) The flexibility of the system to accommodate new uses is coming under stress. When all "uses" were diversions, appropriative rights were adequate. Now, with multiple purposes for stream management, they seem too rigid;
- r) The quality of title or security of the system seems as good as ever. In many American jurisdictions there is much talk of compensation of users from whom administrative permits are taken—that is, of permits being a real property right, with values based on market prospects for water. Statutory provision for expropriation with compensation is a common feature. In Canada and Australia, too, water rights are at least as secure as ever, but there is little understanding that for permits to be marketable they must take on the characteristics of real property;
- s) The exclusivity of appropriative rights for diversionary uses is as good as at the outset. However, when water rights are devoted to in-stream levels or natural states, the various uses can be superimposed, in conflict and not exclusive. Water law probably cannot resolve this;
- t) Transaction costs and transport costs previously exceeded water values, so transferability was not highly sought after. Today, market innovations are eroding barriers to transferability and new procedures and laws make short-term or partial transferability—divisibility—commence. Since about 1900 in the United States, Canada

and Australia, the development of water rights has been only one of several goals of water users. For example, instead of relying on litigation to improve users' security and exclusivity in their water rights, they have looked to government to amend water laws, including water rights' systems, by legislation. Even this has been of less significance than the campaigning by political "elites" to get government directly into the water business. Many of the changes in western and appropriative water rights mentioned in this part were by-products of these larger campaigns, which can only be listed here;

- u) Pressure groups of all political shades have coalesced to create public water-supply and storage organizations and make them major holders of water rights. With water being diverted, stored and transported long distances by "big-dam" entities, with distribution handled, especially after 1902, by compulsory-membership water districts, and with an increasing majority of irrigators relying on public water provision, the changing characteristics of water rights became a matter for large enterprises and governments;
- v) Shares in irrigation organizations and contracts with irrigation companies and public districts have been increasingly taking on the exclusivity characteristics of water rights;
- w) Many of the demanders of greater transferability of water rights have been "urban elites," concerned to melt the iron control of farmer groups over captured irrigation water for non-farm uses;
- x) These elites and pressure groups have played leading roles in policy battles concerning water rights which cross jurisdictional boundaries, water projects which involve more than one government, and water rights held in both riparian and appropriative systems. Winning these battles has promised more additional water than revising water rights.

In the sections ahead we will be designing a system of water allocation having features which we predict will be adopted to handle stream water management. We believe that a combined system would effectively allocate, balance, protect and enhance both out-of-stream and in-stream uses. As our point of departure, we have chosen an appropriative-rights system. We have attempted to overcome its obvious limitations in the face of in-stream use by adding "institutions" within the system, such as a market for trading rights, the "water trust" and the "water corporation." The trust is an organization aimed at acquiring water for an in-stream use of a river. Its activities will help make rights commensurable with and therefore weighed against rights held for out-of-stream uses.

Competition between the various demands will bring about, for each stream, a multiple-use combination of diversions and natural states. The corporation is aimed at restoring the riparian rights concept of the "community of the river," wherein parties are accountable to each other. The "corporation" would be enlarged from the community, however, to include not only water users owning land by the river, but all those others holding appropriative rights in the valley or watershed, especially those who would be most directly affected by a shift in the balance between use and non-use: the "stakeholders" in the river's flow. We see the corporation acting more extensively in flow and level management, and possibly in water quality and groundwater management, than do today's irrigation organizations.

IV. THE DEMAND FOR STABILITY: PRESCRIPTIVE RIGHTS

1. *Introduction*

While formal common law water rights would have seemed to have been the subject of war-like advances and withdrawals on the part of riparian owners and actual users, the battle was moderated by the permanent influence of the principle of seniority. This has been amply illustrated in Section E of the last Part. Another source of stability was the "ideal" of prescriptive rights, which has prevailed for centuries, and which has provided a basis for compromise between common law and appropriative rights in California. What is interesting about prescriptive rights is why they existed: why an institution different from riparian ownership was embraced and nourished within the common law.

2. *The Demand for Prescription: Opponents and Proponents*

A concession of prescriptive rights gave some users certain, secure, enforceable, exclusive and transferable rights, at the expense not only of landowners but also of both other users and potential users. We have seen that in England, legislators actually passed a statute that made obtaining prescriptive rights easier and retaining them more probable. To whose pressure were they responding? Little has been written about this. It is obvious that the English Parliament was long influenced by landowners, often impoverished aristocrats. These owners would likely have been hostile to the concept of another acquiring permanent rights over their land by mere occupancy, and logically, they would have brought some pressure to bear on government to bring an end to prescription. As against this pressure, however, we found that in many if not most of the recorded water-rights cases in nineteenth century England, one of the parties relied on a prescriptive easement; and that

party was generally an industrialist. The industrialists' pressure on Parliament to retain and facilitate the system of prescription must have been even more decisive than that of the landed aristocracy or establishment.

In New England, it appears that such industry lobbying was reinforced by promoters of town or local industrialization. Thus one could deduce that the legislatures believed that prescription would favor industrial development. Yet some modern writers insist that the continuation of old prescriptive rights retarded new development.³¹² Why then did the process continue and why did the law develop so as to increase the number of water users who held such rights? In what follows we classify water users into groups according to their positions: (a) opponents: those whose interests would be harmed by someone's exercising prescriptive rights against them; and (b) proponents: those whose interests were improved by prescription—including both old and new users.

i) Opponents of Prescription:

There were two types of opponents of prescription. The first were a more-or-less organized interest group, *the promoters and land developers* who believed that the existence of prescriptive rights to water turned investors and industries away. Their criticism, recently revived by Horwitz and Lauer,³¹³ would have been that this way of acquiring and holding water rights tied up land and water and prevented new uses, immigration, settlement, industrialization and growth. Horwitz and Lauer suggest further that it hampered the progress of the Industrial Revolution in England and New England by allowing prescriptive users to obstruct the increasing numbers of manufacturers and other industrialists, especially in the textile industry, who wished to use the stream.

Any economist would agree that these are possible results. An owner by prescription might refuse to part with his easement, and industry would go elsewhere. Yet the literature and the cases present no hard evidence. We do know that the number of prescriptive titles to water increased with time.³¹⁴ It seems likely that some of the new holders were industries. We suspect that the literature reflects the discontent of some expanding users that, instead of getting water power sites for nothing, they were having to pay holders of old prescriptive titles for their rights.

In other words, this group should not be seen as favoring growth

312. Lauer, *supra* note 170; Horwitz, *supra* note 139.

313. Horwitz, *supra* note 139; Lauer, *supra* note 170.

314. See Section III.C. above.

and development, but as having a distributive concern. If their demand had succeeded, their goal would not have been to deprive new users of the opportunity to obtain prescriptive rights, but to deprive existing rights holders of the opportunity to capture rents from the new users.

The second type of opponent might be represented by an individual who felt he had been harmed by the working of the prescriptive process, in that he had failed to forestall a neighbor from obtaining prescriptive rights on a stretch of the river, and was now forced either to endure the effects of the new use or to pay to regain rights which once were his.

This situation was most acute in the phase of law where property rights were enforced by nuisance law alone. The person accumulating prescriptive rights would in most cases have been using the streamflow first. As a result, our individual would be unable to claim in court that his neighbor had caused him actual damage, in order to cause the "prescription clock" to stop ticking by registering his disapproval. If he was a newcomer, he might not even have been aware of how close his neighbor was to fulfilling the time requirements of adverse use.

In the transition period to the nineteenth century land-based water rights, this particular problem was alleviated somewhat by the courts' easing up on damage requirements where prescription would otherwise accrue.³¹⁵ Later, in the phase of land-based rights, a similarly-situated individual who was not using the water would be able to sue to protect his riparian right to the unaltered flow, but would only do so if he knew the length of time of the "adverse use," and since there would be many other users on the river, the cost and difficulty of obtaining the necessary information might put such exploration out of reach.³¹⁶ In brief, when sites were scarce, landowners were forced to allow their neighbors' industrial claims to mature into prescriptive rights because of court procedures, the substantive law and non-existent information systems.

The manner of pleading also helped the claimant to prove prescriptive rights and frustrated his opponents' attempts in the courts to balk him. Parties who challenged a prescriptive claim had to rebut the presumption that they had implicitly authorized a diversion, while the diverter had only to establish uninterrupted use for the legal period, say 20 years. The challenger then had the costly and technically difficult task of refuting the "facts" of non-interruption over 20 years. There was no registration of title. Witnesses died. Often legal action was simply not worthwhile.

315. See generally *Bower v. Hill*, 131 Eng. Rep. 1229 (C.P. 1835).

316. See McLaren, *supra* note 137.

It might seem, therefore, that a smart strategy for the opponent would be to publicly consent to or openly "license" the intending prescriber. Then the latter's claim would be knocked out, for if he had been given "consent" to divert water, he could not later claim he had made "adverse" use by impeding another diverter.³¹⁷ Licensing a neighbor, however, would mean allowing him to go ahead with the very projects that opposing prior-users aimed to prevent. We feel this would have prevented opponents from trying the licensing strategy. By giving the "prescriber" consent or a license, an opponent who was a prior-user would run a risk that turned out to be unacceptable to many: that of being deemed to have abandoned his priority *vis-a-vis* other users on the river.

In brief, the procedure was surprisingly favorable to the idea of a user obtaining a prescriptive title, good against his neighbors and which would exclude them from getting a right of the same value. It is likely that landowners who had been or feared being hurt by this process would have supported other demanders who were attempting to get the prescriptive process narrowed or abolished altogether. But the transaction costs of lobbying to change the law may have been sufficient to deter them from proceeding against more wealthy opponents who were holders of the rights.

b) Proponents of Prescription:

Would one expect *those already holding rights such as easements or prior rights* to support those seeking to abolish the privilege of obtaining prescriptive rights? Our answer is, of course, no. The reason is easy to see. Prescriptive rights were more valuable than rights acquired between two parties such as formal easements or grants, and more certain than unwritten "prior-use rights." They were more valuable because they were valid not only against the party granting the easement but against all of the water users on the river. They were more certain than prior use rights because they were definitive for all time, once *proven* in court against a single party, if only through failure of challenge over the required period. Prior use rights were subject to challenge at any time, the shorter the period of time dividing a supposed prior-user from the start-up dates of others on the stream, the greater being the possibility of challenges. It is obvious that water users who

317. See *Webb v. Paternoster*, 79 Eng. Rep. 1250, *sub nom.* *Plummer v. Webb*, 74 Eng. Rep. 1064, *sub nom.* *Webb and Paternoster's case*, 78 Eng. Rep. 165 (1620). Licenses were revocable up to the 19th century but if the licensee had made improvements on the land or had given consideration for a contract Equity would restrain revocation.

had obtained and defended these rights would wish the system to continue. So would those users who were on their way to achieving the same status.

What would be demanded by *newcomers*? The literature often describes them as new industries. They are said to be opposed to prescriptive rights, which prevent them from wresting streamflows from the old rights holders. But such opposition would not be rational. Further thought suggests that, under these circumstances, newcomers would be mad to acquire a mill on a stream without at the same time acquiring the very protection they were said to be criticizing in others: an unassailable right to divert water. This protection could be acquired merely by purchasing the right at a high enough price, from the prescriptive holder. We conclude, therefore, that newcomers would not, as a class, have sought the abolition of the very rights which would suit them best.

c) Demand and Supply of Prescription

To summarize these points, we translate the above scenarios into demands for retaining, and simplifying, the process of getting prescriptive rights to streamflows. We examined the benefits or costs to various classes of users. Owners of ancient mills would wish to retain their prescriptive rights, and subsequent owners of existing mills would gain little from denying them the benefits of maturing their prior rights into prescriptive rights. Some newcomers planning potential new mills might wish to see a particular prescriptive right swept away, or made available to them for nothing, or they might wish to buy it. As a class, however, these newcomers would not invest much in new mills unless their interest in water had adequate amounts of characteristics such as quality of title, specificity, transferability and divisibility. These were offered by prescriptive titles. In short, it appears that from the demand side, all classes of water power users would either favor or would not strongly resist the perpetuation and reform of prescriptive rights, and would act to obtain laws to facilitate the prescriptive process. This explains why the courts and government ("suppliers" of prescription) acted in facilitating the development during the eighteenth and early nineteenth centuries.

If we glance, however, at non-users attempting to influence the suppliers, we observe forces which we might expect to provide opposition to the prescriptive process. Mid-Victorian England was abandoning its Benthamite approval of any law that appeared to encourage private enterprise at the expense of society as a whole. For example, in land uses, private encroachment on common lands was being discouraged and public footpaths and public easements were being revived. In water matters, Parliament was supplanting the private sector in such fields as public health, sanitation and water supply, and the courts were adapting

public nuisance law to deal with private pollution and waste disposal through the mechanism of the injunction. As late as 1832, judges and members of Parliament may have been willing to maintain the prescriptive process as a means of allocating water uses within the private sector, but not much longer. In New England and other water-using American regions, prescriptive owners were already likened to "monopolists" and "conservative interests," opposed to development and economic progress. They were threatened by land developers and municipalities who had some success in inducing state legislatures to make prescriptive titles a little more difficult to obtain. As for the west, the old process of acquiring prescriptive rights was scarcely compatible with the new prior appropriation systems. In states such as California³¹⁸ where the common law was still recognized, the incompatibility was resolved by shortening the required period of continuous use to five years until it came close to resembling an appropriative right, while in the pure prior appropriation states, the prescriptive right was abolished by statute.

Thus by the mid-1800s both English and American support for extended private water rights was on the wane. Neither country was to depend longer, primarily, on the common law for further management of its rivers, and prescriptive and prior rights were to yield to statutory processes on the one hand and to discretionary, flexible judicial "reasonableness" doctrines on the other.

3. *The Stability of Possession*

We have stressed that water use was continuous and stable. We believe that for the most part changes in the bases of water rights followed, and did not lead, changes in water uses or users. These changes were not trivial, for those who mounted damage suits or pressed for political action were prepared to spend their time and money to obtain them. Nevertheless, our reading of the economic history of water use suggests that those who might have suffered from the changes were able to keep going. In this respect the changes, unlike the English enclosures of common land and the Scottish clearances, did not dispossess many—perhaps any—users.

First, those who acquired prescriptive rights kept them, regardless of the phase of water law. Second, the various principles of seniority or priority seem to have remained valid from phase to phase. "Ordinary" users were increasingly invulnerable to encroachments on the water they had customarily used. The holders of "senior" or "prior" rights, even

318. Trelease, *supra* note 169, at 426-427. See also *id.* at 201-2 (providing an excerpt from *Hammond v. Johnson*, 66 P. 2d 894 (Utah 1937) which shows that in Utah, the period was seven years).

without prescriptive rights, also seemed to lead a charmed existence, beyond the reach of revivals of natural-flow theory or of the actual workings of reasonable-use and prior-appropriation laws unless their use was clearly unreasonable. In our discussion surrounding *Holker v. Porrit*³¹⁹ we suggested that the record shows that the judges rarely, if ever, deprived a person who could be said to be "in possession" of a flow of water, of a title that he previously was believed to have enjoyed by actual use. As with a man's home, so with his mill; it was his castle, and the water was his moat!

We must add to prescriptive title and possessory or senior title a third source of stability in the law governing water use. This was that both aspects of water law, giving relied-on title to rights-holders, also helped give stable and secure contractual rights to actual users. Holders were in a better position to transfer their water to non-holders when their own rights were secure and enforceable than when they were in doubt, and the transferees acquired that security through the contract.

4. Prospect

We can gain further perspective on these sources of stability by testing them in a hypothetical future. Will they survive to give users stability in the next "phase," or decade, or water use?

First, we think that seniority in the sense of "first appropriator or user" will become increasingly unimportant. With scarcity there will be little scope for laws and statutes laying out how water grants can be acquired from the government or a large private landholder by simply beginning to take water. Thus the differences between the successors in title of original, prior, or first users and other users will become increasingly remote and incongruous for settling disputes in water rights. But this may make little difference. Future users who hold their rights by descent from the actions or priorities of the original holders need not depend on the original arguments or reasons for favoring seniority. If titles become transferable or divisible, a right will be simply a right, however it was first established.

Similarly, we believe that prescription as a process, like appropriation, will vanish altogether. The processes by which inactive holders can be induced or tempted to release their water entitlements will be adequate. The holder's fear of losing water to squatters will become merely a source of irritation, serving no efficient purpose. The stability given to the whole system by prescription will be lost.

Third, we believe that stability will instead be given to the system

319. 10 Exch. 59 (Eng. 1875), discussed *supra* notes 121, 149.

of water rights by water's increasing value, and by the increasing tendency of all users to see the system of water licenses, permits, riparian rights and appropriative rights as an integral part of the system of rights to land and forest. To use water profitably tomorrow will involve even greater investment in capital goods and labor than in the past.³²⁰ All who benefit from it will insist that governments refrain from unsettling the security that such investments demand. This demand will take a political form, from cottagers, farmers and other small users, as well as from grant industries and municipal utilities. It will prevent fluctuations in the basis of water rights from appearing, and make unnecessary the deliberate continuance of seniority and prescription as sources of stability in water rights.

PART V. THE DYNAMICS OF CHANGE: CIRCUMSTANCES AT EACH POINT OF CHANGE

A. Introduction

Why did water rights twist and turn? Much of the detailed explanation found throughout our essay implies that we do not argue that one mechanism explains both timing and content of each phase. In this section we recapitulate and explore the twists and turns more thoroughly, in search for a theory of the mechanics of alternation.

B. Reminder: Circumstances at Each Point of Change

(a) *Medieval to Prior-Use Turning Point:* The early 1600s saw the beginning of what would become the Industrial Revolution in England. The number of users of the river increased dramatically from one year to the next, but the principal use of the water was the same throughout: power to turn mills. The technological processes involved were often mechanical ones: fulling corn, weaving and spinning textiles, and grinding ores. The non-tidal rivers in England were largely not navigable. It was not necessary to ensure that the water in the rivers flowed continuously at every point or that levels remained constant. Canals, then railways, ensured transportation within the country. The opportunity existed for commerce to use the rivers to their capacity.

Yet in spite of the huge increase in demand for water power, land holdings along many rivers remained in large blocks, in the hands of aristocrats who did not wish to divide and sell them amongst would-be users, but who were too poor in capital to develop them themselves.

320. Also required will be investment in pollution prevention technologies.

Their answer was to lease the riparian land to a large number of prospective users. Hence, the growth in the number of lessee water users. (b) *Prior-Use to Reasonable-Use Turning Point*: The first half of the nineteenth century was dominated by the invention of the steam engine which created a change in the type of technological processes and services demanded from the river. Mills became larger and spaced further apart and were sometimes located back from the river. They employed many more workers. Processes now returned to the stream not just water but heat, chemicals and organic wastes. Population growth exploded. Industrial centers gave rise to important municipalities.

A new dimension to the rivers became apparent: water quality. Pollution, both chemical and thermal, became a major problem, especially as municipalities required clean drinking water. These requirements were translated into a demand for the rivers to be allowed to flow in a more natural state than the ink-black and foul-smelling state which had characterized rivers in the early to mid-nineteenth century. Obtaining this new quality attribute of the rivers became more important than maximizing the number of users of the flow.

(c) *Reasonable-Use to Appropriative Rights*. In the developing American west, rivers were flumes. Economics and topography called for many rivers to be emptied while still running in mountain ravines. There were scant riparian populations, for the downstream watercourses were canyons to be bridged as often as they were valleys to be farmed. To the scattered miners and ranchers the rivers' potentials for navigation, log-running and milling were not important, nor were their freshets and floods regarded as serious problems. Ditches moved waters across miles of sloping hillsides to mines and settlements. Below the intakes, the depleted stream was of little importance to anyone.

Water users were engaged in the few economically important activities of mining, ranching and irrigation. They were in agreement about water rights for, although far apart in their technologies, all users needed only the freedom to bring water to their operations and to put it to a consumptive use. They supported a water law that gave attention to diversion, not to the river. And, in districts where development was in progress, rights holders wanted to be able to transfer water to "higher and better" uses quickly and frequently. They promoted the exclusivity and quality of title that would protect their heavy capital investments in mine capital and land improvements. In short, it was not important to specify the use of water; all uses required diversion. What was important was the priority of diversion, and for this the concepts of appropriation and seniority fitted the situation perfectly.

C. The Alternation of the Periods Between Land and Use-Based Rights: Theories

Why did each crisis result in a shift towards the opposite basis of water law? For the sake of simplification, one might argue that there are only two types of water law systems: those based on land rights and those based on personal rights, and any shift would have to be in the opposite direction, resulting in an undulating curve as history unfolds itself. Yet many modifications could have been made within the existing basis of the law which would have met changing demands.

Several possible theories come to mind to explain the shift in the whole system as a response to the above types of circumstances. The first four that we advance are theories which we feel do not adequately explain the reasons for change. We propose them only to reject them. A fifth, which concerns the changing "composition of demand," goes farther than the others in reflecting the realities of each shift.

(a) *A Change in the Capacity of the Courts:* This theory says that the courts, as suppliers of water rights, brought about changes in the types of rights. Three examples would appear to be on point:

- The development in the seventeenth century of the damage action: the personal action which enabled use-based rights to be enforced. At this time, the Kings' courts were competing for power and money with the old feudal courts, by providing better services to more people. The services included faster and cheaper kinds of court action and more effective remedies combining the elements of deterrence, protection and compensation. Did this competition between courts bring about change that enhanced the capacity to supply characteristics of interests in water law?
- The trend away from a law bound by process and procedure, as emphasized in the courts up to the nineteenth century, and towards a discretionary role for judges in some areas, e.g. through the flexible definition of "reasonableness." This new trend first arose in applications of the law of negligence in transportation cases, and with it came the concept of the "reasonable man." Then it spread to other areas of the law. In the context of water law, "reasonableness" as a basis for litigation gave a great deal of scope to enforcement of water level and quality maintenance by riparians, both users and non-users of the system.
- The development of self-help mechanisms of law and speedy resolution of disputes (Ap-

propriative period).

We do not deny that changes in the type of enforcement of water rights, provided by the courts, were present and facilitated at each point of change. Our position, however, is that they did not constitute the driving force for change in the type of rights created.

- (b) *Increase in Demand for the Water:* Throughout most of the phases, with the exception of the Appropriative phase, there has been an overall increase in population and in population growth. With this has come an increase in the cumulative demand for all of the river attributes. We do not feel that increased overall demand is of itself the reason for water rights to change their basis. It alone cannot explain the change which took place in the Appropriative phase, nor why change would take place at uneven intervals and in the opposing directions of our "twists and turns."
- (c) *Increase or Change in Technology:* In the shift from Prior-Use to Reasonable-Use, technological change was surely a factor. It is certain that changes in technology create new types of demand for water, and that new demand cannot be ignored as a factor motivating change in rights. But it is not the only factor. In fact, in some stages, such as during the Appropriative regime, it was irrelevant to the change in water rights. And there is no reason why a change in technology alone would cause the basis of rights to shift in the opposite direction.
- (d) *Self-Correction of Extremes:* This theory would imply that the law creating rights is progressive and ever changing, and that when it arrives at an extreme (however defined), the process of evolution reverses itself and heads in the opposite direction to "self correct" within the bounds of moderation. We do not agree that change is inherent in the law. Our position is that change may occur at certain points in history, but it is brought about by external factors rather than by an internal, dynamic process. We put forward this theory, but cannot support it.
- (e) *Change in the Composition of Demand:* The theory which we feel best explains the shift from land-based to use-based water rights and vice versa is that of the changing composition or "mix" of types of demand for water. In the use-based phases of water rights, demand was typically based on one overriding "attribute"—either abstraction/diversion of the flow, maintenance of water levels (e.g. for navigation and fishing), or maintenance of

water quality—to the near exclusion of all others.³²¹ We see this during the Prior-Use regime, where water power was clearly the dominant form of demand, and throughout the Appropriative regime where irrigation needs eclipsed all others. In the land-based phases, there was no single, dominant use. This was the essence of the matter. When uses were in conflict, water law retreated to a basis in land. In the medieval phase, mills were ubiquitous but they did not monopolize water use. Fishing and navigation were also strong claimants. Again, during the reasonable-use regime, the attributes of water meant it was in demand for a number of frequently-contending uses: urban water supply, industrial raw material, hydro-electric power, steam power, waste disposal and cooling. And, as the scale of establishments and projects for these newer uses increased, they came into renewed conflict with navigation, fisheries and recreation.

Where demand for river water is comprised of one dominant attribute, and where there is a need for maximum exploitation of a scarce river resource (because of dry climate or dense population), a use-based system of rights has been shown to be more efficient than a land-based system. The transactions in the one attribute that take place can be measured quickly and inexpensively in quantifiable amounts of water and in comparable units. Divisibility and transferability of the units are also easy and inexpensive. Other transaction costs are low. We say that units of water are highly "commensurable" with each other. The system is therefore more specialized than is a land-based system; it caters to maximum intensity of water use. Since marking water level and water quality are less important than water flow, "using up the stream" beneficially is preferable to letting it go to commercial "waste" by non-use. Finding the highest and best use of the resource in terms of efficiency and profit is achieved through the market. Since there is little concern inherent in the system for the river ecosystem, water may be transported out of the watershed.

Where demand is based on more than one attribute (e.g. where pollution and in-stream uses, or concerns for water quality and level, are as important as allocation of the flow), there can no longer be a single, unitary system of measurement. Use may be negative or it may be positive, and one "attribute" is not directly transferable to another. Units are not quantifiable. The riparian right is to a "reasonable" use of the

321. See Lauer, *supra* note 170 (citing this as the reason for changes in the doctrine of riparian rights).

water, but what is reasonable is not defined and what is defined can change according to circumstances of demand and supply. Determining a ranking among the attributes rather than determining and maximizing the highest use of a single attribute is what is required. For this, the market does not provide all the answers.

Who better to be in control of such decisions than the person who is most likely to benefit by the wisest decision? In the reasonable-use period, this was the landowner of the stream. He was entitled to a share in the river which was defined only in relation to other proprietors. Therefore, one landowner alone making decisions about the priorities of the system made little sense. The system of riparian rights implied an inter-relationship of owners along the stream. Judges refer to this as the "community of the river," an institution which should temper the might of the market in allocating water. In thus respecting the integrity of the river system, it tended to control the pace of development. It is important to note, however, that in all areas and times where a land-based system worked well, water was plentiful.

D. Where do the Twists and Turns Take Us Today?

In the common law countries of the world today, water systems are divided between riparian and appropriative systems. Both are modified to a great extent by statutory law. Both appear to be working reasonably well in their particular circumstances. Does this mean that we are no longer on the undulating curve between use-based and land-based rights, and are now on a straight line, as it were, between the two? More important, if this is the case, have we nothing to learn from the patterns of the past?

As global populations increase and the water resources world-wide become increasingly scarce, a new tension has been introduced into the mechanisms of water allocation. On one side are environmentalists who look to future generations and stress the importance of water quality, maintenance of water levels and respect for the river ecosystems. On the other side are those who stress that water must be used for industry in order to feed the people and maintain a standard of living.³²²

Neither system, by itself, can answer both sets of demands. Both may be modified, however, with these demands in view. The question is no longer "which system" is best, but how can a system, land or use-based, best respond to the new, compound demand. Water use today

322. This could include selling it on an interbasin or international market, to reap local profits.

must be mean and lean as well as innovative and dynamic. It must give individual users opportunities for making the best use of the water. Yet the welfare of the river ecosystem is at risk.

Inherent in the appropriative system is rapid and cheap allocation and redistribution of the flow through the market system; inherent in the riparian rights system is community control of quality and levels. The system we propose for the future incorporates elements of the best of both, while avoiding their defects.

The main defect in the riparian system is its inability to quantify the water right, leading to uncertainty in the quality of title, a disincentive to investment and difficulties in transferring or modifying rights. The main defect of the appropriative system is its indifference to river attributes other than the flow and its user group which "floats" without specified location or long-term direction. This latter defect can be remedied somewhat by making appropriative rights appurtenant to land. The disadvantage of a system geared towards allocation of a single river attribute can be remedied by the use of "trusts" to protect various in-stream uses, by statutory control, and by a delineation of a community of users which we shall call a "water corporation," to regulate and monitor water quality, balance uses and develop water policy. The defect of impreciseness in the riparian system, however, cannot be remedied, because riparian rights by their very nature are not quantifiable, but relative.³²³

We suggest, therefore, as a basis for a modern system which best responds to the challenges of tension between development and conservation, personal, use-based appropriative rights rather than riparian rights. They are more amenable to modification in order to remedy their deficiencies.

Where this projects us on the twisting and turning pattern of water law is to a place where *water use* is the starting point in the definition of rights, rather than ownership of riverside land. If enough modifications can be made to the system to address the demands of multiple uses and non-uses, the "twists and turns" will have shown us the way, but can now be relegated to the past.

323. See Hirschleifer, *supra* note 230, at 237 (discussing the problems of defining what is reasonable both in terms of adequate rainfall or in times of drought).

PART VI. FUTURE WATER RIGHTS: IMPLICATIONS FROM THE PAST

A. Introduction: Future needs and problems.

In this Part we attempt an application of the previous Parts to the future. We begin with a very brief prediction of future demands or needs. Then we work out how water rights might be adapted and combined to handle the situations encountered in the rivers.

Our prediction here is that in most river valleys the demand for water will change its nature. It will be less dominated by one overwhelming use, as for irrigation or water power. Instead rivers and their water will be in demand for all their attributes. The result will be that the system of water rights will increasingly be called on to bring order to conflicts among quite different kinds of users. The problem has been glimpsed in the past, and has led to large water projects being made more versatile, such as by redesigning power dams to add more flood control, irrigation and recreation benefits. But this approach seems only to involve the public sector. The question of how to make private right-holding users able to contribute to multiple purpose flexibility, transferability and versatility has hardly been considered.

We expect to see today's main private uses derived from demand for domestic water supply, food, fiber, power, drainage and the thousands of processes in which water is an input continuing in future combinations of uses. But the relative composition of the demand will change. Among the new demands most upsetting to the established sharing will be those for in-stream purposes. Many of these will be for a resumption of water regimes that are more natural, not only in average quality and quantity but in their seasonal and slow fluctuations in depth, width, current and temperature. Other in-stream demands will be quite contrary to these natural uses and will call for the streams to be tamed, redirected or managed to enhance sport and commercial fisheries, water sports, landscape, navigation and so on. Such demands are already being made and met, for example in elaborate fish ladders and spawning beds, and in rapids for kayakers.³²⁴

With so many purposes, and with new ones emerging, each river's own combination of uses usually will be in the process of change, and the changes may well be more frequent than in the past. In the earlier phases, diversions for water-powered milling peaked but later

324. We would point out here that many of these produce private goods or services, available only to a few. Their characteristics are not inherently public, except in the important detail of the cost or difficulty, so far, of excluding non-payers.

faded. After a while other products and technologies raised water demand for new predominating uses. As well, particular streams were subjected to sudden dominating water demands for local processes such as electric power and gold dredging.

Such new demands will occur more frequently, so that the intervals between predominating uses will be shorter and successive uses will overlap and compete. They will be compressed into a steadier and heavier demand in which the percentages dedicated to particular uses are in continuous flux. Therefore we foresee demand becoming more complex as users requiring new types of use are intermixed with existing users and uses.

Each of the interdependent physical attributes of streamflows will become economically more scarce. In the absence of enforced rationing, or voluntary mutual forbearance, we foresee conditions recognized and described elsewhere as overlap, congestion, conflict, competition, multiple use and external diseconomies among private and public, individual and collective, in-stream and diversionary uses.³²⁵

Future society will not be helpless in the face of these conflicts. As in the past, rivers will somehow be managed or allocated. Indeed, increasing scarcity will exert increasing pressure on society to adapt its water institutions and to use them to manage, plan, ration, share, divide and allocate so users can divert, apply, consume, store and/or preserve water and the watercourse.

Such pressures may well call for the coexistence of several kinds of water-use institutions, public or private. In the following analysis our subject will be only one of these: the evolution of the present systems of individual water rights to serve as the basis for a system that can cope with the future conflicts sketched above. We go on to consider the markets in which water rights will be traded.³²⁶ We suggest two innovations that would complement these markets. Space limitations preclude a comparison with evolving alternatives such as government agencies and their own instruments.³²⁷ We simply extend into the future our study of the past development of individual rights.

325. Peter H. Pearse et al., *Currents of Change: Final Report, Inquiry on Federal Water Policy* (1985).

326. We will not consider water rights that can be traded across the frontier. See Anthony Scott, *Individual Water Rights in an International Water Market*, in *Water Export* 141 (1993) (initiating discussion of the problem of water exports).

327. An example is the employment of financial measures such as charges, taxes, subsidies and grants.

B. FOUR STEPS IN REFORMING FUTURE INDIVIDUAL WATER RIGHTS AND THEIR CHARACTERISTICS

1. *Step One: Reforming today's appropriative rights.*

Earlier we raised the question of whether the historical twists and turns of water right bases would turn water law back to a new land based right. We will explain why this is not likely to happen.

First, however, we examine several well-known limitations to appropriative rights as they work today. The system has been refined so that the rights are particularly useful for dividing the waters of a stream when *all the rights holders make the same use of the rights*: diverting water for irrigation, urban consumption, and industry. Each limitation will be dealt with on its own merits.

Exclusive ownership of return flows

Whatever diverted water a right holder does not consume may become a return flow, at once, the next day, or later.³²⁸ Under most current arrangements one or more users downstream get a right to use this return flow by appropriating it. But, in deciding on his irrigation works and practices, and implicitly on the volume of his return flow, the upstream party is not obliged to release any particular volume.³²⁹ He is offered no incentive to take the downstream users into account.³³⁰ In this case economic theory would predict that his spending on preventing return flows will be larger, and accordingly his return flows will be smaller, than if he had a right to the return flow or its value.

Information and transaction costs aside, economic efficiency in water use would call for the upstream appropriator to pay for the amount he withdraws and to be paid for the amount he returns. In a sense he already pays for the amount he withdraws, at least if water rights are easily transferable,³³¹ for typically the law of appropriative

328. At once, if the water merely runs over the dam and through a mill; later if it is ponded and released periodically; later still if it flows back from irrigation or a city water supply.

329. Here "release" means "add to return flow." American state politics are torn on this question. In some, the rule stated in the text, which follows from the original logic of prior appropriation, prevails. In others, the upstream party may not take any of the water conserved or released. In yet others, he gets a prescribed percentage (75% in Oregon). See Maass & Anderson, *supra* note 201.

330. *Id.* at 138-42.

331. Even in administrative systems where the appropriator has to pay for a license, the cost of the license is not normally based on the value of the amount diverted or the return flow.

rights does not allow him to be regarded as the seller of the return flow.³³² In the case of the downstream user who need not pay the upstream party for the volume released, neither the first nor the second part of the efficiency condition is met.

Worse, as we saw earlier, in systems of administrative water rights the administrators tend to shave applications to transfer water so as to reduce the associated injurious loss represented by return flows. Thus the greater each transferor's return flow, the less water he is allowed to sell, and so the greater the expected loss of transfer revenue. That is, the smaller his present return flow, the smaller his future loss on a transfer. His recognition of this gives him an additional incentive to disregard the value of re-use of water downstream.

Put in characteristic terms, both users' rights lack exclusivity.³³³ More exclusivity will give rise to a promise of less water consumption and, probably, of more return flow.³³⁴ The upstream user will gain the ownership of his return flow.

Our prediction is that as water value rises the combined efficiency gains will induce upstream-downstream pairs of parties to bargain on the amount the owner is to release. The mere fact of the bargaining will reinforce the exclusivity to the appropriative right of the upstream party. Furthermore, their agreement will be equivalent to defining their rights in terms of net rather than gross volumes; in terms of the amount each consumed rather than the amount each takes. This return will not be easy for there will be serious measurement difficulties.³³⁵ We also expect that wherever measuring costs can be reduced,³³⁶ the advantages of defining rights by net volumes will spread

332. This is the general rule, especially in administrative systems. However, some jurisdictions, in processing applications for water transfers, do give appropriator-diverters credit for the amounts they return to the river or other users. See generally Micha Gisser & Ronald N. Johnson, *Institutional Restrictions on the Transfer of a Water Right and the Survival of An Agency, in Water Rights: Scarce Resource Allocation, Bureaucracy and the Environment* 137 (Terry L. Anderson ed., 1983); Tregarthen, *supra* note 230.

333. That is, the upstream user is not fully compensated for costs incurred returning water to the system by preventing water from leaking into the river basins, losing altitude, evaporating, or sinking into the soil.

334. It would also move the system farther from the riparian system that it is at present.

335. There are other difficulties, too, arising from the fact that what is important is the value, not the volume of the return flow. This, however, is a difficulty chiefly for a claim that a law which would freely allow transfers denominated in net amounts would automatically end third-party effects of water transfers. Gould, *supra* note 245, at 466-67, gives instances where such transfers would not leave third parties unimpaired. Our prediction is based on this claim. We simply believe that the advantages of measuring rights by volume consumed will make this more common and eventually universal.

336. Measurement problems include the difficulties of widespread measurement of changes in water quality, location and elevation.

the practice from pairwise bargaining to all appropriations and transfers.

Seniority

We predict that today's system of giving priorities over scarce flows to those holding senior rights will continue. We admit that this is a curious arrangement. Indeed it seems obvious that if two users could freely contract to share unknown future water flows, they would think of something better than giving one almost complete certainty and the other all the risk.³³⁷

It must be acknowledged, however, that for most users in a general system of water law, the transition to any other way of sharing would be very costly. When the senior appropriator has complete precedence to use, the measurement and monitoring costs of the parties are minimized.³³⁸

This curious arrangement is made tolerable by trading. The holder of a junior right must carry the burden of insecurity but as compensation his right is relatively inexpensive. He can therefore assemble a portfolio of junior and senior rights and irrigation shares. And he can buy water short-term, on option or in other complicated ways.³³⁹ These can give him as much water security as he wishes to buy.

Our prediction, therefore, is that greater divisibility will convey the advantages of these opportunities to blend security and risk to users in more jurisdictions. Some of them will become more available as pipelines and other facilities allow more water to be moved greater distances. Water clearing houses will reduce the volumes that must actually move. Many such changes are dependent simply on small changes in political willingness to amend present prohibitions. If our prediction is correct, we expect therefore that many water rights will remain clearly distinguished by their seniority.

337. For example, if water values can cover the added transactions costs, each right can be changed to entitle its holder to a specified amount, plus or minus an agreed percentage of the net flow deficiency. More elaborate arrangements might call for a different percentage sharing each season or under each contingency.

338. In Australia, where water rights have the same systems of continuous sharing as are common elsewhere within local irrigation districts and companies, much of the burden is placed on a government agency.

339. See Shupe et al., *supra* note 241 (providing an inventory of the bewildering variety of available water transfer mechanisms and rights); see also Bonnie G. Colby, *Economic Impacts of Water Law—State Law and Water Market Development in the Southwest*, 28 Nat. Resources J. 721, 728 (1988) (describing the "market for reliability").

Beneficial use

Even without attempting to reform water rights so they can allocate water among multiple uses, we expect that beneficial-use provisions will continue to fade away. The concept may have been ethically necessary when water was originally being appropriated, but that need has passed. As we have seen, loading it onto the holding of an appropriative right has stood in the way of allocating water to creating reserves, irrigation and urban storage, and hydro power. To overcome such problems, the doctrine has already been relaxed by statutes and stretched by court interpretations. But, as the beneficial-use requirement does reduce bargaining and enforcement costs, we predict that in irrigation districts it will not vanish quickly. In many such districts, early farmers' water entitlements were set by, in effect, multiplying the individual farmer's irrigated average by a standard water-per-acre factor. This factor, widely accepted in each district, is referred to as the local "Duty of Water." It is acceptable in part as being consistent with the ideas of no waste and good practice—that is, beneficial use. Hence, in such districts, to scrap the beneficial use requirement would entail the conflicts and costs of making apportionments on some new basis. We predict, therefore, that farmers will wish to retain the beneficial use requirement for some time.

2. Step Two: Reforming rights and markets for multiple use

Our predictions above were based on the temporary assumption that streams would continue to be mainly channels for getting scarce water to diverters, so that markets would have a somewhat homogeneous commodity to allocate. Though engineers talk about stream levels and flows, we have thought of the traditional water market as trading only flows. We expect, however, that levels and all the final services which depend on them will also become scarce and valuable. Hence future markets may also be called on to handle demands for particular levels on particular stretches. If so, today's appropriative rights are being refined just when water allocation demands are under transformation. Usufructuary rights will not be based uniquely on diverted flows for much longer. Instead, we anticipate the changes outlined below.

In-stream use rights

We expect that in the allocation of water, there will be greater demand for streamflows to remain running in the watercourse. The resulting increase in in-stream uses is equivalent to the expansion of the public uses that we have referred to in earlier Parts. The increase is being,

and will be, accomplished by a reduction in the amounts which may be diverted under today's present appropriative rights.

A voluminous American literature³⁴⁰ on the legal aspects of such reallocation has made clear that there are many kinds of policy, involving constitutional interpretation, Indian rights, navigation, fisheries, statutory amendment, regulatory orders and individual water rights which can be combined to increase in-stream uses. Rather than survey this literature, we merely mention three implications.

The first is connected to the requirement for beneficial use. Even if we were correct in predicting that the beneficial-use condition will continue to apply to irrigation rights-holders on certain streams, we would predict that governments will neutralize their tendency to prevent allocations for in-stream uses. They may do this in either of two ways. They may choose to by-pass the beneficial-use barrier by simply reducing the amount that license holders as a group may divert. We expect this to happen where administrative agencies have become highly specialized in allocating water to irrigators: governments will try to keep their licensing system intact and to provide for in-stream uses through other laws or institutions, probably without markets.

Alternatively, governments may choose to allow the water right to be re-defined and broadened. Instead of entitling the holder to divert water and requiring him to use it beneficially, it will allow him to apply the entitlement to both out-of-stream or in-stream uses. This way of proceeding will give more potentiality to water-rights markets. If so, the beneficial-use condition must be completely reconsidered.³⁴¹

The second has to do with transaction costs. A right to divert a given flow for a period does not easily translate into a right to a certain depth at a certain location. The multipliers needed to convert the flow into the stream depth or level will vary from place to place and season to season, and so forth. Consequently, a competitive water-rights market cannot easily deal in both depths and individual diversions: the information costs would be prohibitive. We believe, therefore, that there will be no such thing as a formal transferable right to a depth or level. Parties who demand stream depth will have to make their own conversions.

The third has to do with our classification of water rights according to whether they are use-based or land-based. Although setting

340. See, e.g., Craig Bennion, *New Protection for California Instream Water Uses*, 3 *Stan. Env'tl. L. J.* 58 (1981); Paul R. Williams & Stephen J. McHugh, *Water Marketing and Instream Flow: The Next Step in Protecting California's Instream Values*, 9 *Stan. Env'tl. L.J.* 132 (1990).

341. See Bonnie G. Colby, *Mitigating Environmental Externalities Through Voluntary and Involuntary Water Reallocation: Nevada's Truckee-Carson River Basin*, 31 *Nat. Resources J.* 757, 779 (1991) (describing Nevada's action on this).

up in-stream rights is a break with traditional appropriative rights, it does not constitute a return to land-based rights. It is true that the in-stream use of water is tied to a location on the watercourse and is in this sense more similar than a diversion right is to a riparian, land-based right. An in-stream water use can hardly be transferred to another place. Nevertheless, technically, the legal basis of the right is the use to which it is to be put, not the location of the riparian land, or any other land for that matter. An in-stream right is inherently no more appurtenant to a point than is any right of diversion.

3. Step 3—Trusts: New market entities to hold levels as well as flows.

In this section we shall sketch new "trusts" which we predict will be active in acquiring and holding appropriative rights. They will be able to protect and enhance in-stream levels and depths, and, perhaps, to manage the surrounding environment at particular places on certain rivers.

What is the deficiency in the present system that such trusts will remedy? It is that present-day water rights do not give their holders powers to exclude "users" from the various ways in which a protected river can be enjoyed. In the economist's technical sense, such enjoyment inevitably is partly or entirely "free-riding." It cannot be refused, therefore it cannot be a basis for a charge or payment.

For example, persons who might provide river levels by buying water rights from diverters cannot recover their costs from "consumers."³⁴² They cannot find the actual and potential consumers, some of whom live at great distances and rarely or never visit the river. Some of these would even be able to continue their remote and vicarious enjoyment of the existence of the river's attributes and amenities even if a (prohibitively expensive) fence were somehow built around it to support a toll gate or ticket window.

Recognizing this source of market failure, the law has intervened historically³⁴³ with rules that override individual diversion rights and

342. Here we use the word "levels" instead of the word "attributes" to summarize those river conditions that are in demand for public uses. For the sake of brevity we ignore the value that both the level of and the altitude of water can give to private users and diverters. Examples of government rules to protect levels include the blanket provision in Magna Carta forbidding the blocking of certain streams by fishing weirs. Equally constitutional and inflexible have been the statutes and judgments that create the category of "navigable" streams where certain public uses are given absolute priority over diverting or obstructing uses.

343. See Frank A. Sharman, *River Improvement Law in the Early Seventeenth Century*, 30 *Legal Hist.* 222 (1980) for an account of the closing of the era of battles between navigation, promoters and riparian owners.

insist on levels and other stream conditions for "public" stream uses, such as salmon migration and navigation. These laws usually go too far, however, because they are arbitrary and inflexible. They treat other stream users as potential criminals.³⁴⁴ They stand in the way of any compromise or trade between persons for whom levels for public uses have been provided and other persons, especially those holding water flow rights for individual uses. Actually, these laws are capable of great improvement,³⁴⁵ but in what follows we shall investigate the marketable-individual-right alternative to public intervention.

The problem with using the market for many, perhaps most, services of in-stream uses is not just that the services cannot be marketed to consumers. That difficulty is compounded by another. Most products of such in-stream attributes as depth and water quality are public goods.³⁴⁶ Their consumers and immediate users are not rivals, for their enjoyment of a water level does not leave less for others. In short many final consumers can't be excluded and many direct users can be "free riders" on levels or depths that are provided to others. For example, a boat owner who improves a channel has no powers to exclude other owners from taking a free ride. Knowing this, he will not seek to buy the water right that could provide the needed level. For this reason the market fails to allocate water to public navigation use.

These problems of private provision suggest how the market and its participants may be improved.³⁴⁷ Following the lead of organizations like Ducks Unlimited and Nature Conservancy, or a Heritage old-building preservation trust, the rights-holders will now include "trusts."³⁴⁸ They will be non-profit agencies or boards. Each will be set up with terms of reference that instruct them to preserve and protect a certain

344. Like the criminal law, the public use laws must either be enforced, or discretely disregarded.

345. For example, allowing scales or auctions of licenses to do the things that are now absolutely forbidden or by publishing a list of penalties (prices) for various amounts of forbidden behaviour.

346. See Ostrom, *supra* note 308, at chs. 2, 3 (pointing out that common-pool resources have separable consumption while public goods have joint consumption, and providing an extensive bibliography).

See also Glenn G. Stevenson, *Common Property Economics*, ch. 3 (1991); Thrainn Eggertsson, *Analyzing Institutional Successes and Failures: A Millennium of Common Mountain Pastures in Iceland*, 12 *Int'l Rev. L. & Econ.* 423 (1992).

347. They do not, however, affect the nature of the water right.

348. Our use of the word "trust" to baptize this institution has nothing to do with the American doctrine that the states should perform a "public trust" function in providing water uses for all citizens. See Scott, *supra* note 194 (discussing "trusts" in the sense in which we mean the word here). See also Roderick E. Walston, *The Public Trust Doctrine in the Water Rights Context*, 29 *Nat. Resources J.* 585 (1989) (providing a recent update on the public trust doctrine).

cluster of in-stream activities throughout the state or province. To do this, they will acquire water rights and other real estate as their finances permit. Thus several state-wide trusts might be concerned with in-stream conditions in one river: one for fish migration, one for wilderness, one for recreation, swimming and boating et cetera. When their needs coincide or overlap, they will cooperate in bidding for rights to serve all their purposes. Elsewhere, however, they may go their own way. Since their chief means of providing in-stream services would be the acquiring and holding of transferable appropriative rights, the water rights market can be identified as the means of allocating places and attributes of each river to serve demands for private goods and public services.

Having such non-commercial organizations buy and hold in-stream licenses is already a reality.³⁴⁹ What we predict is that these bodies will become increasingly formalized, and increasingly detached from both the government agency that now oversees the water right system and the non-government action groups that now press to preserve rivers and the environment. The former will enforce the licenses held by trusts. The latter will try to influence, not supplant, the trusts.

The extent to which each trust could provide more water for its public purpose in competition with private diverters would depend on its finances. Indeed, we need to ask, what resources will it have? First, it may produce some services that could be individually enjoyed or consumed. If it had exclusive rights to market these services it would obtain monopoly-like sole-owner revenues, including spectator, hiking, camping, fishing and boating charges.³⁵⁰ This source would be very

349. Johnson and DuMars, *supra* note 14.

350. Note that a trust would control public access only to the one amenity or service that it has an exclusive right to provide, on all rivers in the jurisdiction of the government that chartered it. Earlier single-purpose organizations differed from ours in that each river had its own trust or company. For a discussion of how these organizations used compensation to overcome local landowner resistance to navigation companies, see Sharman, *supra* note 346 on river improvement law. In Adam Smith's day river navigation and canal companies flourished. The market was not used to allocate the watercourse between them and individual users on the river banks. Instead, expropriation procedures had given them all or nothing. As franchised or chartered joint-stock monopolies they received exclusive rights. Their revenue came from charges. For example, some chartered English navigation companies (who each improved one river channel, before the age of canals) and canal companies had the power to run canal boats but sold access to other boat owners or collected tolls from them. Adam Smith, *The Wealth of Nations* Vol.13 (Edwin Cannan ed., 1976) (1776). Such exclusive powers permitted discriminatory monopoly pricing, but Smith felt this preferable to the Crown providing free canal services to everyone. Another example is the river companies in Ontario, described by Benidickson, *supra* note 157. These were eventually subject to enfranchisement by government order. They improved rivers for log floating and driving and boom sliding. The monopoly toll they levied was regulated by an early public-utility procedure.

important for some of the trusts, negligible for others. Most trusts would rely on a second, voluntary, source of revenue; including bequests, gifts, and perhaps profits from selling or renting water from their initial endowment of water rights.

The third source for each trust will be government grants. These will be liquid, and spendable at the trust's discretion.³⁵¹ Thus the future's market-oriented approach river management will not escape today's reliance on politics, public choice procedures and public finance. The main difference will be that the conflict or competition for water and sites will be resolved in the market, with each service or use ultimately determined or limited by the amount of a legislature's grant. This will not be a wholly new management. One of the jobs of politicians today is to translate diffuse political currents and pressures into concrete support for museums, orchestras and research institutes. In many governments this is done by setting up non-political councils who do the actual supporting, granting and spending. These are the forerunners of our trusts. Note that they do not save politicians from having to scratch their heads over the amount of each annual grant to each council. So it will be with the river-use trusts. Governments, besieged by interest groups and advisors, will continue to make financial decisions about how much to give each trust, and each trust will carry out the specific goals in its terms of reference by acquiring and holding rights to enhance and protect in-stream conditions on various rivers.³⁵²

4. Step 4: The Corporation and the Community of the River

What it will be

In the first step we sketched how we think individual appropriative rights will evolve to do their present job better. In the second step we sketched how new trusts would acquire and hold appropriative rights that would enable them to act in the market to protect and enhance and perhaps manage water levels and depths at particular places on certain rivers. These two steps will enable individual ownership of transferable water rights to provide, through the market, more of the uses and

351. There may also be grants in kind of water rights, land rights or money. This entails the existing water levels, as originally enforced by government regulation for public stream uses, being converted into transferable rights. This could be a slow and painful business. See Williams & McHugh, *supra* note 343, at 195-97 (very hesitantly recommending public grants).

352. Each trust would have membership drawn from its government's entire jurisdiction: nation, state or province. Partly appointed, partly elected, rotated, and so on. We expect they would be empowered to hold land adjacent to their in-stream water rights.

attributes of the river. The role of government agencies would be narrowed to provision of stream flow data and to superintendence of firms such as trusts.

We believe, however, that there will be further change related to changing demand and technology in river basins. Because of this the unassisted market will run into information problems which in turn will reduce its allocation effectiveness. We suggest, as a third step, the kind of institutional innovation³⁵³ expected to emerge as a remedy for this problem. Our expectation is that it can offer efficiency in providing certain river services to rights holders individually, while assuring that the holders collectively have a voice in the remaining aspects of overall stream management.

We will call this institution a river corporation.³⁵⁴ When a river or stretch of a river is designated by the government, a corporation for that place will come into being. It will, to the fullest extent possible, own or beneficially hold the usufruct of a river by virtue of holding all appropriative rights to that stream's uses. These will include diversion rights, in-stream rights held by trusts to maintain levels, emission rights, where these exist, and possibly groundwater rights.

The corporation will be started on government initiative. Members' and corporate duties and rights, and procedures, will be spelled out in a statute and in by-laws. These will require rights-holders to convene, incorporate, and assemble their water rights. The appropriative diversion water rights contributed by each member will continue to be for his exclusive use. The rights contributed by each trust will continue to serve that trust's public and social purposes. Further water rights, along with land and other assets, can also be acquired by the corporation as a body.³⁵⁵

What it will do

We start with the information problem that occurs when rights are to be transferred or uses changed, or when holders dispute their respective entitlements along a certain stream.³⁵⁶ How can all the parties

353. Of course, irrigation and drainage districts and similar cooperatives and/or self-governing entities already exist. See Ostrom, *supra* note 308, at ch. 3 (giving an account of "long-enduring, self-organized and self-governed common-pool resources." See also Maass & Anderson, *supra* note 201 (a revealing discussion and description of the scheme to pool water over a long stretch of a river (the Upper Basin of the Colorado), leasing it back to its owners and exporting the surplus).

354. Another possible name would be "cooperative".

355. These may include pollution rights or emission rights, and groundwater rights. We discuss the corporation's use of these below.

356. In what follows we assume that water management and water transfers cover an

to a transfer inexpensively agree on the dimensions of the flow and the return flow? Under some adversarial regimes today each party must go to the expense of preparing estimates and measurements for submission to court-like adjudicative proceedings. This has been a costly undertaking, a burdensome aspect of the protection of individual property rights in water.³⁵⁷ But it may soon become a thing of the past. As we have shown, in many jurisdictions, as water becomes more valuable and more frequently transferred, administrative proceedings, which produce decisions and agreements on level and flow data more rapidly and cheaply, have taken the place of judicial proceedings.

But what, precisely, is the essence of these "administrative proceedings?" What sort of institution is needed to provide them? Surveying this question, we have isolated two kinds. The first has been the conventional government water-resources department. The second has been the public authority, a non-political corporation or management agency having a semi-independent role as a player in holding and transferring water and emission rights.³⁵⁸ Both kinds exist and flourish. What they have in common is that they are instruments of government policy, channels for discretionary official control over individual water rights, disputes and transfers. As institutions they overlap, and ultimately override, the kind of market allocation of individual rights that is the subject of this paper.

For this reason we turn from them to the contrasting characteristics of the river corporation. The river corporation can deal with disputes and transfers. If necessary, it can commission professionals to make the same formal surveys of the ownership of levels and flows that are utilized by the two kinds of dispute-resolution institution mentioned above.³⁵⁹ But in addition, the river corporation can augment these procedures by utilizing the knowledge of its own members. Their

entire river basin. However, we recognize that it may easily make political, legal, hydrological and economic sense to divide the basin. If so, what we suggest in the text applies only to the market unit: one valley or one stretch of a river.

357. See Howe et al., *supra* note 248.

358. A greatly-expanded agency could also be the seller or lessor of the water rights and the emission rights. Since 1989 the UK has had a similar National Rivers Authority. It has somewhat autonomous regional units. On each river a unit grants water permits and releases or holds back water from its own reserves. The province of Saskatchewan, too, has such an organization covering all the province's rivers. Percy, *supra* note 202 at 36-43. However, both organizations' pollution instruments are routine command-and-control regulations. One that dealt in both quality and quantity rights could enforce the former with the threat of cutting off the latter. These would become compound Quantitative Water and Emission Rights (QWERs) tried out in a few jurisdictions. See Scott, *supra* note 194.

359. Such surveys are nearly always *ad hoc* and cost about the same, whomever they are made for.

experience and familiarity with the river, sharpened by their sense of place, of proprietorship and of community, makes the corporation's own members good sources. The river corporation can also provide mediators and arbitrators, who will know about local sources of information, and whose compromises and adjustments may be more easily reached where the corporation exists to monitor and enforce their provisions.

Short-term transfers

Another function of the corporation will be to act as a clearing house for short-term transfers. Whether or not permanent diversion rights transfers over long distances become more costly and difficult to arrange, we can expect to see an increase in short-term exchanges. Users will find that short-term water contracts pay easements, sales, rentals, swaps, and future transactions and options. These already exist in some jurisdictions. Such water fluctuates in price, but is usually cheaper than the water acquired with long-duration rights. This can be explained by the extra expense of constant renewal costs for those who depend on short-term rights. Another source of expense is in the risk of default, for short-term users and sellers have only contracts, not property rights, to protect them. Such extra costs of short-term markets can be greatly reduced by the corporation. Finding a trading partner, getting information and enforcing all become internalized within a group of repeat traders.

Discharge permits

From the corporation's capacity to produce and digest the information required to settle disputes and approve transfers we turn to its roles with respect to water quality. To be symmetrical with what we have predicted about the members' pooling of their water rights, we should predict that they will pool their waste discharge rights. But, like most schemes that would integrate water and pollution rights, such symmetry is elusive.³⁶⁰ We cannot assume that, in the initial period, anything as formal, secure or transferable as a pollution discharge permit or right of the kind outlined by John Dales will even exist.³⁶¹ Instead,

360. See Scott, *supra* note 194 (giving references).

361. John H. Dales, *Pollution, Property and Prices: An Essay in Policy-Making and Economics* (1968). Rejecting pollution regulation and charges, Dales recommended that a permissible total amount of waste discharge be determined for each river or lake. This total would be divided into quotas, rights to which would be held by each polluter. He predicted that those who could most cheaply or easily abate pollution would do so, selling their rights to those for whom abatement would be most costly. In this way society would limit pollution to that tolerable at least total cost. *Id.* at 77-100.

politicians may continue to favor today's regime of command-and-control instruments and regulations, administered by government departments or agencies, and enforced by the courts.³⁶² In all probability this cumbersome regime of unintegrated controls cannot be treated as a whole, to be subdivided and handed to the river corporations for continuation, revision and enforcement. The main reason for this is that the component statutes and regulations have been introduced precisely because they are nationally or provincially uniform. Their level of intensity may have nothing to do with a particular river. If so, their revision and even their enforcement cannot be handled with energy or conviction by members of a localized river corporation, unless the corporation is to be a mere local police force enforcing laws made elsewhere.

Our conclusion about the less uniform, price-based pollution-control instruments such as charges or subsidies on volumes of pollution discharge³⁶³ is somewhat different due to the fact that members of local governments, drainage and water districts, school boards and so on have shown a remarkable capacity to tax and charge each other. One example of this is local assessment and taxation of real estate. Another is the setting of sewage charges. These charges are rarely set with the precision of discrimination that would characterize the economists' ideal pollution charge; indeed they usually have revenue and not deterrence as their purpose. Nevertheless, they support our opinion that if water pollution charges were introduced, they would be just as effectively assessed and administered by our corporation or its members as if administered by a more senior government agency.

As an alternative, politicians may overcome their original distaste for water pollution rights (discharge permits). The recent American introduction of tradable rights to emit fixed amounts of "greenhouse" and acid rain gases points to a belated political acceptance of this kind of air pollution control instrument. It could also lead to the gradual annual reduction of their entitlements. Political opposition, however, is not the only barrier to the arrival of tradable rights. The administration and transaction costs of any system of pollution regulation or rights can be very high, especially for the information required to transfer a right. The institution must have the capacity to determine the difference, if any, between the effect on the ambient water condition when the permit, and so the pollution source, is moved. This capacity enables all the parties to verify that a transfer, with all the conditions that may be imposed, is

362. See Rankin, *supra* note 269 (providing a recent legal survey of the spectrum of such regulations).

363. This option seems so far from being adopted by politicians that it is hardly worth discussing.

acceptable.³⁶⁴

The corporation will have some of this capacity, for within its membership it can muster knowledge of flows, level, diversions and return flows. What it will lack is standard-setting capacity (although its trust members will often have their own standards, higher than those of the government or of any external pollution "victim.") We imagine, therefore, that the government will have to continue to set ambient or receptor standards, especially those beyond the stretch of water for which the corporation has become responsible. Within that stretch the corporation can be regarded as overseeing a pollution "bubble," to which the government assigns a total waste-discharge quota for each pollutant.³⁶⁵ It appears that for many pollutants, probably including those originating in non-point sources, the corporation will be better at surveillance, enforcement, verification and monitoring than government agencies as they now exist. By the same token it will be better at overseeing transfers of pollution sources.

We certainly expect that as river corporations are assigned responsibilities for water pollution, the discharge-permit instrument will be more politically successful than if it is assigned to the present province- or state-wide agencies.

C. *Who will gain, who will lose?*

Reliance on markets means consumer sovereignty slanted in favor of those who can cast the most dollar votes. That this should give the future rich more water to drink, as well as more voice in water allocation generally, is upsetting even to people who are not worried that future markets for other commodities will also favor the wealthy.

If so, they may find our "trusts" even more disturbing. We believe these will be financed, in part at least, by private donations. This means that the private distribution of economic power will have some influence on the amount and division of support for public, in-stream, uses.

But we foresee that in the future the trusts and the corporation will moderate the naked power of private single-purpose users in the allocation of water. No longer will miners, irrigators, mill owners, electric utilities or water-transport lines dictate levels, flows and quality. Instead, the trusts will provide a market presence for those who enjoy rivers for

364. See Esther Bartfield, *Point-Nonpoint Source Trading: Looking Beyond Potential Cost Savings*, 23 *Env'tl. L.* 43 (1993) (providing a striking example of how a group of water users can trade while meeting an overall discharge target into a river).

365. This total would be derived as the sum of the emitter's actual permitted discharges in the historic period before the corporation was set up, for each pollutant. If quantitative discharge permits already existed, the total would be the sum of the members' permits.

recreation, for aesthetic purposes or for sustainable-development motives. Financed by public and private sources, probably guided by hearings, interest groups and other public-participation instruments, the trusts will vastly improve the water market's allocations brought about by a trade in private appropriative rights.

Those who believe "global sustainable development begins at home" will find the trusts' presence in water markets helpful only if they can be financed. Such persons will be called on to engage in political action to make sure the appropriate trusts are given cash support by the governments to match their declarations and statements. At the very least the opportunity to support the trusts can make government participation tangible, and its lack of support visible. For example, a trust will not be able to bring about the preservation of a wild watercourse much better than today's agencies unless politicians give it financial power or unless, as with today's nature trusts and heritage trusts, such institutions find other sources from whom to collect funds.

As for undue enrichment from holding a marketable water right, there is no doubt that the existence of a property right has been a necessary condition for many persons' wealth, and that this has been just as true for persons in water-using activities as in any other industry. Indeed it is bound to be true unless the state siphons off the rent or surplus. The modern state has rarely done this, being content instead to let water values get capitalized randomly into the values of the land served by the water use. The politician can easily give an efficiency justification for this inactivity, for if the rent is not taxed the right-holder is left with a healthy incentive to put the water to its socially best use. Furthermore, because the rent of unpriced water accrues to the poor as well as to the wealthy, the politician is bound to pay more attention to leveling down high incomes from all sources than to chasing the water-rent element in everyone's income.

If, however, social pressures do force the politician to confiscate some fraction of the scarcity-rent element in water use, marketable rights would make his task much easier. Each rise in their value reflects a rise in scarcity, and little else. The politician can follow the existing model of taxes and charges on crude petroleum—another fluid resource subject to a kind of appropriative right—which has been justified on the grounds of distribution fairness. In brief, we do not believe that the development of a market in water rights must create new problems of unequal or unfair distribution beyond the reach of government policy.

This leads to another question. Will reliance on the trusts and on water corporations leave too many borderline water and watercourse issues to market forces? In particular, will the degree of dependence of the trusts on outside donors mean that the influence of low-income citizens on the provision of in-stream uses will diminish? We cannot

predict the outcome. We agree it is possible, however, that the net effect may be to reduce water use by the industrial employers of the poor in order to provide more of the in-stream uses favored by the middle class.

In theory, this could be corrected by subsidizing the employers or other water users. But governments are generally also committed to more in-stream uses, in the name of environmentalism and sustainable development. No matter how they pursue these aims, by leaving them to trusts in the market or by their own direct administrative action, governments cannot avoid hurting those whose jobs depend on water. Either way, less water gets allocated to industry and irrigation.

D. Will the water right continue its twists and turns, back to a basis in land?

In this section we pick up a question left hanging in Part IV. Will the twisting and turning of titles to water continue? Will western users' titles become less use-based, and more land-based? Basing our opinion on our predictions in Sections A to C, we believe that (a) for water consumers and diverters, water rights will continue to be use-based and individual-based. However, (b) for purposes of holding rights to water quality and to specific in-stream uses, the immobility of those rights may cause the whole system to increase slightly its resemblance to a system of riparian rights. These points are developed below.

(a) Continuing the use-based right

The increasing scarcity of water suggests that water users will find it increasingly rewarding to allocate water, and re-allocate it, towards its most valuable uses. Thus a quantitative, transferable, usufructuary interest in water will be needed. This is already provided by the western water right or water permit, and we believe it will continue. For this reason we predict that the future water right, to the extent it is held by water-diverters and consumers as at present, will be use-based. There will be no twist or turn toward a land-based riparian, natural-flow or even reasonable-use water right.

Of course, its characteristics will be changed. To become more marketable, many of today's government and administrative barriers will be lowered, giving the right more *transferability*. As the discretionary powers of administrators are relaxed, we will see an increase in *quality of title* and security. Its *exclusivity* will probably change, to the extent that the senior-junior all-or-nothing system of precedence will be modified. And its *flexibility* may be increased by the acceptance of more uses as equally "beneficial."

(b) *How rights to use water will become more closely tied to the adjoining land*

We do not expect that the ownership of a right to use or have a stream used or occupied in a particular way at a particular point will even become a right that is appurtenant to the ownership of the land at that point. Hence the future system of individual rights will not become "land-based" in the sense of our twists-and-turns classification.

Note, however, two exceptions. First, we expect that the present right of riparians to consume water for ordinary or domestic purposes will continue. This is a land-based privilege. Second, we expect that native Indian land claims, if successful, will bring with them incidental or appurtenant water rights.³⁶⁶ These too will spring directly from native rights to land. Thus many individual appropriative right systems will contain an increasing number of land-based claims.

These exceptions aside, we foresee the appropriative water right surviving for many years, altered slowly perhaps, but not becoming a near-relation of the land-based right. However, we do expect that in the future the conditions, specification and rules that make up each user's bundle of rights and duties will "have an address." They will "go with" the point of intake (and discharge) just as much as they are appurtenant to the land which they serve. Just as a water user in the early 18th century was under orders from the court not to change the stream's levels and flows in such a way as would harm his *particular riparian neighbors in that particular stream*, so we foresee that the future appropriative right user will have his discretion in water use circumscribed by rules, by-laws, contracts and easements *made by himself and his fellow rights' holders* who have a sense of place and a membership in the community of that particular stream. A user on another stream whose lands and individual water rights are otherwise identical to his may nevertheless have different rights and obligations. No lawyer would say that this difference actually makes the respective entitlements of the two users "land-based." In this, economists would likely agree. However, we believe that the new system of trusts and corporations will force the right-holder to behave within his "community" as he would behave in a modified system of land-based uses.

366. Native land claims have already done so in the United States and New Zealand, regardless of the prevailing system of water rights.