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THE WATER-IS-DIFFERENT SYNDROME
or
WHAT IS WRONG WITH THE WATER INDUSTRY?*

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Hirshleifer, De Haven, and Milliman close their book on *Water Supply* [1, p. 367] by commenting on

> ...that peculiar, metaphysical line of reasoning which seems to pervade public thinking about water: the 'water-is-different' or the 'magic-of-water' philosophy....

which, they go on to say

> ...might be only amusing if it did not lead to some political actions having very serious implications; in particular, it has led to the near-universal view that private ownership is unseemly or dangerous for a type of property so uniquely the common concern of all.

Bain and his associates in their study of the water problem in northern California [2, p. v] speak of a *water industry*.

> In any major water-producing and water-using region, all public and private agencies that develop and manage water resources, use them to generate electric power, and capture and distribute water for consumptive uses, comprise a water industry.... It is populated mainly by public enterprises which are not profit seekers; it operates substantially without markets for water; its performance thus emerges from the quasi-insular policies and actions of many agencies serving captive constituencies.

They conclude

> Our analysis of the conduct and performance of water agencies [in northern California] suggested that the existing complex of public policies has not been efficacious in securing from the industry conduct and performance which is reasonably close to the optimum from the standpoint of overall economic efficiency or which comes tolerably close to 'best serving the public interest' [2, p. 655].

If the policies and institutions within which the water industry functions were of a sort to set in motion forces that would move it toward more acceptable performance, one could argue that, although the industry is ailing, it has within itself the necessary recuperative powers, but it does not. The

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policies and institutions within which it functions do not facilitate improved performance; in fact, they, *not water shortages*, are largely the reason for the water problem.

Policies and institutions are products of the way people "see" things. First is the way they view their goals and aspirations, ends to be attained and taboos to be avoided; second is their view of the world, how they see the materials, forces, and processes of which it is composed and their ideas as to how these relate to attainment of their goals. Policies and institutions are the product of decisions by the political elite with whom rests the powers of governmental action. In a democracy, public action relating to a resource as ubiquitous as water in its effect on all citizens must reflect the views of a large segment of the voting public. The policies and institutions that govern people's behavior toward water are products of feelings about water held by *most* of the people *most* of the time. When we examine the prevailing beliefs of the public toward water to find some explanation for the peculiarities of water policies and institutions, we find the water-is-different syndrome at the center of our diagnosis.

Webster says that a syndrome is "a group of signs and symptoms that occur together and characterize a disease." The water industry is ailing because the policies and institutions that govern it do not permit it to perform at the optimum of overall economic efficiency or in a manner which comes even tolerably close to best serving the public interest. The water-is-different philosophy is that group of symptoms that lies at the center of and characterizes the industry's ailments. It is the syndrome of the disease afflicting it.

This syndrome leads us to treat water differently from most other natural resources, eschewing private actions in a market system as the means to ration among affected persons access to its benefits and avoidance of its damages; shuning in our property law respecting water, the private property that characterizes most other resources in favor of public, common, and group tenures; relying less often on individuals and more often on collective entities for water development, use, and allocation. In sum, the water-is-different syndrome is revealed in the difference with which we treat water *institutionally*, or we might say by the rules of the game we have adopted to control and liberate the actions of those persons who develop, use and allocate water in our society.

Boulding finds the source of people's behavior in what he calls *The Image* [3, pp. 3-18]--one's *Image* of the world; what one *believes* to be true; one's *subjective* knowledge. It is this Image that largely governs people's behavior.

Taking this cue from Boulding, one can argue that the rules of the game that govern the development and use of water reflect the *images* people have of water resources and how those resources affect the attainment of their goals. Their images are partly the result of objectively confirmed experience and partly a reflection of subjective emotion-based beliefs. Their objective images of water consist of the hard facts which people can ignore only at society's peril in the building of public policies and institutions. Their subjective beliefs about water, however, are not nature-imposed imperatives but dictates of their own emotions which, also, if taken too seriously, can imperil society.

The image that water is somehow unique arises in part because water is, in fact, different from other resources in its physical behavior and in its relations to the satisfaction of some of man's wants. It differs from most other resources in three respects. (1) Because it flows, quantity and quality changes resulting from its use at one place and time may affect other users at other places and times. This is its *externality* feature. (2) Because water is generally not consumed in use, because it enters readily into the soil and the atmosphere, and because it flows, its supply is generally replenished continuously and may be used repeatedly though frequently only with quality deterioration. This is its *cyclic* peculiarity. (3) Because many of the products of water use are available without restraint to everyone in a position to use them, the producer of those products cannot withhold them from consumption until he "gets his price" as can the producer of most other natural resource products. This is its *collective consumption* property.

It is obvious that man cannot with impunity ignore these objective traits of water in his collective action to establish policies and institutions to guide individual action in water development and use, that he must in water policies and institutions reflect the imperatives of these objective peculiarities.

But, the water-is-different images ascribe to water peculiarities that go far beyond its objective idiosyncrasies. To a significant degree, they are figments of the imagination which have no objective reality. They are largely false images. These specious images are the symptoms of what ails the water industry. They have been held in varying degree by sufficient numbers of people, both laymen and professional, to have led to the development of water policies and institutions that are now out of touch with the realities of a world in which water grows in scarcity and confronts increasing demand.

There are six of these false images.

First, there is the *survival image*; water is necessary to life and essential for sanitation; therefore, it is a survival absolute. Without it we die. This image persists in the face of the oft-demonstrated fact that man can survive for a brief period on a quart of water a day and over the long run can live on but little more. True enough, none of us would wish to be restricted to a quart or two, or even three, a day. That would not be comfort by our standards. But notice I said comfort, not survival, and comfort is not an absolute requirement but a relative one. It is not necessary for survival that people have the 50 to 75 gallons a day per person used in the average urban household. They may prefer that amount or more or less depending on how strongly they want it compared to their preferences for the goods and services they must sacrifice to get it. The quantity of water used for personal purposes in most modern American cities is not a requirement, but a preference; the institutional issue is--how strong a relative preference for any given quantity of water do urban consumers really hold? how is it to be allowed to express itself? and, how is it to be allowed to influence the allocation of scarce water?

Second, there is the *image of irrigation fundamentalism*, derived from the image that agriculture is the cornerstone of any viable society. In a desert environment, irrigation is necessary if there is to be any crop agriculture at all, so this image holds that irrigation, hence irrigation water, is an absolute requirement in a desert environment to have a socially viable

society. Even if this were true, which it is not, it is not a requirement that there be water sufficient in quantity to support agriculture on every irrigable acre, or to produce maximum crop yields on every presently irrigated acre. The question is again relative--how many alternative satisfactions do consumers wish to sacrifice to get the kinds and quantities of agricultural products that more or less irrigation water will bring forth? $30 worth of water for $20 worth of cotton for $8 worth of feed grains? Possibly, but only if the cotton or the feed grain are, for some noneconomic reason, so essential to social health and welfare to justify it. This, too, is a preference, not a requirement.

Third, there is the *desert image*. Everyone can see that water is almighty scarce in a desert; therefore, it is easy for the unthinking to hold that more water than nature put there is a must, if a viable economy is to take root and grow. This might sometimes be true; but if so, the economy, if it is truly worthwhile, can and should pay the costs of developing and importing the needed water. The economically prosperous mining district of Kalgoorlie in Western Australia has, since 1903, transported water by pipeline for 350 miles to supply all of its domestic as well as its mining and smelting needs.

In America's arid West, the desert image commonly gets tangled up with the irrigation image. In most of this area there is more than enough local water to support the growing nonagricultural economy, but most or all of it has previously been committed to irrigation, and its transfer out of agriculture is prevented by existing water institutions. Little or no unallocated water remains for general economic and municipal growth--*a water shortage mistakenly attributed to the desert rather than to irrigation*. Again, the problem is not one of requirements, but of preferences--and of images.

Fourth, there is the image of the *idyllic idol*. Water is necessary for greenery, for protection of bird and animal life, and for the pastoral existence pictured in Salem cigarette ads on TV. Parks, playgrounds and golf courses, lawns and boulevards, peaceful hills and valleys and bird watching do make life more pleasant for most of us. But this idol is considerably exaggerated when called upon to justify irrigated crop agriculture as a desirable "green belt" around the urban communities in arid settings. Agricultural fundamentalism and the idyllic idol here join hands to support the position that presently used irrigation water is an imperative for the social health of the related nonagricultural society. As with the desert image, if the community is truly viable (agricultural or otherwise) it can and should pay the costs of getting the necessary water to satisfy its idyllic idol. But existing water institutions often prevent this reallocation of water even when its value to the community for these purposes is greater than is its value to agriculture for irrigation. The realization of a preference is prevented by a fundamentalist requirement--by an image.

Fifth, there is the *recreation image*, the newest but the fastest growing of the absolute images of water. Sometimes the recreational image of water attaches directly to the water itself--to fish or swim in, to boat upon--and sometimes it attaches only to activities ancillary to water--for camping and picnicking, for the preferred golf links, baseball diamonds and playfields and for hunting the birds and animals it supports. The categorical imperative of the recreation image is clearly apparent in the debates over wild rivers and scenery unsullied by man, the assertions that modern urbanized man must have

areas of surcease from the frustrations of crowded living--even that he requires the peace of mind incident to knowing that areas of idyllic solitude are there although he may visit them only in his imagination or only holds an option on them for his children's future enjoyment.

But, these, too, are preferences, not requirements. Water policies and institutions should provide an arena where the comparative strengths of the preferences for recreation use of water can be gauged and where the appropriate transfers of water to satisfy them can be effected.

Last on my list is the *free-good image* of water. It holds that water is "a free gift of nature" so should cost its user no more than the net cost of its production and delivery. But, this argument can be advanced for any natural resource product whether the resource be cropland, ores, crude oil or recreational sites. Yet, no one argues that a farmer or miner or oil field developer or resort hotel owner should receive only a "fair" return on his capital invested in improvements and for his management--or that the price charged for his product should include no return for the natural resource that enters into it. Have you heard of the "depreciation allowance" for oil? or of prices being charged for the transfer of undeveloped sites?

This free-good image reinforces the other five. Because of it, the other images can be stated as requirements instead of preferences because it insulates each image, in turn, from the competitive pressures that relative preferences among them would bring about. If water in nature carried a value --whether or not it is also a market price is immaterial--if it carried a value representing its community worth at the margin of preference of each image, its allocation among uses and locations in accord with these values would bring about its most efficient allocation from the standpoint of community welfare. All these images would then be expressed as preferences, not as requirements.

These six false images of water together with those realistic images that reflect its peculiar natural characteristics determine the nature of public policies and institutions formed by society to guide and control its development and allocation, and, in turn, have recognizable consequences in water development, use, and allocation. Let us briefly consider some of them.

The Consequences of These Images

Water is almost totally insulated from the workings of the market mechanism. For most other resources, the collective judgments of the market are relied on to assess the strengths of the relative preferences for the resource, to establish their relative values, and to reach collective judgments as to preferred development goals and allocations. Not so, generally, for water.

In the absence of price signals that radiate from markets, administrative rationing of water among developments, users, and uses must be relied on and the relative intensities of man's desires for water tend to be stated as requirements that are absolute values rather than as demands that are relative values. The absence of price signals also leads to development and allocation of water as if it were free at its source. But when growing demands for water cause it to become scarce, it must somehow be rationed among competing uses and users. Because reliance must be placed on administrative rules and

regulations to do the job, the rigid, unresponsive and clumsy actions of administrative practice then get in the way of flexibility in water allocations.

These images have "led to the near-universal view that private ownership is unseemly or dangerous for a type of property so uniquely the common concern of all" [1, p. 367]. Water-supplying and water-allocating activities, at least for surface water, are vested either in public agencies or in user cooperatives. Yet private users of the water resources require tenure security over time to be willing to make the long-run commitments of capital and plans necessary to its efficient use. They require security against unilateral and capricious acts by other users and by officials. Whereas private property is the institution relied on for this security on most other resources, seldom does it attach to water. Private users of resources in America commonly fear that collective administrators of those resources will act unilaterally and capriciously. This leads to overemphasis in water institutions on security of water rights to private users and to rigidity and inflexibility in its administrative allocation among users and locations of use. In the face of pressures for reallocation of water, users will emphasize security at the cost of inflexibility. Thus, our existent water policies and institutions emphasize security of tenure expectations achieved through rigidity rather than flexibility to achieve efficiency and equity through reallocations.

The inevitable outcome of all this is economic inefficiency in water allocations over space and time--inefficiency in the allocation of water in the short run between uses and users, and inefficiency in the commitment of developmental capital to long-run water uses and allocations. Historical patterns of water allocation and past relative preferences among water uses get locked into the distribution pattern of water because of resistance to transfer and the lethargic character of the institutions by which such transfers as are possible can be effected. Although initial water allocations to uses, users and locations may have been efficient relative to the demands and technologies of an earlier time, they have steadily diverged from efficiency goals as demands and technology have changed with ever increasing speed.

We, in the West, can see how water development and use are presently tied to irrigation and how the inflexibilities in water transfers to meet the expanding demands for municipal-industrial and recreational water lead to the search for and investment in the development of presently unused water supplies that may be imported to satisfy these burgeoning demands without disturbing the existing patterns of irrigation use. The result is an ever increasing cost of water development and transport insulated against lower cost competition from local water transfers between uses, users and locations.

The search for new supplies of water insulated against competition from low-cost transfers of existing supplies characterizes the development of groundwater in many areas. Its extensive development is a phenomenon of recent technologies. In areas where surface water supplies are fully developed, but large supplies of groundwater remain undeveloped, the drive to find increased supplies of water to meet emerging new demands leads to development of the groundwater as the cheapest and most easily available undeveloped source. It can be obtained at a fraction of the development and transport cost of distant undeveloped surface supplies and it can be obtained in relatively small quantities to fulfill the needs of individuals or small user

cooperatives. For these reasons, it is turned to increasingly as the cheapest available additional supply. But, here is the rub. Groundwater is generally a stock resource, extraction and use of which depletes the supply--often in perpetuity. The anomaly follows that, because a flow resource is being used inefficiently, an irreplaceable stock resource is being depleted. Depletion of the stock resource is not bad in itself. Its depletion will be necessary in the long run as we put all available supplies of water to use to meet the growing demands of our expanding economy. The tragedy is that we are depleting it now instead of saving it for efficient use later. Each acre-foot of surface water used inefficiently today, because it cannot be allocated to meet growing demands, forces the use of an acre-foot of groundwater to take its place. Because these waters are perfect substitutes for one another, it is as though we are throwing away the acre-foot of groundwater. This is inexcusable inefficiency in water development and allocation over time.

What Can be Done About the Water-is-Different Syndrome?

Bain and his associates have well stated in the concluding chapter of their study of the northern California water industry the problems involved in making the needed changes in the institutional framework of the industry.

> ...two things are notable. First, they may be accomplished or imposed by the electorate and its representatives directly and deliberately through the process of amending or repealing old laws and writing new ones.... Second, these changes would thus...embody changes in public policy toward the industry.... [T]he flaws...do not rest narrowly upon particular institutional features of agency bias.... [I]t does not appear that a sufficient means of securing appreciably better future performance from the federal and state water agencies will be found in exhorting the agencies in question to improve their processes of project evaluation or their ways of thinking. Nor will it lie in exhorting legislatures to pass statutes giving more rigorous and adequate substantive instructions to the water agencies.... And, finally, better performance cannot be attained by exhorting the executive branch to be more prudent, to seek and pay heed to dispassionate and expert economic counsel, or otherwise to change its ways.

They add that it is necessary

> ...to view the water policy problems as a governmental as well as an economic problem, and to consider what legal and governmental changes would actually result in the adoption and pursuit of better economic policies [2, pp. 655, 658-59].

Only continuous educational effort toward better understanding by the electorate as well as by its professional counselors of the inaccuracies in their images of water, its development and uses can bring about the necessary legal and governmental changes. It is particularly important that the public and its counselors be made aware that their images are not absolutes but relatives, that the many uses of water are not requirements but preferences, that its water-is-different image is in large measure--a figment of their imaginations.

As this realization grows in the public and professional minds, revision of water policies and institutions so that security of tenure together with greater flexibility in water allocations among uses and users will become increasingly possible.

As Bain and his associates have said, it is largely fruitless to exhort existing public agencies, user cooperatives, or individuals to adopt a greater measure of economic rationale or to give a greater place to social efficiency in their decision making. Existing players in the water-managing game are now acting rationally, are now striving for economic efficiency within the existing rules. They are guided by the "unseen hand" of current water policies and institutions.

When Adam Smith in 1776 penned his famous line about the "unseen hand" that guides actions of individual decision makers toward the welfare of all, he knew or should have known that the "unseen hand" is not hidden except in the sense that the rule book by which any game is played is not in evidence because it is not carried by each player along with the ball. The "unseen hand" is really the hand of society expressed in the policies and institutions it prescribes to direct play by the individuals engaged in the water game in order, presumably, to maximize society's welfare score in the game against nature. If the rules permit too much individual stardom at the expense of the team score, the rule-making body can change the rules to restrain grandstand players. If the rules unduly restrain fluidity of play thus failing to take full advantage of changing skills and scoring opportunities on the part of individual members of the team, the rules can be altered to permit more forward passing, for example.

But the electorate and its counselors who influence the rule makers must understand the weaknesses in existing rules of the water-managing game, the possibilities for change, and the gains that change would engender. Only as they do, will change for the better in social welfare from water use be possible.

References

[1] Hirshleifer, Jack, James C. De Haven and Jerome W. Milliman, *Water Supply: Economics, Technology, and Policy*, Chicago, University of Chicago Press, 1960.

[2] Bain, Joe S., Richard E. Caves, and Julius Margolis, *Northern California's Water Industry*, Baltimore, Johns Hopkins Press, 1966.

[3] Boulding, Kenneth, *The Image*, Ann Arbor, The University of Michigan Press, 1956.