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Frank J. Quinn

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**INLAND WATERS DIRECTORATE,
WATER PLANNING AND MANAGEMENT BRANCH,
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LE PROTECTIONNISME RÉGIONAL VIS-À-VIS DES EAUX DE L'OUEST

L'expérience américaine et ses implications
pour le Canada

RÉSUMÉ

Le grand public s'est tellement intéressé aux projets internationaux et inter-régionaux de détournement des eaux que les protestations actives des habitants des régions adverstement touchées par ces travaux ont passé presque inaperçues. Les régions bien pourvues en eau de l'Ouest américain n'ont jamais accepté volontairement de partager cette ressource. S'il était impossible d'écarter la menace, on cherchait pour le moins à fixer des limites, à obtenir des concessions.

La présente étude ne prétend pas évaluer les mérites du détournement des cours d'eau sur de longues distances et ne contient pas de recommandations en vue d'améliorer les attitudes publiques. Son but est d'exposer les réalités historiques et politiques dont il faut tenir compte dans tout programme d'action. L'auteur traite des motifs qui ont animé les habitants des régions-sources, des succès obtenus en matière de législation et d'accords entre États, des moyens de pression mis en oeuvre au Congrès et ailleurs et enfin des perspectives dans cette perpétuelle controverse. Au Canada, la lutte n'a été engagée que récemment et l'auteur ne réserve que les derniers chapitres au problème canadien.

Le détournement des cours d'eau a été pratiqué à grande échelle dans l'Ouest américain, à tel point que le quart de la population jouit d'un système d'adduction dont la source est éloignée de cent milles ou plus. Vu le déséquilibre croissant entre la disponibilité de l'eau et la hausse de la population dans les régions plus arides du Sud-ouest des États-Unis, et la réticence des autorités locales à satisfaire aux besoins de l'urbanisation en réduisant la quantité d'eau consacrée à l'agriculture, il est à prévoir que d'autres travaux de détournement s'imposeront. Il s'agirait alors de franchir les frontières entre États, voire la frontière nationale, projet sans précédent et qui, à en juger par l'attitude des gouvernements du Canada et des États du Nord-ouest américain, ne sera pas d'exécution facile.

En ce qui concerne les régions-sources, la majeure partie de l'expérience a été acquise à l'échelle des bassins. Les conflits qui ont opposé les habitants de

l'amont et de l'aval sur les cours du Colorado, du Missouri, du Rio Grande et de la Saskatchewan ont permis d'établir certains principes de distribution des eaux entre compétences administratives qui constituent des précédents de protectionnisme des bassins devant la demande provenant de l'extérieur. Les limites imposées par la loi riveraine à l'échelle des bassins ont cependant été repoussées progressivement, non seulement par les tenants des projets de détournement mais aussi par les habitants mêmes des régions-sources, qui doivent ordonner leurs moyens de défense selon des théories de compétence plus conventionnelles.

Il n'existe pas de meilleur exemple de ce type de protectionnisme que le succès qu'ont connu les États de la côte nord-ouest du Pacifique dans leur lutte contre l'adoption d'une loi prévoyant des études sur la possibilité d'alimenter le bassin du Colorado. L'auteur décrit la lutte qu'ont menée les chefs des États du Nord-ouest sur deux fronts: réorganisation et réunification des éléments locaux et exploitation de la conscience nationale en matière de conservation et de planification globale, en vue de contrecarrer les projets de détournement devant le Congrès.

La multiplication des propositions visant divers détournements à l'échelle continentale fait ressortir non seulement des nuances de grandeur mais aussi des différences entre conjonctures politiques. L'auteur étudie les compétences fédérale et provinciales au Canada. Il conclut qu'il est mal à propos de chercher à tracer un parallèle entre la situation du détournement des cours d'eau et celle de la vente de certaines autres richesses naturelles canadiennes aux États-Unis, puisque l'eau s'inscrit dans le cadre de la protection de l'environnement, sujet qui éveille beaucoup plus l'opinion publique.

On n'attend aucune action de la part des gouvernements canadien et américain dans le domaine du détournement des cours d'eau avant la fin des années 1970, époque à laquelle seront terminées les études sur la demande et les réserves d'eau à l'échelle régionale. Toute décision visant la redistribution des ressources en eau serait alors fondée sur des options nationales plutôt que sur le règlement de dissensions entre régions ou localités.

ADDENDUM

This study was undertaken as an academic requirement by the author and deals mainly with experience in the American West. It is published in the Social Science Series (Inland Waters Directorate) for the relevance this experience (resistance to water export) has for Canada.



Environment
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Area-of-Origin Protectionism in Western Waters

Frank J. Quinn

SOCIAL SCIENCE SERIES NO. 6

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Foreword

Some people, it is said, look at things through rose-colored glasses; others have blinders on; and some never see the forest for the trees. However it is, the way we look at things to a considerable extent determines what we see and what we do. This is as true of flowing waters as of anything else.

Possibly as a reflection of the ambiguities of multiple use, river basin development means many things to many people. Those who are convinced that water in abundance is, was, and ever shall be the key to survival and success in the dry West are unlikely to welcome the dispassionate employment of efficiency analysis to public expenditures; neither of these perspectives, in turn, relates easily to the ecological and esthetic values which are sometimes associated with no development at all. The current controversy over proposed long-distance water diversions brings into play all of these ways of looking at the resource.

Out of their common confrontation, one might expect a closer approximation of national consensus. All indications, however, do not point in that direction. Consider the *areas of origin* of Western streamflow: profiting incidentally from the growing public hostility to privilege elsewhere in the form of subsidized water redistribution, they pursue their own privilege to the exclusive or preferential use of "their" waters. Allocating water among its political regions will apparently remain, for some time to come, the real business of the West. *Plus ça change, plus c'est la même chose.*

This study was conceived out of a number of ideas gathered during courses and seminars at the University of Washington in Seattle. Several faculty members helped me to cover the waterfront of social issues — Richard A. Cooley and Marion E. Marts (Geography), Ralph W. Johnson (Law), Robert Warren (Political Science), James A. Crutchfield (Economics) and Vernon Carstensen (History). Professor Cooley, as my advisor, encouraged me to take a broad, independent approach of which this study is the result.

Most of the research into area-of-origin considerations proceeded in the year 1967-68. A Canada Council pre-doctoral grant allowed me to follow up earlier mail inquiries by visiting numerous government agencies in the Western states.

The writing itself was completed in Ottawa. I am most grateful to E. Roy Tinney, at that time Acting Director and my colleagues in the former Policy and Planning Branch, Department of Energy, Mines and Resources, and to the professionals, typists and draftsmen who assisted in one way or other to see the effort through. I hope that the contents will provide useful reference to the Government of Canada. The responsibility for the use and interpretation of all information provided and the conclusions reached is mine alone.

A belated expression of gratitude I owe my wife for sending me back to work night after night until now it is done.

F.J.Q.
June, 1970.

Abstract

Public interest has focused so completely on proposals for interregional and international water diversion, few have noticed the effective opposition to them put forth by those areas with the most to lose. No area of streamflow origin in the North American West has ever parted willingly with its water. If the challenge could not be turned back, at least some concessions or limitations might be secured.

This study is not an evaluation of the merits of long-distance diversion, nor is it essentially a recommendation for improvements in public policy. It is designed to bare the framework of historical and political realities with which any serious statement on public policy must contend. Area-of-origin motivations, past successes in state statutes and interstate compacts, strategies employed in and out of Congress, and prospects in the continuing struggle are discussed in turn. This struggle is of more recent origin in Canada to which major attention is withheld until the closing chapters.

The American West has seen many streams diverted out of their natural basins; already one out of every four persons living in the region is served by a water supply system which imports from a source 100 miles or more away. A widening imbalance between water availability and population in the drier environments of the Southwest and a reluctance therein to accommodate urban growth by reducing water allocations to agriculture has led to expectations of further diversions. But these would cross state and/or national borders, something which has never before been achieved and, judging from the attitudes of the governments of the Northwest states and of Canada, will not come easily.

Much of the early area-of-origin experience obtained within the basin. Upstream-downstream confrontations on

the Colorado, Missouri, Rio Grande and Saskatchewan Rivers evolved some of the principles for interjurisdictional water allocation which continue to stand as precedents for protectionism by separate basins of origin against external demand. The basin limitations of riparian law, however, have been progressively weakened, not only at the hands of diversion proponents but by areas of origin themselves which must organize their defenses along more traditional jurisdictional lines.

No better example of protectionist strategy exists than that of the Pacific Northwest states in successfully opposing legislation providing for studies of means to augment the water supplies of the Colorado Basin. The two-pronged effort of Northwestern leaders—to reorganize and close divisions in their own ranks at home while taking advantage of national sentiment for conservation and comprehensive planning to counteract diversion proposals in Congress—is followed in detail.

What becomes apparent with the escalation of diversion proposals to continental levels is a difference not just in scale but in political context. Federal and provincial jurisdictions in Canada are explored. Analogies with the sale of other Canadian resources across the international border are found not to be very relevant, given the stronger environmental context of water.

No significant action on diversion is expected to be taken by either of the two national governments before the late 1970's, when completion of regional supply and demand studies is expected. If at that time any major redistribution of water supplies is approved, it will more likely derive from a consideration of national alternatives than from local or interregional power struggles.

The Area of Origin in Modern Context

EXPANDING SYSTEMS OF RESOURCES TRANSFER

Americans take pride in their contributions to making the world smaller. The accelerated movement of people, goods and ideas has long since steeped the consumer in wider contexts of supply and demand than his immediate neighborhood. Sometimes, of course, he is urged to "Buy American", but seldom do his interests revert to a wholly provincial level. The fruits of the good life now draw from a larger harvest.

Ever longer supply lines make this result both possible and profitable. Today's rail, tanker, highway, pipeline and transmission systems recognize few boundaries in distributing the products of forest, field and mine. Many people, it now appears, would like to see a similar system established for water supply.

To be sure, nature offers a means of supply of her own in the river and stream courses which everywhere drain the land; but her deliveries seldom come at the times or places which are convenient for modern society. Increasingly, public attention is drawn to a possible water crisis.¹ To those regions where present or impending scarcity of available water is assumed to threaten economic growth, the prospect of importing more has considerable appeal. An elaborate system of water control might well reach across the divides of several river basins, tapping the runoff that is little developed elsewhere for use in growth centers. Carried out on a large enough scale, such manipulation might even overcome, once and for all, the whole range of drought, flood and pollution problems which have continually frustrated local solution. Or so it is claimed.

The capture and diversion of streamflow, even over long distances, requires no technological breakthrough; small interbasin diversions were accomplished longer ago than the nine aqueducts which served Rome, and conveyance methods have improved considerably since those times. What have normally been considered fixed features of the natural environment, namely the divides separating major drainages, do fall within man's capacity to rearrange. That the construction effort required for a continental or interregional plumbing system might be more massive than anything in previous experience and that it might override the usual limits of territorial sovereignty make it only the more impressive for those who are used to thinking on a scale to match the challenges of their vast landscape. For a few, it may even carry an element of vision or romance in correcting the "mistakes" made by nature in distributing

water where people aren't; no longer will major rivers have to "waste" into the sea unused.

Without a doubt, there are alternatives to transferring water between basins and regions. But weather modification and seawater desalination still appear too remote for widespread application. More localized solutions, such as reallocation of existing rights to higher-valued uses and waste-water reclamation and reuse, involve difficult political choices in assigning costs among affected interests; all of which seem to establish interbasin water transfer as the course of least resistance.²

Apparently, it is a tempting course. The world now abounds with large-scale water schemes, if not with the means of carrying them out. Lake Vattern in southern Sweden is eyed as a possible source for Danish and German use; the Snowy Mountains project in Australia may at some future date be dwarfed by increased transfers from the eastern coastal region. The Soviets in abandoning plans for an even larger scheme, have apparently decided on blocking the northward courses of the Pechora and Vychegda Rivers in order to restore the Caspian Sea to historic levels. A south-to-north transfer of waters from the Yangtse to the Huang Ho has been under investigation in China. Other proposals cover large parts of the African and South American continents. For one enthusiast, "the conjunction of Congo and Sahara offers more possibilities to mankind than journeys to the moon, and is altogether a much simpler and less costly project."³ It has become fashionable to speak of coordinating governments interregionally and internationally for the purpose of conveying millions of acre-feet (cubic meters) of water over distances of thousands of miles (kilometers) and pumping lifts of thousands of feet (meters) for costs in billions of dollars (francs, rubles, pounds, yen, pesos, etc.).⁴

Someday, networks for water supply of the same magnitude as those already existing for road, electricity and pipeline transport may criss-cross the world map. Today, the impetus for long-distance water transfer is nowhere further advanced than in the American West. Indeed, many of the schemes proposed for other lands have their roots in American experience.

The expanding scale of water and related systems in the American West can be illustrated by recent developments along the Pacific slope. In late 1967, a brief news release announced several power contracts which utilities in the U.S. Pacific Northwest had signed with the state of

California.⁵ The power in question was to come out of Canada's share of international Columbia River Treaty hydropower benefits; bought by these Northwest utilities, it would be resold and transmitted southward, along with other surplus seasonal water power available in the Northwest, via the new Pacific Northwest — Southwest Intertie; in California it would help to pump State Water Project streamflows from northern California in a journey of over 400 miles, across the Tehachapis and into the populous south. All three stages of this integrated water and water power transfer system, stretching from interior British Columbia almost to the Mexican border, were said to result in significant savings over local investment alternatives. Renewed interest now centers on sending water itself over the longer route pioneered by its electric power derivative. Some proposals reach even as far north as the Mackenzie and Yukon Rivers of the Western Arctic for water inputs to an international distributing system.⁶ (See Fig. 1)

AREA-OF-ORIGIN PROTECTIONISM

What the news report described above did not mention was the long-standing reluctance on the part of areas of origin to export either their water or their water power. Area-of-origin resistance resulted in some degree of modification of the eventual system in each of the three stages to be discussed.

At the northern end of the transfer system, Canadian negotiators had refused for years to consider storing upper Columbia River flows without sharing in U.S. power and flood control benefits downstream; after long debate they had their way. A further issue developed within Canada between provincial and federal authorities when British Columbia insisted on the removal of a federal ban on long-term power export, thereby allowing the sale of Canada's share of the power benefits to the U.S.; in this case, the province prevailed.⁷

The Pacific Northwest — Southwest Intertie by which this power and other power supplies generated by Columbia River plants will move to California was itself an issue among Northwesterners for a number of years. Doubts continued even though potential secondary and peaking energy had been cascading over the spillways of Columbia River dams for lack of a local market and the federal marketing agency, Bonneville Power Administration, was in financial difficulty. The Northwest states insisted that a regional preference clause be inserted in any Congressional intertie legislation. Without this protection, public power users in the distant Southwest would gain preference to Columbia federal power over private utilities and industries within the generating region. The Northwest states were successful in this effort.⁸

In California, the State Water Project was approved by the legislature in principle in 1959 and given a boost in the

1960 bond election which voted funds for the first stage of construction. Opposition to water export in the northern areas of origin was overwhelmed by massive support for it in the heavily-populated southern desert. Some of this opposition, however, had already been neutralized by a provision which authorized funds for water development in the northern counties themselves.⁹

This example is but a brief preview of the area-of-origin sentiment which fills the body of the present study. If separate segments of the water and power system described above were each the subject of lengthy controversy, negotiation and compromise, one can well imagine how much more unrest attends recent proposals for large-scale, long-distance water transfers which would pay little respect to political borders at any level. Interestingly enough, of all the man-made diversions which presently carry water outside the basin of origin, none cross provincial, state or national borders. Thus far, political lines, drawn as arbitrarily as they often were on the North American map, seem to have withstood such movements more effectively than the mountains, deserts and other barriers erected by nature.

The conflict between water "surplus" and "deficit" areas is of long standing. In the past, it obtained mostly within the basin, typically between the upper reaches where most of the streamflow originates and downstream areas which often develop earlier and faster. Attorney General Harmon gave as his opinion in 1895 that the United States was under no obligation to respect Mexican water uses existing downstream on the Rio Grande.¹⁰ After the First World War the Upper Basin states of the Colorado moved to protect their long-term interests in the river against their lower neighbors who were ready to put it immediately to work. The defensive nature of the Upper Colorado campaign was not unlike the campaign more recently joined against the whole Colorado Basin by the U.S. Pacific Northwest and other projected source areas of water for the Southwest. It was, in fact, the upstream-downstream confrontation in many Western basins which evolved the majority of the statutes, compacts and principles of water allocation which stand today as precedents for further protection by separate basins of origin against external demands.

The continuing water struggle among basins and regions involves much more, however, than the simple application of laws and principles already in effect. It also encompasses the rationales offered, the motivations uncovered and the strategies employed by areas of streamflow origin toward the accomplishment of self-protection. The term "protectionism" would therefore seem to be an appropriate description of their resistance.

Self-interest features of protectionism can be found, of course, in virtually every kind of commercial activity. At the national level, protectionism has always played a strong hand in foreign trade policy. Embargoes, tariffs and quotas

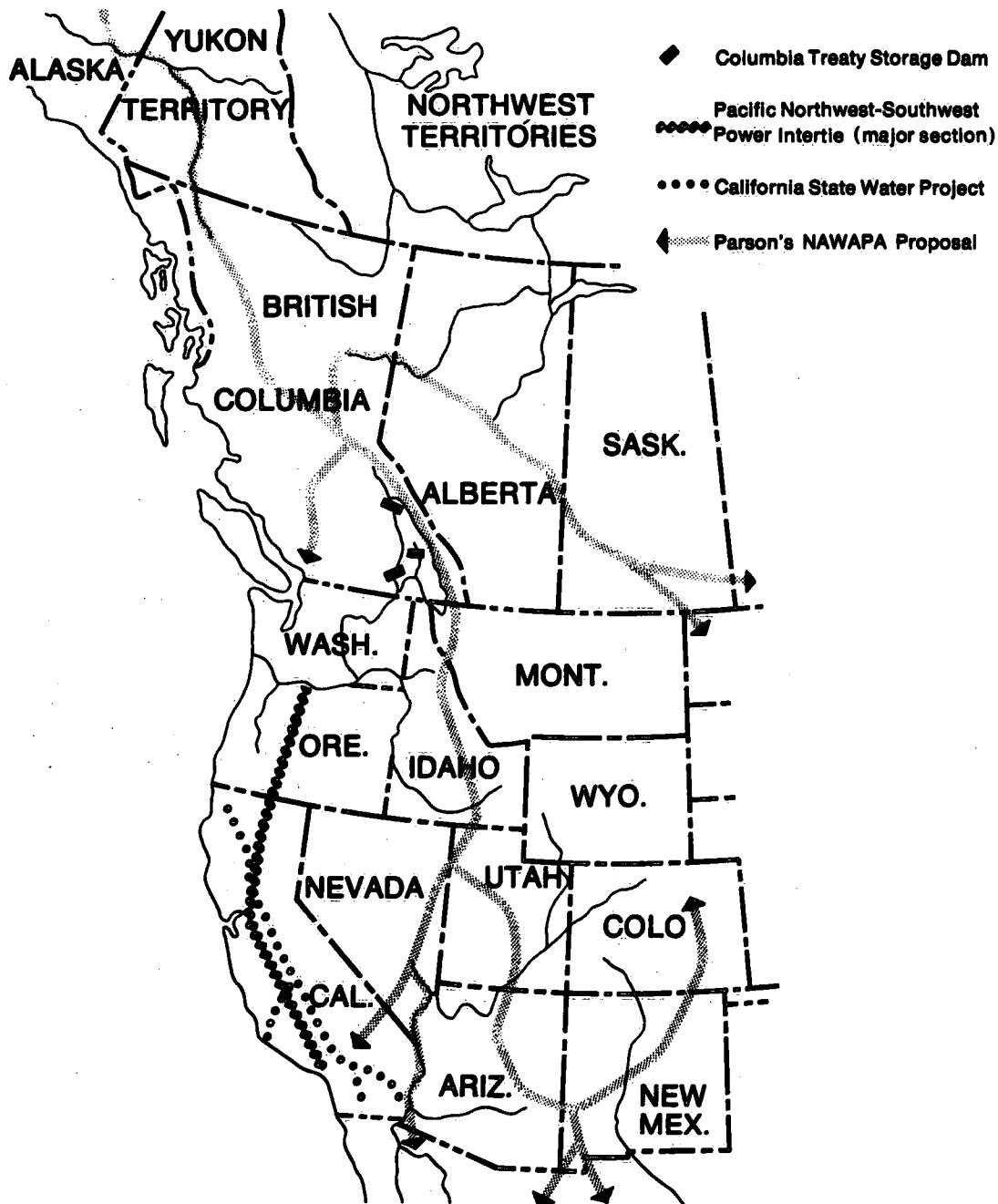


Figure 1. Expanding Pacific power and water systems.

are usually employed against imports from other countries in the interests of domestic producers, sometimes against domestic producers who would export materials considered essential for national development. The quotas on foreign oil and sugar imports fall into the former category, the ban on long-term power export until recently in effect in Canada into the latter.

At the regional level also, the export of resources in

their natural condition is frequently resisted. Most regions, like nations, have no wish to remain "hewers of wood, drawers of water." The states of the Columbia River Basin in the American West are as unwilling to become a water colony for the Southwest as Switzerland is said to be for the rest of Europe.¹¹ This kind of thinking has been applied at one time or another to most resource materials. The difference is that other resources do move as goods in interregional and international trade and water does not.

IS WATER DIFFERENT?

When other natural resources are bought, sold and transported to distant markets, and even electrical energy generated from falling water finds its way into national and international grids, there are still no comparable markets for water itself. A review of the literature reveals few people who think there should be.¹² What distinguishes water from other resources? Why should a region guard this perpetually renewable resource more jealously even than those like oil or coal which are non-renewable?

The evidence suggests that water is managed differently than most other resources in matters of ownership and pricing. The developers' right to water is a property right, but under both common law and statutory provision it is directed more to use (usufructuary) than to the body of water itself (corpus) which remains a public responsibility. Constitutionally, the provincial and state governments of North America are the proprietors of water inside their borders.¹³ Individuals or firms wanting to develop water rights must operate within a complex administrative framework and thus without the same freedom to alter or dispose of water rights that they would have with other kinds of property. In other words, public considerations which are found on the circumference of land law seem to come closer to the center of water law.¹⁴

The second difference applies to the procedure by which water rights are allocated and reallocated among users. When the land was empty, almost all resources were made readily available on the frontier as part of a public policy which encouraged settlement and development. Early homestead, mining, timber, and grazing, as well as water acts carried this policy westward.¹⁵ Of all these resources, however, only water has retained the status of a virtually free good. There is, of course, a nominal license or permit fee and a governmental requirement for beneficial (or at least not flagrantly wasteful) use, but a constant two-dollar or five-dollar fee may reflect less with each passing year the real value of water among those who are now competing for its use.

Therein lies a challenge that will not go away, of establishing a suitable meeting ground between law and economics, where property rights are not exclusive and marketable in the usual sense. The result has been governmental regulation of water uses, carried out with the best of intentions but struggling with difficulty to equate private with social costs and benefits.

A number of rationales has been offered both to support and to attack the special status accorded water. Responsible officials frequently dismiss any suggestion of competitive pricing on the ground that water is the key to man's survival, without which no life would be possible.¹⁶ That is, of course, the case, but as other authorities have pointed out, food, clothing and shelter are just as important to survival and no one suggests that they be either kept out

of commercial channels or restricted to their area of origin. The same reluctance to consider the value of water beyond the sense of survival seems to lie behind the suggestion that water which flows to the sea without full control and use is thereby "wasted".

At the other extreme, there are those who, with an eye on export markets, hold that water should be handled like any other commodity in international trade. To use their argument, if Canada is willing to export strategic resources like petroleum and electrical energy, then surely little trauma should attend the export of some of its renewable water supply.¹⁷ Allusions are frequently made to current oil and gas exports and to the change in national energy policy during the Columbia Treaty negotiations which permitted long-term sale of electricity from Canada.¹⁸ These analogies, however, are not altogether appropriate. Most of the energy resources whether renewable or not are readily substitutional, either one for another or one area of supply for another; whereas water for many purposes is distinctly less so. With competing sources of energy from conventional and nuclear fuels and with emerging grid systems which can wheel electricity back and forth across the continent, national concern for scarcity and for terminating specific energy exports is no longer the critical issue it once was. It is presently possible and may eventually be practical to interconnect drainage systems with NAWAPA in the same manner as energy systems. But the prospects are not all pleasing. Water, as Nace has said,¹⁹ has more dimensions.

A reasonable position, one which would rationalize some degree of public regulation over market procedures for acquiring and developing water rights, will make this allowance: water by its nature cannot be as readily divorced as most other resources at any given location or in any given volume from its larger natural and economic environment. Interrelationships in the drainage basin are such that the same water may serve many different uses at one location and many different locations of use along its course. What one party uses for irrigation or domestic supply returns in large part to the lake or river where others depend upon it for their own more or less consumptive uses; if that party is to alter the timing of flow by storage, its quantity by diversion, or its quality by pollution, public welfare demands that some consideration be given to those who may be adversely affected.

That poses a horrendous enough problem of accountability and accommodation among recognized water right owners whose interests are direct and measurable. But what about the growing numbers among the public whose pleasures in, on, and by the water course extend well beyond consideration of economics? And what about the survival of other forms of life which have limited tolerance to changes in the water balance? Large-scale transfer of streamflows out of their natural basins cannot help but disturb channel equilibrium, estuarine fertility, fish and wildlife populations and the enjoyment of natural

beauty, in a way which is commonly diffuse, selective and intangible, but nonetheless real.

Whatever the outcome of the current export controversy, in the wider scheme of things water must emerge as more than a commodity to be harvested, processed and transported like a bushel of wheat or a barrel of oil. It is an integral element of the environment. Manipulating the distribution, timing or quality of flow on a large scale consequently becomes not just another exercise in trade and commerce; it has the effect of manipulating the environment itself.²⁰ Because the river or lake has always been there, because it permeates so many aspects of their daily lives, directly and indirectly, small wonder that the people of a region or country perceive water as their heritage, to which they have first, if not exclusive right.²¹

As far as they are concerned, as far as most people are concerned, water *is* different.

THREE CONCEPTS AT ISSUE

How water should be allocated among competing interests and regions, and whether it should be manipulated beyond its natural drainage patterns, depends on the way one looks at it. Basically, there are three approaches or concepts at issue: efficiency, equity and environmental quality.

Efficiency

Economic efficiency requires the allocation of resources among various alternative uses in such a way as to maximize national benefits. This is the purpose behind techniques like benefit-cost analysis. In terms of efficiency, a large-scale water transfer plan should be implemented only if (1) the economic demand in the importing area is sufficient to pay for the benefits foregone in the area of origin because of water export, as well as for the construction and maintenance of the physical works for transfer (and any negative effects arising therefrom), and (2) transfer is cheaper than any other means of satisfying water demands in the importing area. Professional economists have challenged the need for long-distance water transfers under both of these conditions.²²

Most of the water proposed for diversion in engineering schemes is earmarked for agriculture, which also returns the least net value per unit among various kinds of use and which, accordingly, is least able to pay for diversion costs.²³ Owing to the continuing surplus of agricultural output in America, the price support program for many commodities and the interest-free construction of U.S. federal irrigation projects, which are commonly further subsidized by power or other water users, the cost of any large increment in farm output would likely be borne by

the taxpayer nationally and by other users regionally rather than by the irrigators themselves. In other words, inter-regional transfer might result merely in a redistribution of income along with water, rather than in a net benefit to the country.

Even in those cases where water transfer promises substantial national benefits, the question remains of whether some other means of meeting water demands might not be more efficient. These include means of conserving existing supplies locally, like evaporation suppression, reallocation to higher-valued uses through realistic pricing, and waste water reclamation and reuse; and other means which may be preferable in some areas at some future date, like desalination and weather modification. Further to this search for the least-cost alternative, it has been suggested that the goals of regional economic growth might better be served by investments entirely outside water development — in health, education, urban renewal or other programs.²⁴

Proponents of efficiency in public spending tend to react to the atmosphere of crisis in water supply with some disbelief. But they have little inclination to favor the area of origin as such either. Water has no intrinsic economic value in the basin as opposed to its use outside; it should flow to the highest bidder, to wherever the marginal returns are greatest, unrestricted by legal or emotional taboo. Economists instinctively recoil from regional preference to any article insofar as it upsets the price system for allocating resources. The competition between basins and regions in this case is thought to be not substantially different from that between political units and interests within the same river basin. In the latter case, efficiency under the aegis of "integrated development" has been more concerned with development of the basin as a unit to maximize total benefits than with which participating state or province or country shares what proportion of the benefits and costs.²⁵

In fact, when so much of the litigation and controversy in Western waters seems to have a fixation on allocation among political units, the economist is tempted to ask: Why divide the river at all? Why should each state through which a river passes have a right to a specific portion of its flow? Why should a basin of origin have a right to preferential or exclusive use over other, possibly more profitable, uses outside? ²⁶

Indeed, regional protection is hard to defend on economic grounds. A claim to unused water for some indefinite future use in the area of origin may interfere with its application elsewhere for immediate benefit. California could quite probably have used all the waters of the Lower Colorado Basin more efficiently than could Arizona which has yet to build a conveyance system; the Lower Basin with its more developed economy and superior agricultural climate could doubtless achieve a higher-valued use of the whole river than can users higher in the watershed. But the nation has never taken efficiency that far.

Equity

The national interest includes many components — foreign aid, public housing, the race into space — which may be judged desirable although not necessarily economic when compared with alternative ways of sustaining productivity. So too in resources development, it is not economic growth alone which public policy encourages, but as well the “equitable” sharing of that growth and its attendant social effects. For example, public power was encouraged as a means of regulating private producers and extending service to rural areas; flood control has been justified to save lives, irrigation to foster democratic communities of family-size farms, and TVA to uplift a depressed region.²⁷

The intention, clearly, is that all parts of a nation should progress, that the nation gains from a policy under which no area loses. Among states and regions as among people, a certain distribution of wealth may seem preferable to the accumulation of maximum wealth; a spatial balance of development may seem preferable to maximizing development. To this extent, the notion of equity serves as a political counterbalance to economic efficiency.²⁸

A nation is built of states (or provinces), each of which holds some power and hope of self-development. States have made claims to water rights on behalf of their populations which have been respected in court decisions and interstate compacts, and to development funds which have been validated in Congressional appropriations. The Upper Basin states of the Colorado, contributing perhaps 90% of the total runoff, refused to be told that they should not reserve a large part of the river for their future growth just because downstream users could make more immediate and better use of the water. Their 50-50 split with the Lower Basin represented a consensus for “equitable apportionment” more than for scientific or efficient allocation, a consensus which continued unto the subsequent funding of the Colorado River Storage Project.²⁹ Today the Columbia Basin states claim that it is only fair that their future be protected; with their abundant water supplies, they stand prepared to take up whatever slack might be left by the incapacity of water-limited areas to maintain current growth rates.³⁰

Some confusion is inevitable, of course, when areas anticipating water import, as well as those resisting export, try to employ equity arguments to advantage. The dry Southwest claims to have a basic right to continue growing without any limitation in water availability; otherwise, going economies will be stranded, Arizona might dry up and blow away, at a tremendous social cost to the nation.³¹

Such arguments are, more than not, a cover for regional self-interest. Regardless, regionalism and states rights, efficient or inefficient, are the law of the land and a fact of life. No doubt they will continue to operate as political constraints upon the economic system of America.

Environment

The third perspective, which places water within an environmental context, is suggestive of changing times. It implies a fundamentally different motive than national or regional economic gain, confident that society can afford to do things beautifully as well as efficiently. In the words of a recent report by a committee of the National Academy of Sciences in the United States:

When much of the country was still wilderness and when all the nation sought economic advantage, priority in the Halls of Congress, as in the minds of the people, was given to land settlement, navigation improvement, and the exploitation of tangible resources. Now that the wilderness has all but disappeared, now that many of the people have both comfort and leisure, there is a greater appreciation of, and a willingness to pay for, certain qualities of the environment which formerly were more common and therefore less valued than they are today.³²

A number of writers today seem less concerned with what can be harvested from the environment in material goods and services than with what happens to that environment in the process. There is a growing feeling that society cannot continue to eat, drink, spend, extract, pollute and generally be merry, with the comforting thought that technology will somehow make everything come out alright. Diversion from east Texas rivers during dry years, or even from the larger Mississippi, could have a detrimental impact on the marine life in the coastal estuaries, where such life has a narrow tolerance to changes in environment.³³ The alteration of channels and the filling of huge reservoirs along the Pacific slope may stabilize water levels; they may also disrupt salmon runs, threaten crustal stability and degrade natural beauty. What creates recreation for some may destroy it for others who prefer wilderness to water skiing.

Many of these kinds of changes have been going on for a long time with little alarm or even awareness. But a stage appears to have been reached where the number of natural scenic wonders, wilderness experiences, and unpolluted, free-flowing rivers has declined in the face of mass encroachment to the extent that conservation organizations are gathering popular support. The assumption by the U.S. Senate Select Committee in 1961 that “comprehensive planning should be undertaken on the premise that full regulation of nearly all the nation’s streams is necessary over the long run and that substantial progress toward this end will have to be made before the end of the present century”³⁴ is not everywhere accepted. Should not some of these areas and streams be saved from manipulation, at least those which are exceptional in some way and whose alteration may be irreversible? Must all the West be watered and developed or is there some value in variety of landscape and life?³⁵

This way of thinking, as one might expect, is not strongest in the areas where people depend on water

control and use for their livelihood. Ecological and esthetic values have a wide constituency but one with little regional concentration.

This constituency is growing. In a major turnabout to his Administration's previous stance on pollution abatement expenditures, President Nixon's first act of the 1970's decade was to sign the National Environmental Policy Act.³⁶ In Canada, the federal responsibility for water management was proposed in late 1970 to a new Department of the Environment.³⁷ Probably nowhere else is the confrontation between environmental and developmental forces more marked than in the management of water resources.³⁸

The three concepts or objectives are not usually as neatly distinguished as one might expect from the above account. In attacking the Colorado River Basin Project bills in Congressional hearings, the Sierra Club argued not just for preserving a natural wonder but against an inefficient allocation of development funds in dam construction.³⁹ And a few economists see ecological limits beyond which efficiency goals are meaningless.⁴⁰ Finally, areas hoping to protect or import water are likely to emphasize their contribution to national development.

Mostly, these and other possible objectives have been implied, rather than defined and compared, in the planning process for water management. In one departure from past tradition, however, the U.S. Water Resources Council is considering multiple-objective planning, illuminating the range of choice among combinations of national income, regional development, environmental quality, and well-being of people possibilities.⁴¹

THIS STUDY, PURPOSE AND PLAN

This study is not an evaluation of the merits of long-distance water diversion schemes, nor is it essentially a recommendation for improvements in public policy. It is less concerned with the way things should be on grounds of efficiency, equity or ecology than with understanding the way they are. Promotionism on the part of transfer aspirants and protectionism by areas of origin may each be criticized as detrimental to the national interest, but too often those who are ready to level charges are insufficiently aware of the circumstances which surround them. Traditions, attitudes and motivations are not easily overcome. The present study, therefore, is designed to bare the framework of historical and political realities with which any serious statement on public policy must contend.

The question of long-distance water diversions is an important one both to the areas directly affected and to the nations of this continent. A panel on needed research convened by the federal Council for Science and Technology in the United States notes that Congress has in effect declared itself unprepared to come to grips with major

interregional water transfer possibilities.⁴² The panel also notes that considerable experience with diversions and diversion plans has been amassed, and suggests that this experience be examined by "post audit" in order to determine under what conditions such diversions could be mutually advantageous to the exporting and importing parties. This study might be considered part of such a "post audit," with emphasis on one side of the controversy.

Singled out for investigation are the principal areas of origin of streamflow in the Western United States and their efforts to prevent or limit the loss of water which may be surplus to their immediate needs.

Area-of-origin motivations, past successes in state statutes and interstate compacts, present strategies in and out of Congress, and prospects in the continuing struggle are discussed in turn. This struggle is of more recent origin in Canada, to which major attention is withheld until the closing chapters.

The reader may find it useful to carry these overall questions with him through the pages which follow: Is previous, smaller-scale, area-of-origin experience relevant to presently proposed interstate, interregional and international diversions? How much is the difference primarily of scale and how much of genuinely different political milieu? How much simply a difference in the times?

The study will proceed along the following lines: In Chapter 2 the designs on areas of abundant water supplies by faster-growing centers in the dry West are described. Local alternatives proving unacceptable, the popular trend to long-distance importation is represented as extending gradually from intrastate to interregional and international scales. Summarized information on engineering proposals indicates which source areas are under pressure and what is being offered as compensation; the same proposals can be used as an index of attitudes to water in the dry West. The thrust of recent strategy on the part of the states of the Colorado Basin and Southwest stands out in the series of bills which they have sponsored in Congress since 1965.

Chapter 3 considers the interplay of river basins and political units in defining the area of origin. The basin is investigated for its relevance in the natural order, in the evolution of political patterns in the West, and in water management by government today. Continued experimentation with basin commissions, authorities and accounting systems suggests the difficulty of representing public interest on a drainage basis.

What were the early experiences from which present claims for area-of-origin protection derive? Chapter 4 provides a record of successes and failures. Attorney General Harmon could find no limit to U.S. sovereignty on the Rio Grande; Owens Valley residents fared less well against Los Angeles' water needs. The early doctrines governing Western water use and diversion are pertinent but

not specific to this issue. Over the last 50 years, however, a number of interstate compacts, together with statutes enacted in California, Colorado, Nebraska, Oklahoma, and Texas, have legitimized area-of-origin demands in whole or part. Generally speaking, the degree of protection seems to reflect the relative autonomy of the political unit involved. Thus, a hierarchy of areas of origin emerges, paralleling that of governments themselves.

Chapter 5 narrows the focus to the on-going confrontation between the states of the Pacific Northwest and those of the Southwest. Attempts toward a Westwide reconciliation are described and Northwest strategy analyzed over a period of five years preceding the legislative outcome of 1968. With national conservationist sentiment attacking Southwestern designs on another front, the Northwest is seen to have played its hand well, both in

Congress and outside. A new unity among the states of the Columbia Basin seems to have jelled.

With the escalation of water planning to continental levels, it becomes pertinent to explore the Canadian scene. What is at once apparent in Chapter 6 is a difference not just in scale but in political context. The distinction in Canada between federal and provincial jurisdictions in resource matters is vital to understanding water problems and opportunities. U.S. markets for Canadian water? The question appears premature at best. Some reasons behind Canadian reluctance to entertain export proposals are suggested. Investigation of alternative possibilities for diversion within the country are described.

Chapter 7 summarizes and concludes the study.

The Spreading Thirst of the Drylands

The American drylands include at least parts of all seventeen contiguous states which stretch westward from the tier connecting the Dakotas with Texas. Through the heart of the drylands, in the Southwest, runs the Colorado River. Its basin is large in area but small in water production compared with the Columbia, the Missouri, the Mississippi, or the accumulated coastal drainage along its margins. Nevertheless, a population of 27 million now live in the seven states drained to a greater or lesser degree by the Colorado. Considerable rearrangement of natural drainage patterns has been effected already in this century to accommodate this growth. Further changes are widely anticipated.

This chapter describes the widening differences in the distribution of Western water and people, the changing rural-urban balance in the drylands, and the failure thus far to substitute local for distant water supply horizons. Also discussed are existing and proposed interbasin diversion projects, persisting attitudes to, and images of water in the dryland economy of the Southwest. Finally, a preview is given of obstacles to expanded diversions, including the unexpectedly strong intrusion of national politics into traditionally Western matters.

PATTERNS OF PREFERENCE FOR THE OASES

The magnitude of migration to the dry Southwest since the outbreak of World War II can only be described as phenomenal in the experience of the United States. Its implications for future regional planning may be in as much doubt today as the possibility of its occurrence obviously was to Lieutenant G.C. Ives who commanded the first navigation up the Colorado over a century ago and reported:

The region. . . is, of course, altogether valueless. It can be approached only from the south and after entering it, there is nothing to do but leave. Ours was the first, and will doubtless be the last party of whites to visit this profitless locality. It seems intended by nature that the Colorado River, along the greatest portion of its lonely way, shall forever be unvisited and undisturbed.⁴³

The population challenge in the West is all the more compelling for its distributional pattern, which is out of sorts with water supply in terms of both time and space. In California, for example, urban and agricultural needs are greatest in the late summer, when water levels are lowest;

and most of these needs rise south of the latitude of Sacramento, whereas most of the available supplies are north of it. Fortunately, nature's regimen lends itself to some degree of alteration on both counts, through seasonal (and annual) storage and areal diversion, to accommodate preferred patterns of human occupancy. Within this framework it is possible to trace the progressive stages by which water supplies have been expanded and the changing nature of demands on them.

Stages of expansion

1. First occupancy. This was the period, roughly the latter half of the nineteenth century, of original settlement, based mainly on agriculture (in some cases preceded by mining). Western American development was based in general on two assumptions: that large surpluses of unexploited wealth existed on the frontiers, and that public policy should encourage the settlement and development of this domain by making land, minerals, and water resources freely available. From the first, water assumed a sustaining role unknown in the earlier-settled, more-humid regions of the country. Liberal use was made of *natural* streamflows, and the right to their use was guaranteed by appropriation based on priority of use in time, (after riparian privileges had been found generally impractical for consumptive use). Users learned that by forming cooperative organizations, they could build bigger ditches and carry water farther from the stream. Communities were small and scattered; they grew slowly, gradually appropriating the remaining dependable low flows. Throughout the period, irrigators generally had the field to themselves.

2. Regulation within the river basin. From the turn of the century, economic progress in the more-favored environments of the dry West began to exhaust available natural water supplies. Conflicts among users for similar, and now also for different, purposes came to be resolved by expansion of dependable supplies through provision of seasonal *storage*. This period witnessed the ultimately successful crusade, helped along by federal participation in a reclamation fund, for big dams over little dams, and multiple-purpose over single-purpose projects. Grand Coulee and Hoover Dams became the kingpins of their respective river systems, each providing for the major water users of town and country in co-ordinated operation. No water problems were foreseen that could not be resolved by reasonably efficient use of resources available within the basin.⁴⁴ In fact, "integrated development" came to mean

the organization of projects that were economically the most rewarding for the basin as a whole, its administrative division notwithstanding.

3. A search for solutions outside the river basin. In the last two decades it has become increasingly apparent that the river basin has not always materialized as a harmonious community of interests. Groundwater deficits and questions of streamflow allocation and regulation have become subjects of intensive study, but rarely of concerted basinwide action. These problems have proved even more difficult where basins cross state boundaries. Now the dryland metropolis, a relative newcomer to the Western scene, has turned the search for alleviation of impending shortages in another direction.

The nineteenth-century American West was won largely through the adjustment of rural communities to the limitations of local water availability. Today's West may still be a land of wide open spaces; its population, however, lives mainly in cities. It is, moreover, a population that seems determined to overcome rather than adjust to local environmental handicaps. The search for water supplies extends *outside* the immediate river basin.

Between 1950 and 1960 the seventeen Western states emerged as a region more highly urbanized than the United States as a whole. Most of the region's population growth since 1950 has occurred in Arizona, California, Colorado, and Texas, and more specifically, in urban communities in the drier parts of these states (Table 1). In the same period municipal and industrial water use increased a remarkable

274 per cent, as opposed to a meager 5 per cent increase for irrigation deliveries (Table 2). Manufacturing and service activities have effectively displaced agriculture and mining as the principal sources of income.

Table 2. Selected Water Uses in the Western States

State	Municipal-Industrial Withdrawals (in millions of gallons daily)		Irrigation Deliveries* (in thousands of acre-feet annually)	
	1950	1960	1950	1960
Arizona	120	280	5,200	5,200
California	1,595	12,600	23,000	20,000
Colorado	240	620	9,660	10,000
Idaho	140	300	15,350	12,000
Kansas	330	910	250	2,000
Montana	305	370	5,345	5,700
Nebraska	180	860	2,600	2,500
Nevada	61	127	1,660	2,000
New Mexico	75	155	3,700	2,100
North Dakota	115	51	75	94
Oklahoma	172	630	180	300
Oregon	380	1,590	2,300	5,400
South Dakota	56	71	81	170
Texas	2,200	5,700	4,800	9,900
Utah	160	520	3,450	3,700
Washington	900	1,510	3,870	4,100
Wyoming	52	209	3,220	3,500
TOTAL	7,081	26,503	84,741	88,664
% Increase 1950-1960	274		5	

*Irrigation figures refer to water delivered to farm, exclusive of conveyance losses. Withdrawal figures are not available for irrigation, hence the municipal-industrial and irrigation figures are not comparable.

Sources: Kenneth A. Mackichan, *Estimated Use of Water in the United States, 1950*, U.S. Geological Survey Circular 115 (Washington, 1951), 6-7; and Mackichan and J.C. Kammerer, *Estimated Use of Water in the United States, 1960*, U.S. Geological Survey Circular 456 (Washington, 1961).

Table 1. Population and Urbanization in the Western States

States	Population (thousands)			% Urban	
	1950	1960	1965	1950	1960
Arizona	750	1,321	1,575	55.5	74.5
California	10,586	15,862	18,403	80.7	86.4
Colorado	1,325	1,768	1,949	62.7	73.7
Idaho	589	671	693	42.9	47.5
Kansas	1,905	2,180	2,248	52.1	61.0
Montana	591	679	703	43.7	50.2
Nebraska	1,326	1,417	1,459	46.9	54.3
Nevada	160	291	434	57.2	70.4
New Mexico	681	953	1,014	50.2	65.7
North Dakota	620	634	652	26.6	35.2
Oklahoma	2,233	2,337	2,448	51.0	62.9
Oregon	1,521	1,772	1,938	53.9	62.2
South Dakota	653	683	686	33.2	39.3
Texas	7,711	9,631	10,591	62.7	75.0
Utah	689	900	994	65.3	74.9
Washington	2,379	2,855	2,973	63.2	68.1
Wyoming	291	331	330	49.8	56.8
TOTAL	34,010	44,285	49,090	63.6	75.6
United States	151,326	179,992	193,795	64.0	69.9

Sources: *Current Population Reports*, Ser. P-25, Nos. 304, 336, 348, U.S. Bureau of the Census, 1965-1966; Census of Population, 1950, Vol. 2; Census of Population, 1960, Vol. 1.

A contrast has been drawn between the nomads and oasis dwellers in the Old World, with their careful husbandry of water, and the new urban oases in the American West.⁴⁵ These cities have not come to terms with aridity by depending on a level of water consumption that the natural streamflow can support; they are in, but not of, the desert. On these rapidly growing oases, therefore, is forced a critical problem — where to find more water. Opportunities for tapping new sources of water in the dry lands themselves are no longer available; they have disappeared under the irrigation ditch. Irrigation agriculture still accounts for 90 percent of all water consumed in the West.⁴⁶ Legal and political entanglements have allowed the expanding city only mediocre success in dislodging these local agricultural water rights, despite the city's ability to pay a much higher price. Water continues to escape

competitive market evaluation under the protection of a value system that reaches back into the frontier period.

NON-COMPETITION BETWEEN URBAN AND RURAL INTERESTS IN THE DRYLANDS

The more obvious possibility by which a city in the dry West could increase its water supplies would seem to be close at hand, not far away — the purchase of local supplies that have already been developed into irrigation rights.

This may at first mean a change only in the use of the water, as the suburbs gradually encroach on the adjacent agricultural land, and the transformation of the irrigation district into a municipal water-supply agency. Businessmen will gradually replace farmers on the board of directors; water-quality standards will reflect a shift in emphasis "from alfalfa to children."⁴⁷ However, the conversion has few unavoidable external effects and can usually be carried out without crippling litigation, in a manner analogous to land sale. This has been the experience in coastal Los Angeles County, where irrigated acreage decreased 52 percent between 1955 and 1960 and may well disappear before the end of the century. Similar trends have been noted along the fringes of Denver, El Paso, Phoenix, and Tucson.⁴⁸ Unfortunately, water rights acquired along the expanding fringes of an urban area in the early stages of physical growth are not nearly enough to satisfy its needs after it has begun to take on the appearance and functions of a commercial or industrial center.

The next logical step would be an effort by the city to increase its rights by an extended transfer, characterized by a change in the point of diversion as well as in the kind of water use. If, as is likely, the local stream is already fully appropriated, an alternative would be to buy existing rights from less productive users of the water.

All evidence points to the ability of municipal and industrial users to outbid agriculturists for water rights under unrestricted market conditions. Studies carried out independently in Arizona and New Mexico have shown beyond doubt that nonagricultural uses yield many times more income per acre-foot of water applied than agriculture does, and it makes little difference whether or not the indirect income to agriculture is included in the calculations.⁴⁹ And this in spite of a federal subsidy under which most irrigators are provided with water below its real cost. Southern California cities presently pay more than twenty-five dollars an acre-foot wholesale for their share of Colorado River water; under the federal subsidy a number of irrigation districts receive water from the same source for as little as two dollars. The greater part of this agricultural water is being used to produce low-value crops such as alfalfa. It has been suggested that the urban centers of the region could buy, at a price that reflected its value in use, a part of this water — perhaps one million acre-feet — from the agricultural community. The increment would amount to one-quarter as much urban water as is presently being

used in south-central California, and the need for importation would largely disappear.⁵⁰ However, the conditions under which such a transfer might be effected are not unrestricted; they are subject to legal regulation and political pressure. "Cannibalization" has been rejected.

Whether or not the language and intent of Western state water codes permit efficient transfer of rights from one place to another and from one use to another has been argued by lawyers and economists for a good many years.⁵¹ Because of obviously important external effects, such transfers must be regulated against abuse. Externalities arise from the continuity of water in flow, so that what is not actually consumed under an appropriator's firm legal right contributes as return flow to the rights of his neighbors downstream. If, therefore, the appropriator sells or moves his point of diversion he should not be able to transfer any more of his water right than he had actually been consuming; otherwise, the third parties, the parties external to the transfer but dependent on his non-consumptive, or return, flow, would be injured. Alternatively, the would-be transferer might buy out the third parties.

The intent to protect external parties cannot be faulted; often, however, the means available constitute a serious weakness of the system. In most states the earliest water rights were developed simply by use, and some are still unrecorded. Even in the areas where all rights have been adjudicated, they are measured in quantity of water withdrawn rather than in quantity actually consumed, which must be determined before a transfer can take place.⁵² Where there are no state forfeiture statutes, the problem of distinguishing actual affected uses from abandoned "paper rights" further complicates transfer proceedings in terms of time and expense. The problem is compounded in a few states that follow the Colorado system of investigation, where a court process, often lacking accurate hydrological data, is the main recourse. Because a large city such as Denver must plan ahead for steady increments in water supply, it cannot easily afford to jeopardize its growth by multiple court proceedings with individual irrigators. Denver's discouraging history of local litigation with irrigators along the South Platte explains in large part its preference for developing new supplies across the Continental Divide.⁵³

Legally, urban communities appear to have advantages in competition with other users for developed water supplies. All state governments, for example, rank domestic and municipal use at the top of their official preference lists. California goes so far as to consider it "first in right, irrespective of whether it is first in time." These same preference lists generally rank agriculture second and industry third or lower (except in Texas, where industry ranks above agriculture).⁵⁴ But preferences are not priorities; they seem to be invoked only in the acquiring or reserving of new supplies and not in the existing competition to displace lower-value but developed agricultural rights.

There remains the power of eminent domain, by which a municipality as a preferred user of water may condemn other users in accordance with state law, providing compensation is paid. Condemnation powers are available in every state. In practice, however, eminent domain is an uncertain, piecemeal process, generally invoked as a last resort. In any case, this power does not apply to self-supplied industrial uses, however much they may contribute to growth.

It might be expected that the newer forces of urbanization and industrialization would work against the historical privileges of rural water users. Agriculture, cattle-raising and mining still retain their popular image, however, as contributors to regional culture and prosperity, and their

spokesmen continue to dominate public policies. A good example of disproportionate rural representation is New Mexico, where 27 percent of the population could elect a majority of the members of the lower house of the state legislature and a mere 14 percent could elect a majority in the state senate.⁵⁵ Court-ordered⁵⁶ reapportionment is in process throughout the West. Even so, legislators and administrators are hesitant to take from one group to give to another, at least when a less politically painful alternative exists. This alternative, importation over long distances from better-watered regions, becomes an "easy way out." As a result, the popular mandate in the dry West seems to be founded on the logic that everyone gains — or at least no one loses directly — if unappropriated water can be found

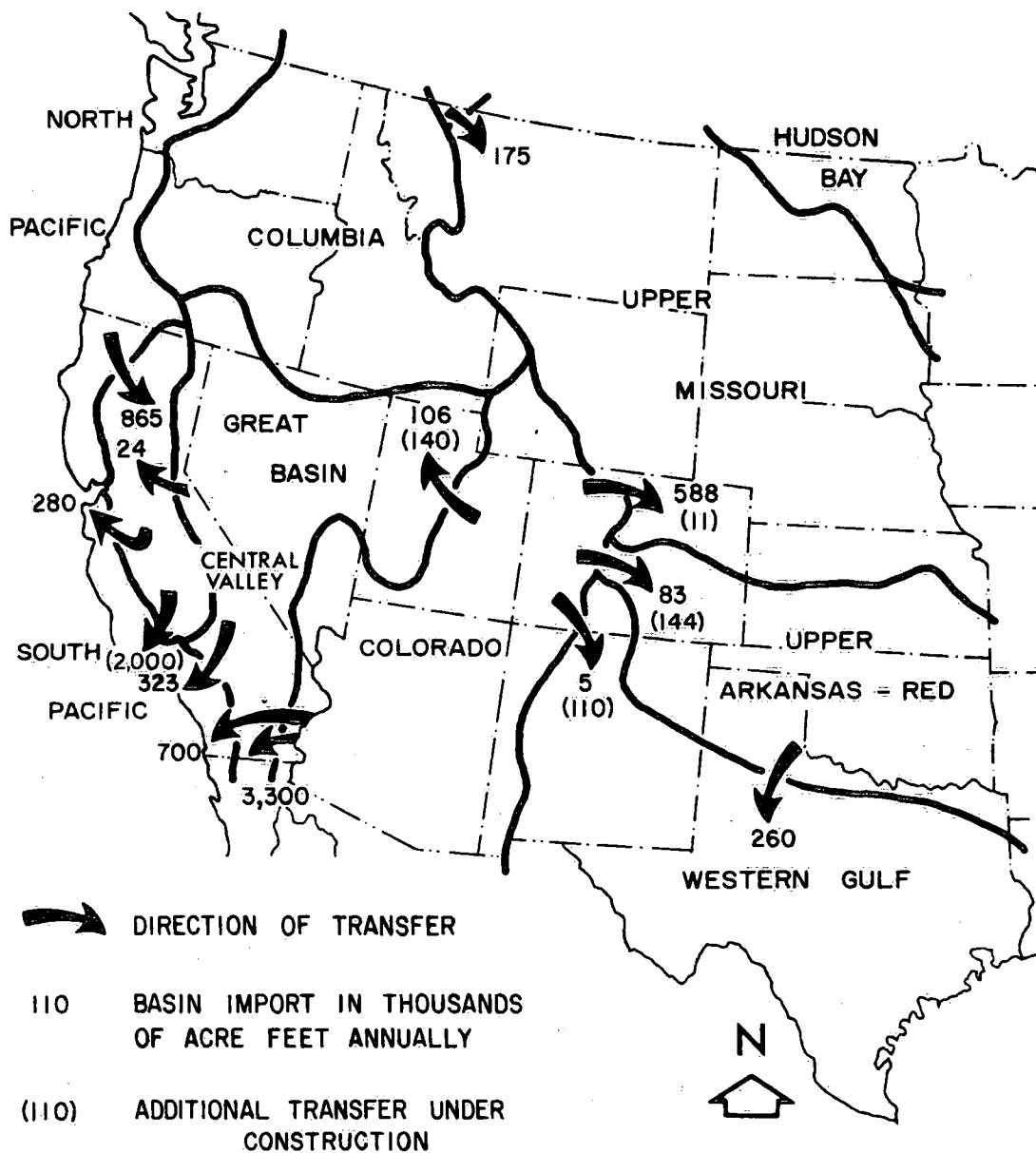


Figure 2. Aggregate water transfers between major river basins.

elsewhere, as an alternative to buying out local rights, the value of which has already been capitalized into going concerns.

Thus, if the framework of state water laws is in many respects inadequate, in the long run it is the political milieu of the dry West that makes local rural-urban transfer all the more unlikely. An active local conflict for the developed water rights of the oases can hardly be said to exist. After the city of Los Angeles buys its share of Colorado River water wholesale, it turns around and sells part of the water for less than half this price to the few irrigators remaining within the city limits. Los Angeles will avoid any local conflict which might recall its unfortunate experience in buying out Owens Valley water rights.⁵⁷

Much of the dry West's continuing love affair with agriculture can be traced back to a policy of cheap water begun in the frontier period and maintained in federal irrigation projects ever since. If a city can follow a similarly successful formula, by passing along to state and federal budgets the increased costs of long-distance transfer, so much the better, both for itself and for its immediate rural neighbors. The water shortage in this circumstance is, to that extent, a shortage of *cheap* water.

PATTERNS OF REDISTRIBUTION

In his transportation report⁵⁸ to Congress in 1808, Gallatin included recommendations for "Communication

Table 3. Western States Interbasin Transfers Reported in 1965

State	Number of Transfers		Quantity Transferred (acre-feet)	
	Total	Municipal-industrial use	Total	Municipal-industrial use
Arizona	2	—	9,000	—
California*	12	6	7,500,000	1,494,000
Colorado	24	6	675,000	360,000
Idaho	1	—	1,000	—
Kansas	1	1	3,000	3,000
Montana	1	—	175,000	—
Nebraska	—	—	—	—
Nevada	2	1	223,000	4,000
New Mexico	2	1	2,000	1,000
North Dakota	—	—	—	—
Oklahoma*	1	1	70,000	70,000
Oregon*	6	2	200,000	120,000
South Dakota	1	1	10,000	10,000
Texas	58	26	5,965,000	4,294,000
Utah	10	2	162,000	41,000
Washington	24	18	3,200,000	2,800,000
Wyoming	1	1	5,000	5,000
Total	146	66	18,200,000	9,202,000

*Returns are incomplete in describing smaller transfers or in indicating the purpose of the transfer, in which case approximations are based on other sources of information.

Between the Atlantic Waters and Those of the St. Lawrence", specifying those routes which were soon to take form as the Champlain and Erie canals. Farther west, Major J.W. Powell foresaw the possibilities for agriculture in the Dakotas from diverting part of the Missouri River into the James⁵⁹, a project which is about to be realized a hundred years later as an element of the Pick-Sloan plan. And north of the border, Captain John Palliser noted in 1859 the ease with which the South Saskatchewan River could be diverted at the Elbow into the nearby Qu'Appelle, providing an uninterrupted flow from the Rockies to the Red River settlement to the east; this diversion has likewise been implemented, though for other purposes than Palliser anticipated.⁶⁰

The earliest interbasin connections were generally minor and prompted by other considerations than water supply. A few major centers like New York, Denver and Los Angeles had begun to draw from farther afield. But only in the recent past has this become the course of least resistance for so many communities in the dry West. Today, one out of every four persons in the Western states is served by a water supply system that imports from a source a hundred miles or more away.⁶¹ In total tonnage the amount exceeds that carried by all the region's railroads, trucks and barge lines combined.

Existing Water Transfers

Information concerning the present extent and character of diversions between basins or sub-basins was obtained for the most part by correspondence survey with the agencies responsible for water resources administration in each of the seventeen Western states. Table 3 summarizes this information. Evidently, interbasin transfers exist in all but two of these states. The great bulk of them, however, occurs in only four states: California, Colorado, Texas and Washington.⁶² Municipal-industrial transfers are also most numerous in these four states. Of the total quantity of water diverted, slightly more than half is intended for municipalities and their industries. A total of 18.2 million acre-feet of water manipulated annually across river-basin divides is not an insignificant amount, though it represents only a small proportion (13 percent) of all water withdrawn from streamflow in the West, and a still smaller proportion (4 percent) of total runoff.

Figure 2 illustrates the aggregate transfers existing and under construction that cross boundaries of *major* river basins;⁶³ consequently, it ignores the cluster of transfers across divides between smaller basins or sub-basins in the Northwest and Texas Gulf regions. The Colorado Basin is established as a well-tapped source of export to surrounding basins; the Columbia and North Pacific Basins remain largely self-enclosed water-abundant regions. Table 4 indicates the large proportion of Western runoff in these latter two basins. At the present time no transfers cross state boundaries.⁶⁴ It is quite likely that Los Angeles, Salt Lake City, Laramie, Denver, and Colorado Springs would

have found it impossible to reach beyond their own river systems toward the Colorado if the diversions had meant crossing their state lines as well. The same limitation seems to hold for the rest of the continent.⁶⁵ How much longer these boundaries to diversion will last is uncertain, owing to increased pressures for new water in the dry West.

Table 4. Estimated Annual Withdrawals and Actual Runoff in the Major River Basins of the Western United States (in millions of acre-feet)

Basin	Withdrawals*	Runoff**
Central Valley	22	24
Colorado	15	3
Columbia***	29	180
Great Basin	8	4
Hudson Bay***	—	2
North Pacific	3	140
South Pacific	12	2
Upper Arkansas-Red	7	40
Upper Missouri***	25	32
Western Gulf	22	48
Total	143	475

*Includes both consumptive and nonconsumptive uses, except hydropower. Based largely on Mackichan and Kammerer, *op. cit.* (see text footnote 46).

**After depletion by consumptive uses. Based on *Compilation of Records of Surface Waters of the United States, October 1950 to September 1960*. U.S. Geological Survey Water-Supply Papers 1728-1738 (Parts 5 - 14) (Washington, 1964).

***Includes contribution from upstream portions in Canada.

Proposals for Larger-Scale Transfers

On the assumption of a continuation of the tendency to look to new horizons and "greener fields" of unappropriated supply, what is the picture of things to come? Among the many contributions are a number of schemes which must strike as much fear in the proposed areas of origin as excitement in the growth centers of the drylands. They are reviewed briefly here.

In its United Western Investigations of 1950-51, the Bureau of Reclamation made a reconnaissance survey of several sources of water in the Northwest for possible export southward.⁶⁶ The report was withheld from general distribution because of political pressure from the Pacific Northwest and from California, where the projected interim use of northern California water outside the state was not well received.⁶⁷ A change in Administrations in Washington, D.C., was also influential.

For the next few years, agitation for development by the states of the lower Colorado Basin was held in abeyance while Arizona and California fought out their long dispute in the Supreme Court.⁶⁸ As it became clear that none of the states in the Southwest would emerge a real winner against the water demands of the whole region, the Secretary of the Interior prepared to break the impasse

with a "regional solution" immediately following the Court's decision in the spring of 1963. His Pacific Southwest Water Plan (PSWP)⁶⁹ again pointed to northern California as the closest source of surplus water to fulfill the allocations granted by the Colorado River Compact. Adverse reaction to PSWP led to a rash of alternative contributions, mostly by Californians, that looked farther north for sources of still unappropriated water. By this time, west Texans were also shopping about for more water.

For a time, it seemed that every consulting engineer with the time to spare was making paper projections. Most of these concentrated on making, first the Columbia, then the Missouri and Mississippi, tributary to the Southwest; but some saw an opportunity to go all the way, solving in one massive campaign the water problems of the West, the nation and the continent. In almost no time, it became popular to speak of coordinating governments at all levels for the purpose of conveying millions of acre-feet of water over distances of thousands of miles and pumping lifts of thousands of feet for costs in the billions of dollars.

A reversal of position about this time by planning officials of the two most populated states in the West, California and Texas, on the adequacy of their water supplies did nothing to discourage speculation. The rationale behind the California Water Plan and its satisfaction of both area-of-origin and area-of-deficiency demands in 1959 was that the state had sufficient water within its boundaries to accommodate the needs of all areas. Within five years, however, California legislators and officials were making overtures for future supplies elsewhere, first from the Columbia, then from Canada.⁷⁰ Similarly, the first of the annual Water For Texas Conferences, held in 1955, rested on the stated belief that:

Enough water for all our needs, present and future, falls on Texas or is brought into this State by surface streams and underground seepage originating elsewhere. Our basic water problem is one of management — to make available and use effectively the water provided by Nature.⁷¹

Federal agencies adhered to this assumption in their own surveys which contributed in large part to the Texas Water Plan of 1968. By this time, however, demands for importation in dry West Texas and unwillingness in the eastern part of the state to bear the full burden of statewide supply compelled officials to look elsewhere for 50-year needs, primarily to the lower Mississippi, 700 miles away.⁷²

Impending water shortages in the American Southwest are not alone responsible for the escalation in water projections to a continental basis. A fortuitous coincidence of drought in the Northeastern states with renewed interest in Western water diversions helped to extend the theater of operations. The tempo of activity continues to accelerate in this region, now that the Corps of Engineers has a Congressional mandate to explore interbasin transfer possibilities for the entire Northeast, something beyond the

reach of the Bureau of Reclamation in the West for the time being.⁷³

A collection of 20 large-scale water diversion proposals which have come to light thus far is summarized in Tables 5 and 6 and in Figures 2 and 4. These do not include any projects presently under construction, such as the California Water Plan, nor any investigations recently begun.⁷⁴

Dryland Attitudes to Water and Development

Almost without exception, the proposals noted previously are of an engineering reconnaissance nature and based on a variety of assumptions with respect to population growth, economic conditions and social preferences which have not been substantiated. A comparative evaluation of their feasibilities is therefore out of the question.⁷⁵ It is possible, however, to read the diversion proposals as an index of popular thinking about water in the dry environments of the West. This will serve to focus, to a degree, what budget balancers and conservationists nationally, as well as areas of origin regionally, are up against.

Fundamental to most diversion schemes is the attitude that water is, was, and ever will be the key to material growth, regionally and perhaps nationally. The Parsons Company, sponsors of the North American Water and Power Alliance, finds that "water is our number one problem".⁷⁶ It is typical, for that matter, for drylanders to reminisce over the decline of old hydraulic civilizations and to predict a similar fate for the American Southwest tomorrow if governments don't learn to keep their expanding populations in water. The "water is our lifeblood" syndrome can only be satisfied, apparently, in more of the same kind of development which characterized earlier frontier reclamation. If abundant water supply is made available for all conceivable purposes, the implication is that everything else should fall into place. All kinds of unfavourable trends will be countered: urban unemployment, rural decline, crowded recreation facilities, world food shortages.⁷⁷ To this way of thinking population and economic growth will proceed only with proportional increases in water supply.

Secondly, and perhaps naturally to an engineering mind, technology is the solution to problems of resources development, not adjustments in the habits or institutions of man. The questions which challenge are not how water is used or misused, but how to find more and transport it to areas of deficiency, thus reducing the problem to its physical dimensions. Its professional bias toward construction is what made Northwest congressmen wary of giving the Bureau of Reclamation the responsibility of determining interregional water diversion feasibility.⁷⁸ The conflicts and uncertainties inherent in water rights, demands and goals among various interests are either

grossly simplified or avoided altogether, as though they would dissolve anyway in the solution of more water for everyone. Thus unburdened but for the loosest social guidelines, technical considerations assume the initiative; the resulting plan is therefore precise and unqualified, if sometimes bordering on naiveté.⁷⁹

It is typical of dryland water planning that none of the proposals for long-distance diversion suggest change in priorities in the process of accommodating the expansion of all uses. Just as the California Water Plan projected irrigation to consume eighty percent of that state's ultimate water availability,⁸⁰ most of the more recent proposals continue to favor irrigation. Other uses appear to be subordinate, although necessary for financial and political reasons. Thus, flood control is provided to the designated areas of origin, by the simple process of having their "surplus" flows stored and exported; navigation and recreation benefits, nonreimbursable, are anticipated as a consequence of constructing new channels; hydropower generated along the route of transfer is relied upon to pay the majority of overall project costs; and pollution in the area of import, mainly salt concentration, is "controlled" by dilution with new water.⁸¹ Municipal and industrial water users in the Southwest are projected to receive a relatively small amount of imported water, but to pay three to four times as much per unit as irrigators. This apparently is no cause for friction; rather, the possibilities of importation encourage the rural and urban communities of the dry West to pull together for federal dollars, instead of fighting among themselves for the meager resources with which nature has endowed them locally.

Another element of the diversion proposals — scale — speaks for itself. The vast frontier has ever challenged America in its ingenuity to do better, to think bigger, until one becomes virtually synonymous with the other. Summing up its frustration with past piece-meal, stop-gap measures that leave the states of the Colorado basin still mutually distrustful, the import approach favors implementing, in one massive sweep, an ultimate solution to all foreseeable water problems. One might well wonder whether a spirit of Manifest Destiny is not reborn in the continental use of Canadian waters. Some plans, of course, are larger than others; many admit to being merely inter-regional in scale, increments to the ultimate system. Quite obviously, however, most public interest attends those schemes which cover the most territory, capture the most water, and cost the most money.

Lastly, it remains to mention a trait which gives purpose to technology and scale in diversion schemes. This is the view of the environment as incomplete, even inequitable, until put to work for man. An uncontrolled river is said to "waste" into the sea, something of which at least the marine biologist must have reservations. Water diversions become necessary to "correct" the "deficiencies" of nature in placing water where people aren't. The Federation of Rocky Mountain States believes that "the

Table 5. Interbasin Diversion Proposals -- Interregional

Proposal (Author)	Year Proposed	Water Source	Volume of Diversion in millions of ac. ft.	Estimated Cost in billions of \$
Pac. SW. Water Plan (Interior Dept.)*	1963	north coastal Calif. rivers	1.2	?
Western Water Project (Pirkey)	1963	lower Columbia R. above the Dalles	13.0	12.8
Sierra-Cascade Project (Miller)	1963	lower Columbia below Bonneville	7.5-30	?
Snake-Colorado Project (Nelson)	1963	middle Snake R. in Idaho	2.4	1.4
Modified Snake-Colo. Project (Dunn)**	1964	lower Snake R. in Oregon	5.0	3.6
Yellowstone-Snake-Green Project (Stetson)	1964	Yellowstone & Snake Rivers in Montana & Idaho	2.0	0.4
Undersea Coastal Aqueduct (NESCO)†	1965	mouths of Klamath, Eel & Rogue Rivers	11.0	8.0
Undersea Hose (Conner)	1967	mouth of Columbia River	12.0	2.0
Great Plains Plan (Beck)	1967-8	Missouri R. in Nebraska	10.0	3.5
Hudson Institute Plan (Hudson Inst.)§	1968	Mississippi & Arkansas Rivers	34.0	12.2
Texas Water Plan (State of Texas)‡	1968	Mississippi & East Texas Rivers	17.0	9.0

*Initial proposal of the Secretary; the diversion from this source was deferred in the revised 1964 proposal.

**Initial stage; Dunn foresees a need to increase diversions from this source eventually to 10 and 15 million acre-feet.

†The Department of the Interior is presently making a reconnaissance study of such a proposal.

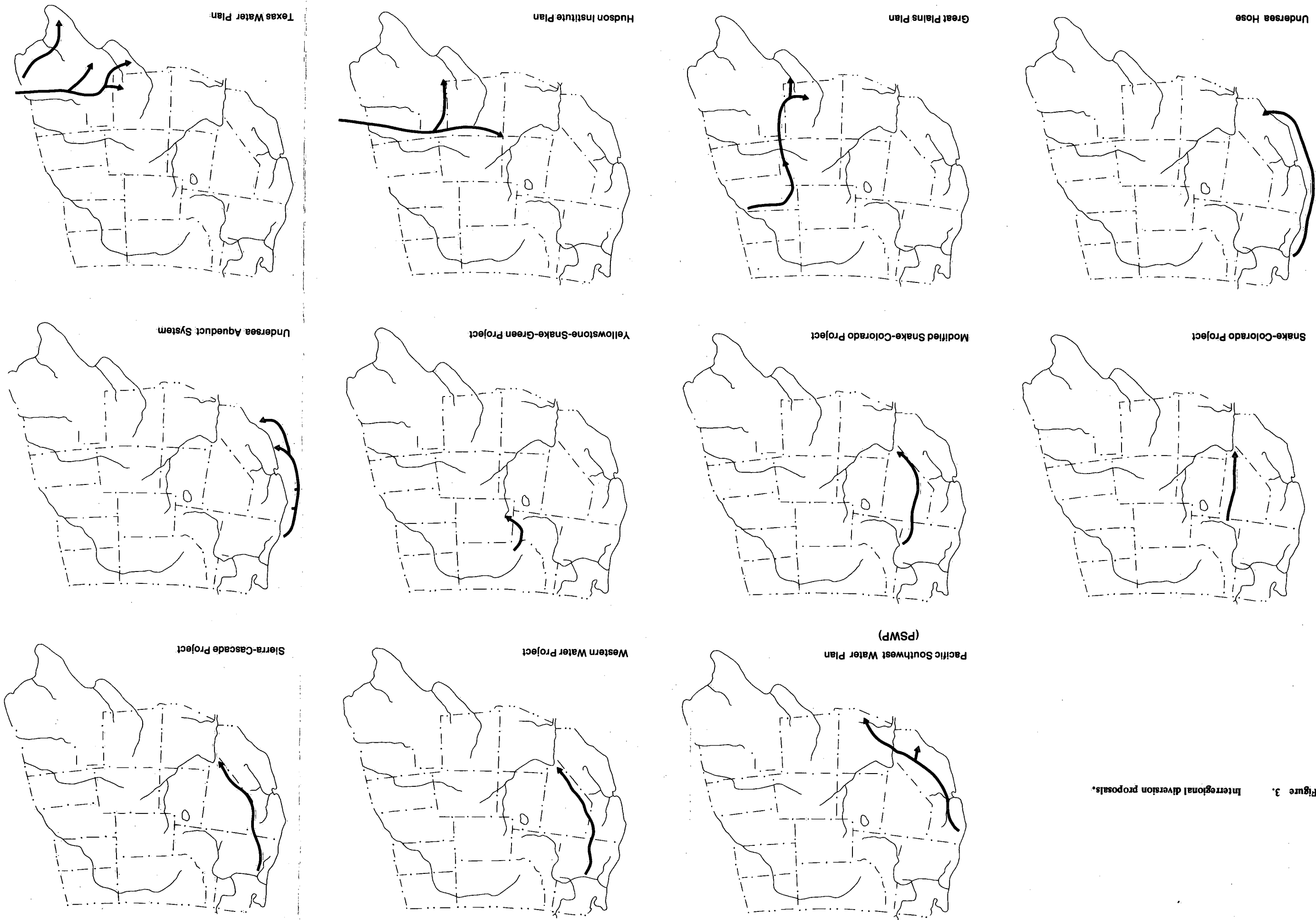
§ Preliminary study; a more detailed evaluation is underway by the Institute. A joint Corps of Engineers-Bureau of Reclamation study of the lower Mississippi source for West Texas and Eastern New Mexico supplementation is also in progress.

‡ Preliminary version in 1965 omitted possible diversions to West Texas as infeasible, relied on East Texas water only.

Table 6. Interbasin Diversion Proposals -- International

Proposal (Author)	Year Proposed	Water Source	Volume of Diversion in millions of ac. ft.	Estimated Cost in billions of \$
Grand Canal Plan (Kierans)	1959	James Bay dyked, rivers "recycled" to Great Lakes	?	?
Great Lakes-Pacific Waterways Plan (Decker)	1963	Skeena, Nechako & Fraser of B.C., Peace, Athabaska, Saskatchewan of Prairie Provinces	115	?
North America Water & Power Alliance or NAWAPA (Parsons)	1964	Primarily the Pacific & Arctic drainage of Alaska, Yukon and Brit. Col.; also tributaries of James Bay	110	100
Magnum Plan (Magnusson)	1965	Peace, Athabaska & N. Saskatchewan in Alberta	25 at border	?
Kuiper Plan (Kuiper)	1967	Peace, Athabaska & N. Saskatchewan in Alberta, Nelson & Churchill in Manitoba	150	50
Central North American Water Project or CeNAWP (Tinney)	1967	Mackenzie, Peace, Athabaska, N. Saskatchewan, Nelson & Churchill	150	30-50
Western States Water Augmentation Concept (Smith)	1968	Primarily Liard & Mackenzie drainages	40 at border	90
NAWAPA-MUSHEC or Mexican-United States Hydroelectric Commission (Parsons)	1968	NAWAPA sources + lower Mississippi & Sierra Madre Oriental Rivers of Southern Mexico	158 + 129 NAWAPA MUSHEC	?
North American Waters, A Master Plan or NAWAMP (Tweed)	1968	Yukon & Mackenzie Rivers, drainage to Hudson Bay	1,500	?

Figure 3. Interregional diversion proposals.



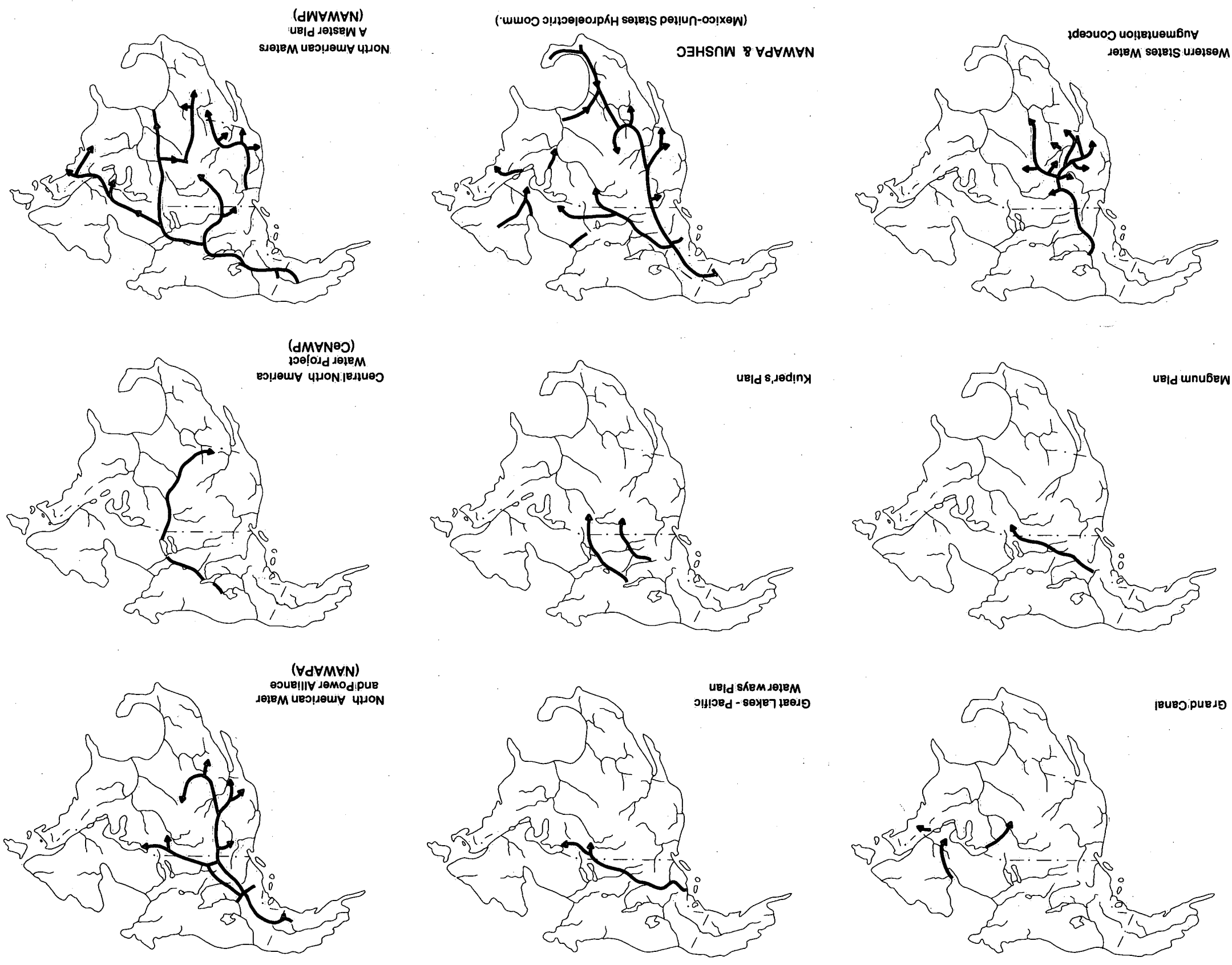


Figure 4. International diversion proposals.

West should not be penalized for lack of water"; if something can be done about it, then plainly it should be. Apparently, there is little redeeming value in things natural, or in alternatives non-structural, at least little in comparison with the kinds of mass benefits which concrete development can create. Thus, the Bureau of Reclamation refers to Glen Canyon Dam's role in taming the Colorado River:

The wild red outlaw river
Tamed.
Now flowing clean and blue
Unmaimed.⁸²

And thus, the proponents of more dams inside the Grand Canyon can see nothing but benefits in visitor-days to the reservoirs created behind them.

THE NATIONAL PICTURE

Existing interbasin diversions all fall within state and national borders; proposals for expanded diversions reach well beyond these borders. Interesting as these latter may be, they are really no more than lines on a map. Any real breakthrough to interstate (and international) diversion must ultimately be made in legislation before Congress (and Parliament, where Canada is involved), not on the drawing board. As if to underscore this point, the states of the Colorado Basin have taken their case to Congress.

The aftermath of discussions between the Administration and the Southwestern states, since *Arizona v. California* was decided and the Pacific Southwest Water Plan was promulgated, resulted in a series of Colorado River Basin Project bills. These called for, among other things, dams within the Grand Canyon to finance not only irrigation in the Southwest but studies of importation from elsewhere. By the time the final version was written into law in 1968, the Colorado Basin states had achieved much less than they wanted, although their gains were considerable.⁸³

The prospective areas of origin from which water might be imported into the Colorado Basin were neither defined by criteria nor pinpointed geographically. Some provisions, derived from Southwestern intrastate experience, were offered to guarantee protection to, and encourage co-

operation from, such areas as might be designated. The nature of these provisions and the opposition by Pacific Northwest spokesmen to diversion studies is left for discussion in later chapters. In the meantime, larger circumstances which would contribute to the outcome of the Northwest-Southwest struggle are described briefly.

It had not been uncommon in the past for different parts of the West to join together in support of each other's projects, and to trade favors with other parts of the country for similar mutual gain. This was easily enough done in the decentralized Congressional system in which Westerners were able to dominate the appropriate committees for water matters.⁸⁴ Independent projects seldom infringed on one another and could be justified separately. That day appears to be over.

Westwide unity was unlikely to persist with one large region vying for the water, surplus or not, of another. But even without a breakdown of the Western block in Congress, the controversy over large-scale water diversion was bound to exceed the interregional level. The Colorado bill was to cost more than one billion dollars, the largest single project expenditure in federal water development experience. Other needs and other regions were now prepared to compete with Western water projects for federal funds, not only those large national programs for defense and space, but those which are becoming more dear to the hearts of constituents in the urbanized and industrialized parts of the country — housing, welfare, transportation and pollution programs. Even in the water field, Congress appears to have veered away from regional favoritism and toward national planning and environmental protection. Recent legislation includes the Water Resources Research Act, the Wilderness Act, the Water Resources Planning Act, amendments to the Water Quality Act, the Water Project Recreation Act, the Scenic and Wild Rivers Act, and the National Water Commission Act, the last-mentioned to carry out some studies which the Colorado Basin states wished to control within their own legislation. Concern for environmental quality has been registered not only in pollution abatement appropriations for Eastern states, but in Western projects which threaten such obvious scenic grandeur as the Grand Canyon of the Colorado.⁸⁵

These conditions pointed to a higher-level confrontation than the West had ever before experienced in its water development programs.

Drainage and Politics: Which Determines the Area of Origin?

Frequent reference has been made to the area of origin and its resistance to exporting water. It remains to define that area. Is it a country, state (province), group of states, or is it a drainage basin in whole or part? Is it sometimes one and sometimes another?

What constitutes an area of origin received a great deal of attention at the second Western Interstate Water Conference at Corvallis, Oregon in the summer of 1965.⁸⁶ A number of ways of demarcating its boundaries were offered, some more inclusive of affected interests than others, but no one definition prevailed. Many conference participants considered general research into the topic superfluous, in that political bargaining would be necessary to settle the relevant facts in each case.

It will be instructive to identify the area of origin in two stages: one an approximation in which the drainage pattern assumes paramount importance, the other essentially a refinement of the outline in that those who feel their rights or their welfare threatened by external control of the basin, or part thereof, are likely to group along more traditional jurisdictional lines. The resolution of basin and jurisdictional units toward defining the area of origin is the purpose of this chapter. In the process it should become clear that the basin is not an isolable unit for defining water development interests.

THE BASIN AS A NATURAL REGION

A river basin is commonly identified as the land area drained by a river and its tributaries. The basin owes its evolution to certain fundamental properties of water — it flows under the force of gravity, sinking through porous surfaces and running off others, and in so doing transports material with which it carves out its channels. A major part of the overall hydrologic cycle is fulfilled in the basin — what is discharged at the mouth plus what is evaporated from its surface area balances what is received as an annual average.⁸⁷

The cycle which constantly renews the water supply of the basin thereby affords it a certain unity of its own in the natural order. All of the waters flowing in the basin find their way to a common outlet, illustrating the behavioral interdependence which is characteristic of a system. Are the facts of basin unity such that artificial disturbances, particularly additions or subtractions to the total flow through interbasin diversion, cannot be tolerated or

absorbed by the system? The question of flexibility within the system is worth considering.

On anything other than hydrologic criteria, the basin appears to have no claim to distinction. Climate and landform patterns hardly conform to basin boundaries. The Missouri Basin, for example, encompasses both mountains and plains, and areas which are well-watered as well as those approaching aridity.

Even in the behavior of water itself, the basin cannot be taken for granted as an all-inclusive or changeless entity. Ground water divides do not always coincide with surface outlines; most Texas rivers, for that matter, are traversed underground by aquifers which effect inter-basin transfer.⁸⁸

Drainage boundaries have likewise varied seasonally. Where divides are low, floods have been known to overflow them; as for example between the Lake Michigan and Mississippi systems before dyking and drainage activities after 1860 eventually put an end to them. Some lakes and streams in the Canadian North are known to flow in two directions.⁸⁹

Over a longer period of time, all rivers tend to increase the areas they drain by headward erosion, the more powerful extending their basins at the expense of others whose tributaries they capture. This process, known as piracy, is so gradual that it is usually estimated in geologic time.⁹⁰

More dramatic than piracy are the major changes in flow directions that came about by natural means during the last Ice Age. Recent suggestions which would stabilize Great Lakes levels, relieve drought along the Eastern Seaboard or create ever larger oases in the Southwest are hardly comparable in scale to the inter-basin diversions which occurred during this period in the northern half of the continent. Future diversions out of the Great Lakes Basin might someday follow the example of Chicago in reopening one or more of the spillways which once served to carry tremendous meltwater overflows from the basin into the Illinois, Ohio, Susquehanna, Hudson and Ottawa rivers;⁹¹ these fell into disuse as soon as the retreating ice front uncovered the St. Lawrence outlet. A number of modern projects and proposals in the West also owe their origins to the disruptions of streamflow by glaciers, the South Saskatchewan Dam Project in the Canadian Prairies,

Grand Coulee on the Columbia, and a possible future diversion of the Shuswap (Fraser drainage) into the Okanagan in British Columbia.⁹²

These examples are sufficient to illustrate the variety of possibilities available, particularly when the present divides are as low as those between the Arctic, Mississippi and Great Lakes-St. Lawrence systems. At least one need not worry about taking water out of the valleys "where God had obviously intended it to flow."

Returning to the present, and notwithstanding the relatively minor circumstances of overflow and leakages, the general proposition still holds that the waters which find their way to a common outlet form an interdependent system. Hydrologic unity is not lost by short- or long-term fluctuations in flow; these are encompassed within the meaning of the water balance which is a dynamic equilibrium achieved among the variables of climate, vegetation and landforms. Changes in any of these are compensated by adjustments in rates of flow, quantity of discharge and sediment load.⁹³

Man frequently interferes with the natural balance, but his effects are not usually of a different kind; he simply changes the magnitude of certain variables in the balance. The unfortunate part of man's interference has been his all too frequent failure to understand how balances are upset and restored. Examples are legion: hydraulic placer mining in the Sierra Nevada resulted a century ago in the scouring of headwater areas and sedimentation of the lower Sacramento, to the consequent decimation of its salmon run; dam obstructions in many areas to the free flow of water encourage sedimentation of the reservoir and starvation downstream of coastal beaches deprived of their sand; the spreading of homes and industries to the river's edge proceeds in disregard of the certainty that floodplains will sometimes flood; the separation of laws relating to surface and ground waters in most jurisdictions illustrates an ignorance of their interdependence. Dredging, damming and straightening channels, draining marshlands, polluting and filling in lakes and estuaries, diverting into or out of the basin, all are done at specific locations for specific purposes. All likewise are attended by effects in other parts of the basin system which are often unanticipated and may be detrimental to further use of the water or to the life which exists in it.⁹⁴

In sum, water can be moved out of one basin and into another; it has happened naturally in the past in greater quantities than man has so far attempted himself. But the basin does not thereby lose all importance in water management. It remains the fundamental unit for collecting and concentrating water supply. And the adaptations already made by a variety of living things, including man, to the basin's existing flow system offers some limits to the potential for adding to or subtracting from that system through inter-basin diversion.

THE BASIN AS A POLITICAL REGION

Little is known about territorial delimitation before the Spanish, French, English and Russians began to claim dominion over the New World. Salmon streams which coursed through the north Pacific lowlands each had its own proprietor, and some boundaries between tribes in the East seem to have followed heights of land.⁹⁵ But nowhere did Indian boundaries have much effect on the evolution of the present political landscape.

Early European settlements depended on water mainly for transportation, except along the north Atlantic coast where fishing dominated and in the distant Southwest where some irrigation was practiced. The long lots of the French stretched back from the St. Lawrence and from parts of the Ohio and Mississippi rivers, affording maximum access to the only practical means of getting about before well into the nineteenth century. Gradually the waterways carried exploring parties and the penetration of the fur trade deeper into the continent.

Were river basin divides considered significant by the politicians and statesmen of early North America when they were faced with the task of delimiting national and subnational boundaries? It does not appear so.

For the most part, international boundary-makers took little notice of the basins they divided in drawing their lines across the continent. In the West they continued to view water, if at all, only as a transportation medium, and agreed that the Columbia (1846), the Colorado and Rio Grande (1848), and the rivers draining into the Gulf of Alaska (1871) should remain free and open to navigation by adjoining countries, just as they had agreed years earlier on the Great Lakes-St. Lawrence system.⁹⁶ Only at a later date did governments value water for other purposes in the arid and semi-arid West.

On its part, the Hudson's Bay Company did establish control in the seventeenth century over a huge reserve called Ruperts Land which was roughly defined by drainage into the Bay; the Company eventually divided and subdivided it into units the boundaries of which also approximated basins.⁹⁷ Meanwhile, Louisiana Territory which passed to the United States in 1803, was also vaguely conceived along drainage lines, in this case of the Missouri. Rather than survey the precise location of their interface, however, the British and Americans agreed to border their sovereignties across the Great Plains on a parallel of latitude which came closest to separating these two drainage areas.⁹⁸ They subsequently followed this line, the 49th parallel, westward to the very margin of the continent, slicing the Columbia in two in the process.

As with international boundaries, so too with the subsequent internal boundaries in both Canada and the United States — a partiality for straight lines. Some-

times river channels were chosen instead, but hardly ever drainage-basin divides. The only exception to this rule in the West consisted of portions of the Continental Divide between the Yukon and Northwest Territories, between Alberta and British Columbia and between Idaho and Montana. Political regionalization by straight lines, with secondary reliance on river courses, becomes understandable when one recalls that these were the easiest to delimit, given the vast area, the lack of field knowledge and the sparsity of a resident population to dispute their seeming objectivity. Maps of the time reflected a less than accurate knowledge of continental geography.⁹⁹ Not surprisingly, boundary markers relied on parallels and meridians when they were not sure of the trend of distant mountain ranges and rivers. Such lines could also be selected more easily to enclose areas of roughly equal size, where this was thought desirable. Figure 5 shows the pattern of international, interstate and interprovincial boundaries of Western North America.

The pattern carried to still smaller scales. As it became expedient to open the vast public domain to Westward migrants, the "township and range" rectangular land survey which originated in eastern Ohio was extended to all public land states and to Western Canada.¹⁰⁰

The domination of parallels, meridians and the whole rectangular land survey in the West proceeded, of course, without reference to drainage or topographic features. For this reason, some have called it a triumph of geometry over geography.

Before the pattern was entirely set, Major John W. Powell attempted to convince the delegates to the Montana Convention in 1889 that they should organize their new state into counties which would be bounded along drainage, rather than straight or otherwise arbitrary, lines. From his earlier investigations of the dry West, Powell recognized that the rectangular land survey would leave the control of water in a relatively few hands and most of the land without direct access to it.¹⁰¹ His plea, however, was unsuccessful.

There is at least an air of clarity and permanence about straight-line boundaries. Where features relating to drainage have been used, disputes have not been uncommon. Some rivers have a habit of shifting their courses in the process of meandering across the floodplain. Iowa and Nebraska have held different views on the location of their common boundary where the Missouri has shifted, as have Mexico and the United States on the Rio Grande.¹⁰² Where heights of land separating drainage were chosen as boundaries the negotiators often had little knowledge of location, hence vague legal descriptions and inevitable disputes; Quebec still omits its common border with Labrador on provincial maps.¹⁰³

For all practical purposes, there is no point in questioning how effectively governmental units were delimit-

ited in space. They are here to stay. In fact, it would seem easier today to relocate rivers than to relocate states or provinces.¹⁰⁴

It can be concluded that the configuration of rivers and their basins has had little influence on the pattern of political regions created in the West. But conversely, once these regions were set, they had a great deal to do with the pattern of subsequent water development, as the following pages in this chapter will demonstrate.

THE BASIN AS A PLANNING-ADMINISTRATIVE REGION

The evidence presented thus far suggests that the river basin is an appropriate unit for controlling water physically insofar as its flows comprise an interdependent system; at the same time, the territorial units into which governments are organized, nationally and subnationally, do not coincide to any important degree with basin units.

Periodic agitation by certain areas for seceding from existing governments or for redrafting the political map along drainage lines notwithstanding, the chances of this happening in twentieth-century North America are negligible. Instead, the emphasis has been on effecting a workable relationship between governments at all levels and basin development. Experiments with valley authorities, interstate compacts and basin commissions continue in pursuit of an arrangement that will work well. Words like "integrated", "coordinated", "unified" and "comprehensive" attached to water planning symbolize the hope for reconciling area and function, or in other words, the resource and the political structure.¹⁰⁵

John Welsey Powell was able to grasp the river basin as a totality and some advantage in managing it as such. While he failed to organize the political map along basin lines, today's river basin surveys, the water conservancy district and the antimonopoly provisions in reclamation law owe much to his vision.¹⁰⁶ In another part of the world, Sir William Willcocks advanced similar basin thinking and proposed storage facilities which could serve several purposes at once.¹⁰⁷ The concept of basin management was beginning to take hold. In 1908, President Theodore Roosevelt could tell the Inland Waterways Commission: "Each river system, from its headwaters in the forest to its mouth on the coast, is a unit and should be treated as such."¹⁰⁸

As it developed, the concept of river basin development seems to draw from three ideas: multiple-purpose storage, basin-wide integration and comprehensive development.¹⁰⁹

If a dam could be built to retard flood runoff, could it not also store water for irrigation and perhaps recreation, or periodically release water to generate power? Hoover and

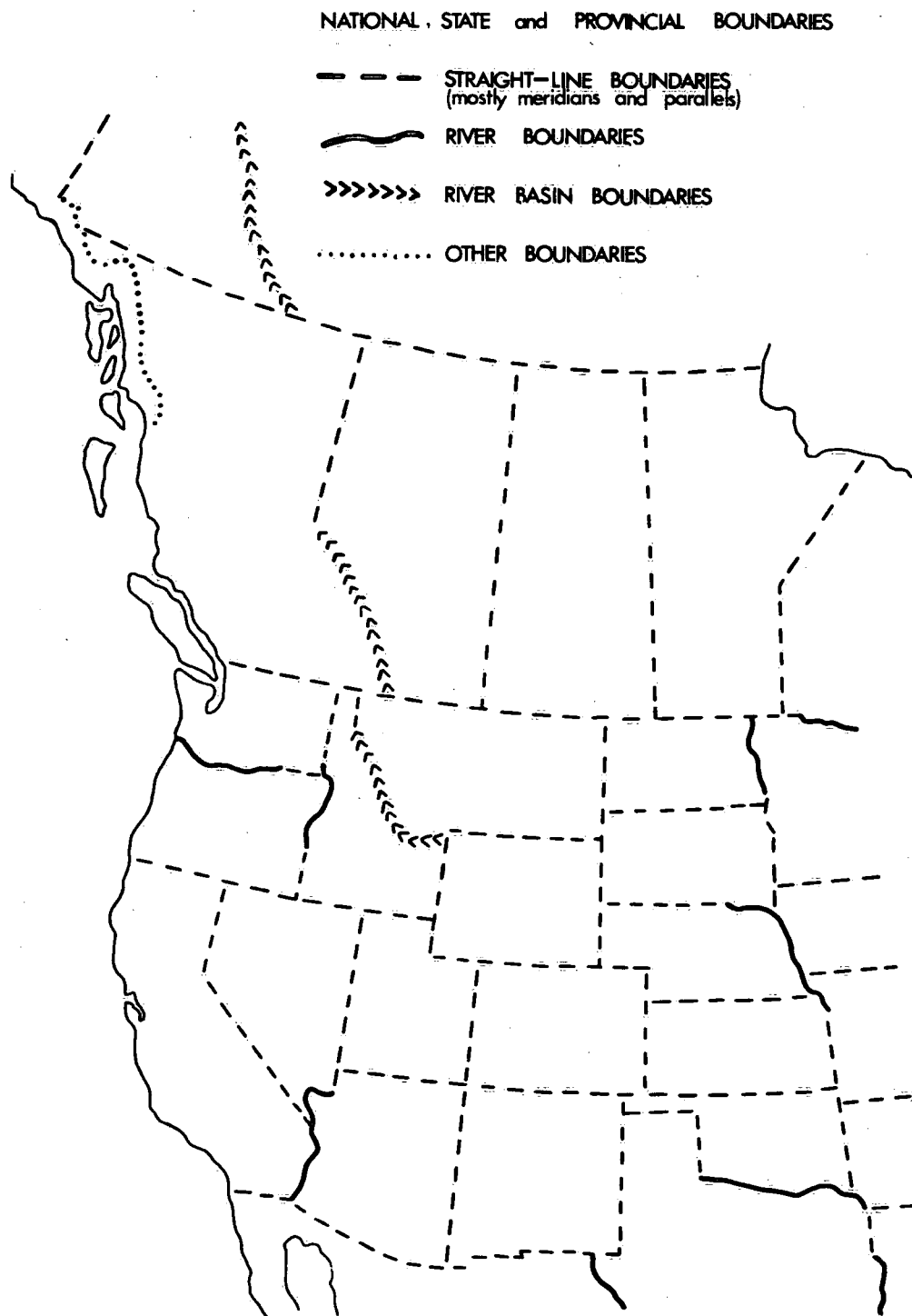


Figure 5. Political regionalization of the West.

Grand Coulee dams widened their appeal by so multiplying beneficiaries. And in providing water services in various parts of the basin, it became apparent that some coordination would reduce the cost of separate facilities, because of economies of scale and the avoidance of needless duplication. An upstream reservoir might make unnecessary

costly flood defensive works around each town downstream or might increase the firm power potential of each downstream power plant. In an integrated program those projects would be developed which appeared to be most beneficial for the basin as a whole in terms of the excess of benefits over costs, jurisdictional divisions notwithstanding.

In extending the evaluation of benefits and costs into larger social significance, however, the task becomes much less easily defined. Comprehensive development, as applied to basins and the regions in which they are located, has come to mean more than kilowatts, crop yields and boat rental fees; it includes consequences such as educational and employment opportunities, redistribution of income, racial harmony and quality in urban and natural environments.

Is the river basin a suitable geographical unit for multiple-purpose, integrated and comprehensive development? Some planners have thought so. The creation of a federal regional authority in the Tennessee Valley took a dramatic step in this direction during the depression-ridden 1930's when river basin regionalism was most in fashion in the United States. Included in the TVA Act, beyond provision for a system of dams and reservoirs, was mention of:

... guiding and controlling the extent, sequence, and nature of development that may be equitably and economically advanced through the expenditure of public funds, or through the guidance or control of public authority, all for the general purpose of fostering an orderly and proper physical, economic and social development of said areas...¹¹⁰

Proposals soon followed which would divide the whole country into river basin authorities as the administrative basis for federal activities in all resources. It was argued that the functions of weather forecasters, soil conservationists, foresters, farmers, power producers and transportation planners were all related to water and the topography through which it drained. The temptation was widespread to look upon drainage limits as general boundaries and the river and its tributaries as networks for integrating all resource activities regionally. "Water is the sovereign wealth of a state and its people. It is nourishment; it is fertilizer; it is power; it is transport."¹¹¹ The idea of river basins as planning regions was seriously investigated in 1935 by the Natural Resources Committee organized by President Roosevelt. It was not supported, however, and subsequent proposals to create authorities specifically in the Arkansas, Columbia and Missouri basins failed to win the necessary support of Congress.¹¹²

Short of allowing the substantial administrative independence characteristic of TVA to spread to other basins or regions, Congress has exhibited some willingness to try other approaches to basin programs. One of these is the federal "basin account" in effect in varying degrees in the Central Valley, the Missouri, the upper Colorado and, more recently, in the Columbia and lower Colorado. Such an account consists of the net revenues of water and hydropower services pooled from all federal projects within the basin; these are then made available to subsidize those water uses which are unable to pay for themselves. The effect is to spread the benefit of localized profit-makers, generally those projects providing power in the Columbia

Basin and municipal-industrial supply in the Missouri, to other uses, primarily irrigation, in other parts of the basin. A reclamation project which might be unattractive on its own economic merits could still be constructed in a basin with money in the account contributed by other and perhaps distant projects; the overall basin program is evaluated more closely than the project.¹¹³ The significance of the basin accounting concept for the area-of-origin struggle is described in Chapter 5.

A second boost to basin orientation comes from the federal Water Resources Planning Act of 1965, by which Congress gave its blessing to the formation of river basin commissions which would prepare "comprehensive basin plans." As a coordinating device, however, the commissions are still only advisory.¹¹⁴

State and local governments have jealously withstood the formation of basin administrations even more than Congress. River basin regionalism, what there is of it in the United States, would appear to be less an inspiration on the part of subnational governments and water users than a requirement occasionally imposed from without, through the planning and funding of Uncle Sam.

OBSTACLES TO BASIN ORIENTATION

When all is said and done, it is clear that the river basin has not been adopted as the focus of comprehensive planning and administration with strong powers of coordination. There are problems with the basin as a region, when it is offered for overall social utility rather than just the physical control of water.

For one thing, the theoretical potential promised by integrating all water developments within a basin-wide program must be discounted by historical precedents which have already "skimmed the cream," leaving something less than a full opportunity for a central basin agency to rationalize. An old power plant which may not utilize the full potential of its site for storage on a river can hardly be written off as though it didn't exist by a new overall plan to optimize basin power production. Prior uses become enshrined in law and tradition, whether or not they contribute to the best use of the basin's resource by modern standards.¹¹⁵

More serious discrepancies to basin cohesion stand revealed with the passage of time. The basin is hardly an isolable unit for defining users' interests; it is breached increasingly by extrabasin forces of all kinds. Air masses, animals, people, money and most products of human labor spill over river-basin divides with little awareness of, or interest in that fact. Water itself may be produced and stored in the basin but, like its electric power derivative, its distribution is spreading well beyond the source area. Interregional and international mobility makes local restrictions appear anachronistic as the gap between eco-

nomie and drainage patterns widens.¹¹⁶ To some extent, recent water planning has adjusted to these changes by assembling the multibasin region as a focus for development. Several contiguous basins become a single region for supply and demand studies which consider transfers between basins as more or less internal readjustments. Two of these have attracted major attention recently, the Pacific Southwest Water Plan having emerged from a federal effort to heal the wounds of *Arizona v. California* in 1963, and the Northeast Water Supply Study which was delegated to the Corps of Engineers in 1965 during the severe drought affecting the Northeastern States.¹¹⁷

Relating the river basin to larger social and economic forces in the process of comprehensive planning is a challenging task. No matter how comprehensive, the river basin or multi-basin approach tends to pre-judge most problems as water problems. So often in the past, programs of basin development have been offered as a way out of all kinds of difficulties. There were implications, for example, that the answer to periodic droughts, agricultural surpluses, industrial retardation and depopulation in much of the Great Plains could somehow be found in a plan to develop the waters of the Missouri Basin.¹¹⁸ However vaguely expressed, a feeling persists that water is the key to Western progress and that massive investments in river basin development will take care of other resource and regional problems. Those who offer the river basin as the logical basis for economic development, and as eliminating politics because basin unity is equated with harmony of interests, have never been able to demonstrate how upstream-downstream and rural-urban hostilities within a basin like the Missouri could suddenly disappear with the establishment of a basin authority, compact or commission. As well, there is the fact that the solution to many regional problems will lie elsewhere, outside the context of water. Basin development provides things like flood control, power, water supply and recreation which are simply some means of approaching broader social goals; other means may in some cases be more efficient or otherwise more appropriate.¹¹⁹

Probably in the less developed world the boundaries of the river basin are more appropriate for overall social development. Here are to be found fewer complications from existing developments which might preclude a basin-wide approach; and because of the very lack of economic development, water projects may have a more dominating influence in stimulating growth.¹²⁰ No doubt, this is a factor in the many duplications of the TVA experience abroad.

Whatever its other strengths and weaknesses, however, probably the chief reason for the river basin not emerging as a unit for substantial planning and administrative independence lies in the refusal of existing governments to accept it.

Political Sovereignities Overriding

No matter how suitable a river basin might otherwise be as an areal unit for water management, the absence of political institutions which can adequately represent the interests of basin inhabitants limits its effectiveness. Federal and state agencies may speak in terms of coordinated basin planning, but their own interests are more specifically flood control, water supply, etc., and their decisions are made outside the basin. There is no real legislature in the basin, no playing field on which contending forces might manoeuvre and struggle in the open toward consensus.¹²¹ And in the absence of new political boundaries, not even an administrative agency like TVA seems capable of providing such a forum for policy choices.

Neither Congress, the state governments, nor the well-entrenched federal water agencies are anxious to distribute their power regionally to new authorities. Instead, the national and subnational governments of North America engage in resource development activities each with a view to serving the welfare of its constituents, not just those who live in a basin under consideration and certainly not those who live in those parts of the basin which extend beyond that government's jurisdiction.

In the case of international basins, jurisdictional limits are obvious. Integrated or comprehensive development of international basins has proven illusory everywhere that its proponents have pictured the basin as a self-contained unit, free of the centrifugal forces of national orientation. Usually, neighboring countries do not have identical aspirations or capabilities. The issue is well expressed by Scott:

It is not helpful to regard the two national halves of the basin as halves of a self-contained region artificially split by the frontier. From the point of view of the two countries, each half is merely one region out of the several that make up the whole economy. It is its whole economy for which each country plans to get water, food, power and recreation. Hence each nation must compare development in the river with investments elsewhere. Country A's "best alternative" to joint river basin development may not look like a feasible alternative from B's point of view at all.¹²²

For Canadians, the Columbia River Treaty was significant not only for the upper basin's development but for its economic and psychological effects regionally and nationally.¹²³

No doubt the interruptions to basin unity posed by national borders are responsible for the tendency of countries to develop first their internal possibilities before approaching their neighbors for joint development. Even when Canada and the United States explore the potential of joint development of their boundary waters, Article II of the Boundary Waters Treaty¹²⁴ reserves sovereignty in each country through "exclusive jurisdiction and control."

At a subnational level, the perspective is less clear but the outcome is not much different. Conceptually, the states of an interstate basin should try to develop the most efficient or appropriate combination of projects in the basin, modified by considerations of equity in sharing benefits. Each state or region should also strive to serve national growth and other national goals. Benefit-cost analysis is supposedly predicated upon national gain. But in fact, the real business of Wyoming has been in establishing how much of the Colorado and Missouri rivers it owns and in promoting development in those parts of the rivers above all for the good of Wyoming, rather than for the good of the basins, the West or the nation.¹²⁵ Hart records instances of state superiority in the early days of the Reclamation Fund. According to the Secretary of the Interior in 1925: "The political pressure to have works built in the different states frequently determined the location of many of the projects".¹²⁶ And Marts has found that the Hells Canyon Dam controversy involved more than public versus private power; it saw the state of Idaho exercising sovereignty over the Middle Snake River.¹²⁷

Congress itself has not been noticeably successful in subordinating state and regional ambitions to the greater national good. The U.S. Congress is organized by states. Every state, whether large or small, whether densely or sparsely populated, has an equal voice in the Senate, and even the House districts which do represent population distribution generally well never cross state boundaries to include metropolitan communities of interest. Those states whose U.S. senators or representatives rise through seniority to chair committees which are influential in Western water legislation are all the more fortunate.

The states, as indicated in Chapter 1, have proprietary rights over the resources within their borders. Anyone wanting to develop water rights must do so under state regulation unless federal jurisdiction is overriding. It is the basin states, and not the basin inhabitants otherwise constituted, which pursue their claims to an interstate river. States rights have been upheld both by the courts and by compact. In either case it is inevitable that each state will try to get as much as possible for itself, thereby emphasizing the differences rather than the common interests in the basin. On the other hand, once effected a compact may facilitate the basin states' common interest in gaining federal funds for development or in gaining water from other basins and states.

The bias of state over basin in the matter of interbasin transfers is made explicit in the Colorado River Compact.¹²⁸ The several states were the signatories and it was to them that allocations of water were eventually made, not to the basin portions of the states. More water is diverted out of the Colorado basin than any other river basin on the continent, but in each case diversion consists of redistribution within the state. The *raison d'être* for heavy extrabasin diversion is evident on a map of water and people; the important centers of water consumption among

the basin states almost all lie outside the basin itself. (See Fig. 6 and Table 7.) A state like Wyoming, therefore, has a claim to Colorado River water because a portion of that basin lies within the state. Wyoming's use of that water, on the other hand, is not limited to the basin portion of the state. Associated power generation likewise serves the greater numbers outside the basin.

Table 7. Population and Water Use In The Colorado Basin States

States	Total Pop. 1966 in thousands	Colorado Basin Pop. in thousands	% of Pop. in Basin	% of Pop. in Service Area	Basin Export in thousands of acre feet
Arizona	1,618	1,610	99	99	—
California	18,918	45	<1	57	4,000
Colorado	1,977	178	9	99	825
Nevada	454	211	46	46	—
New Mexico	1,022	73	7	72	110
Utah	1,088	87	9	71	106
Wyoming	329	35	10	25	5
Total	25,326	2,239	9	64	5,046

Sources: U.S. Bureau of the Census, *County and City Data Book, 1968*. Estimates of Basin Population from county data and base maps. Estimates of Service Area from Colorado River Board of California. Estimates of Basin Export, existing and under construction, from correspondence with state agencies and from literature review.

It will be recalled from Chapter 2 that all transfers of water that have been effected thus far fall within state (and provincial) lines. In this connection it is interesting to speculate on the effect of political boundaries on water allocation in the West. A century ago a strong movement developed in California to sever the southern part of the state and unite it with Arizona, with which it had more in common both physically and economically. If this movement had been successful there would have been no water dispute over the lower Colorado, and the coastal area could have taken virtually all the allocation from the east by a simple majority vote of the people. At the same time, Los Angeles would have found it more difficult to drain water from Owens Lake and the Feather River in the north, and there would never have been a California Water Plan in its present pattern. Another example of the relationship between political boundaries and the water-transfer pattern is found in Colorado: Would Denver and Colorado Springs have tunneled through the Rocky Mountain Front to the Colorado River headwaters, in preference to increasing appropriations from the South Platte and Arkansas at their doorsteps, if the Colorado-Utah boundary had abrupted at the Continental Divide? It is worth repeating that to date no interbasin transfers of water cross state boundaries. While their effects are certainly felt downstream across these boundaries, it is still fair to say that the present pattern of interbasin diversions strongly reflects the political regionalization of the Western states, or for that matter, of the continent.¹²⁹

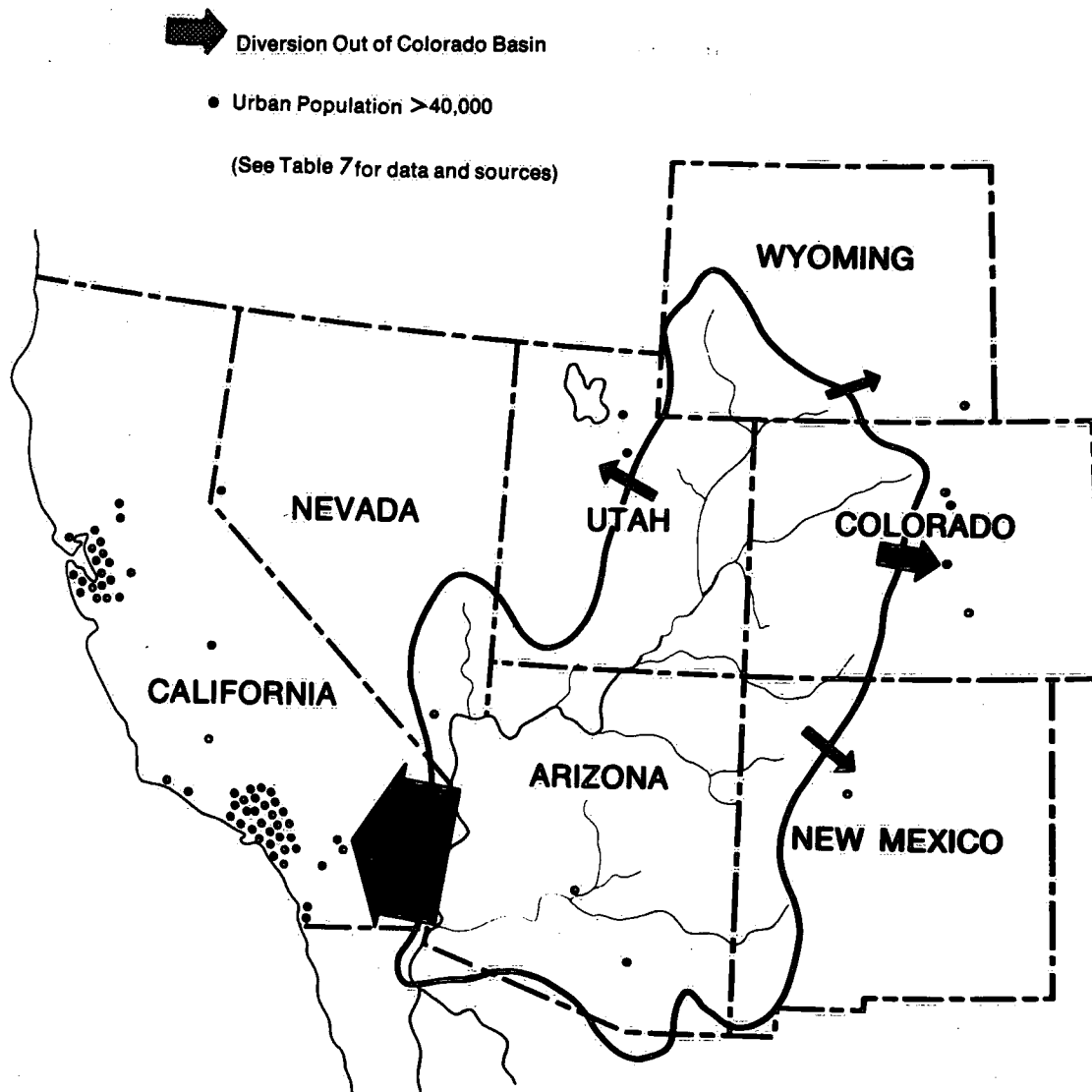


Figure 6. Basin and basin states of the Colorado River.

FORMING AN AREA-OF-ORIGIN HIERARCHY

The literature speaks of the protection of rivers like the Columbia, the Mackenzie or the upper Colorado against outside or downstream appropriation, and certainly area-of-origin considerations have no meaning except with reference to the river whose future is at stake. The water in the river is the object of contention.

Yet cries for protection come not alone from the basin or part thereof; there is no effective representation along strictly basin lines. The term "area" is preferred to "basin" of origin in this study, because it is the encompassing political area, usually the state area, which speaks for basin interests. Nor is this simply a matter of political or administrative convenience. That part of the political area outside but close to the basin may identify closely with the

basin, as does Seattle with the Columbia, both as a consumer of the basin's power or water or recreation and through other commercial or social relationships. The object of political action in this case is to extend protection on the basis of proximity to, and jurisdiction over, the source of supply rather than on a narrow hydrologic interpretation.

There is no one area of origin in the West nor is one singled out for study. Basin and jurisdictional units interplay at various levels to form what might be called a hierarchy of areas of origin. At the lowest level is found the local area of origin, whose protection against adjacent areas depends on a higher authority like the state; the counties-of-origin legislation enacted by California is an example. At the next level in the hierarchy are the states (provinces)

which by adjudication or compact protect their rights to interstate waters, as does New Mexico, for example, on the Pecos. At a third level might be included a group of states which have a common stake in a river basin and move to reserve it against the importation ambitions of other states; the Northwest-Southwest conflict has assumed this form. Finally, Canada as a whole might be considered an

area of origin vis-à-vis American diversion interests.

There is, of course, a paramount difference between what residents of a small intrastate valley and what the Parliament of Canada can do at either end of the hierarchy. Sovereignty, it will become apparent, counts for little at the lower end.

Area-of-Origin Precedents in the Western States

In light of the pervasive influence of political boundaries on water allocation and use, it is possible to phrase certain questions relevant to the hierarchy described in the previous chapter, namely: Does a local area of origin within a jurisdictional unit like the state, have the right to exclude or limit other parts of the same unit from diverting its waters?

What rights does one jurisdiction have in the waters of an interjurisdictional stream? Are there differences as between upstream (area of origin) and downstream jurisdictions? Does any jurisdictional unit (or group of such units) have the right to reserve its waters from use by other jurisdictions which do not have natural access to them?

A century of experience in framing laws, adjudicating disputes and finding common ground within the Western states and among them provides some, if not all, of the answers. States statutes, interstate compacts and international treaties give testimony to some degree of success for the areas of origin. Taken together, they have considerable significance for the current water diversion controversies which will be discussed in subsequent chapters.

CONFLICT AND RESOLUTION OF WATER DOCTRINES

Early prospects for area-of-origin protection varied widely across the West, depending largely on which kind of water law was likely to win general acceptance. Protection might well have become an all-or-nothing proposition if the nineteenth-century riparian or Harmon doctrines were the only options available. One doctrine prevented anyone from making substantial use of the stream, in or out of its basin; the other granted the area of origin freedom to do whatever it wanted with its water regardless of effects on other jurisdictions. As it happened, neither of these extremes prevailed.

Riparianism

In colonial America, where water was thought to be anything but a limited resource, where consumptive uses were negligible and navigation by far the most important claim on lakes and rivers, what could be more reasonable than that all those who lived along their banks, individuals and governments, should have equal access? It was noted in Chapter 2 that the treaties by which the United States finalized its boundaries with Great Britain, and later with

Mexico, secured the right of unrestricted navigation to both signatories throughout their common river systems. Indeed, the influences of an earlier time and another environment are still present in the constitutions of Canada and the United States which continue to justify federal involvement in Western water development programs which have little or nothing to do with navigation itself.¹³⁰

With its concern for the rights of all riparian landowners to enjoy equal advantages in the passing flow, riparianism was at first taken to mean that no one could deplete, interrupt or otherwise impair the flow. For a while this doctrine served well enough as the common law in the more humid Eastern parts of the continent. But it fared less well in the West where water was less abundant. Modifications were soon introduced. In the first place, the restrictions imposed by early riparianism were relaxed to allow "reasonable" use, even to including some consumption of flow by irrigation, as long as it did not interfere substantially with the rights of other riparians. And more to the point in the drier West, the riparian doctrine was soon replaced in whole or part by the appropriation doctrine which granted rights to discrete amounts of water without condition of riparian location.¹³¹

To the extent that riparianism is still in effect, however, it embodies some protection for areas of origin against extrabasin transfers. Riparian land was defined as embracing only land within the basin. The intention, as enunciated in an early California case,¹³² was to ensure that water diverted for any use would, for the most part, return to the stream where other riparians below could continue to use it. A further deterrent to outside interest has been the variable nature of the riparian right which guarantees no specific amount of water to the user and which is liable to encroachment by new riparians who may begin to withdraw water on an equal basis with their neighbors on the stream at any time.¹³³ The insecurity of such a right for potential purchasers out of the basin is obvious. Nevertheless, in effecting a degree of compatibility between riparian and appropriation doctrines, the modern trend evidently is to refrain from granting relief against transfers to riparians who can establish no present economic need for the water.¹³⁴

Prior Appropriation

Because there was obviously more land than water to supply it in the dry West, the tenets of riparianism—which

firstly, militated against any depletion of natural flow, and secondly, restricted any use to land within the basin of origin—were bound to be modified. It should be noted, as well, that the basin limitation was never an absolute. During the late eighteenth and early nineteenth centuries, Parliament in England and the legislatures of the Eastern and Midwestern states passed laws granting charters which permitted many canal companies to divert water from natural watercourses to fill their canals.

In a landmark opinion the Colorado courts rejected riparianism in 1882:

Under the principle contended for, a party owning land ten miles from the stream, but in the valley thereof, might deprive a prior appropriator of the water diverted therefrom whose lands are within a thousand yards, but just beyond an intervening divide.¹³⁵

The doctrine of prior appropriation seems to have developed spontaneously from the experience of the Forty-Niners who not infrequently extended their ditches across basin divides to new workings as the older placers gave out. Acceptance in the California code of an appropriator's right to move his point of diversion soon found its way into the codes of other states. The measure of such a right became priority of beneficial use of a given quantity of water, rather than natural access to it.¹³⁶ Those who came first developed the better rights; latecomers, who would otherwise be cut off when flows fell below a certain level, were thereby encouraged to provide storage on the stream to safeguard their rights.

Appropriation according to priority in time of application became a practical means by which each of the Western states could regulate the development of consumptive water uses by inhabitants within their jurisdictions. But it was not practiced identically by every state. And it was hardly adequate on interstate rivers. No state, or nation for that matter, whether it originates the flow or not, was about to stand quietly by and watch a faster-developing neighbor legally appropriate all the water in their common river. There had to be found some other basis than "first come, first served" for allocation; otherwise, the effect would be a headlong rush by each jurisdiction on a river to build up its claims, putting water to use long before any real need for that water developed.

The Harmon Doctrine

This doctrine exploded out of an international controversy on the Rio Grande. In 1895 Attorney General Harmon was asked by the U.S. State Department to give an opinion respecting Mexico's rights in the face of increasing American water consumption above the point where the river became an international border.¹³⁷ The Mexican ambassador had charged that the principles of riparian law and the navigation clause of the treaties of 1848 and 1853 had been violated by upstream diversions which greatly

reduced the river's volume; also that Mexico's use of the water was "prior to that of the inhabitants of Colorado by hundreds of years," thus making it difficult for the U.S. to fall back on the newer doctrine of the West, prior appropriation. The practical inconveniences of existing water law were never more apparent. To save the U.S. position, Harmon declared in favor of absolute sovereignty. The United States could do as it wished with any water originating in its territory, he claimed, regardless of any adverse effect on Mexican users downstream.¹³⁸

From his limited research, Harmon opined that "the rules, principles and precedents of international law imposed no liability or obligation upon the United States." Such a statement went further than the doctrine of ownership in private or municipal law; the latter at least respects the property of others.¹³⁹

As it happened, the Harmon doctrine was never actually applied against Mexico; notions of international amity prevailed. Most writers do agree, however, that it was incorporated in the Boundary Waters Treaty between Canada and the United States, as Article II.¹⁴⁰ The Allagash diversion into the Penobscot in Maine, the Chicago diversion of Lake Michigan waters, and probably also the St. Mary diversion proposal in Montana, were earlier examples of this kind of thinking preceding the treaty itself. Never formally repudiated, it was to embarrass the United States greatly in future years, culminating in the Columbia River Treaty negotiations of 1959-1961 in which Canada happened to be the upstream country.¹⁴¹

Roundly condemned after seventy years of controversy in the international sphere, the Harmon opinion never won acceptance domestically.

Equitable Apportionment

The above doctrines, evolving out of a variety of circumstances, each lacked something where proprietary jurisdiction over the river was divided. A quite different approach was articulated for interstate waters by the U.S. Supreme Court, later winning popularity on international waters. "Equitable apportionment" has none of the precision of the other doctrines, rather it has the virtues of wider applicability and perhaps moral defensibility.

Interstate conflicts have generally proven susceptible to resolution by three routes: a decision by the U.S. Supreme Court in its original jurisdiction, when the affected states cannot agree among themselves on an apportionment; a compact, with the consent of Congress, when the states can reach agreement among themselves; or Congress itself, if and when it so chooses.¹⁴² None of these means was invoked before the turn of the present century. Increasingly common recourse to the courts and to compacts ever since is evidence of the crowding ownership claims being made upon most rivers and the end of a period when each state

could determine for itself, without regard to its neighbors, what and how much use it could make of interstate waters.

Kansas v. Colorado reached the Supreme Court in 1902. Kansas, as the downstream state on the Arkansas River, claimed that Colorado appropriators were violating the natural flow conditions of riparianism through the practice of irrigation and were causing hardship for Kansas riparians. Colorado countered with a declaration of sovereignty over all the waters of the river because it originated in its territory. The Court held the extreme contentions of both states to be without merit, and opted instead for a more equitable basis for decision.¹⁴³ Nowhere, however, were the riparian and Harmon doctrines rejected in clearer language than by Justice Holmes who delivered the opinion of the Court in *New Jersey v. New York* in a conflict over diversions from the Delaware River:

A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it. New York has the physical power to cut off all the water within its jurisdiction. But clearly the exercise of such a power to the destruction of the interest of lower states could not be tolerated. And on the other hand equally little could New Jersey be permitted to require New York to give up its power altogether in order that the River might come down to it undiminished. Both States have real and substantial interests in the River that must be reconciled as best they may be. The different traditions and practices in different parts of the country may lead to varying results, but the effort always is to secure an equitable apportionment without quibbling over formulas.¹⁴⁴

In this particular case, New York was diverting water out of the basin to supply New York City. The Court's limited approval here, along with similar approval in *Wyoming v. Colorado*¹⁴⁵ and *Connecticut v. Massachusetts*¹⁴⁶ which also involved extrabasin diversion within the upstream state, confirms its acceptance of diversions as against the old riparian limitation, even when the states affected may themselves subscribe to some form of riparian law. The decisions also underline the Court's respect for states, over basins, as areas of origin.

Equitable apportionment has emerged as the guiding principle for allocating interstate waters, both in Supreme Court decisions and in interstate compacts which are discussed below. Equitable apportionment is not so much a hard and fast rule of procedure as it is a goal, that of sharing the benefits of water development fairly, which depends, of course, on the particular facts of each basin.

Priority of appropriation is one of those facts, given special notice in *Wyoming v. Colorado* since both states followed appropriation law.¹⁴⁷ But other factors are also important and may occasionally override existing development, as emphasized in the *Hinderlider* case¹⁴⁸ which saw an appropriation give way to an interstate compact although the former had been developed many years earlier.

In establishing the goal and some interpretations of equitable apportionment as interstate common law, the Supreme Court has nonetheless sometimes been reluctant to make final apportionments by its decrees. Instead, the Court has preferred that, wherever possible, the states work out their own accommodations by compact.¹⁴⁹ This has, in fact, become the more common course to resolution of interstate controversies.

Pressure toward this course came from another direction as well — the power of the federal purse. The federally-financed Colorado River Storage Project could not begin to take form until the upper basin states settled their respective rights by compact after the second World War.¹⁵⁰ Likewise, the Arkansas River Compact made the previously litigating states of Colorado and Kansas eligible for federal construction of the John Martin reservoir as a permanent solution to their difficulties.¹⁵¹

It is possible, with this background, to trace how the above principles of law have been adapted at various levels of area-of-origin conflict within the Western states.

PROTECTION OF SOME AREAS FROM OTHERS WITHIN A STATE

A few states, all in the West, have extended a protective mantle over areas of streamflow origin from other areas within their own borders. Their statutes, noted below, can be interpreted as legislative reinforcement of the old riparian-preference doctrine.

California

Area-of-origin considerations have seen more history and greater controversy in California than anywhere else in North America. No study of this nature could be adequate which did not review the California experience. Indeed, some Californians have suggested that their way of reconciling areas of origin and areas of deficiency within the state is operable on a Westwide, or even international, scale.¹⁵²

The geographical patterns of imbalance between water and population are obvious enough. Approximately 70 percent of the state's water supplies are found north of the latitude of Sacramento, while 80 percent of the people now live south of that latitude.

The fear of more slowly growing and largely rural communities at higher elevations in the north that their opportunities for future water use would be foreclosed by downstream appropriations evolved with the first statewide efforts at water planning in the 1920's. The unfortunate experience of Owens Valley, east of the Sierra Mountains, which went into decline in the first decade of the century after Los Angeles had bought out most of its water rights, was not forgotten; prolonged negotiation and periodic

violence had seen to that.¹⁵³ San Francisco's fight to bring in water from Yosemite National Park followed shortly thereafter. The most severe decade of drought in the state's history, beginning in 1924, intensified both the planning efforts and the fears.

As early as 1925, there began attempts to reserve water for northern areas in a series of legislative proposals, known as the "fifteen percent bills", reserving roughly that proportion of the water which originated in any county unto itself.¹⁵⁴ Such bills were vetoed by the governor as administratively impractical.

In 1927 the first of the planning reports was completed, recommending a major transfer of water from the Sacramento River southward into the San Joaquin, both of these rivers being within the state's great Central Valley. In that same year, the legislature enacted the Feigenbaum Act which authorized the state to file applications for all unappropriated water needed in furtherance of its general plan.¹⁵⁵ The Act also permitted the state to release any portion of its appropriation for uses which were not in conflict with its plan.

It was not until 1931 that an amendment was made to the Feigenbaum Act, taking advantage of the release clause. Known as the "county-of-origin law," Section 10505 of the Water Code states:

No priority under this part shall be released nor assignment made of any application that will, in the judgment of the Commission, deprive the county in which the water covered by the application originates of any such water necessary for the development of the county.¹⁵⁶

The county-of-origin proviso hardly gave complete protection. It applies only to state filings and thus only to the extent that the state applications cover future contingencies in the counties of origin either in terms of the general state plan or in terms of releases from the plan for those whose works will benefit the counties. Also, it appears that state officials retained discretionary power over the filings.

Why were counties chosen as the unit for protection? They were more easily delimited than vague "mountain regions" first suggested, and sufficiently exact to satisfy the Feigenbaum Act and constitutional requirements. What was wanted at the time was some division between the upper and lower reaches of streams flowing into the Sacramento and San Joaquin Delta. It just so happens that county lines serve this purpose fairly well in northern and central California, but not in all cases.¹⁵⁷ It remained for the future Department of Water Resources to define more precisely where water originates in exportable quantities. Probably, as someone has remarked,¹⁵⁸ it is fortunate that California has such large counties; otherwise, the opportunities for strife would have multiplied.

By 1933, the state legislature approved the long-considered Central Valley Project Act.¹⁵⁹ The framework of the Project consisted of storage on the northern Sacramento River and a canal leading from the river, past the Delta, to the San Joaquin. Once again, area-of-origin considerations were raised and adopted, this time in the form of the "watershed-of-origin law." The first part of this law reads:

In the construction and operation by the authority of any project under the provisions of this act, no watershed or area wherein water originates, or any area immediately adjacent thereto which can conveniently be supplied with water therefrom, shall be deprived by the authority directly or indirectly of the prior right to all of said water reasonably required to adequately supply the beneficial needs of said watershed, area or any of the inhabitants or property owners therein...¹⁶⁰

Protection is broad in that it applies not only to the Central Valley itself but to adjacent areas as well, which can be served therefrom. In the same year, a constitutional amendment was passed by the legislature which would have extended the coverage of the law to *all* projects constructed by the state. It was defeated, however, by the voters in the 1934 general election.¹⁶¹

In contrast to the country-of-origin law, that applying to the watershed is not limited to appropriations filed from state applications, but it is limited otherwise in that it applies only to the agency constructing the Central Valley Project. When the depression of the 1930's forced the state to surrender control of the project to the Bureau of Reclamation for financing and construction, federal officials gave assurances that they would comply with the law.¹⁶²

No real conflict emerged until the 1950's. A comprehensive guide was then prepared for the ultimate development of all the state's water resources, culminating with a definitive report in 1957 on the California Water Plan.¹⁶³ The most important element of the plan was to be the first stage construction, as the State Water Project, of facilities to store and export a large volume of water from the Feather River, tributary to the Sacramento, to the far southern parts of the state. No immediate progress on implementing the project was possible, however, owing to a resurgence of area-or-origin opposition.

In 1955, the Attorney General of California was asked to declare on the validity of both the county-of-origin and watershed-of-origin provisions. Southern Californians became alarmed at his replies,¹⁶⁴ ruling not only in favor of the constitutionality of the statutes, but as well holding that, even though water had been put to use through an export project constructed by the state, it could be recaptured whenever needed by the area of origin. He also declared that the area of origin would not have to pay for the cost of facilities for export made worthless by the recapture.

The fight was on between the northern and southern regions of the state, between the areas of origin and the areas of deficiency, between the Assembly (dominated by the more populous south) and Senate (where the north and central parts of the state, with more counties, were better represented). The fast-developing southern desert was naturally unwilling to expend millions of dollars for facilities which might someday become massive white elephants; southern interests insisted on a firm water commitment, not recapturable. On the other hand, the northern areas feared that their ultimate needs or those of the south might be underestimated, contributing to a permanent drain to the south at their expense. The north also feared that its few main valleys would be inundated and the most desirable reservoir sites developed for export projects, leaving northerners with higher-cost alternatives; and that by the time the north needed more water, the south, already satisfied, would be indifferent to northern needs as expressed through the appropriation of public funds. The dilemma for the state legislature was to relieve the fears of the north while ensuring the south a continuing supply of water.¹⁶⁵

At first, it was generally believed that the only solution was a constitutional amendment. In three sessions of 1956, 1957 and 1958, more than 50 such amendments or other legislative proposals were offered, including those by the Attorney General's Committee of Water Lawyers, the State Chamber of Commerce, the State Department of Water Resources, and a Subcommittee of the Legislature.¹⁶⁶ Agreement could not be reached. It was impossible to find wording which would satisfy both sides.

Governor Brown brought the matter to a head in 1959 by approaching it from quite a different direction. The state, it was declared, had sufficient water to meet the demands of both the areas of origin and the areas of deficiency. The real problem, in that case, was to provide adequate financing to develop those resources for all parts of the state. This latter argument was telling, for in hearings held even in the northern counties, many local officials expressed more concern for financing of storage and multiple-use facilities than with the streamflow which they could not use to a much greater extent anyway without regulation.¹⁶⁷

The outcome of this logic was the California Water Resources Development Bond Act,¹⁶⁸ popularly referred to as the Burns-Porter Act, adopted by the legislature in 1959 and approved by the electorate at the general election of 1960. The Act authorizes the issuance of 1.75 billion dollars in general bonds for construction of the State Water Project. It also appropriated all money in the California Water Fund¹⁶⁹ created earlier in the session mainly out of tideland oil and gas revenues.

The county- and watershed-of-origin statutes were not repealed by the Burns-Porter Act. Rather, they were made applicable to the State Water Project.¹⁷⁰ And water service

contracts were deliberately put beyond the legislature's power of abrogation, insofar as possible, by pledging revenues therefrom as security for the bonds to be issued. Beyond this were financial provisions favoring northern water development. The act provides 130 million dollars exclusively for assistance to local water projects under an expanded Davis-Grunsky Act;¹⁷¹ most of the projects eligible for this assistance are located in the north. Also, to the extent that California Water Fund money is expended an equal amount is provided in offset bonds for local needs and export facilities in the areas of origin. It should be noted also that the initial facilities of the State Water Project were designed to meet demands in the areas of origin, these being five dams and reservoirs on the upper Feather River. Finally, the State Department of Water Resources announced that it would respect area-of-origin needs as a matter of policy.¹⁷²

Meanwhile, a courtroom test of California's area-of-origin statutes was narrowly avoided.¹⁷³

Were Californians generally satisfied with the solution offered? Although the official literature coming out of Sacramento makes little reference to any division of feeling within the state, in fact the bond issue of 1960 passed by a narrow margin, and only because there are more voters in the southern than the northern counties.¹⁷⁴ Figure 7 shows clearly the interregional split. The only apparent anomalies, Butte and Yuba Counties, are located downstream on the Feather River and stand to gain flood control and other services directly from the export features of the State Water Project. The bare fact of the outcome is that the northern areas of origin had no state border to protect themselves against their neighbors to the south. Outnumbered and outvoted, their political power was still sufficient to achieve what accommodation they did.

California officials rely on the State Water Project, and on additional features which will complete the California Water Plan, to mute any future demands for area-of-origin recapture. But new rumbles of discontent have developed. Conservationists have joined Contra Costa County leaders in fighting the Delta Peripheral Canal on the ground that it will deplete the fresh water input to San Francisco Bay. The environmental issue has spread to the state's proposed Dos Rios dam on the Eel River and, indeed, to the whole State Water Project which is nearing completion but in need of new bonding.¹⁷⁵ Southern California water agencies were enraged in 1968 when State Resources Secretary Livermore suggested that north coastal counties might be *paid* for exporting surplus water.¹⁷⁶ It is unlikely, however, that major changes in the Project or its financial underpinnings will be made at this late date.

Colorado

Rejecting riparianism in *Coffin v. The Left Hand Ditch Co.*,¹⁷⁷ the Colorado Supreme Court made it clear in 1882,

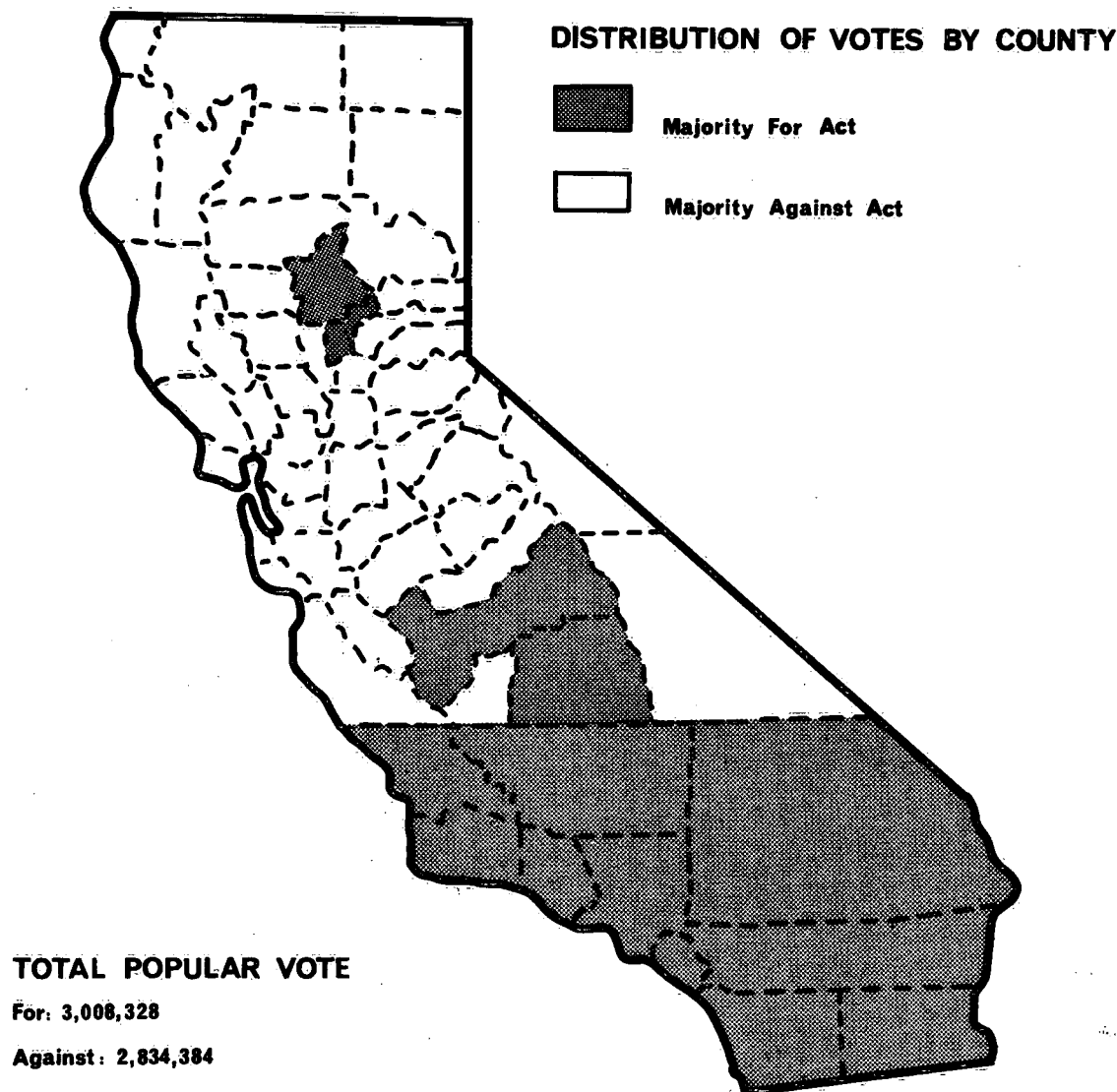


Figure 7. California Water Resource Development Bond Act, 1960.

and ruled repeatedly since, that basin or other geographical limitations on the law of prior appropriation for beneficial use were not to apply. Indeed, Article XVI of the state constitution declares water to be the property of the public, not any privileged part of it.¹⁷⁸ It was therefore up to Colorado appropriators individually to determine where they would apply their rights, subject only to the arrangements on interstate waters as specified in U.S. Supreme Court decrees and interstate compacts.

Pressure for spatial considerations was inevitable, however, owing to the fact that, as in California, most of the population and arable land are in one part of the state (East Slope), while most of the water is in another (across the Continental Divide, on the West Slope).

Several diversions on a small scale had crossed the Divide before the general economic depression of the 1930's. No real conflict began, however, until 1933 when, under drought conditions, a Northern Colorado Water Users Association formed east of the mountains to support a private study of major diversion from the Colorado River to irrigable acreage in the vicinity of Greeley. Shortly afterward, the federal Bureau of Reclamation endorsed the project, known as the Colorado-Big Thompson, and secured permission to enter Rocky Mountain National Park in search of storage possibilities.¹⁷⁹ In 1936, the Office of the Solicitor, Department of the Interior, ruled that the Colorado River Compact permits transmountain diversion of the waters of the Colorado River into other basins, so long as they are used beneficially within a Colorado Basin state.¹⁸⁰

Against these plans formed the Western Slope Protective Association. Its members realized that they could not hope to retain exclusive ownership of all the water the state would eventually take from the Colorado, but they wanted some assurances on limitation of export across the Divide. The Western Slope interests sponsored the Delaney Resolution which was adopted, after hearings, by the State Planning Board.¹⁸¹ The thrust of the resolution was that in the absence of comprehensive surveys, it was reasonable to assume that the West Slope would ultimately use half of Colorado's apportionment in the Colorado River, and, accordingly, that every plan for transmountain diversion should incorporate, at its expense, compensatory storage equal to the amount diverted. In other words, a form of equitable apportionment should apply intrastate.

Fortunately for the West Slope, it had political bargaining strength in the U.S. Congress beyond its numbers. Representative Edward Taylor, as Chairman of the House Appropriations Committee, had power to block any federally-financed project which would take water away from his district unless the proponents of such a project were willing to make concessions. Taylor and his West Slope colleagues also demanded that such concessions be written into the laws of the state of Colorado.¹⁸²

The two sides came to an agreement in 1937. The Colorado-Big Thompson diversion feasibility report, printed as Senate Document 80,¹⁸³ 75th Congress, outlined conditions for compensatory storage for West Slope protection in the form of the Green Mountain Reservoir, with a capacity of 152,000 acre-feet.¹⁸⁴ Assurance was also given that, if necessary to meet Colorado River Compact obligations, transmountain diversion would be discontinued in advance of a cutback in West Slope appropriations. At the same time, an act passed by the state legislature authorized the creation of water conservancy districts,¹⁸⁵ of which the area receiving Colorado-Big Thompson water was to become the first. This act provided the state counterpart to the federal guarantee of area-of-origin protection. At that time, it placed a ceiling of 320,000 acre-feet on ultimate diversion; this was the amount expected to be reached by the Colorado-Big Thompson Project. Later, however, when state officials anticipated negotiating the Upper Colorado Basin Compact and realized that this might leave more water on the West Slope than could be used there, thus weakening the state's bargaining position, the absolute limitation on diversion to 320,000 acre-feet was removed.¹⁸⁶ The pertinent section of the Water Conservancy District Act, as amended in 1943, reads:

However, any works or facilities planned and designed for the exportation of water from the natural basin of the Colorado River and its tributaries in Colorado, by any district created under this article, shall be subject to the provisions of the Colorado River Compact and the Boulder Canyon Project Act. Any such works or facilities shall be designed, constructed and operated in such manner that the present appropriations of water, and in addition thereto prospective uses of water for

irrigation and other beneficial consumptive uses, including consumptive uses for domestic, mining and industrial purposes, within the natural basin of the Colorado River in the State of Colorado, from which water is exported, will not be impaired nor increased in cost at the expense of the water users within the said natural basin. The facilities and other means for the accomplishment of said purpose shall be incorporated in, and made a part of, any project plans for the exportation of water from said natural basin in Colorado.¹⁸⁷

The practical effect of the Colorado statute is that a project proposing to divert water from the Colorado River across the Divide must construct a compensating reservoir that will leave the West Slope in as good a position for present and future development as if the diversion project had never been constructed and the river had remained unregulated. There is considerable doubt, however, about the long-term effectiveness of the statute.

In the first place, it pertains only to conservancy districts, not to any other private or public group nor to any individual. Thus the city of Denver was able to deny the principle of compensatory storage in its latest major diversion. The Colorado Supreme Court favored Denver in a sweeping statement:

We find nothing in the Constitution which even intimates that waters should be retained for use in the watershed where originating.

The waters here involved are the property of the public, not any segment thereof, nor are they dedicated to any geographical portion of the state.

The right to appropriate water and put the same to beneficial use at any place in the state is no longer open to question.¹⁸⁸

Although not yet tested, the 1943 statute may be foredoomed as unconstitutional by the court's strong language in this case, on the ground that it interferes with the requirement of beneficial application by favoring reservation.

Even the West Slope's protection written into the Colorado-Big Thompson Project Act of 1937 has been more recently construed as limited to presently existing appropriations for the storage of water in Green Mountain Reservoir.¹⁸⁹

The vitality of West Slope protection as promoted by its representatives in Congress, on the other hand, is evidenced by the federal Fryingpan - Arkansas Project.¹⁹⁰ An enabling statute for this diversion across the Divide provides that its construction and operation must conform to the Colorado state basin-of-origin statute. Further, the Secretary of the Interior is precluded from using the power of eminent domain to acquire Fryingpan water rights for use outside the basin. Finally, this project was denied the status of "participating project" in the Basin Fund of the Colorado River Storage Project.¹⁹¹

Nebraska

The Nebraska legislature enacted a general irrigation act in 1889 which flatly prohibited the transfer of water from one basin to another within its boundaries.¹⁹² Four years later, a curious amendment was added: "Unless such stream exceeds in width one hundred feet, in which event not more than seventy-five percent of the regular flow shall be taken,"¹⁹³ thereby making an exception to the rule for the state's major rivers.

This statute was invoked in 1936 against an application by the Central Nebraska Public Power and Irrigation District to irrigate a larger part of its acreage outside the Platte River Basin.¹⁹⁴ Other interbasin diversions proposed by the Bureau of Reclamation also were abandoned.¹⁹⁵

In a 1960 case, however, the Nebraska Supreme Court essentially nullified its earlier decision against inter-basin diversion by allowing a diversion from the Snake to Niobrara River, on the ground that the former was a tributary of the latter.¹⁹⁶ Of course, all streams in the state are directly or indirectly tributaries of the Missouri, so the implications of the whole statute are now open to doubt.

Oklahoma

Oklahoma is a relative newcomer to the field of area-of-origin protection, having enacted its statute only in 1957. One of the guidelines to be followed by the State Water Resources Board is as follows:

Before an appropriated or adjudicated right may be granted for water to be ultimately used at a distant point, sufficient reserves should be set up to take care of the present and reasonable future needs of the area or origin. Limitations should be placed on transportation of water resources from any watershed or other source of supply until reasonable present and future beneficial needs of equal rank within the immediate area have been supplied.¹⁹⁷

No controversy has yet developed over these provisions.

Texas

In reconciling the riparian and appropriation doctrines in Texas, the former were confined to normal flows and did not attach to flood waters which presumably could be appropriated for use outside the basin of origin.¹⁹⁸

Explicit recognition of basin needs was incorporated in a 1913 irrigation act, part of which declares:

It shall be unlawful for any person, association of persons, corporation, water improvement or irrigation district to take or divert any of the water of the ordinary flow, underflow, or storm flow of any stream, water course, or watershed, in this State into any other natural stream, water course, or watershed, to the

prejudice of any person or property situated within the watershed from which such water is proposed to be taken or diverted.

Before any person, association of persons, corporation, water improvement or irrigation district shall take any water from any natural stream, water course, or watershed in this State into any other watershed, such person, association of persons, corporation, water improvement or irrigation district shall make application to the Board of Water Engineers for a permit... and no such permit shall be issued by the Board until after full hearing before said Board as to the rights to be affected thereby... and from any decision of the Board an appeal may be taken to the district court of the county in which such diversion is proposed to be made...¹⁹⁹

These articles became known as the "watershed-prejudice" act. For many years they went largely unnoticed, which is probably fortunate insofar as confusion attends their meaning. Does prejudice refer to existing basin rights only or does it extend to potential development? Does the statute really mean "any" prejudice at all, or sufficient prejudice to outweigh the benefits of diversion? Does the act apply only to major watersheds or basins, or to the smallest tributary?

The last-mentioned problem probably can be attacked according to the nature of the controversy, as elaborated in the Nebraska experience. A transfer of water from one tributary to another tributary of the same major river is beyond the watershed if complained of by a riparian located on the originating tributary; but such a transfer is deemed to be within the watershed and therefore lawful if the only complaining riparians are located downstream from the point of confluence of the two tributaries.²⁰⁰

Concerning the first-mentioned problem, *City of Antonio v. Texas Water Commission*²⁰¹ seems finally to have provided an answer. The Texas Supreme Court construed the watershed-prejudice act to cover only *existing* water rights without regard to future development in the basin of origin. In upholding the trial court's denial of permission to San Antonio to bring in new water supplies from the Guadalupe Basin, however, more weight seemed to be attached to the city's failure to consider supplemental supplies available in the San Antonio Basin than the prejudice which diversion would cause in the Guadalupe Basin. Of most importance in this case, the Texas Supreme Court declared that considerations of interbasin diversion must be based upon three factors: purpose of use, existing rights and the public welfare. Obviously, considerable discretionary power remained with the regulatory agency in matters of public welfare.

A resurgence of interest in area-of-origin protection developed progressively with water planning efforts on a statewide basis after 1950. The Bureau of Reclamation played a leading role at first in proposing major water transfers, at the same time taking the position that the

federal government would comply with the Texas protection statute.²⁰²

In 1965, the Texas Water Development Board was created with responsibilities for planning and working out financial arrangements for the Texas Water Plan. One provision of the legislation creating the board has a strong bearing on interbasin transfers:

However, the Board shall not prepare or formulate any plan which contemplates or results in the removal from the basin of origin of any surface water to some other river basin or area outside of such basin of origin if the water supply involved in such plan or project will be required to supply the reasonably foreseeable future water requirements for the next ensuing fifty-year period within the river basin of origin, except on a temporary, interim basis. . .²⁰³

The Board, which also has the responsibility of holding hearings in the process of determining basin needs, has more recently taken the stand that the fifty-year requirement is a continuing limitation on all future modifications of the statewide water plan. In other words, any additional water transfer projects designed in the future will have to count fifty years ahead from that time in protecting in-basin needs.²⁰⁴

The "fifty-year lock up", as some describe it, is a compromise arrangement which avoids the awkward and indefinite situation of recapture. It was insisted upon by eastern Texans whose fears were generated first by widespread discussion of the Texas Basins Project of the Bureau of Reclamation and increased with preliminary drafting of the Texas Water Plan.²⁰⁵ Concern was expressed for the effect of abnormal drought on streamflow in the eastern part of the state and for protection of the fresh-salt water balance along the Gulf Coast, as these problems would intensify with export of water to south and west Texas.²⁰⁶ Even a revised Texas Water Plan²⁰⁷ in late 1968, which placed greater reliance on out-of-state sources, primarily the Mississippi River, failed to impress many critics.

In 1969, while federal agencies were engaged in a reconnaissance study of the feasibility of diverting "surplus" Mississippi waters to west Texas and eastern New Mexico,²⁰⁸ the government of Texas decided to go to the people for financial backing. Voters were asked on August 5 to support, not the Texas Water Plan directly, but a constitutional amendment raising the authorized amount of Texas Water Development Bonds to 3.5 billion dollars, and associated matters.²⁰⁹ Without a majority vote of support, the massive Water Plan could not begin to take shape. The vote was close; the amendment was defeated, nonetheless. Figure 8 shows, as did the earlier vote in California, clear interregional separation. The outcome in Texas differs from that in California because in the Lone Star State only a minority of the population occupies the drier region which stands to gain by importing water. The vote was closer in

that a greater proportion of eligible voters registered their preferences in the drier regions of Texas than in more humid east Texas.²¹⁰ This characteristic of constant awareness of water and zeal in promoting water as the key to progress in west Texas may yet bring a reversal in outcome, if the amendment is returned for another vote in the near future. In the meantime, the Texas Water Plan, which proposes to transfer 4.45 million acre-feet of "surplus" water from east Texas, as well as 12 to 13 million from the Mississippi, into the western drylands, is effectively stalled.

PROTECTION OF UPPER FROM LOWER BASIN STATES

Compacts and other arrangements have largely supplanted Supreme Court decisions as a means of allocating the waters of a river among states each of which has proprietary claims over it. Commonly, the basin states divide up the whole river among themselves, leaving nothing to be exported to any state outside the basin.

A large number of compacts have been effected to date on U.S. interstate waters. Western states have entered into eighteen of these,²¹¹ the state of Colorado, headwaters area for so many streams, is itself a party to eight of them. Equitable apportionment or division is almost always a stated goal. It is questionable, however, whether interstate compacts have satisfied the expectations of the Supreme Court, the federal government, or states-rights advocates for mutual accommodation by quasi-sovereign entities. Most of the criticism²¹² levelled at them would seem to apply to the Colorado River Compact.

Compacts on the Colorado

The first compact, and still the most controversial, was drawn up in 1922 by representatives of the federal government and the several states of the Colorado Basin.²¹³ The conditions which brought them together were those common to most area-of-origin conflicts. The lower basin states had got off to a headstart in water development. Irrigation was practiced along the lower reaches of the river on both sides of the international border and in the Imperial Valley farther removed. Los Angeles, meanwhile, was looking to the Colorado for a cheap source of power and additional water supply. The regional economy had developed about as far as it could from natural streamflows which varied widely, causing serious floods at some times and shortages at others. It all pointed to a major storage facility on the river to protect and provide for the expansion of all of these uses. Boulder Dam was to become that facility, for which federal funds were necessary.

The slower-growing states of the upper basin, meanwhile, were becoming increasingly fearful of losing their water and hostile to the construction of Boulder Dam. They felt that so large an impoundment for the lower basin

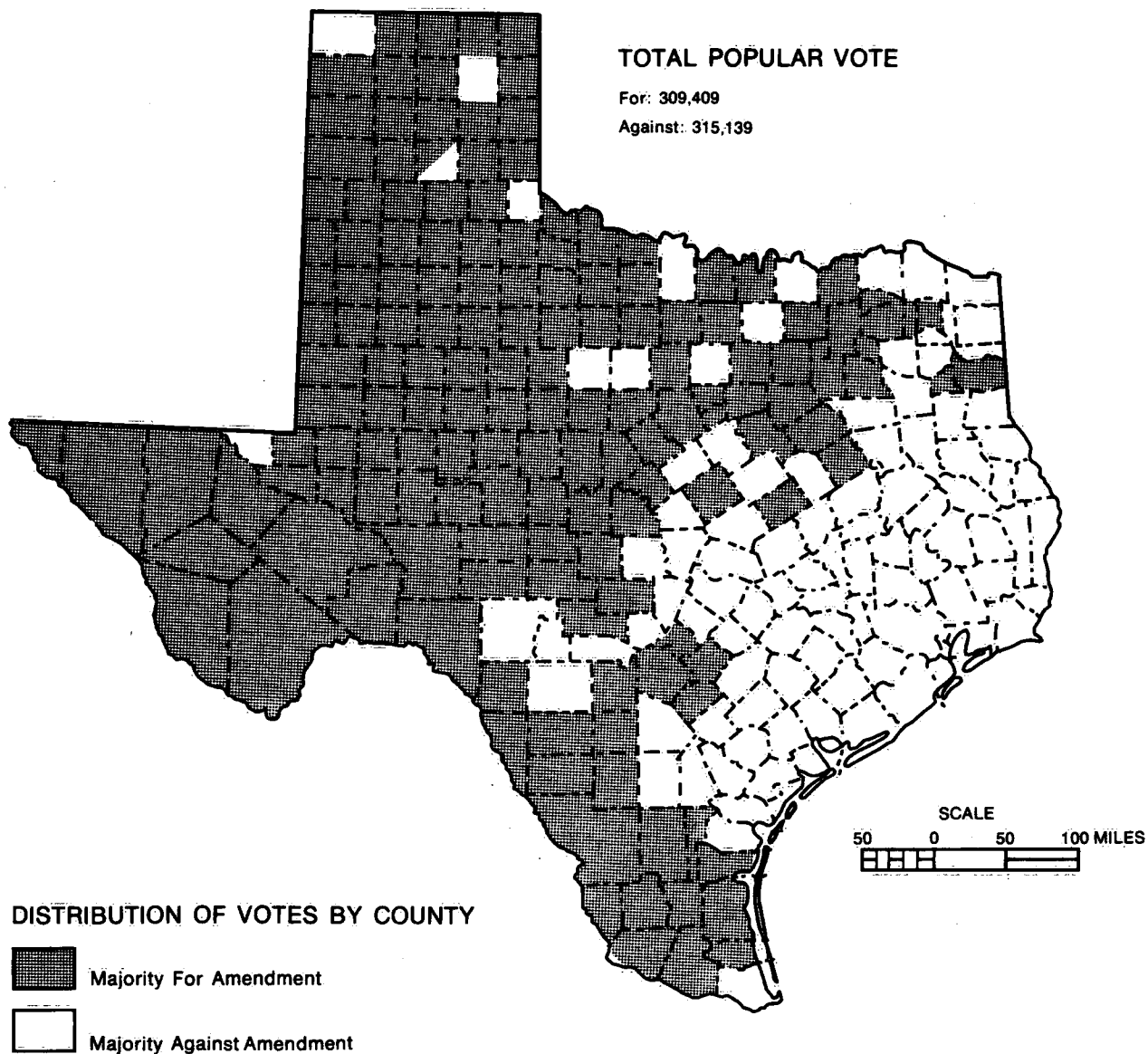


Figure 8. Texas Water Amendment, 1969.

would endanger their own future right to utilize the river, since downstream users were ready to put almost all of the controlled flow to use and thereby establish priorities which would preclude later development in the upstream states where, they argued, ninety percent of the flow originated.

Conditions were such as to bring the two sides together in a compact. The upper basin states would support the authorization of the dam in Congress, in return for a guaranteed amount of water, free of the pressure of temporal priorities, which they could develop whenever they needed it.

Items of interest within the resultant compact are Article II, which defined the basin to include not only the natural drainage area of the river but all other territory to which it might be applied; Article III, which contains the apportionment on a fifty-fifty basis between the states of the upper and lower basins, but unfortunately determined in absolute amounts which were later discovered to exceed the actual supply; and Article IV, which makes navigation and power, the downstream uses, subservient to domestic and agricultural uses.²¹⁴

Apportioning water to each state in the compact became an impossible task; the compromise of grouping the

states was effective for the time being but, like other serious problems of measurement of supply and of authority to apportion, led to continued disputes on interpretation before the U.S. Supreme Court, and finally, as a political matter, back to Congress.

Interestingly enough, when it came time to settle with Mexico on the river in 1946, it was the lower basin states which draped themselves in the Harmon doctrine to deny the Mexicans *any* right to Colorado River water. California contributed the same amount of flow to the river as did Mexico, which was virtually none at all; as part of the country of origin, however, California complained of being "sold down the river" to benefit an alien economy.²¹⁵

While Arizona and California continued to fight a running battle over their rights in the lower river, the upper basin states were preparing their own long-range plans which involved a second compact on the river. It was evident to all by this time that there was much less water in the river than earlier estimated.²¹⁶ The upper basin states could not meet delivery requirements to the lower basin and still develop new projects without storage facilities to carry over flows from wetter to drier years. The only realistic source of financing such facilities was, again, the federal government, which insisted on a water-rights settlement first among these states.²¹⁷ Within two years and without the interstate frictions which commonly precede a compact, the commissioners of the four upper basin states and of Arizona²¹⁸ had accomplished a final allocation of their waters in an Upper Colorado River Compact. With a common obligation to the earlier Colorado River Compact, no state would gain by delay. All were undeveloped and none had the resources to go it alone.

Most of the negotiation period was consumed in determining the flows of tributary streams contributed by each of the upper basin states, a task complicated by water losses through natural and artificial depletions.²¹⁹ It was early decided that percentages, rather than absolute quantities, of flow were a more realistic means of apportionment in a river system with such wide variations from year to year.

Wyoming's commissioner suggested that diversions outside the Upper Colorado Basin not exceed 25% of the share of any state and that these be cut off when necessary to fulfill discharge obligations to the lower basin. The rest of the upper basin states, however, refused to accede to any basin limitation or preference, declaring it a matter for each state to freely decide where its water was to be used.²²⁰

On what basis, then, was water allocated among the states? Colorado, which contributed much more water than all the other states combined, proposed that streamflow contribution be the basis for decision. With more irrigable land than water, New Mexico and Utah held out for a recognition of future development potential. A master plan for development based on best use for the

upper basin as a whole was rejected, but a Bureau of Reclamation report²²¹ on ultimate irrigable land and potential projects for each state in the basin was considered carefully. When the data from the latter source were corrected by the states' engineering advisors, they formed the chief basis for the final compromise²²² (see Table 8). In effect, the shares were "what each state could live with," sufficiently equitable for the respective legislatures to ratify and for Congress to confirm.

Table 8. Upper Colorado Basin Apportionments

States	Contribution to Total Flow*	Corrected Irrigation Potential**	1948 Compact Apportionment of Water	1956 CRSP Apportionment of Basin Account Revenues
Arizona	.87%	.6%	50,000 a.f.	-
Colorado	70.14%	52.5%	51.75%	46.0%
New Mexico	1.58%	9.5%	11.25%	17.0%
Utah	16.38%	25.4%	23.00%	21.5%
Wyoming	11.03%	12.0%	14.00%	15.5%
Total	100%	100%	100%	100%

*Average virgin flow 1914-45 with allowances made for out-of-state losses, from *Official Record*, Upper Colorado River Basin Compact Commission (1948), III, 3.

**Revised from U.S. Department of the Interior, Bureau of Reclamation, *The Colorado River* (1946), 3-5, by the engineering advisors to the Compact Commission, *Official Record*, II, Meeting 7, 111 ff.

Besides a gross apportionment to states, accommodations were made for cooperative regulation of storage and releases. Water could be stored in one state for the benefit of another; several agreements specify minimum inflows for major tributaries from one state to another. A permanent commission was created with a range of administrative powers surpassing anything that had gone before in compact-making.²²³

The payoff to continuing cooperation among the upper basin states and with the federal government came in 1956 when Congress authorized the upper basinwide Colorado River Storage Project.²²⁴ The major features of this program are four large storage units and a greater number of participating, largely irrigation, projects.²²⁵ This act provides for another apportionment among the states, this time of net power revenues through a basin account, to help repay the costs of irrigation in the participating projects. As Table 8 shows, this apportionment is not much different from that attached to water itself. Projects to be subsidized from power revenues need not be located in the basin portion of the state.²²⁶

The Missouri

The demands of better-watered upper parts of other Western interstate systems for what they consider their fair share of runoff to satisfy future needs have likewise been given some expression in legislation.

Toward the end of the Second World War, plans were being drawn for almost complete development of the waters of the Missouri Basin by both the Bureau of Reclamation and the Corps of Engineers. A bitter controversy arose over which agency's plan would be controlling — the Bureau's favoring irrigation interests or the Corps' with emphasis on downstream navigation and flood control.²²⁷ With the threat of a Missouri Valley Authority hanging over their heads, the rival agencies abruptly effected a merger, known as the Pick-Sloan plan, in which the Bureau dominated development upstream in the drier lands and the Corps downstream. The 1944 Flood Control Act which authorized the Pick-Sloan program carried an important concession to the upstream states which feared that the maintenance of a flowing navigation channel in the downstream reaches might someday curtail their consumptive uses. By insertion of the O'Mahoney-Milliken amendment,

The use for navigation . . . of waters arising in states lying wholly or partly west of the ninety-eighth meridian shall be only such use as does not conflict with any beneficial consumptive use, present or future, in states lying wholly or partly west of the ninety-eighth meridian, of such waters for domestic, municipal, stock water, irrigation, mining or industrial purposes.²²⁸

Reproduced in all successor flood control acts, this principle is not necessarily limited to the Missouri River but applies to all Western states.

An earlier effort on the part of some of the same states, namely Colorado, Nebraska and Kansas, to restrict by compact the Corps from operating a reservoir on the Republican River in aid of navigation on the lower Missouri had failed. President Roosevelt vetoed it as incompatible with the federal commerce power.²²⁹ The three states at that time had to content themselves with a Congressional declaration of intent to respect the priority of irrigation and other consumptive uses.

The Columbia

The upper basin states of the Columbia had tried for years to achieve advantages comparable to those enjoyed by their counterparts on the Colorado and Missouri. Idaho and Montana contribute a significant portion of the American streamflow and a number of storage sites which benefit power generation as well as other uses downstream (see Table 9). It seemed to them only fair that they share in these benefits.

Interstate friction over storage in the upper basin developed on a small scale as far back as 1918. A rival plan to Grand Coulee Dam for serving the drylands of central Washington took form at that time in gravity canals and tunnels leading from the Pend Oreille River.²³⁰ But the gravity plan was conditional upon interstate cooperation. The prospect of an Idaho lake being used to store Idaho

water for the irrigation of Washington land and, during part of the year, the generation of energy for the Washington Water Power Company, did not rest well with the upstream neighbor. The Montana Legislature was also disturbed when it became clear that the plan intended to store water in Flathead Lake, raising its level between 10 and 14 feet and drowning out surrounding farms and cottages.²³¹ Washington's attempt to reach a settlement by interstate compact was defeated when Idaho decided in 1925 to act unilaterally, denying by law its state engineer the power to permit the use of Idaho water outside the state. Senator Borah declared in Congress that he was in favor of Washington's Columbia Basin Project but that "we don't want them making a duck pond out of our domain. They will have to stay off Idaho."²³² And two years later, the Idaho Legislature passed another law, holding the waters of the three northern Idaho lakes and their shorelines in trust for the state.

Table 9. Water Supply and Power Generation in the Columbia Basin

Political Unit	Percent Contribution to Water Supply at Bonneville Dam*	Percent Generation of Power from all Federal Dams**
Canada	36.5	
Idaho	25.9	2.7
Montana	13.4	2.9
Oregon	8.1	23.0
Washington	12.1	71.4
Nevada, Utah	4.0	
Wyoming		
	100.0	100.0

*Bonneville is the farthest-downstream installation on the Columbia River.

**1965 fiscal year power data, combining Bureau of Reclamation and Corps of Engineers generation. Three major projects on the interstate reach of the lower river, Bonneville, The Dalles, and McNary, were considered as being half in Oregon, half in Washington, for statistical purposes. It should be understood that power generation data are not exclusive to the Columbia River Basin from Bonneville upstream; that non-federal generation is ignored; and that future downstream generation will be even greater by the time Canadian Treaty storage is complete. (With Treaty storage, Grand Coulee alone could increase its capacity to as much as 9½ million kilowatts from its present 2 million.)

Source: U.S. Senate Committee on Interior and Insular Affairs on *Columbia River Basin Account*, 89th Cong., 1st Sess. (September, 1965) 32; and *Congressional Record*, CXII (July 12, 1966) Senate, Table 3.

The immediate cause of unrest subsided with the construction of Grand Coulee Dam in the 1930's; it resumed, however, in 1943 when the federal government itself proposed to raise the levels of Flathead and Pend Oreille lakes as a means of increasing power output for emergency war needs.²³³ Within a few years after the war and after the destructive Columbia flood of 1948, two major federal storage projects were endorsed in this region: Hungry Horse in Montana, as an alternative to additional storage in Flathead Lake, and Albeni Falls in northern Idaho, with storage capacity limited to the maximum natural water level of Pend Oreille Lake.

More headwater storage would not be forthcoming for some time, despite the importance attached to it in federal agency recommendations for comprehensive development of the whole Columbia Basin.²³⁴ Rejecting the President's suggestion that a valley authority be established, the governors of the Northwest states returned to the idea of a Columbia Interstate Compact. From 1950, when the compact commissioners of Idaho, Montana, Oregon, Washington and Wyoming first met, until 1964 when they terminated their efforts, the allocation of water development benefits between the upper and lower basin states remained the chief source of contention.²³⁵

Idaho and Montana argued that they should receive some kind of reward for their storage releases which benefitted federal and non-federal power plants downstream. They had suffered some dislocations of existing land uses in providing storage, and were being asked to provide more storage. Meanwhile, their downstream neighbors were reaping the benefits in abundant, low-cost power, with some left over to subsidize reclamation in the vicinity of the larger dams.

Beyond a general concession of priority for upstream consumptive uses, Oregon and Washington showed little inclination to bargain. When the upper basin states made a specific proposal for retention of at-site power for their exclusive use, no agreement could be reached. And when the Montana delegation suggested that any commitment by an upstream state to provide storage control should be counterbalanced with an allocation of power attributable to those storage projects to the state in which the project was located, the downstream states refused to have anything to do with a definitive allocation.²³⁶ Reconciliation over this issue was not made any easier by Idaho's support for private power development at Hells Canyon, against a federal proposal which would have provided more storage at the same location and thereby more power capability for the basin as a whole.²³⁷

As the prospects improved of reaching an agreement with Canada to supply further upstream storage, all the more necessary since Idaho and Montana were not about to increase their contribution to the system, the legislatures of Oregon and Washington progressively lost interest in ratifying a Columbia Interstate Compact.

Although the compact idea was laid to rest in 1964 and their hopes for an allocation of compensatory power along with it, Idaho officials were not about to stop pressing for a redistribution of Columbia River benefits. But now the emphasis was on reclamation benefits and the vehicle they proposed was basin account. The Bureau of Reclamation had first suggested a system of pooling water project costs and revenues for the entire basin in 1947.²³⁸ It had been only partially adopted, however, chiefly in directing federal power revenues, in excess of what was allocated to repay the cost of power features of major projects, to subsidize irrigation developments in their respective vicinities. Thus the downstream states had received a lion's share of

reclamation assistance, as well as low cost power, from projects like Grand Coulee, Chief Joseph and the Dalles.²³⁹ Idaho received some like benefits,²⁴⁰ but wanted more; specifically, Idaho's Senator Jordan wanted net power revenues from the larger downstream plants extended immediately to help finance the cost of new reclamation development miles upstream in his state.²⁴¹

There being no foreseeable limit to water availability in the basin, and no need for active and continuing cooperation among the states as long as the federal agencies took the initiative in operating major projects and negotiating with Canada, the upstream states had little bargaining power. It was not until the threat of outside interference, in the form of Southwestern thirst, made itself felt about this time that the upper and lower basin states of the Columbia began to reconcile their varying interests. This reconciliation is discussed at greater length in Chapter 5.

Protection of Basin States from Non-Basin States

There is, then, an established precedent of interstate agreements by which the better-watered upstream states in major river basins have safeguarded their own future development. Self-interest provisions are also in effect in some places at intrastate levels. At issue in this section is the right of a state (or group of basin states) to reserve its waters from other states which do not have natural access to them; which are, in other words, outside the basin in question.

Most states are simply silent on the question of exporting their water to other states. A few — California, Idaho, Montana, Utah, Washington and Wyoming — permit diversions (not necessarily interbasin diversions) for use outside the state if reciprocal privileges are granted by the importing state or if the legislature gives specific approval.²⁴² The only absolute prohibition is found in Colorado which provides for the welfare of its citizens in no uncertain terms.²⁴³ But even Colorado is bound to mutual accommodations with its neighbors in the Upper Colorado Basin Compact.

The question of a state's sovereignty over its internal waters seemed to be answered for many years by *Hudson County Water Co. v. McCarter* in 1908.²⁴⁴ A New Jersey statute forbidding transport of water by pipe or ditches out of the state was upheld by the U.S. Supreme Court against a water company which had contracts to provide water from the Passaic River to parts of New York City. Two justices, however, dissented on the ground that the statute violated the interstate commerce clause of the federal constitution.

Only three years later, the same court struck down an attempt by Oklahoma to conserve its natural gas by prohibiting exportation.²⁴⁵ According to the decision, "In matters of . . . interstate commerce there are no state lines," and "The welfare (of the several states) transcends

that of any state." A similar conclusion was reached several years later in *Pennsylvania v. West Virginia*²⁴⁶ against the latter's attempt to restrict gas export by state statute until such time as its own needs were satisfied.

The water and natural gas cases appeared to be in conflict. Mr. Justice Holmes, who had written the opinion of the court in the Hudson County case, dissented on the West Virginia finding. Perhaps, as some reviewers suggested, water was placed in a different category than oil and gas, because it was to the state a "great public good, and what it has, it may keep and give no one a reason for its will";²⁴⁷ whereas natural gas was an obvious and lawful article of interstate commerce, requiring general and not local regulation. Or perhaps New Jersey got its way in the water case because no established use in New York had yet been built on it; whereas substantial dependence of out-of-state consumers on West Virginia gas had already obtained.²⁴⁸ In the Oklahoma case, at least, the opinion seemed to find some difference, if unexplained.

And surely we need not pause to point out the difference between (a great) river, flowing upon the surface of the earth, and such a substance as gas, seeping invisible through sands beneath the surface.²⁴⁹

More recently, the Hudson County water decision seems to have been overruled in favor of interstate commerce by *City of Altus v. Carr*.²⁵⁰ Altus, Oklahoma, contracted for a ground water supply a few miles across the border in Texas and expended considerable funds by means of a bond issue before the Texas legislature intervened with a statute prohibiting export without its consent. Failing to give any explanation itself, the U.S. Supreme Court upheld a federal court's decision which declared the natural gas cases better authority than Hudson County, which Texas relied upon.²⁵¹ The groundwater was exported.

Because the Altus case received only a review of, rather than a full hearing before the Supreme Court, it may not be the last word on state power in this regard. Rather, it seems logical to expect that, since a state's right to reserve water for future needs has been sanctioned in interstate compacts, the state should be able to do the same with waters which are intrastate. The issue, therefore, would probably revolve around whether the state's claimed needs were realistic or excessive.

Early in the present century, the states of Maine and Nebraska had enacted legislation prohibiting the export of electric power beyond their respective boundaries.²⁵² Never challenged in the courts, both states realized nonetheless how disadvantageous such restrictions were for modern economies and repealed them.

The above-mentioned statutes and cases all refer to the attempts of states individually to keep their resources at home. Until recently, no regional association of states such as those sharing an interstate river basin has found it necessary to band together in opposition to proposals

which would divert its waters elsewhere. Could any such interstate alliance legislate its own protection?

In view of the power of Congress to apportion interstate waters, as clarified in 1963 in *Arizona v. California*, and to override state statutes according to the commerce clause, interstate as well as state protectionism by this route is no guarantee of success. As if to underline this interpretation, the Attorney General of the state of Washington gave an opinion in 1964 that the Columbia Basin states, even with a ratified and approved compact, could not reduce Congress' power to decide on the question of water export out of those basin states as it wished.²⁵³

SUMMARY OF PAST EXPERIENCE

Three different circumstances of area-of-origin protection in the Western states have been considered in this chapter. In the first, a state acts to protect its local areas of streamflow origin against unlimited diversion by other areas intrastate; in the second, an upstream state acts to protect its claim on an interstate river; and in the third, a state acts to protect its waters from an extrabasin diversion by non-basin states. None of the accumulated experience points to interbasin or interstate diversions as good or bad in themselves. Their accommodation with state water policies seems to be the critical factor. Federal agencies have shown no inclination to "buck" area-of-origin preferences when these have been consolidated at the state or interstate level.

At an intrastate level, the riparian limitation has been reinforced by statute in a few states with the intention of granting preference, without exclusive use, to the area of origin. Interbasin diversion within a state's boundaries cannot be denied, however, when a majority of the population stands to gain from it, as the California and Colorado controversies made clear. The best a basin of origin in that situation can do is attach strings of a statutory or, perhaps better, financial nature to reduce its loss. Clearly, area-of-origin protection is weakest at this level.

On interstate rivers, the U.S. Supreme Court early upheld the right of upstream states to reserve a portion of flow for their future uses, whether or not these were to be developed in the basin in question. In striking down the riparian limitation as well as the time priority of appropriation law for interstate waters, the court nonetheless refused to go all the way with upstream sovereignty. It decreed, and interstate compacts subsequently applied, a principle for the equitable sharing of common waters among quasi-sovereigns.

So much for allocating intrastate waters within the state and interstate waters among the affected states. It is the remaining case for which answers are not as apparent. What are the prospects for a state (or group of states which

share a basin) keeping its waters against the import designs of other states located entirely outside the natural drainage area? This question ceased to be academic after the expansive United Western Investigations of 1950-51. The interest of California and the Southwest in the Columbia Basin and of Texas in the lower Mississippi are unmistakable. The recent Texas groundwater case has implications,

but provides no clear direction. Probably only Congress can speak with assurance on an issue of this magnitude. As more states in the American Southwest complain that they are approaching the point of exhausting the supplies of water available within and running along their boundaries, here is where the action promises to be. Here is where the precedents of law give way to the strategy of politics.

The Pacific Northwest as an Area of Origin

The Northwest-Southwest confrontation in Congress over water diversion was more than interregional. Outside forces, mentioned toward the end of Chapter 2, were larger than either region could muster. The factor that made this area-of-origin experience different from others before it was the success with which Northwest strategists were able to close past divisions in their own ranks and play the changing national temper for all it was worth. Armed only with the water supply arguments of the past, the states of the Colorado Basin gradually found their position untenable.

As a matter of course, the protagonists produced charges and counter-charges. Southwestern spokesmen were incensed that the Columbia River, with ten times the volume of the Colorado, was "wasting" to the sea; Northwesterners replied that their non-consumptive uses should not be downgraded, that the fish, the barges and the power plants were capable of using all of the water in the river. Southwestern leaders argued that they must have new water to accommodate a rapidly expanding economy; Northwestern protectionists complained that irrigation should not be extended where water was costly at the expense of the national taxpayer and the Northwestern farmer who could grow most of the same crops. These and more arguments were heard. No attempt is made to catalog or appraise them here.²⁵⁴ This chapter is concerned more with the strategies inside Congress and out by which the states of the Columbia Basin were able to fend off the ambitions of their thirsty neighbors to the south.

OVERTURES FROM THE SOUTHWEST

From 1964 when the first version of a Colorado River Basin Project bill began to gather momentum in Congress, there was little doubt which was the intended source for augmenting the Colorado. California had rejected a Pacific Southwest Water Plan which hoped to draw from its north coastal rivers. Interested parties from the private sector hastily drew lines farther northward on their maps. Secretary of Interior Stewart Udall himself admitted in Hearings. "We don't think it even wise to study anything other than that source, meaning from the Columbia River below Bonneville Dam. . . ."²⁵⁵

H.R. 4671, which carried Southwestern hopes through a series of Hearings in the House, started with the Central Arizona Project, having a priority junior to California's

compact allocation; Bridge and Marble Canyon dams within the Grand Canyon; and a Development Fund financed largely from these dams. It also directed the Secretary of the Interior to investigate and recommend a project for delivering not less than two and a half million acre-feet of water into the Colorado Basin from outside sources. This sum was later raised to eight and one-half million by the bill's sponsors, more than enough to fulfill the legal obligations of the early Colorado River Compact to the satisfaction of all its signatories. To ensure the support of its neighboring states for its own project, Arizona had found it necessary to add the importation clause and to back its financing with power revenues from the Grand Canyon dams.²⁵⁶ These very additions, however, were what provoked the formidable opposition of Pacific Northwest congressmen and environmental conservationists.

Area-of-Origin Incentives

Directly and indirectly, spokesmen for the Colorado Basin states tried to persuade their colleagues from the Northwest that interregional water transfer would be good for the West in general and protective of the area of origin in particular.

Westwide unity provided a major theme. It was stressed that all of the Western states had some arid or semi-arid lands that would benefit from water development projects. In this respect, they were different from the rest of the country against whose growing urban and civil priorities Western water programs must compete for federal funds. The backlog of Congressional appropriations for Corps of Engineers and Bureau of Reclamation projects in the West was approaching several billion dollars.²⁵⁷ The West was also described as an interdependent region, whatever large-scale project benefited California ultimately benefited Idaho as well. The Colorado River Association commissioned a consulting study to publicize just how dependent Northwest products were on Southwest markets.²⁵⁸

The Pacific Northwest-Southwest Intertie, already under construction as a means of marketing surplus Columbia River power southward, was cited as an example of cooperation which resulted in gains to both regions. The Northwestern states accomplished long-term protection as well as profit by inserting a regional preference clause in the enabling legislation with the approval of the Southwestern customers. Such protection, it was suggested, could be provided similarly for water as for power.²⁵⁹

Proponents of diversion studies hoped that protective clauses might win the support of the Northwestern states; but if that were not possible, at least congressmen from other parts of the country might be convinced that the legislation was not unfair to the Northwest.

The kind of protection offered in statutory form in H.R. 4671 and adopted in principle by the Western States Water Council²⁶⁰ derived in both cases mainly from California experience. In sum, no statutory language by itself could be relied upon to satisfy the needs of both the exporting and importing region; it must be made meaningful by funding water development in and for the area of origin at the same time as some water is removed. An added virtue of this approach in the view of Southwesterners, of course, was a change in emphasis, away from the question

of future area-of-origin recapture and toward the mutual benefits of cooperation. See Tables 10 and 11.

Beyond undefined and unqualified assurance of priority for water use in the areas of origin as against the areas of importation, H.R. 4671 carried a guarantee for the former of "prices to users not adversely affected by the exportation of water to the Colorado River System."²⁶¹ How would this guarantee be made financially operable? The Pacific Southwest Development Fund, a variation of the basin accounting concept, was to provide the means. Earlier, Bureau of Reclamation officials had expressed some interest in treating all seventeen reclamation states as one basin for the purpose of pooling costs and revenues;²⁶² understandably, the Northwest with its enviable hydroelectric power position was cool to the idea that its power

Table 10. Protection Available to Prospective Areas of Origin as a Condition of Water Export – State Experiences

State	Statutory Protection	Compensation		Recapture?
		Nature	Funding	
Nebraska	Prohibition of interbasin transfer in 1889; amended in 1893 to permit some transfer from major streams. (Neb. Rev. Stat. 46-206 [1960]) Recent court decision makes protection dubious even for smaller streams. (<i>Ainsworth Irrig. Dist. v. Bejot</i> , 170 Neb. 257 [1960])			
California	County-of-origin law, 1931, and watershed-of-origin law as applied to Central Valley Project, 1933. (Calif. Water Code, Sec. 10505, 11460-63) Both made applicable to State Water Project under the 1959 Burns-Porter Act: (Calif. Water Code, Sec. 12930-44)	As of 1959, policy is to build local water projects along with facilities for export.	Offset bonds to equal expenditures from California Water Fund, plus expanded Davis-Grunsky program for local development.	Possible in principle. (25 Ops. Cal Attorney General 8, 9 [1955]) Unlikely, in view of emphasis on developing water for area of origin rather than reserving it.
Colorado	Federal guarantee of West Slope protection in 1937 Colorado-Big Thompson Project report. (Sen. Doc. 80, 75th Cong. 1st Sess.) Colorado River Basin Project Act of 1968 restricts application to existing water users. (P.L. 90-537, V, Sec. 501 [f]) State counterpart legislation is Colorado Water Conservancy District Act of 1937, amended 1943, applicable only to such districts. (Colo. Rev. Stat. Ann. 150-5-13, 2d [1943]) Constitutionality of state, legislation in some doubt after Denver diversion, litigation. (148 Colo. 173, P. 2d 273 [1961])	Compensatory storage, to leave area of origin in as good a position for using water as if there had been no diversion effected by Green Mountain Reservoir in C-BT Project, Ruedi Dam in Frying Pan-Arkansas Project, both federal.	Users of diverted water assessed cost of replacement storage in federal projects.	Temporary recapture promised only in C-BT Project, under specified flow conditions.
Texas	1913 Watershed prejudice Act, (Tex. Rev. Civ. Stat. Ann. 7589-91 [1954]) 1965 Texas Water Development Board Act provides for foreseeable 50-year requirements of basins of origin within State Water Plan. (Tex. Laws 1965, ch. 297, Sec. 3[b], 588)	Assumption that basins of origin will have first right to purchase water from the future Texas Water System.		No. Fifty-year limitation designed as compromise between area-of-origin and area-of-deficit demands.
Oklahoma	Limitation on Interbasin transfer in favor of area-of-origin future needs, as of 1957 (Okla. Laws 670, No. 502, Titles VII and IX)			

Table 11. Protection Available to Prospective Areas of Origin as a Condition of Water Export – Interstate Transfer Proposals

Proposal	Assurance of Protection	Compensation		Recapture?
		Nature	Funding	
Pacific Southwest Water Plan (1964 revision)	"Diversion of water would be subordinate to all existing and anticipated future needs, including the retention of water in the watersheds of origin if estimates of future needs prove insufficient."	"Financial assistance . . . for construction of any future projects in the watersheds of origin, if such assistance is not otherwise provided; and a guarantee that any additional costs of future projects, caused by the preemption of lower-cost water sources which otherwise would benefit the area of origin . . . would be offset by . . . revenues to the extent that the costs chargeable to such projects would be no greater than if there had been no export under the . . . Plan."	Pacific Southwest Development Fund, consisting of net power revenues from Bridge Canyon and Marble Canyon dams proposed by the Plan, and from Hoover and Parker-Davis dams already in service.	Unknown. "Retention" does not necessarily mean the recapture of water which has already been exported.
Lower Colorado River Basin Project, H.R. 4671, 1965	"All requirements, present or future, for water within any State lying wholly or in part within the drainage area of any river basin and from which water is exported by works planned pursuant to this Act shall have a priority of right in perpetuity to the use of the waters of that river basin, for all purposes, as against the uses of the water delivered by means of such exportation works, unless otherwise provided by interstate agreement." (Title II, Sec. 207 [b])	" . . . assistance to the end that water supplies may be available for use therein [areas of origin] adequate to satisfy their ultimate requirements at prices to users not adversely affected by the exportation of water to the Colorado River system." (Title II, Sec. 207 [a])	Lower Colorado River Basin Development Fund, consisting primarily of net power revenues from Bridge Canyon and Marble Canyon dams proposed, Hoover and Parker-Davis dams in service, and Arizona-Nevada section of Pacific Northwest-Southwest Intertie under construction. (Title IV, Sec. 403)	Implicit but unknown in respect to "priority of right in perpetuity."
Western States Water Council, Principles – Standards – Guidelines, 1967	"1.3.1. Inter-basin or inter-regional transfer of water shall contemplate only the transfer from the area of origin of those quantities of water deemed to be surplus . . ." "1.3.2. In making determinations of possible surplus water, all water-related needs of the states and areas of origin . . . shall be recognized." "1.3.3. All water requirements, present or future, for uses within the drainage area of any river basin, shall have priority and right in perpetuity to the use of the waters of that river basin, for all purposes, as against the uses of water delivered by means of such exportation works, unless otherwise provided by treaty, interstate agreement or compact."			Alternatives presented for subsequent decision: "1.2.1 . . . (a) The return or replacement of the water exported to the area of origin; or (b) Providing equivalent beneficial programs acceptable to the area."

Table 11 (cont'd.)

Proposal	Assurance of Protection	Compensation		Recapture?
		Nature	Funding	
Western States Water Council, Principles—Standards—Guidelines, 1967 (cont'd)	<p>“1.3.4. The cost of water development to the states of origin shall not be greater, but may be less, than would have been the case had there never been an export from those states under any such plan.”</p> <p>“1.3.5. In the study of interstate diversion, any interstate diversion project shall neither impede nor minimize the development of water resources in the state of origin, and shall result in substantial net advantage to such state over the advantage it could have obtained, by itself or otherwise, without such diversion project.”</p> <p>“1.3.6. All plans for inter-basin diversion of water shall provide for such financial arrangements with the states of origin as may be necessary to comply with sections 1.3.4. and 1.3.5. above.”</p> <p>“1.3.7. The exportation of water shall not change an area of origin from a water-rich to a water-deficient economy and shall not adversely affect the competitive position of the area of origin.”</p> <p>“1.3.8. State or area of origin priority shall be explicitly set forth in all contracts for the use of imported water. Should such priority ever be denied, through subsequent action of the Congress, or otherwise, areas of origin will be entitled to just compensation.”</p> <p>“1.3.9. Federal statutes designed to protect states and areas of origin, in any regional interstate plan of water development, should include the consent by the United States for any such state of origin to sue in the Federal Courts, to compel Federal Officials to comply with such statutes and for such other relief as deemed equitable.”</p> <p>“1.4. This statement of principles shall not be considered as any support or advocacy for the diversion of water from one river basin to another.”</p>			
Colorado River Basin Project, P.L. 90-537, 1968	Same as H.R. 4671, 1965 (Title II, Sec. 203 [b])	Same as H.R. 4671, 1965 (Title II, Sec. 203 [a])	Same as H.R. 4671, 1965 except for the elimination of Marble Canyon and Bridge Canyon dam revenues. (Title IV, Sec. 403)	

revenues should underwrite some irrigation project a thousand miles away. A few members of the Western States Water Council had hoped that all eleven of its member states might be considered one basin under provisions of

the 1965 Water Resources Planning Act with similar advantages of pooling costs in the case of water redistribution; again this was not well received and was effectively blocked when the Pacific Northwest states petitioned to



Figure 9. The promise of new life in the desert through water transfer.

organize their own basin commission under the Act.²⁶³ The Development Fund created under the terms of H.R. 4671 would mark the first time in which revenues raised in one basin would support feasibility studies and compensation in another. The net power revenues from Bridge Canyon and Marble Canyon dams and from the existing Parker-Davis and Hoover (Boulder) dams, all in the lower Colorado Basin, would be used for this purpose.²⁶⁴

Off the record, proponents of interregional transfer were less hesitant in projecting positive benefits to areas from which water might come. The Northwest would gain a large payroll from construction and continuing operation of export facilities, a variety of benefits from water control and availability locally, expanded markets for its products in a more populous Southwest, and more.²⁶⁵ Particularly tempting to rural communities in the dry environments of southern Oregon and Idaho was the prospect of tapping water supplies en route southward for local agricultural expansion. Congressman Tunney of California transformed this "sweetener" onto a map which truly seemed to make the desert bloom. (Fig. 9)

Unlike the experience gained in other resource developments, even hydropower developments, the possibility of the states of the Columbia Basin selling water by the acre-foot to the Southwest was never taken seriously by either side. This great public good, was, apparently, too priceless for any region with some left over to deny or take advantage of another in need. For an international transfer, direct monetary payments might be the only acceptable alternative, but within the national borders, who had ever heard of such a thing? The Director of the California Department of Water Resources expressed disdain for the idea of paying "tribute" to areas of origin. In California he considered that such a transaction would be unconstitutional and that it made no more sense on a larger scale either.²⁶⁶

Incentives Questioned

Alarmed at declining ground water levels and the prospect of continuing depletion of the Colorado River by sequential project authorizations, the Southwestern states were understandably willing to make promises now in return for immediate action on importation studies. How good were these promises? A suspicious Northwest raised several doubts about them publicly.

It might well be two or three decades before Northwest water users would feel any real pinch from a reduction of flow in the Columbia River. Would there be sufficient money remaining in the Pacific Southwest Development Fund to compensate inconveniences and lost incomes, or to make up the difference between normal project costs and those made necessary by flow reduction?²⁶⁷

Because the Colorado project bill was not a pact or contract between two parties or regions alone, but a matter

for Congressional decision and federal funding of any ultimate construction, it would be vulnerable to changing national circumstances in the long run. The Bureau of the Budget appeared reluctant for this reason to endorse by legislation any guarantee against rising prices of water projects to either the area of origin or the area of importation.²⁶⁸ Even if a federal commitment were forthcoming, could one Congress obligate all future Congresses? Under pressure of continued growth, what was to stop the Southwest from using its greater political power in Congress to amend the protection clauses?

The possibility of recapture by the area of origin of its waters was implied, but not clarified in H.R. 4671.²⁶⁹ Under a program of interregional diversion, if Northwest residual flows proved insufficient to meet all local needs, could the tap be turned off either permanently or during critical periods? This was obviously an issue which the proponents of diversion preferred not to face until later, when at least the broad feasibility of the program were established. For the Northwest, however, the unlikelihood of recapture was clear. And it was bothersome because the protection offered, that is, compensation against rising costs occasioned by water removal, seemed to be intended for future project construction, whereas greater costs might be suffered in terms of declining fish runs, water quality or power generation. Protection of these non-consumptive uses of the Columbia could better be served by recapture, at least temporarily, than by compensatory projects.²⁷⁰ Of course, cash could be offered as another form of compensation for losses incurred in the source area, but this, like selling water itself, would mean a precedent in interstate water experience which none of the Southwest states appeared eager to establish.

The dissatisfaction of the states of the Columbia Basin was perhaps best expressed during the Western States Water Council deliberations over principles for interregional water diversion, when they insisted upon a final clause:

1.4. This statement of principles shall not be considered as any support or advocacy for the diversion of water from one river basin to another.²⁷¹

Their real opposition was not wasted here, however. It was saved for Congress where they set about not merely amending the protection features of a diversion bill but deleting any mention of diversion itself. Once the immediate threat of water export was defeated, they were amenable to such protectionist clauses for eventual implementation.²⁷²

PACIFIC NORTHWEST STRATEGY IN CONGRESS

Most of the pleas voiced in Congress about the Colorado River Basin Project bill related to one region's need for more water and another's need for more time. Behind the pleas, both sides were busy forming alliances

and planning strategies. These latter held more significance for the area-of-origin struggle.

Figure 10 provides a capsule commentary of the actions and reactions which contributed, over a period of six years, to the ultimate legislative compromise. It will be evident that most of these took place in committee rather than on the floor of the House or Senate.

Committee Orientations

For anyone reviewing the history of Western reclamation bills, three findings are inescapable. First, such bills as a rule go to the Interior and Insular Affairs Committees of the respective Houses for consideration, committees whose membership is invariably dominated by Westerners. Second, the voting pattern of Western members reflects stronger identification with their region(s) than with their parties. Third, the chairmen of these committees, in a manner which is traditional throughout the Congressional structure, wield considerable personal influence on the outcome of any proposed legislation.

Membership of the Interior Committees which deliberated over the Arizona and Colorado Basin project bills in

the 89th Congress is indicated in Table 12. Of the 33 House members, 22 were Westerners (17 of the 20 Irrigation and Reclamation Subcommittee members); all but one of the Senate members represented Western states. The labels Democrat and Republican counted for little in committee voting on the Colorado River Basin Project; separation was entirely on regional grounds.²⁷³ In the House, Chairman Wayne N. Aspinall of Colorado complemented a heavy representation from the Southwest; on the other side, Henry M. Jackson of Washington ensured the northwestern states more committee strength than their numbers alone could achieve. As chairmen, Aspinall and Jackson could and did determine which, among competing proposals, would be entertained by their respective committees and hence what form such proposals must take to ensure passage. The Southwest states were soon made aware that any legislation which espoused the cause of interregional diversion would make no headway in a committee chaired by Senator Jackson.²⁷⁴

National Focus

The representatives from the Pacific Northwest did not have to fight alone. There was enough in the Colorado

Table 12. Membership in the Interior and Insular Affairs Committees of the House and Senate, 89th Congress*

HOUSE

Wayne N. Aspinall (D. Colorado), Chairman

Leo O'Brien (D. New York)**
Walter Rogers (D. Texas)**
James A. Haley (D. Florida)**
Ed Edmondson (D. Oklahoma)**
Walter S. Baring (D. Nevada)**
Ralph Rivers (D. Alaska)
Roy A. Taylor (D. North Carolina)
Harold T. Johnson (D. California)**
Hugh L. Carey (D. New York)
Morris K. Udall (D. Arizona)**
Compton White (D. Idaho)**
Phillip Burton (D. California)**
David King (D. Utah)
Walter Moeller (D. Ohio)
John V. Tunney (D. California)**
John Bingham (D. New York)

Thomas S. Foley (D. Washington)**
N. Neiman Craley (D. Pennsylvania)
John Race (D. Wisconsin)
Richard White (D. Texas)**
Teno Roncalio (D. Wyoming)**
John Saylor (R. Pennsylvania)**
E. Y. Berry (R. South Dakota)
Craig Hosmer (R. California)**
Joe Skubitz (R. Kansas)**
Charlotte Reid (R. Illinois)
Laurence T. Burton (R. Utah)**
Rogers C. Morton (R. Maryland)
Wendell Wyatt (R. Oregon)**
George V. Hansen (R. Idaho)**
Theodore Kupferman (R.N.Y.)
Edwin Reinecke (R. California)**

SENATE

Henry M. Jackson (D. Washington), Chairman

Clinton P. Anderson (D. New Mexico)
Alan Bible (D. Nevada)
Frank Church (D. Idaho)
Ernest Gruening (D. Alaska)
Frank E. Moss (D. Utah)
Quentin N. Burdick (D. N. Dakota)
Carl Hayden (D. Arizona)
George McGovern (D. Dakota)

Gaylord Nelson (D. Wisconsin)
Lee Metcalfe (D. Montana)
Thomas H. Kuchel (R. California)
Gordon Allott (R. Colorado)
Len B. Jordan (R. Idaho)
Milward L. Simpson (R. Wyoming)
Paul J. Fannin (R. Arizona)

* Membership listed by party and seniority by *Congressional Quarterly*.
** Members also of Subcommittee on Irrigation and Reclamation.

1963

88th Congress

1964

1965

89th Congress

1966

1967

90th Congress

1968

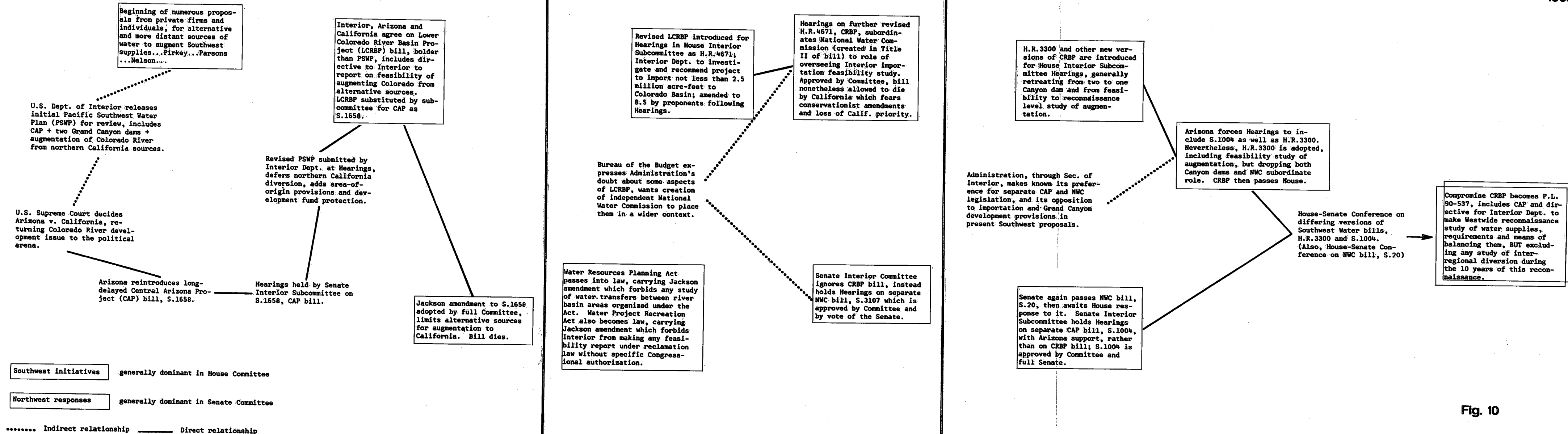


Figure 10. Interregional moves in the legislative history of the Colorado River basin project.

Fig. 10

River Basin Project bill from the first to make others unhappy, as well. Consequently, much of the controversy was diverted from local and regional water supply needs to national water management problems across the board, taking in such things as technological alternatives, environmental sensitivities and spending priorities, as well as problems peculiar to other regions.

An immediate, if fortuitous, assist for Northwest protectionists developed from the ranks of conservationists who opposed any further dam construction in the Grand Canyon of the Colorado. The Sierra Club and other like organizations were able to rally a national constituency for their cause.²⁷⁵ By eliminating the two power dams from the Southwest's ambitious legislation, conservationists were likewise eliminating much of the support necessary for financing another aspect of the bill, namely the study of sources for augmenting the Colorado's flow.

The Administration was slow to develop a position on the bill. Interior Secretary Udall had worked closely with Southwestern water leaders to resolve the supply problem with a solution acceptable to all the states of the Colorado Basin. When the solution appeared to be running unacceptable costs among other groups and regions, the Administration could sit on the fence no longer. Through the Bureau of the Budget, it began in 1965 to question the propriety of some of the bill's precedents, such as the guarantee to both the area of origin and the Colorado Basin of protection against rising prices occasioned by interbasin diversion.²⁷⁶ The whole gamut of water problems and opportunities across the nation was becoming so complicated as to lead the Bureau to suggest that the financial, aesthetic and interbasin aspects of the Colorado Project bill might be placed in better perspective by an independent national commission. The point was naturally not lost on Northwestern legislators that such a commission would be taken up with more considerations than interbasin diversion criteria.

It was the capability of Northwestern leaders to take advantage of this widespread unrest over the Southwest's bill which made their strategy effective. Leaving the conservationists to bear most of the burden of opposition to Southwestern ambitions in the House, the Northwest was able to play its stronger hand in the Senate Interior Committee. There, Chairman Henry Jackson was instrumental in blocking progress on the Colorado River Basin Project bill.

As early as 1964, Jackson was able, by legislative amendment, to turn aside the threat of a Northwest-Southwest diversion study by excluding his region from those possible alternative sources mentioned in S. 1658. The effect was to return pressure to northern California as the most likely water surplus area from which to augment the Colorado River. Californians could only allow the bill to die in the 88th Congress.²⁷⁷ (See Figure 10.) In the next

year, two pieces of legislation having broad bipartisan support received Jackson amendments before enactment. These were the Water Resources Planning Act and the Water Project Recreation Act.²⁷⁸ The amendment on the former forbids any study of water transfers between river basin areas organized under the Act by either the Water Resources Council or any commission responsible for a basin area; in the latter legislation, the Department of Interior is prohibited from making any project feasibility report without specific Congressional authorization.

From that point on, Senator Jackson was well-placed to contribute to Administration doubts on the Colorado Project legislation, and to follow them through in his committee's deliberations. He refused to hold Hearings on the Colorado River Basin Project at all, but was pleased to entertain the Administration's proposal for a National Water Commission which would include such things as interbasin transfers and environmental values within a context of national needs.²⁷⁹ The commission bill, S. 3107, was approved by vote of the Senate. Meanwhile, the House Committee, under Southwest domination, first ignored, then accepted the idea of a national commission, but only in a role of subordination to the Interior Department's study of Colorado River augmentation in the 1966 version of H.R. 4671.²⁸⁰ Toward the end of the 89th Congress, California members of the House Rules Committee allowed H.R. 4671 to die in fear of added amendments on the floor of the House by conservationists from the Eastern states.²⁸¹

The 90th Congress opened with a new statement by the Secretary of Interior that the Administration could not support the Southwest's legislative package as it stood, and favoured instead separate measures for the Central Arizona Project and the National Water Commission.²⁸² The chairman of the Senate Interior Committee was only too glad to oblige, but proponents of the Colorado River Basin Project in the House were intransigent; their retreat was nonetheless foreseeable, if gradual, in view of a split in their own ranks. Arizona broke with what she concluded to be a losing cause.

Dividing the Southwest

The seven states which shared the Colorado River came together on the Colorado River Basin Project solely on the issue of imported water solving their mutual problems. As opposition to this objective stiffened on many fronts, the temptation of the basin states to revert to their separate and conflicting interests in the river similarly grew.

Distrust between the upper and lower basin and between the states of the lower basin had not been put to rest by past compacts, court decisions, or construction

programs. Even as they were negotiating a common legislative position in 1965, the upper and lower basins were in dispute over the filling schedule of the reservoir behind Glen Canyon Dam because of its effects on power generation at Hoover (Boulder) downstream.²⁸³

None of the basin states was deluded into believing theirs was an alliance among equals. California, with its 38 Congressmen and with an active state program budgeting \$360 million for water development alone in 1967, exceeded the political power and financial capability of all her neighbors combined.²⁸⁴ Still, California had not always won its own way in Southwestern water matters when national decisions were required.²⁸⁵

All Arizona ever really wanted was the Central Arizona Project. For years Arizonans had watched their neighbors on the river move ahead with their own projects while their state remained frustrated. In 1951, the House Interior Committee had refused to consider Arizona's project until its legal rights to the river had been adjudicated.²⁸⁶ *Arizona v. California* was finally decided by the U.S. Supreme Court in 1963, clearing the way for the state to return to Congress for the project that was then more than ever needed to restore falling ground water levels, rescue abandoned acreage and sustain explosive urban growth. Its legal victory notwithstanding, Arizona was rebuffed by its neighbors who insisted that there was not enough water left in the river to accommodate the Central Arizona Project without hurting them. California led the rebellion against the Secretary of Interior's Pacific Southwest Water Plan when it appeared that surplus supplies in the northern regions of that state would be directed in part to Arizona's use.²⁸⁷

As the price of their support in Congress, Arizona had reluctantly agreed to add some provisions to its project bill which would satisfy all the basin states. These included a California priority to 4.4 million acre-feet in the Colorado River over Arizona's future project withdrawals, several smaller projects in the Upper Basin, two power dams rather than one inside the Grand Canyon, and a requirement for the Department of the Interior to make a feasibility report on means to augment the flow of the Colorado by 8.5 million acre-feet. Arizona then observed the growing opposition to H.R. 4671: The Senate Interior Committee refused to consider it, while the measure was blocked from reaching the House floor late in the 89th Congress, even after committee approval, by Californian members of the Rules Committee who feared conservationist amendments. Taking stock of the situation at the beginning of the 90th Congress, Arizona Representative Morris Udall was led to tell his neighbors across the Colorado River:

I must tell you bluntly that no bill providing for a so-called 'Grand Canyon dam' can pass the Congress today I must also tell you that no bill providing for augmentation of the Colorado River by importing water from the Columbia — or even feasibility studies directed at the Columbia — can pass the Congress today. Senator Jackson, chairman of the Senate Interior Committee, will see to that.²⁸⁸

Arizona could foresee no success in bucking the Administration, the Canyon conservationists, and the Northwest, none of which was actually opposed to the Central Arizona Project alone. The state therefore cooperated with Senator Jackson in holding Interior Committee Hearings on its project alone. Both the Arizona project and water commission bills passed the Senate without difficulty.²⁸⁹ When House Committee chairman Aspinall refused to continue Hearings into 1968 on Arizona's project, Carl Hayden, Arizona's powerful member of the Senate Appropriations Committee, forced him to change his mind with a threat to pass the project within a general appropriations measure.²⁹⁰

PACIFIC NORTHWEST ACTIVITY OUTSIDE CONGRESS

All the while pressures were building in Congress for a feasibility study of interregional diversion, the four states of the Pacific Northwest were not about to simply wait and worry. As the Colorado Basin states had come together in pursuit of external supply, it now seemed urgent to the Columbia Basin states that they find a common position of their own. This would require a degree of active cooperation they had never before reached among themselves.

Idaho, Montana, Oregon and Washington had not had a great deal to do with each other directly in water development. With so much water in the Columbia and coastal systems and so little withdrawn for consumption, there was little likelihood of one state infringing on another's appropriations. The greatest need was for major storage projects, and for these each state looked to the financial capabilities of the federal government. In the federal-state partnerships which ensued, however, the senior member supplied most of the initiative, the plans and the funds. Indeed, federal agencies invested more heavily in Northwest waters than in any other of the West's basin regions (see Table 13). What little interstate cooperation there was in controlling the flows of the Columbia, therefore, came about for the most part under federal auspices.²⁹¹

This situation was to change radically in response to the threat from the Southwest.

Table 13. Federal Expenditures in Western Water Development Existing and Authorized, 1964

Regions	No. of Projects	Storage (Acre-feet)	Construction Cost
Arkansas-White-Red	166	66,975,338	4,082,725,162
Central, South Pacific, and Central Valley	158	30,821,403	3,455,564,380
Colorado	105	47,744,905	1,413,518,338
Columbia-North Pacific	213	67,458,493	7,551,400,010
Great Basin	53	2,223,580	203,461,958
Missouri	193	118,813,179	3,566,734,361
Rio Grande-Gulf	115	35,582,562	1,098,701,153
Total	1,003	369,619,460	21,372,105,362

Adapted from U.S., Senate, Committee on Public Works, *Western Water Development* 1964, Chap. III.

Improving State Performance

All four of the Northwest's state governments recognized a golden opportunity to overhaul and streamline their water programs. Beginning in 1965, they made their new priorities clear in three related measures: reorganization of the state administrative structure pertaining to water, reinforcement of the budgetary allocation for water planning and promotion of ultimate statewide needs studies.

Oregon was somewhat ahead of its neighbors in the Northwest, perhaps because of its proximity to California and a forewarning of what might come after the 1950-51 United Western Investigation.²⁹² In 1955, the Legislative Assembly created the Oregon Water Resources Board with broad responsibility to speak for the state in program formulation. A basin-by-basin appraisal was well underway when the Board urged in its Fifth Biennial Report:

That immediate fiscal authorization be obtained to determine the ultimate water requirements on a statewide basis notwithstanding the need for continuation and progressive review of the normal, shorter-range program. There is no question as to the Pacific Southwest's water needs. Diversions from the Pacific Northwest should be restricted to water known to be in excess of the ultimate needs of Oregon and of the Northwest²⁹³

The Legislature complied and an intensive four-year study projecting the states' supply and demand for water a full century ahead was quickly underway. In May 1969, the results were in:

The Study indicates that Oregon does not have enough water originating within its borders to fulfill its total requirement in the year 2070.²⁹⁴

In releasing the 1969 report, Oregon's governor announced that his state would probably have to import water from Canada before the year 2070.

In Idaho the Legislature established its State Water Resources Board in 1965. With the generous funds appropriated for it, the Board was charged with formulating a state water plan to be completed in 1970. At its first meeting, a slogan was set: "Idaho Water for Idaho People."²⁹⁵

In Montana, the State Engineer's office was abolished in 1965. The Montana Water Resources Board was created in 1967, with expanded authority to conduct comprehensive statewide planning.²⁹⁶ The Legislature appropriated additional funds for a state water plan to assess needs 50 years into the future and to be completed in 1970 or 1971.

After several years of talking reorganization, the Washington State Legislature made it official in 1967.²⁹⁷ Where previously 18 different agencies were involved in some aspect of water management, limited consolidation resulted in a State Department of Water Resources and a supporting Advisory Council. The State Water Plan to be developed by the Department will no doubt fill in many of the gaps of the sixteen-month *Initial Study of the Water Resources of the State of Washington* brought forth by university researchers, which projected water demands to the year 2065; the unsurprising, if tentative, finding of that study left the state in ultimate need of all its waters.²⁹⁸

In sum, the water management structure of all four Northwestern states was reorganized; ultimate need studies were well underway and state expenditures in support of such studies were roughly tripled;²⁹⁹ all of these before Congress moved toward a decision on the Colorado River Basin Project legislation.

Resolving Upstream-Downstream Differences

The Columbia Basin states were anxious to achieve collective, as well as individual, strength in the face of their common threat. The Pacific Northwest River Basins Commission would, in 1967, become the agency to focus and coordinate their efforts. Before that could happen, however, the state of Idaho insisted that they come to terms over one issue about which the upper basin states had long been resentful. That was the disproportionate sharing of benefits downstream from storage projects in the upper reaches. Fortunately for the Northwest, the storage issue had never precipitated a division of the magnitude which served to bring the construction program on the Colorado River to a halt.

The background of upstream-downstream differences in Columbia Basin development was described in Chapter 4.³⁰⁰ Idaho and Montana had failed, over 15 years of interstate compact negotiations, to win concessions for their flow and storage contributions to power generation and other benefits in the lower basin. It did not make them feel any better to see Canada handsomely rewarded for the same kind of contribution by treaty, as the compact commission closed out its efforts in 1964. Idaho officials continued to press for a redistribution of Columbia River benefits, but by this time not in terms of power allocation so much as in reclamation assistance, and not by interstate compact but by basin account.³⁰¹ Montana showed little interest in this latter development;³⁰² Idaho, on the other hand, was anxious to see the Columbia's partial basin account, which worked largely for the benefit of reclamation projects associated with downstream federal power plants, extended so that the net revenues of these same plants could cover new reclamation developments in southern Idaho.³⁰³

Fearing an increase in the cost of electricity such an arrangement might mean for its consumers, the mainly public-power state of Washington was just as reluctant to accept a formalized basin-wide account as it had been earlier to ratify any concessions to its upstream neighbors in the Columbia Interstate Compact. But now Idaho's bargaining position was much improved. Northwest unity was a priority item for turning aside the threat of water diversion to the Southwest; and Idaho officials made it clear that their price for Northwest unity was a Columbia Basin Account, recognized and formalized by Congress.³⁰⁴ Without it, Idaho would not cooperate with its neighbors in establishing the Pacific Northwest River Basins Commission to carry forward their joint program of assessing regional water supply and future need patterns.

Washington's Senator Jackson accepted the basin account principle in 1966. The occasion was a bill before his Interior Committee providing for a third powerhouse at Grand Coulee Dam, to which bill the basin account was added in amendment.³⁰⁵ Later that same year, Jackson negotiated a limitation on funding reclamation through the account to protect federal power consumers against an increase in rates.³⁰⁶ The outcome appeared to leave everyone happy, but no one more so than the regional director of the Bureau of Reclamation who was "encouraged at the first substantial unanimity of a major issue on the part of all interests of the Northwest."³⁰⁷

Establishing the Pacific Northwest River Basins Commission

Just as the Columbia Interstate Compact Commission was terminating its unsuccessful efforts in 1964, publicity

attending Southwestern ambitions caused some Northwest water leaders to have second thoughts. A few years earlier, the commissioners had agreed on a clause prohibiting water export from the Columbia Basin without the consent of all member states.³⁰⁸ Perhaps the Compact should now be ratified after all, if it could effectively block any external attempt to divert the Columbia.

Asked for an opinion, the Attorney General of the state of Washington could give no credence to this hope. Even if ratified by member states and consented to by Congress, no compact could preempt future Congresses from exercising their superior power to legislate in inter-regional matters.³⁰⁹ There was a definable limit, in other words, to regional protectionism.

To coordinate their individual water studies, the Northwest states chose instead to take advantage of the provisions in the Water Resources Planning Act of 1965. The Act allowed for the establishment of a federal-state commission, amply financed, for any large basin(s) region in which the majority of affected states petitioned for it.³¹⁰ Such a commission would be responsible for coordinating state planning efforts and for creating a comprehensive plan for the future water-related development of the region.

Thanks to Senator Jackson's amendment, the Act also forbade the Federal Water Resources Council or any such commission "to study, plan, or recommend the transfer of water between areas under the jurisdiction of more than one river basin commission".³¹¹ The important thing for the Northwest, therefore, was to petition for commission status as a geographical area which excluded the dry Southwest.

In 1966, the Northwest governors defined their area as "those parts of Idaho, Montana and Wyoming which are within the Columbia River Drainage, plus all of Washington and Oregon except for the Klamath River."³¹² By excluding the Klamath River, they thought that California's participation on such a commission would be precluded. But California argued that the proposed commission would include some Great Basin drainage, Goose Lake, and the Smith and Rogue rivers, and that such inclusions gave California the right to representation on it. Utah and Nevada also asserted their claims for representation. Redefined upon request of the federal authorities, the Pacific Northwest River Basins Commission came into being in March 1967, without Southwest membership.³¹³ The speed with which the Northwest moved cannot be mistaken; this was the first basin commission to be established under the 1965 Act.

The Commission immediately assumed responsibility for an ongoing Columbia-North Pacific framework study of

gross water supplies, needs and problem identification, which should be completed in late 1970; also, more detailed studies on the Puget Sound and Willamette subregions.³¹⁴ It will probably be 1977 or 1978 before the remaining subregions are analyzed in detail, and before a comprehensive plan to provide for Northwest water needs to the year 2020 will emerge. There appears to be little doubt that the Commission will make a strong case for keeping the Columbia within its natural basin.³¹⁵

LEGISLATIVE OUTCOME

Starting fresh in the 90th Congress, the Senate Interior Committee heeded the Administration's plea for separate Central Arizona Project and National Water Commission bills. Both passed in 1967, without difficulty and were tabled in anticipation of House action.

In the House, Northwest legislators pressed their opposition to the Colorado River Basin Project bills, pleading for more time to complete their own water need studies through the Pacific Northwest River Basins Commission before any interregional diversion report was attempted. At first refusing to give way to the demands of conservationists, area-of-origin protectionists, or the Administration, Southwestern supporters of H.R. 3300 gradually retreated—from two to one to no dam inside the Grand Canyon; and to removal of the National Water Commission from a role of subordination to importation studies. A final concession to the Northwest was then incorporated in the bill:

Provided, that the Secretary shall not, under the authority of this clause or anything in this Act contained, make any recommendation for importing water into the Colorado River system from other river basins without the approval of those states which will be affected by such exportation, said approval to be obtained in a manner consistent with the procedure and criteria established by Section 1 of the Flood Control Act of 1944. (58 Stat. 887)

Southwestern legislators claimed that this clause made area-of-origin protection as complete as could be accomplished,³¹⁶ that the originating states would have veto power, as well as a price guarantee and a right of recapture. Northwestern congressmen countered, however, with a charge that the Flood Control Act criteria required only that affected states be consulted and permitted to express their views, and that no veto power was involved.³¹⁷

With these changes, the whole House still voted for a bill in 1968 with provisions for the Secretary of the Interior to study alternative sources for Colorado River augmentation.³¹⁸ It was then up to the Senate and House to resolve their different versions in conference committee.

The legislative outcome, P.L. 90-567, has been described as a compromise. The Southwest states did make some gains for the long run in project authorization and a national guarantee to provide for Mexico's rights to the Colorado River in future augmentation of the river. And they secured an agreement by which

The Secretary of the Interior shall conduct full and complete reconnaissance investigations for the purpose of developing a general plan to meet the future water needs of the Western United States. Such investigations shall include the long-range water supply available and the long-range water requirements in each water resource region of the Western United States A final report shall be submitted not later than June 30, 1977³¹⁹

A long-term basis was finally emerging upon which each of the eleven states in the Columbia and Colorado Basins would have to justify its claims, using principles and criteria comparable to its neighbors, whether it wanted to take water from them or hold its water against them. With strong federal participation in all parts of the West, the respective framework studies of Northwest and Southwest would less likely end in accusations of unrealistic estimates of resources or requirements. For the benefit of the Northwest, however, the language quoted above continued:

Provided, that for a period of ten years from the date of this Act, the Secretary shall not undertake reconnaissance studies of any plan for the importation of water into the Colorado River Basin from any other natural river drainage basin lying outside the States of Arizona, California, Colorado, New Mexico, and those portions of Nevada, Utah and Wyoming which are in the natural drainage basin of the Colorado River.³²⁰

This was a remarkable concession to the Northwest. For the next ten years, the federal authorities and the affected states could explore desalination, weather modification, reallocation between uses, or any other means of solving the Southwest's supply problem, but they could not study importation into the region from other states. The Northwest had secured its protection for the time being; and a lot could change in ten years.

Canada and its Provinces as Areas of Origin

After the U.S. Secretary of the Interior has reported on the Western states water supply and demand circumstances, and the moratorium on interregional water diversion studies has expired, both by 1978, Congress may, if it wishes, put an end to further squabbling by investigating and approving a plan to move Columbia waters southward (or, for that matter, Mississippi waters westward). The U.S. Congress has the power to act positively for interregional development, just as the U.S. Supreme Court has the power to invalidate negative measures of state and regional protectionism.

In the event of an official shift of interest to Canadian water supplies, however, there will be other considerations. For one, the nature of discussions between sovereign states gives a quality to any negotiations vastly different from domestic matters where ultimately one sovereign has the authority to enact a law deciding what development, if any, will take place. For another, any international rapport would have to take account of the different constitutional frameworks of Canada and the United States, particularly in the matter of how jurisdiction over water is divided between levels of government in each country.

Whatever else the continuing controversy over water diversions proves, Canadians cannot be accused of apathy on this issue. Reaction to diversion proposals has been swift and, with exceptions, negative. No previous arrangements between the two countries in resources ownership, development or exchange has quite prepared the way for Canadian waters to flow into American hands. At the same time, it should be understood that neither country has been tested with a real offer to bring that about.

FEDERAL AND PROVINCIAL JURISDICTIONS IN RESOURCES MANAGEMENT

In contrast to the more clearly realized responsibilities of various levels of government in water management south of the border, and the growing dominance at the federal level, federal-provincial relations in Canada are much less fixed and federal initiative less apparent. Many questions of water law have never reached the courts; indeed there has been no litigation at all between governments on inter-provincial waters.³²¹ One reason why this situation has not become critical, at least until recently, is the administrative

machinery developed at an early date for regulating private water development; another is the relatively small population of the country, in relation to the general abundance of water and the large territorial size of most of the provinces, allowing each to manage its affairs without doing great harm to its neighbors.³²²

The legal framework for water management in Canada has been conditioned almost entirely by the British North America Act, which dates from Confederation in 1867.³²³ The Act imposes a bifurcation of jurisdiction between the federal Parliament and the provincial Legislatures, now ten in number.

A reading of the B.N.A. Act leads one to draw a distinction between the *proprietary* and *legislative* rights of governments to water, that is, between who owns the resource and who can legislate respecting its use. This distinction is unimportant only in the Yukon and Northwest Territories where the federal government retains complete jurisdiction. Elsewhere, the provinces own the resources. As owners, they may regulate flows and licence users.

But both senior levels of government have *legislative* responsibility for water in the provinces. The provincial governments may legislate in the matter of water supply for urban and rural uses, pollution control, power generation and recreation. The federal government, on its part, has exclusive legislative jurisdiction over navigation and fisheries, which were the most important uses of water in 1867; it has power concurrent with the provinces in agriculture, and can legislate over interprovincial undertakings, particularly as they involve trade and commerce; finally, the federal government has overriding jurisdiction in international waters.³²⁴

Federal-provincial cooperation in multiple-purpose or comprehensive water development programs was not foreseen by this early legislation. Except when its spending power could be drawn upon, more or less in an ad hoc manner, the provinces preferred to carry out their programs without federal participation.³²⁵ No better example of provincial autonomy exists for Americans than the way British Columbia forced Ottawa, as well as the United States, to make important concessions in the eventual Columbia River Treaty.³²⁶

It is essential to understand the divided jurisdiction over water management in Canada when considering the possibilities of export. Because the provinces own their waters, it is quite improbable that any diversion could take place to another country or even another province without the active support of the province(s) from which the water would come. Conversely, no province could arrange an export without the approval of the federal government, in view of the latter's jurisdiction over international waters, as clearly set forth in the Boundary Waters Treaty of 1909 and the International River Improvements Act of 1955, and over the regulation of interprovincial and external trade. What this comes down to, then, is a veto power on water export at both levels of government.

As an importer of water, on the other hand, the United States would face less difficulty vis-à-vis its state governments. A U.S. treaty is the supreme law of the land and overrides state laws and even state constitutions. It is unlikely, however, that any state would oppose a plan which would make more water available to it. If a state, or a province, objected to the mere transportation of water through its territory en route to another jurisdiction, federal powers in both countries appear sufficient to proceed regardless.³²⁷

Before leaving the topic of jurisdiction, it will be well to clarify the national origin of any waters which may be involved in international diversion. No nation has a right, legal or moral, to water in another nation, any more than it has a right to other resources there. Insofar as discussion centres on waters which flow wholly within Canada, it must admit these waters to be Canadian, not "continental" resources.³²⁸ If on the other hand, the United States wished to draw off more water from the international drainage system for its own use, some accommodation would presumably have to be made through the Boundary Waters Treaty and the good faith now existing between the two countries on their common waters. It is unlikely, however, that any further unilateral withdrawal from boundary waters would solve any more problems than it would create. A more complicated situation would seem to arise from the interplay of internal and international waters.³²⁹

CANADIAN EXPERIENCE IN ENERGY RESOURCES EXPORT

Those who are inclined to favor international water diversions make the point that water can be sold as a commodity essentially no different from oil, natural gas or electricity, all of which are being exported from Canada to the United States.³³⁰ These energy exports have prevailed

despite earlier fears that, once committed to a foreign market, they could never be recaptured for domestic use; and despite the non-renewable nature of oil and gas in contrast to water where there is not the same threat of permanent exhaustion of the resource itself. Some Western Canadians, hoping to increase their share of the U.S. oil market and anticipating a strong American interest in Canadian water, have suggested that Canada could make a better deal by negotiating them together.³³¹

When the federal Minister of Energy, Mines and Resources, J.J. Greene, went to Washington in December, 1969, to seek expanded markets for Canadian oil and natural gas, he was met with a proposal by his counterpart, Secretary Hickel of Interior, that the two countries consider establishing continental markets for all energy resources. Impressed as he was, the Minister took pains to explain upon his return that discussions of a continental energy market were only of a preliminary nature and that, in any case, the resources package would *not* include fresh water.³³²

It may be useful to digress briefly at this point into a consideration of Canadian experience in energy resources export, particularly for any analogies which may be applicable in the current water debate.

Change in Energy Policy

Anti-export attitudes in Canada concerning strategic energy resources seem to have developed as a result of the frustrating experience of trying to recapture electricity generated on the Canadian side of Niagara Falls and used on the other side. During the first decade of this century, hydropower capabilities on the Niagara and St. Lawrence rivers greatly exceeded Canadian power demands. Charters were therefore granted by the Ontario and Quebec governments to several U.S.-controlled companies whose projects were financed on the basis of long-term sales contracts with their parent utilities across the border.

By 1910, two-thirds of the Canadian generation at Niagara was being consumed by industries and other users in the vicinity of Buffalo, New York.³³³ Alarmed at this trend, the federal Parliament had passed in 1907 "An Act to Regulate the Exportation of Electric Power and Certain Liquids and Gases". The Act required a federal license to export power, subject to review each year, and charged an export duty of up to ten dollars per horsepower year.³³⁴ Apparently, this deterrent did not have the desired effect, for another export contract was entered into in 1912 for a term of 85 years; and the Public Service Commission of New York gave it scant notice in passing upon further applications.³³⁵

The first attempt by Canada to actually withdraw power being exported was not made until 1917 when acceleration of munitions production for the war pressed upon existing power capabilities at Niagara. A one-man Royal Commission was appointed by the Canadian government to arrange for electricity repatriation, if that was desirable. The best that could be done was a twenty percent reduction of sales across the border.³³⁶ The Commissioner did not believe that any more reduction was advisable, since the Americans were using the power to contribute to the same war effort. Nevertheless, the incident took on significance with the passage of time. "Power exported is power lost" became the official and unofficial attitude of Canadians interested in providing for their own industrial growth.

During the recession of the 1930's, Ontario and Quebec power producers failed to obtain permits to export surplus capacity to the United States.³³⁷

It was not until the late 1950's that the policy of the Canadian federal government on long-term energy export changed. A number of factors were important in this change. When the 1907 restrictive legislation requiring annual permit renewal was enacted, the quantity of electricity exported, while small in absolute terms, represented a major portion of the total generation of power in Canada (33 percent) and a major portion of the power supply available to upstate New York.³³⁸ Also at that time, there were no alternative sources of power at hand to replace the hydroelectricity exported, at either end of the line; power could not be economically transmitted more than a few miles, and thermal plants were not very efficient.

The situation was very different by the end of the 1950's. Power exports from Canada, although greater in absolute terms, represented only a negligible amount of the total generation of either country.³³⁹ Electric power could be transmitted hundreds of miles from distant generating sites to load centers without appreciable loss of efficiency. Thermal plants burning coal, oil and gas provided competition such that neither an exporting nor an importing region would be wholly dependent on the generation of energy from one source. Interconnected grid systems which could wheel electricity back and forth over long distances were beginning to reinforce the stability of supply. Repatriation was no longer a vital issue, with all these alternatives available.

But also, Canada was from the early 1950's exporting natural gas, oil, coal and uranium, all of which can be, and some of which were, used to generate electric power. The prospect of nuclear power becoming competitive with hydro in the foreseeable future was a further impetus to

develop large-scale hydro potential in remote areas while the opportunity lasted. The United States was the only market large enough to consume these large increments of power and to provide the financing necessary to develop them.³⁴⁰ Likewise, the United States was the only market large enough to support Western Canada's burgeoning petroleum development and to encourage the exploration necessary to finding more deposits.

Accordingly, a Royal Commission on Energy was appointed in 1957. As a result of its recommendations, a National Energy Board was created by the federal government in 1959, with authority to review applications for energy export against reserves and future national demand.³⁴¹ The rule applied by the Board for natural gas, as an example, is 30 years supply in proven reserve for Canadian requirements before export is permitted. For electric power export, licenses have been extended under the Board Act from one year up to a maximum of 25 years or for a period specified by provincial statute. The export duty on electrical energy was abolished. In 1963, under the prodding of the British Columbia government, it was agreed by Ottawa that the Columbia River Treaty power benefits allocated to Canada could be sold to the United States for a 30-year period.³⁴²

Implications for Water Export

The record shows that Canadians have benefitted materially from exports of oil, gas and electricity to the United States, not only in direct terms but in the investment and exploration activities which attended the opening of these markets. The proved reserves of oil and gas are much greater now than in the early 1950's when exports began.³⁴³ Long-term Canadian needs for energy and energy resources appear to be well protected, given the extent of reserves and the interchange-ability of energy resources. The provincial and federal governments are eager to increase oil sales to the United States, whether as a separate commodity or within a continental energy package.

Are the Canadian people likely to change their attitudes and the federal and provincial governments their position on water export, as they have with regard to energy export?³⁴⁴ How analogous are the two situations?

Some parallels are clear. Before the Alberta government was prepared to export natural gas, before the federal government would sanction long-term energy exports in any form, it had to be proved that reserves were sufficient for domestic needs. Inventories of potential hydroelectric sites, determination of new petroleum fields and forecasts of future demands were instituted with the objective that Canadians would be served "first and

always". This is much the same caution advocated by government with regard to water resources. Indeed, it has been suggested that a national water board be created to make a similar inventory and determine export levels in the same way in which the National Energy Board sets out guidelines for natural gas.³⁴⁵

Another parallel applies in the economies gained from access to U.S. markets. Canadian hydroelectric development could not have progressed as it has on the Columbia, the Peace, the Nelson and the Hamilton rivers in recent years, nor could Western Canadian petroleum exploration have developed on its present scale, without the incentive of a larger U.S. market and the support of U.S. investment. A natural gas pipeline serving Vancouver industrial growth from northern B.C. and Alberta became feasible in the 1950's only because the same line would serve the states of the Pacific Northwest.³⁴⁶ Similarly, American financing for a large-scale water export plan might assist local and regional water development in Canada by making water and attendant benefits available to the water deficient parts of the Canadian Prairies en route southward.

The differences between the situations are also impressive, however, perhaps enough to outweigh their similarities. For one thing, gas, coal and uranium are of no use to anyone lying in the ground; they become commodities and assume value only when exploited and transported to markets. Secondly, the various energy resources and their electrical derivatives are mobile and, to a significant degree, substitutional one for another. Given these factors and the vast energy reserves of this and other continents which may be drawn upon, Canada appears to have little reason to fear either exhausting its own supplies or being unable to recapture specific exports. Water, on the other hand, does not have the properties of a substitutional commodity. Water cannot easily be divorced from a larger natural and economic environment; it is an essential part of that environment, unlike a subsurface petroleum pool. A removal of say ten million acre-feet of flow from the Peace River cannot help but affect barge navigation and muskrat trapping downstream on the Mackenzie delta, not to mention other dislocations such as flooding along the route of export. Balancing these interests becomes more than an exercise in trade and commerce; everyone has some interest in what happens to his visible environment. The first bothersome doubt about large-scale water redistribution, therefore, concerns the protection of the Canadian environment, a cause of increasing public anxiety.³⁴⁷

The second and probably greater doubt centers on recapture. What if water thought to be surplus to regional or national needs and therefore exported, was three or four decades hence found to be needed for Canadian economic

growth? Could it be withdrawn from American markets which had come to depend upon it? Fears of this consequence are likely to persist much longer in respect to water than they did in respect to energy resources with their ready interchangeability. There are no substitutes for many consumptive and recreational uses of water. The question of recapture will quite likely remain a stumbling block, despite promises or treaty termination provisions.³⁴⁸

POSITIONS ON WATER EXPORT

Canada seems to figure prominently in at least nine of the privately-contributed proposals for water redistribution mentioned in Chapter 2. All have been rejected on grounds of insufficient technical and economic evidence and questionable objectives.³⁴⁹ This is not to disguise the obvious interest some academics and even elected officials have in regard to the benefits which large-scale diversion could bring to the southern Prairies of Canada.³⁵⁰

Canadian officials have noted the confusion on this matter within the United States itself. The record of area-of-origin struggles by northern California counties and by the Pacific Northwest is at hand; and even the state of Alaska seems unwilling to declare support for exportation to the "lower 48".³⁵¹ When asked in 1966 whether his government had any designs on Canada's waters, U.S. Secretary of the Interior Udall made this decisive comment:

We've suddenly begun to realize in the United States that if we do the right job in pollution control, we are going to increase our water resources enormously... we are not looking hungrily at Canada's water resources, we are looking at our own.³⁵²

And to be quite clear on this matter, the U.S. government has made no offer to the government of Canada, formally or informally, either to buy water or to initiate a joint discussion of the question.

Official Views

What response has Canada made vis-à-vis the privately-sponsored diversion proposals? Statements made by the responsible federal ministers over the past few years, both inside and outside the House of Commons, can be summarized as follows:

- (1) Canadian waters are not a continental resource: they are as Canadian as any other resource found within the national boundaries.
- (2) There is no identifiable market as yet for Canadian water in the United States.

- (3) Canada would be unwilling to negotiate any sale of water at present even if there were a market, because Canadian water supplies have not yet been adequately inventoried and Canadian water requirements into the future have not been assessed. Canada must satisfy its own requirements first.
- (4) An accelerated effort is underway in Canada to this end, but it will take at least several years to complete.
- (5) Federal and provincial governments in Canada must both agree before international negotiations can begin.
- (6) Canadian waters will never be sold under conditions which would jeopardize their permanent ownership and their repatriation if and when needed in Canada.

These major points were repeated continually by the Government of Canada into 1970³⁵³. The provincial governments have been in accord with the federal position, Western provincial leaders making it explicit that they prefer to investigate diversion possibilities within their own borders.³⁵⁴

It should be understood that the response of the federal and provincial governments was not necessarily intended to preclude large-scale water export for all time, but rather to make clear that the question was premature. As seen from north of the border, there is no buyer and no seller at the present time. Each country should determine what its own needs are and how it wants to satisfy them before any international discussions can be meaningful. There must be national plans (incorporating regional plans) before there can be any real international discussion. With this in mind, Canadian water officials began to do some long-needed homework.

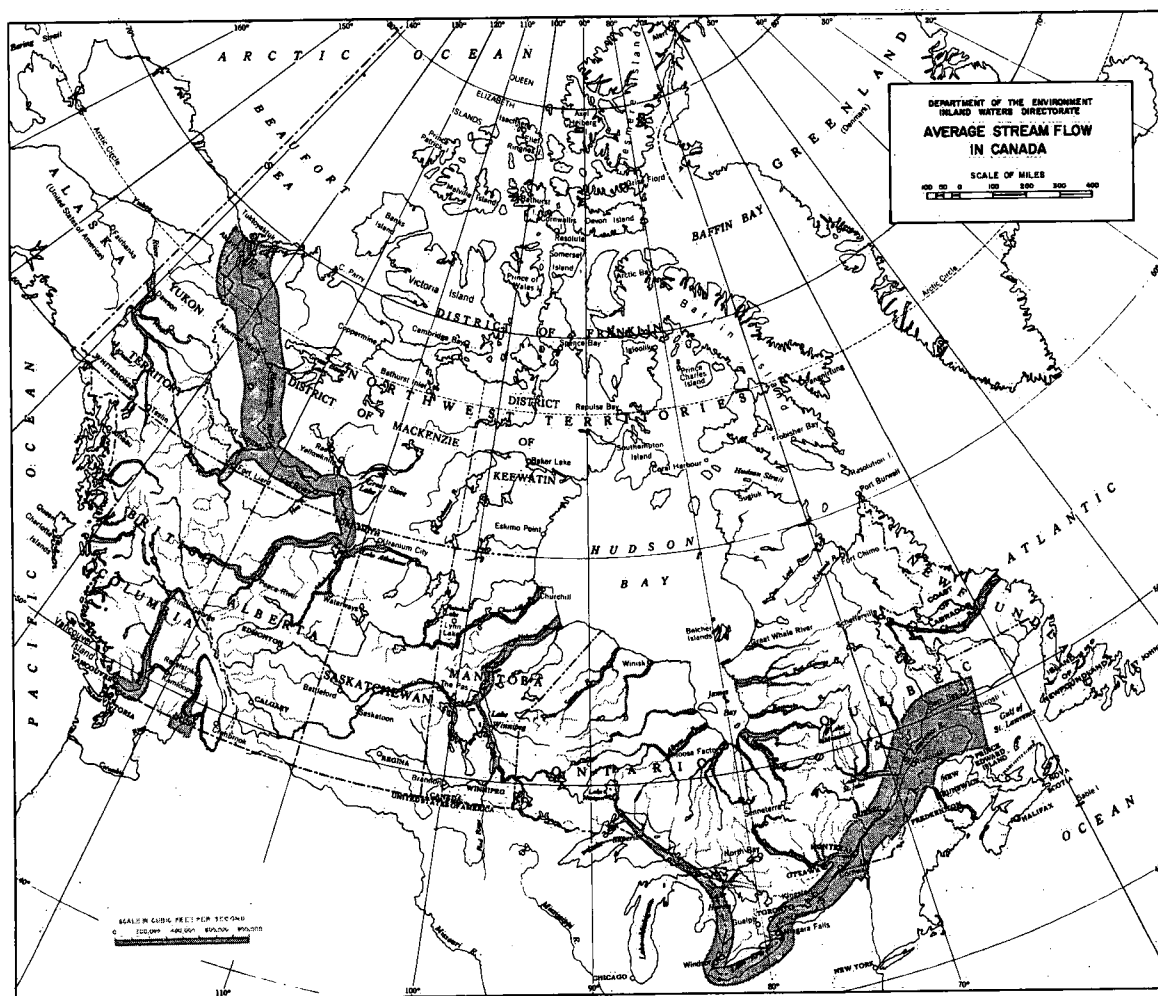


Figure 11. Average streamflow in Canada.

National Inventory

Federal department reorganization in 1966 created a Water Sector within the new Department of Energy, Mines and Resources. There were immediate indications that, while Canadians were not prepared to consider water export at the present time, neither could they afford to stick their heads in the sand. In cooperation with provincial agencies, the Sector began to expand and accelerate its inventory of fresh water supplies³⁵⁵ and to consider means of assessing future requirements for all purposes in the major basins and regions of the country. External pressure, here as in the case of the Pacific Northwest, provided a golden opportunity to reorganize and lay the foundation for any eventuality.

As would be expected, hydrometric coverage began in the more populated regions of Canada; it is only now being extended into the far North.³⁵⁶ Several years from now, reliable average flow data should be available for the whole country. Averages, of course, provide an overall picture without necessarily answering all needs. An order of streamflow magnitude can be appreciated from some of the major rivers illustrated in Figure 11 and Table 14.

Table 14. Average Flow of Ten Major Canadian Rivers

River and Recording Station	Flow in Millions of acre-feet year
Fraser River at Hope, B.C.	70
Columbia River at International Boundary	72
Yukon River at Dawson, Y.T.	55
Mackenzie River at Fort Simpson, N.W.T.	185
Nelson River at Cross Lake, Man.	53
Churchill River at Granville Falls, Man.	20
Ottawa River at Grenville, Que.	49
St. Lawrence at Cornwall, Ont.	174
Hamilton River at Muskrat Falls, Lab.	40
St. John River at Pokiok, N.B.	19

Source: Water Survey of Canada, Department of Energy, Mines and Resources, *Surface Water Data* (Ottawa 1966).

Information on existing water uses is similarly incomplete on a national basis. Some provinces maintain a partial inventory through their licensing procedures; detailed use information has been collected in a few major basin studies; and the federal government publishes annually a record of developed and potential hydropower sites.³⁵⁷ Obviously, a more systematic inventory of all existing uses will be required before it is possible to make an adequate assessment of Canada's future requirements. Federal-provincial discussions have been initiated toward developing better tools for future needs evaluation, but thus far there is little to show from them.³⁵⁸ The federal government offered in

1967 to finance one comprehensive basin study in each of the major regions of Canada, where forecasting needs, among other things, could be tested.³⁵⁹

NORTHERN OPPORTUNITIES AND PROVINCIAL BOUNDARIES

As Figure 11 suggests, approximately 60% of Canada's runoff is carried by rivers flowing northward. But 90% of the population concentrates within 150 miles of the international border. As local resources are developed to capacity in the population's southern regions, it is quite possible that Canadian governments may want to dip more deeply into the northern reservoir than in the past for water and power needs. A beginning has already been made in interbasin diversions, as Figure 12 and Table 15 indicate, and more are under investigation. Of the few diversions existing and under construction in Canada, none cross provincial boundaries, and almost all are for power purposes. Both of these circumstances may change in the next decade as some projects now under study consider increasing water supply in the southern parts of the country. Of special interest today are two joint federal-provincial investigations of alternatives to continental thinking gathering momentum behind the protection of the national border.

The Saskatchewan-Nelson Study and Prairie Waters Apportionment

If any part of Canada can be considered water deficient, it is the southern Prairie Provinces, and a few small valleys in British Columbia. Almost twenty years before J.S. Powell's magnificent report on the arid lands of the United States, Captain John Palliser identified the bulk of the semi-arid Prairie lands in his expedition from 1857 to 1860.³⁶⁰ Southern Alberta and Saskatchewan users have, a century later, utilized most of the available flows of the South Saskatchewan River which, with its tributaries, flows through the heart of "Palliser's Triangle." Meanwhile, the North Saskatchewan, Peace, Athabasca and Churchill rivers continue to flow northward and eastward away from most of the region's population and economic activity.

In 1967, the federal government reached an agreement with the provinces of Alberta, Saskatchewan and Manitoba for a five million dollar survey of the water resources of the Saskatchewan-Nelson Basin which would include the potential additional supply by storage within the basin and/or diversion from northern watersheds.³⁶¹

The federal government was unsuccessful in attempting to supplement studies of supply and engineering feasibility with demand forecasting studies for the region; none of the

Table 15. Interbasin Water Diversions: Canada*

River Diversion	Political Unit	Average Annual Amount		Purpose	Year Estab.
		mil. ac-ft.	(or sq. mi. dr. area)	(formerly) now	
A. Affecting Canada					
1. Allagash to Penobscot	Maine	?	(270)	(log driving) power	1,841
2. L. Michigan to Illinois R.	Illinois	2.31		(navigation) supply, dil.	(1848)1910
3. St. Mary R. to Milk R.	Montana	.18		irrigation	1917
B. Existing in Canada					
4. Nechako R. to Kemano R.	B.C.	2.17		power	1952
5. L. St. Joseph to Winnipeg R.	Ontario	2.02		power	1957
6. Long Lake to L. Superior	Ontario	1.01		power	1939
7. Ogoki R. to L. Superior	Ontario	2.82		power	1943
8. Megiscane R. to St. Maurice R.	Quebec	?	(263)	power	1953
9. Indian R. to Humber R.	Newfoundland	.15		power	
10. Grey R. to Salmon R.	Newfoundland	.69		power	1967
C. Under Construction in Canada					
11. Naskaupi & Canairiktok to Hamilton R.	Labrador	?	(4384)	power	1968—
12. Victoria & White Bear to Grey R.	Newfoundland	1.87		power	1968—
D. Studied or Under Study in Canada					
13. Porcupine to Peel to Rat R.	Y.T., N.W.T.			power	
14. Yukon to Taiya or Taku	B.C., Alaska			power	
15. McGregor R. to Peace R.	B.C.			flood control & power	
16. Shuswap R. to Okanagan R.	B.C.			supply, dilution, etc.	
17. Alberta's PRIME Study	Alberta			supply, etc.	
18. Fed-Prov. Sask.-Nelson Study	Prairie Provs.			supply, etc.	
19. Northern Ontario Study	Ontario			supply, navigation, etc.	
20. Churchill to Nelson R.	Manitoba			power	

*First-order diversions only are indicated, i.e., those which result in flow reaching the ocean by other than its natural channel. Second-order diversions, such as that from the South Saskatchewan to the Qu'Appelle, and lower orders, such as those effected by canal feeding right down to the individual user's different points of intake and outflow, are not shown. Note that most existing diversions serve power uses and required only minor construction activity to bring about, whereas future diversions will serve supply and other purposes to a greater extent and will probably require more complicated management and longer conveyance facilities.

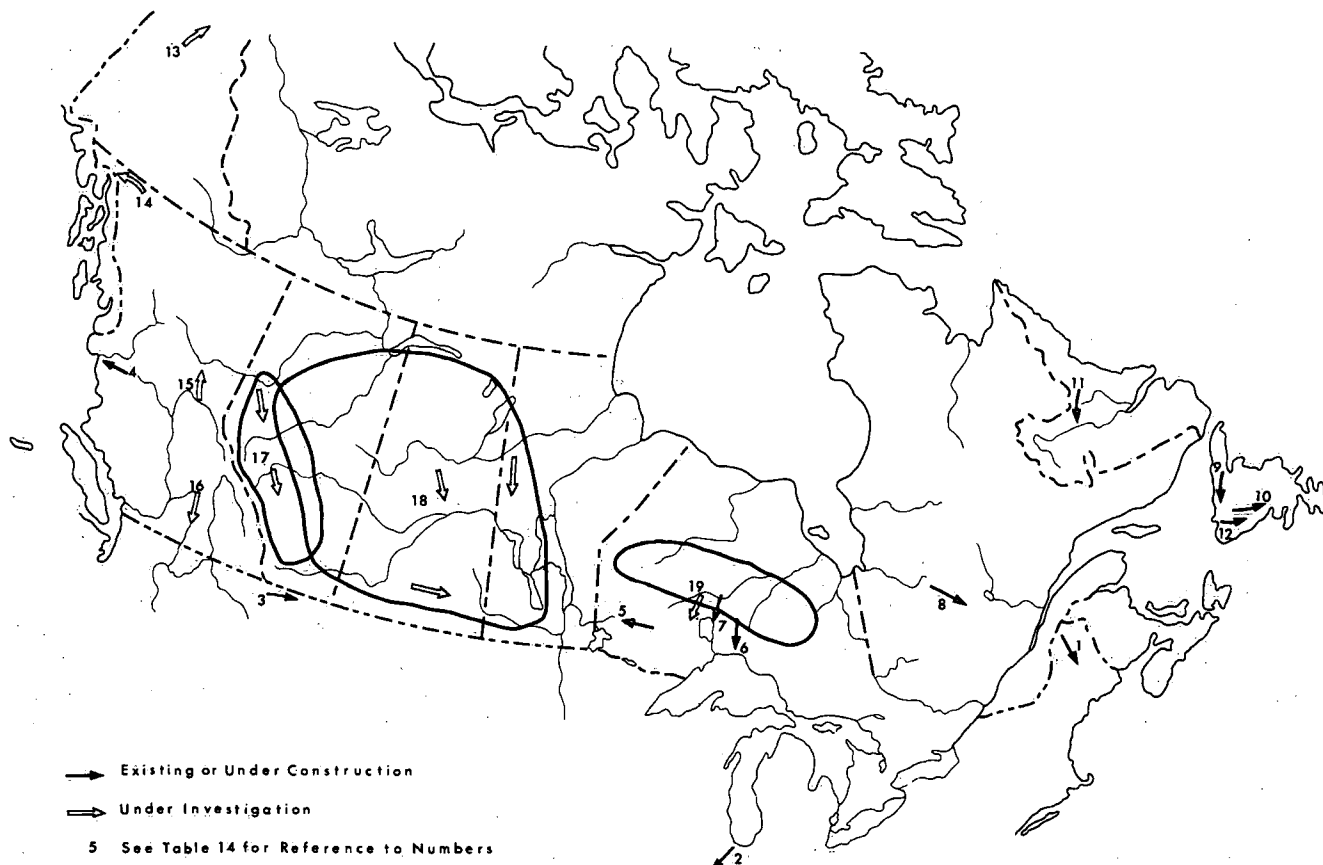


Figure 12. Interbasin diversions - Canada.

provinces wanted its neighbors or Ottawa to determine that the best use of interprovincial waters might be outside its boundaries.³⁶² Yet the present survey is not comprehensive enough to result in the selection of projects for implementation.³⁶³

The situation moved somewhat toward resolution in 1969 when the three provinces agreed among themselves upon an "equitable apportionment" of all their common waters.³⁶⁴ Now that each province knows how much water it "owns", a further federal-provincial agreement may follow in the future to study patterns of water use and future demands. As a result, eventual diversions from north-flowing rivers seem highly possible.

Important questions remain for resolution. What objections will downstream residents in the Northwest Territories raise at a diminution of their natural flows to satisfy provincial growth? What compensation, monetary or otherwise, might be offered to the mutual satisfaction of the territory, the provinces and Ottawa? The participation of the federal government in any such arrangement would necessarily be strong; it is both the proprietor of territorial resources and the bankroll of major water project construc-

tion to help the Prairies. Finally, would it become more economically feasible (and perhaps more environmentally harmful) to divert more water southward than the southern Prairies will need initially, paying off project costs by a sale of the extra volume across the international border?

Northern Ontario Studies

After rejecting Kierans' GRAND Canal proposal in 1960 and again in 1965, a committee of the House of Commons recommended that the federal government invite Ontario and Quebec to investigate the possibilities of something along the same lines, that is, diverting southward some of the drainage in the James Bay watershed.³⁶⁵ Quebec preferred to decide its own program; the federal and Ontario governments, however, agreed to study the water resources of five basins tributary to James Bay, the use of the water in these basins, and the potential gain of diverting water out of them.³⁶⁶ The obvious receiving area, of course, would be the Great Lakes, which have already been supplemented with a small volume of northern waters through the Long Lac and Ogoki diversions of 1939 and 1943 respectively.³⁶⁷ Again, the on-going studies are primarily of a hydrometeorological and engineering nature.

Unrest in northern Ontario over what may happen, heightened by the failure by the governments to articulate their objectives clearly, places the outcome in serious doubt.³⁶⁸ Thus far, the federal government has kept this potential reservoir of supplementary water out of the hands of the International Joint Commission in the latter's continuing study on regulating Great Lakes levels.³⁶⁹ Of course, any additional diversion into the Lakes cannot help but involve American interests. It has been suggested that further importation of northern Ontario waters into the Great Lakes might help not only in regulating their levels but in controlling a worsening pollution problem in the lower Lakes.³⁷⁰

CANADA WATER ACT PRIORITIES

In the fall of 1969, the federal Minister of Energy, Mines and Resources introduced a bill into Parliament which has been described as the most important piece of legislation respecting resources since Confederation a century ago: the Canada Water Act.³⁷¹ It consists basically of an enabling framework for comprehensive and cooperative water management among all levels of government, but its immediate emphasis is directed to a water problem of national concern: pollution.³⁷² No mention is made of water diversion or export. The omission is probably as good an indication as exists of how unprepared and indisposed the Canadian people and their governments are to make any

decision on this latter subject.

New products and processes have created a major pollution threat to the public's use of nearby lakes and rivers, and other social and environmental values have intruded into what was once the engineer's domain of single-use planning. A recent and dramatic instance affecting diversion is the case of Southern Indian Lake in northern Manitoba. A provincially-sponsored plan to divert over 20 million acre-feet of flow from the Churchill River to the Nelson River for power enhancement foundered in 1969, largely on the rock of Indian reluctance to relocate backed up by strong public sentiment.³⁷³ This diversion by itself would have exceeded all interbasin diversions now existing in the United States.

Finally, it should be expected that many Canadians will probably not be satisfied with a conventional determination by government agencies of what supplies will be "surplus" to future national needs and therefore exportable. Some will want to keep all of their waters at home regardless, because that is their image of "the true North strong and free". Water, with its environmental connotations, brings out the nationalism in Canadians of all walks of life.³⁷⁴

Indeed, whatever national identity Canadians as a people ultimately make, it probably cannot exist apart from the wealth of water which characterizes the geography of Canada.

Summary and Conclusions

SUMMARY STATEMENT

Area-of-origin protectionism is a phenomenon of long standing. It has been followed in this study through the greater part of a century of water law and politics in the North American West. It shows little evidence of fading quietly away in this age of interregional and international linkages. Self-interest persists in ways that cannot easily be accommodated by an economist's model.

The challenge of large-scale interbasin water movements does not lend itself to limited analysis, either geographically or intellectually. There are too many different circumstances and ways of approaching them. Chapter 1 discussed the perspectives of efficiency, equity and environmental quality. Areas both of water abundance and of water scarcity have rested their cases mainly on equity grounds; in more recent controversies, efficiency and environmental criteria appear to be working against dryland importation and therefore, if only incidentally, to protect intrabasin interests.

The weight of evidence for increasing water supplies in the American Southwest was compiled in Chapter 2. Post-war population growth is impressive, but no more so than the prevalence of traditional attitudes to water in this dry region. Perhaps the most significant decision made by state water officials was to protect their existing irrigation economies against competitive pricing and expropriation. Traditional irrigational uses consume ninety percent of California's water supplies; under ultimate development as foreseen by the California Water Plan, irrigation will still consume eighty percent of the state's water. State government recoils from the thought of "cannibalizing" agriculture to support newer municipal and industrial customers, however much these latter dominate economic growth today. Political expedience directs the search to greener fields of unappropriated water elsewhere; the difficult choice locally between urban and rural users is thus avoided. The official attitude that more water will solve everyone's problems is mirrored in numerous private engineering schemes which focus on potential additional supplies to the exclusion of social and technological alternatives.

With considerable experience in states like Colorado and California at redistributing flow patterns, and with the power of population numbers adding to the clamor each year, Southwestern thirst begins to look like an irresistible force. But when that force meets an immovable object in the form of a state or national boundary, the outcome is not entirely predictable. Are areas of water abundance capable of building protective walls around themselves and defying outside interference indefinitely?

Chapter 3 investigates the river basin as a source of political strength. Protecting the basin's waters, whether it is the Columbia or the Tuolumne, is a meaningless objective except with reference to the political jurisdiction(s) encompassing it in whole or part. There is no effective representation along strictly basin lines. Political regionalization of the continent has determined the existing pattern of interbasin diversions; none cross state boundaries (or provincial boundaries in Canada). No political jurisdiction is as concerned with keeping water in its natural channels as it is in keeping it within the jurisdictional area. Basin boundaries usually only approximate the area of origin.

The long history of area-of-origin experience recounted in Chapter 4 indicates the hierarchical relationship between degree of protection and level of political involvement. A small valley within a state must bargain to achieve any limitation on the export of its waters; even then, it risks being outvoted by neighboring areas which may be outgrowing their own supplies, as the counties of origin in northern California discovered. At a higher level on the hierarchy, an upstream state speaks with more authority in protecting its interests on interstate waters; it cannot, however, assume the right of absolute sovereignty which Attorney General Harmon had suggested in earlier years. The greatest ambiguity would seem to lie at a higher level still, in the case where a state (or group of states) adopts a "hands off" attitude toward other states which have no riparian access to the waters in question. This is the level to which recent controversies have reached. The Pacific Northwest - Southwest conflict over the Columbia River has helped to dispell some myths in this regard, in transforming the controversy from points of law to the possibilities of politics.

The states of the Pacific Northwest were unable, individually or collectively, to legislate their own protection against their neighbors in the Southwest. Congress would not be bound by that. But, as described in Chapter 5, Congress also presented an opportunity to isolate the proponents of interregional water diversion from the mainstream of national policy. Southwestern legislators, drawing upon their intrastate area-of-origin experiences, attempted to provide similar assurances and incentives in return for Northwest support of their legislative proposals for diversion studies. The protective clauses suggested were probably sincere in intent, but ironclad guarantees against future loss to an area of origin occasioned by export cannot be written. The Northwest moved both to close past divisions and weaknesses in its own ranks at home and the capture changing national priorities in Congress. The strategy was sound. A ten-year moratorium on diversion studies was bought to allow for a more comprehensive look at the Western water picture. For the Northwest, there were other gains: improved state administration and direction of water studies, and improved cooperation regionally. For the first time, the state governments of the Northwest were prepared to initiate, rather than merely review, federal-state comprehensive water programs.

What at once becomes apparent with the escalation of water redistribution proposals to continental levels is a change in political context as well as in scale. Chapter 6 explored federal and provincial jurisdictions in Canada, the imperfect analogy of water to energy exports, and attitudes to serving American markets. For the time being, as in the Western states, there is more official interest in a comprehensive assessment of regional water problems and opportunities than in implementing any major scheme of diversion. Again, the pressure of outside interest has forced the responsible governments to reorganize and accelerate their own basic water studies, and in the case of the Prairie Provinces and Ontario to consider alternative diversions which would serve Canadian needs. The coincident resurgence of nationalism and environmental concern north of the border makes even preliminary official discussions of international diversion unlikely in the near future.

AREA-OF-ORIGIN ALIGNMENTS

Ironically enough, area-of-origin strategies have succeeded in particular circumstances partly through cultivating the demands of antagonistic or potentially antagonistic interests. Two expedient but effective alliances can be mentioned.

Upon occasion, certain areas of streamflow origin have given encouragement to their dryland neighbors by offering to join forces. What might be termed an "escalation tendency" appears to have developed within the framework

of the area-of-origin hierarchy described in Chapter 3. When, despite its best efforts, a threat to its water supply continues, a lower-level area of origin will join with its antagonist for the purpose of shifting attention to a larger source of unappropriated water somewhere else, that is, to the next level of the hierarchy.

Thus, the upper basin states of the Colorado, not secure in the protection afforded by the Colorado River Compact against the growing needs of their downstream neighbors, and particularly fearful of the Central Arizona Project's projected draw on the river, agreed in 1966 to join Arizona and California in support of the Colorado River Basin Project legislation, H.R. 4671. A condition of their support was that a feasibility study be made of a specified amount of water which could be diverted into the Colorado Basin from outside. In protecting its compact allocation on the Colorado in this way, of course, the upstream area of origin on that river shifted the conflict to a higher level, to an interregional struggle with the Pacific Northwest in Congress.

The Northwestern states, on their part, are not reluctant to pass on the search for new water still farther north, to Canada. The ten-year moratorium gained out of their efforts to counteract diversion provisions of the Colorado River Basin Project legislation will not protect the Columbia River forever. The governor of Oregon, it was noted in Chapter 5, expected that his and other states in the West would have to look to Canadian water supplies sometime in the next few decades; his colleagues at the 1969 Western Governors' Conference were inclined to agree. The chairman of the Pacific Northwest River Basins Commission has made several hopeful references to water abundance north of the border, as have some regional newspaper editorialists. Similarly, the Mississippi Valley Association, with an uneasy eye on Texas' ambitions, adopted a policy statement at its 1969 annual meeting to the effect that before any major interbasin diversion is authorized, a comprehensive study should be made of the whole North American continent³⁷⁵

For future struggles, another relationship may be more significant, that between area-of-origin protection and environmental protection. Ironically, the prospects for such areas being able to retain water for their own future economic development have come to depend, to a large degree, upon the anti-development sentiment surrounding environmental causes. This sentiment is expressed articulately and forcefully against large-scale water impoundments and movements. The Northwestern states have profited from adverse publicity attending proposed dam construction within the Grand Canyon, the revenues from which were intended in part to support diversion feasibility

studies to augment the Colorado River. The threat to the Canyon's grandeur in the Colorado Project bill and to other environmental features elsewhere across the nation helped Washington's Senator Jackson to focus the necessary political support in favor of a National Water Commission and against any kind of commitment to interregional diversion. Economic and Environmental motivations cannot always be separated, of course. East Texas' opposition to the State Water Plan was based largely on its implications for estuarine fresh-salt water balance, but this balance was also important to an already profitable fishery. The political potential of the environmental movement over the long run is unclear. It has given new strength to areas of origin today which their predecessors never had in their lonely and local struggles; but it may eventually work against the aspirations of the area of origin for its own development.

A PERSPECTIVE ON THE CONTROVERSY

We in Montana know that we are on the threshold of great future economic development. Water will play a most important part in that development, and if it is not available, we stand to be left as a hinterland, supplying our water to other areas.³⁷⁶

All out water can be translated into growth somewhere. Let it take place here in Canada.³⁷⁷

The message has not varied greatly over the years, from Owens Valley, through the counties of northern California, the West Slope of Colorado, the states of the Pacific Northwest, even to the provinces and territories of Canada. Areas of greater-quantity and better-quality water supplies want recognition of their "right" to grow, to keep up or catch up with developing economies elsewhere; and, like those who would capture some of their supplies, areas of origin give credence to the conventional wisdom that water is the key to this objective.

Whether any area, large or small, can afford an obsession with water supply as the sine qua non for its economic progress is questionable. Many residents of the Pacific Northwest have still not awakened to the fact that a low-cost hydroelectric power advantage since World War II has failed to make the region an industrial giant.³⁷⁸ Meanwhile, the remarkable affinity of population migration for the warmer and drier parts of the West continues unabated. In the period 1960-1965 seven of the Western states grew faster than the national average; most of them belong, at least in their faster-growing areas, to the dry West. If swimming pools, air conditioning and manicured lawns are any indication, in-migration has not been accompanied by an adjustment of living habits to the paucity of natural water supplies. But neither nature nor

morality dictates that there should be. If this kind of living reflects popular preference, it will hardly be thwarted by the jealous designs of better-watered but less-developed regions to divert growth in their direction. To restrict streamflow to internal use when greater opportunities for it are available outside the basin may be roughly analogous to prohibiting the diversion of highway traffic to faster expressways on the ground of protecting existing local businesses.

Of course some bothersome doubts have surfaced on the other side, too, in the wake of controversy. If people will continue to live where they want, there is still a price to be paid for their choice. Elsewhere this price may be expressed in higher bills for fuel and clothing, or in a degree of material comforts foregone for the sake of sovereignty; in the drylands it is the cost of water. Some hard questions remain: whether there is any longer justification for federally-subsidized water programs on the ground, for example, that southern California is an underdeveloped land; whether the consumptive uses of water by farms and industries is inherently more valuable and should always take priority over its non-consumptive uses, which seem to be more highly regarded outside the drylands; whether one region or nation should risk a psychological loss of identity in serving the demands of another.

This dissertation has studiously avoided labelling either side "right" or "wrong" in the positions taken. Many shortcomings become obvious when measured against efficiency, equity or environmental criteria. But self-interest is human nature, no less for regions and nations than for individuals. The conflict of these interests is essential in providing alternatives for a political process which must choose a course from among them. It has been said that conflict and controversy are to politics what competition is to economics. This study is intended to contribute to that controversy, that it might be better informed of what has gone before and what is likely to result from further overtures for major streamflow redistribution.

Already there have been some rewards out of the heat of controversy. Simplistic claims to successful regional development through water availability are increasingly questioned. Governmental agencies in the various areas of origin undergo reorganization and some of their duties become more clearly defined. The public is made aware of the magnitude of water development programs in relation to other spending priorities. Future diversions of major proportions are not foreclosed by the protective caution which has come to dominate recent supply and demand surveys, but neither is water likely to be captured and conveyed over hundreds or thousands of miles merely because it is "wasting to the sea unused."

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Nelson, H.T. June 6, 1966. Regional Director, Bureau of Reclamation, Boise, to George L. Crookham, Jr., Chairman, Idaho Water Resources Board.

Staats, Elmer B. May 10, 1965. Deputy Director, U.S. Bureau of the Budget, to Hon. Henry M. Jackson, Chairman, U.S. Senate Committee on Interior and Insular Affairs.

Udall, Morris K. July 13, 1965. U.S. Congressman from Arizona, to Al Ullman, Congressman from Oregon.

Footnotes

1. The titles of some popular books and articles are indicative: Jim Wright, *The Coming Water Famine* (New York: Coward-McCann, 1967); Frank E. Moss, *The Water Crisis* (New York: Frederick Praeger, 1967); "Danger Facing Boom in the Desert," *U.S. News and World Report*, May 9, 1966, 66 ff.; Blair Fraser, "Water Crisis Coming," *Macleans*, March 5, 1966, 7 ff.
2. For an account of why reallocation of supply locally is less attractive to the dry West than importation, see Frank Quinn, "Water Transfers: Must the American West be Won Again?" *Geographical Review*, LVIII (January, 1968), esp. 122-126.
3. Robert P. Beckinsale, "Human Responses to River Regimes," *Water, Earth and Man*, ed. Richard J. Chorley (London: Methuen, 1969), 508.
4. There appear to be no barriers to water engineering concepts, national or ideological. Compare I. Adabashiev, *Global Engineering* (Moscow: Progress Publishers, 1966) with John T. Tucker, *Water for Survival*, (publication forthcoming). A fairly complete review of North American diversion proposals can be found in Alberta Department of Agriculture, Water Resources Division, "Water Diversion Proposals of North America" (prepared for Canadian Council of Resource Ministers), Edmonton, December, 1968. The most complete international bibliography on this topic yet compiled is George A. Whetstone, *Interbasin Diversion of Water: An Annotated Bibliography* (Contributions No. 70-2 and 71-1, Texas Tech University Water Resources Center I and II; Lubbock: Texas Tech, 1970 and 1971).
5. "Pacts OK'd to Send Power to California," *Seattle Times*, November 1, 1967, 23.
6. One of these is the NAWAPA scheme outlined in Figure 1. See Ralph M. Parsons Co., "NAWAPA: North American Water and Power Alliance" (Brochure 606-2934-19; Los Angeles and New York: Parsons Co., 1964).
7. Canadian negotiators threatened to divert the Columbia into the all-Canadian Fraser, then to develop the Peace instead of the Columbia, before the U.S. agreed to benefit-sharing. A chronology of events and circumstances preceding final ratification is set out in Canada Departments of External Affairs and Northern Affairs and National Resources, *The Columbia River Treaty and Protocol, A Presentation* (Ottawa: Queen's Printer, 1964), 21-25. For a critical review of the Treaty and British Columbia strategy in particular, see Ralph W. Johnson, "The Canada-United States Controversy Over the Columbia River," *Washington Law Review*, XLI (August, 1966), 676-763.
8. Charles F. Luce and J. Kenneth Kaseberg, "The Bonneville Power Marketing Area Legislation: Is Regionalism in Electric Power Planning Old Fashioned?" *Oregon Law Review*, XLV (June, 1966), esp. 264-266.
9. P.A. Towner, "Protection for Areas of Origin and Areas of Export in Water Projects: The California Experience", *Proceedings, International Conference on Water for Peace* (Washington: Government Printing Office, 1967), V, 637-648. See Fig. 7 of this study for a geographical breakdown of results from the 1960 bond election.
10. U.S. Attorneys General, *Official Opinions*, XXI, 281-283. A good account of the circumstances of and reaction to Harmon's declaration is given by Norris Hundley, Jr., *Dividing the Waters* (Berkeley and Los Angeles: University of California Press, 1966), 17-30.
11. Henri Zurbrugg, *Aspects Juridiques du Regime des Eaux en Suisse* (Basle, Helbing and Lichtenhahn, 1965), 361.
12. One of those few sources of dissent is Jack Hirschleifer, James C. De Haven, and Jerome W. Milliman, *Water Supply: Economics, Technology and Policy*, (Chicago: University of Chicago Press, 1960). Even here, a degree of public regulation over water distribution is condoned: 364-6.
13. Except in the case of federal and Indian lands. See British North America Act, (1867) 30 and 31 Victoria, and (1930) 20 - 21 George V, Section 109. *Hudson County Water Company v. McCarter*, 209 U.S. 349 (1908).
14. Per Gisvold, *A Survey of the Law of Water in Alberta, Saskatchewan and Manitoba*, Can. Dept. of Agriculture Pub. 1046 (Ottawa: Queen's Printer, 1959), 18.
15. For criticisms of the disposal of the public domain through the Homestead Act of 1862, various railroad grants, the mining acts of 1866, 1870 and 1872, the Timber Culture Act of 1873, the Desert Land Act of 1877 and the Timber and Stone Act of 1878, see various articles in *The Public Lands*, ed. Vernon Carstensen (Madison: University of Wisconsin Press, 1963).
16. For example: "Since time began, water and life have been synonymous. Water is the cheapest, yet the most priceless, of all commodities. . . No life can exist without it." These are the opening words from Congressman Wright's book, *op. cit.*, 5.
17. Harry Enns, Manitoba Minister of Agriculture: "For some reason or other people get emotional about exporting water. Yet it's a renewable resource. Oil isn't, yet nobody gets excited about exporting oil. Look at it, we could be North America's water tap." (*Edmonton Journal*, April 23, 1968) George Whetstone summarizes export possibilities as follows: "Sale of water differs little in character from sale of electricity, fish, timber, furs or crops. On the contrary, sale of these renewable resources is far easier to justify than is the sale of mineral products - metals, coal, or petroleum - all of which are being exported without qualms at present." (Paper Presented to New Mexico Section, A.S.C.E., October, 1968, publication forthcoming).
18. Canada, *House of Commons Debates* (8 October 1963), 3299 - 3301.

19. Raymond L. Nace, "Water in Flatland," *Highlights, Second International Water Quality Symposium* (Montreal: 1966), 2 – 6.

20. Of course, other resource activities — logging, mining, agriculture — also have environmental overtones. Water is therefore not unique in this respect; its "difference" is more a matter of degree.

21. "We'll sell the United States hydro-electric power but not water. Even to talk about selling water is ridiculous. Water is our heritage and you don't sell your heritage." (Statement of Premier W.A.C. Bennett of British Columbia, *Toronto Globe and Mail*, July 23, 1965).

22. William K. Easter, "Interbasin Water Transfers — Economic Issues and Impacts," *Proceedings, Fourth A.W.R.A. Conference* (New York, 1968), 191 – 200.

23. Irrigation agriculture already accounts for over 80% of the consumption of water in the West. Municipal and industrial uses can afford to pay more for supply, but characteristically their demands are small. See Nathaniel Wollman, (ed.), *The Value of Water in Alternative Uses* (Albuquerque: University of New Mexico Press, 1962); and William E. Martin and Leonard G. Bower, "Patterns of Water Use in the Arizona Economy," *Arizona Review*, XV (December, 1966), 1 – 6.

24. Charles W. Howe, "Water Resources and Regional Economic Growth in the United States, 1950-1960," *Southern Economic Journal*, IV (April, 1968), 477-489. Also, see National Academy of Sciences, *Water and Choice in the Colorado Basin* (Washington: NAS-NRC Publ. 1689, 1968), chapter 5.

25. J.D. Chapman, (ed.), *The International River Basin* (Proceedings of a U.N. Seminar held at the University of British Columbia, Vancouver, 1963), 1 – 5.

26. Marion E. Marts, "When Can California Join the Union?" *Yearbook of the Association of Pacific Coast Geographers* (1963), 7-12.

27. Irving K. Fox, "Action in River Basin Development: the U.S. Experience," *Transactions of the Fourteenth British Columbia Natural Resources Conference* (Kelowna, 1963), 11. For a convincing argument on equity grounds, see Frank J. Trelease, "Arizona v. California: Allocation of Water Resources to People, States and Nation," *Supreme Court Review* (1963), 166 – 169.

28. Hubert Marshall discusses the incompatibility of the concepts of balanced development and efficiency in "The Evaluation of River Basin Development," *Law and Contemporary Problems*, XXII (Spring, 1957), 252 – 253.

29. *Colorado River Compact* (1928), 45 Stat. 1057. *Colorado River Storage Project Act* (1956), 70 Stat. 105.

30. See Statement of the Idaho Water Resources Board in U.S., Senate, Subcommittee on Water and Power Resources of the Committee on Interior and Insular Affairs, *Hearings on the Central Arizona Project*, 90th Cong., 1st Sess. (May, 1967), 706.

31. See U.S., House of Representatives, Committee on Interior and Insular Affairs, *Colorado River Basin Project*, Report No. 1849, 89th Cong., 2nd Sess. (August 11, 1966), 28.

32. Committee on Water, National Academy of Sciences, *Alternatives in Water Management* (Washington: NAS-NRC Publ. 1408, 1966), 26.

33. See Texas Water Development Board, *A New Concept: Water for Preservation of Bays and Estuaries*, Report No. 43 (Austin, 1967); and Calvin T. Watts, "Proposed Diversion of Mississippi River Water from the Viewpoint of the Basin of Origin," *Aspects of the Diversion of Mississippi River Water to Texas and New Mexico*, School of Engineering and Water Resources Center, (Ruston, Louisiana, 1969), 14 – 15.

34. U.S., Senate, Report of the Senate Select Committee on National Water Resources, Report No. 29, 87th Cong., 1st Sess. (1961).

35. The case for variety is made by F. Raymond Fosberg in "Restoration of Lost and Degraded Habitats," *Future Environments of North America*, ed. J. Fraser Darling for the Conservation Foundation (New York: Natural History Press, 1966), 513 – 515.

36. P.L. 91-190 (1970), 83 Stat. 852. The Act creates a Council of Environmental Quality at the executive level.

37. Bill C-207 was introduced into the House of Commons on Dec. 9, 1970. Part I pertains to the new department.

38. Claiming that the most important task of the National Water Commission is to bridge the gap between the developers and protectors of water resources, the Commission convened a panel of ecologists to advise on its study program. The initial report of this panel is included as Appendix 6 in U.S. National Water Commission, *Annual Report for 1969*, Interim Report No. 1 (Washington: Government Printing Office, 1969).

39. See Statement of David Brower, Sierra Club, in U.S., House, Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, *Hearings on the Colorado River Basin Project*, H.R. 4671, 89th Cong., 2nd Sess. (May, 1966), 1432 – 1482.

40. Kenneth E. Boulding, "The Economics of the Coming Spaceship Earth," *Environmental Quality in a Growing Economy*, Sixth Resources For the Future Forum, ed. Henry Jarrett (Baltimore: Johns Hopkins Press, 1966), 3 – 14.

41. U.S., Water Resources Council, *Procedures for Evaluation of Water and Related Land Resources Projects*, Report to the Council by the Special Task Force (Washington: 1969).

42. U.S., Federal Council for Science and Technology, *Water Resources Policy and Political Institutions*, Report of a Panel on Needed Research (Washington: 1968), 11 – 12.

43. As reported in U.S. Department of the Interior, *The Colorado River* (Washington: Government Printing Office, 1946), 48.

44. The "308 reports" of the Corps of Engineers became the point of departure for river basin planning in the United States after 1930. On one river after another, the Corps and the Reclamation

Bureau searched out promising storage sites around which to build their basin plans. See Gilbert F. White, "A Perspective on River Basin Development," *Law and Contemporary Problems*, XXII (Spring, 1957), 170.

45. Andrew W. Wilson, "Urbanization of the Arid Lands," *Professional Geographer*, XII (November 1960), 4-7. See also Marion Clawson, "Critical Review of Man's History in Arid Regions," *Aridity and Man*, ed. Carle Hodge, American Association for the Advancement of Science Publ. No. 74 (Washington, 1963), 432.

46. Estimated from K.A. Mackichan and J.C. Kammerer, *Estimated Use of Water in the United States, 1960*, U.S. Geological Survey Circular 456 (Washington: Government Printing Office, 1961).

47. Stephen C. Smith, "The Rural-Urban Transfer of Water in California," *Natural Resources Journal*, I, (March, 1961), 73.

48. California, *Coastal Los Angeles Land and Water Survey, 1960*, State Department of Water Resources Bull. No. 24 = 60 (Sacramento, 1964), 49; James D. Geissinger, "Institutional and Legal Framework for Optimal Water Use: The South Platte Basin," *Papers, 1960 Western Resources Conference* (Boulder, 1961), 102; Elwood J. Unbenhauer, "Meeting the Challenge of System Growth at El Paso," *Journal of American Water Works Association*, LIII (1961) 399 = 402; Andrew W. Wilson, "Tucson: A Problem in Uses of Water," *Aridity and Man* (see footnote 45 above), 483 - 489.

49. William E. Martin and Leonard G. Bower, "Patterns of Water Use in the Arizona Economy," *Arizona Review*, XV (December 1966) 1 - 6; Wilson, "Tucson: A Problem in Uses of Water," 488; Nathaniel Wollman (ed.), *The Value of Water in Alternative Uses* (Albuquerque: University of New Mexico Press, 1962). The Arizona economists conclude a more recent study: "Our view is that irrigation development, its maturation and its ultimate decline are natural phenomena in an economically developing arid region and irrigation decline should not in itself be a subject for general alarm." (William E. Martin and Robert A. Young, "The Need for Additional Water in the Arid Southwest: An Economist's Dissent," *Annals of Regional Science*, III (June, 1969), 31).

50. The one million acre-feet transfer example is suggested by J.W. Milliman, "Welfare Economics and Resource Development," *Papers, 1961 Western Resources Conference* (Boulder, 1962), 186.

51. See, for example, the dialogue in the *Journal of Farm Economics* (XLIII, 1147 - 1152, and XLIV, 427 - 434 and 435 - 443) arising out of an attack on water law by Mason Gaffney ("Diseconomies Inherent in Western Water Laws - A California Case Study," *Western Agricultural Economics Research Council Conference Proceedings*, Rept. No. 9, Tucson, 1961, 68 - 75).

52. Willis H. Ellis, "Water Transfer Problems: Law," in *Water Research*, eds. Allen V. Kneese and Stephen C. Smith (Baltimore: Johns Hopkins Press, 1966), 235 - 237.

53. D.A. Seastone and L.M. Hartman, "Alternative Institutions for Water Transfers: The Experience in Colorado and New Mexico," *Land Economics*, XXXIX (February 1963), 35 - 37.

54. Frank J. Trelease, "Preferences to the Use of Water,"

Rocky Mountain Law Review, XXVII (1955), 141. "Pueblo" rights were another form of preference, locally important. A few cities in the Southwest have been able to call upon their historical origins as Spanish or Mexican pueblos. These settlements were granted by their sovereign superior rights against irrigators to water from the local stream as their growth required. Los Angeles and San Diego gained early ascendancy with this advantage; Las Vegas, New Mexico, has profited by it more recently. However, the failure of Albuquerque and Santa Fe to prove similar origins implies that this unique privilege has run its course. See Robert Emmet Clark, "The Pueblo Rights Doctrine in New Mexico," *New Mexico Historical Review* XXXV (1960), 265 - 283; Wells A. Hutchins, "Pueblo Water Rights in the West," *Texas Law Review*, XXVIII (1960), 748 - 762.

55. Dean E. Mann, "The Political Implications of Migration to the Arid Lands of the United States," *Natural Resources Journal*, IX (April, 1969), 218.

56. *Reynolds v. Sims*, 377 U.S. 533 (1964).

57. Warren Hall, "Industry, Agriculture and Municipality: Partners or Competitors?" *Papers, 1963 Western Resources Conference* (Boulder, 1964), 166. Also, see chapter 4 of this study.

58. "Report of the Secretary of the Treasury, on the Subject of Public Roads and Canals, Made in Pursuance of a Resolution of Senate, of March 2, 1807," included in *American State Papers, Miscellaneous*, I, 724-921.

59. U.S. Senate, Special Sub-Committee on *Irrigation and Reclamation of Arid Lands*, Report 928, Part IV, III, 5 - 6 (1890).

60. Captain Palliser, *Papers Relative to the Exploration of British North America* (London, 1859) 14.

61. Based largely on data from Charles N. Dufor and Edith Becker, *Public Water Supplies of the 100 Largest Cities in the United States, 1962*, U.S. Geological Survey Water Supply Paper 1812 (Washington: Government Printing Office, 1964).

62. The Washington case is anomalous in that transfers are not a reflection of the unavailability of water supplies locally but, rather, of the opportunity to divert and combine easily for hydroelectric-power generation the flows of parallel streams draining the Cascade Range and the Olympic Mountains. Also several cities and towns have closed certain watersheds to public use and diverted their waters for municipal supply. Note that no water is transferred from the humid Puget Sound region to the arid eastern part of the state.

63. The basin boundaries shown here differ in places from those commonly delineated in studies by government agencies; they represent personal choice. Projects under construction include the Frying-Pan-Arkansas Tunnel and the Homestake Tunnel in Colorado, the San Juan-Chama Project in New Mexico, the Central Utah Project (Bonneville Division) in Utah, and the State Water Project in California.

64. The first interstate transfer is, however, nearing completion. The San Juan-Chama Project will divert water out of the Colorado River system across the Colorado border into New Mexico. But as a project in the Upper Colorado River Compact, the transfer hardly represents a giveaway by Colorado; the member states of the compact sponsor redistribution of allocated supplies wherever it is mutually advantageous. See Upper Colorado River Commission, *Seventeenth Annual Report*, (Salt Lake City, 1965) 89 - 90.

65. New York City takes from the Delaware, Boston from the Connecticut, Chicago from Lake Michigan into the Illinois; the state

of New Jersey from the Delaware into the Raritan, Maine from the Allagash tributary of the St. John into the Penobscot; New York State from Lake Erie into the Barge Canal; the province of Ontario from the Albany and Kenogami drainage of Hudson Bay into the Winnipeg River and into Lake Superior; British Columbia from the Nechako to the Coast at Kitimat: all of these divert water outside the basin of origin, but in no case across a state or provincial boundary.

66. U.S. Department of the Interior, "United Western Investigations," 2 vols. (Washington, 1952). This document was multilithed for administrative use only in numbered copies; it was never printed as a public or congressional document.

67. California was also afraid of prejudicing its case against Arizona over allocation of the Colorado River by this time.

68. No projects had been authorized on the Colorado River since the House Committee on Interior and Insular Affairs decided in 1951 to shelve the Central Arizona Project until such time as Arizona's Claims to the river were adjudicated. See Ernest A. Engelbert, "The Origins of the Pacific Southwest Water Plan," *Papers, 1964 Western Resources Conference* (Boulder, 1965), 129.

69. The initial report was prepared by a Departmental Task Force and released in August, 1963. After review and comment by the states, the provisions for transfer from northern California were dropped in U.S. Department of the Interior, *Pacific Southwest Water Plan* (Washington: Government Printing Office, 1964).

70. See Chapter 4 of this study for the rationale behind the California Water Plan in 1959. Governor Reagan, at the Western Governors Conference of 1969 nodded toward Canada in suggesting that "we'll trade a university for some water." See Colorado River Association, *Newsletter*, (August-September, 1969) 4. "Water For the West," *Public Service Paper* by the Los Angeles Section of the American Society of Civil Engineers (October, 1967), admits that Californians have enough water for the next 50 years but suggests that the state should not be selfish and ignore the plight of its neighbors; better to join with them in seeking new water for everyone's benefit in the Southwest. The altruism is hardly touching, in view of California's persistent struggle against the Central Arizona Project and the Colorado River Storage Project, not to mention its reluctance to share any water with Mexico in the 1944 treaty.

71. As late as the tenth annual conference on Water For Texas, these momentous words were recalled from the first conference. (*Proceedings of the 10th Annual Conference*, Texas A & M, 1965).

72. While the state was busily revising its preliminary plan of 1965 which failed to provide for the High Plains-Panhandle and its declining groundwater levels, residents of that area were successful in having funds included in the 1967 Public Works Appropriations Act to make it possible for the Bureau of Reclamation to study possible sources of augmentation. The Army Corps of Engineers and Mississippi River Commission were shortly instructed by Congress to join in the five-year reconnaissance study as it became apparent that Texas' eyes were upon the lower Mississippi. See Fred H. Bayley III, "The Role of the Mississippi River Commission in the Mississippi River Export Study," *Aspects of the Diversion of Mississippi River Water to Texas and New Mexico*. A 1969 Water Resources Institute sponsored by the School of Engineering and Water Resources Center, Louisiana Polytechnic Institute (Ruston, Louisiana, 1969), 77 - 78.

73. P.L. 89 - 298; Title I of this, the *River and Harbors Act* of October 27, 1965, authorizes the Northeastern Water Supply Study by the Corps, and instructs it to investigate inter-basin diversions

among other things from Virginia to the Canadian border along the lower Lakes and St. Lawrence.

74. The sources of information for most of the inter-regional and international diversion schemes follow: U.S. Bureau of Reclamation, *Pacific Southwest Water Plan*, (Washington: Government Printing Office, 1964); F.Z. Pirkey, "Water, Power, Prosperity," *California Farmer*, (March 21, 1964), 13 - 15; Los Angeles Department of Water and Power (Samuel Nelson), "Snake-Colorado Project," (Los Angeles 1963); for Dunn's plan, "Pacific Southwest Water Problems," *Joint Hearings of the Senate Fact Finding Committee on Water Resources and the Assembly Interim Committee on Water* (Sacramento, 1964), Part II, Appendix 10; Thomas M. Stetson Co., "Review of Pacific Southwest Water Plan," (Los Angeles, 1964); Lewis B. McCammon and Fred C. Lee, "Undersea Coastal Aqueduct" *Journal of the American Water Works Association*, LVIII (1966), 885 - 892; for Conner's plan, *Seattle Times*, Sunday, June 4, 1967, 7; R.W. Beck and Associates, "A New Water Resource Plan for the Great Plains," 1967; B. Candela et al., "Large Volume - Long Distance Fresh Water Transferral as an Alternate to Desalination," (New York: Hudson Institute, 1968); Texas Water Development Board, *Texas Water Plan*, (Austin, 1968); T.W. Kierans, "The GRAND Canal Concept: A Means of Linking the Fresh Water Needs for the Great Lakes and the Continent to the Development of Northern Canada," *The Fresh Water Resource of New York State*, (Dubuque: Brown, 1965) 87-98; Ralph M. Parsons Company, "NAWAPA: North American Water and Power Alliance", brochure No. 606-2934-19, Los Angeles, 1964 (also reviewed in "Western Water Development," U.S. Senate, Committee on Public Works, Special Sub-committee on Western Water Development, 88th Congress, 2nd Session, October, 1964); E. Kuiper, "Water Utilization in Canada," *Engineering Digest*, June, 1967 (also E. Kuiper, "Canadian Water Export", *Engineering Journal*, July, 1966); E. Roy Tinney, "Engineering Aspects", *Bulletin of the Atomic Scientists*, (September, 1967), 21 - 25; Lewis G. Smith, "Western States Water Augmentation Concept", unpublished manuscript submitted to the Federation of Rocky Mountain States, 1968 (subsequently published as "Toward a National Water Plan," *Irrigation Age*, April, 1969); for NAWAPA-MUSHEC, Ralph M. Parsons Co., "Water Import Systems for Arid Land Development," presentation before the International Symposium about Increasing of Food Production in Arid Lands, Monterrey, Mexico, April 22-25, 1968. Other proposals available only as rough manuscripts or maps, including those by Decker, Magnusson and Tweed.

75. These proposals might better be considered as concepts developed from existing information on small-scale maps with wide contour intervals, and from very rough average flow data. Approximations of water availability and of project costs may be in error by a factor of 2 or 3. On the social side, one might consider the limitations of a scheme like Parsons: NAWAPA talks of fixed quantities of water "needed" by the Western economy at present and in the year 2000, rather than of elasticities in demand according to the competition of water supply. It extrapolates present population growth rates, pricing policies, and inefficiencies in the application of water as though these would continue indefinitely. It does not consider alternative ways of providing future supplies, such as pollution reduction, reuse of water, desalinization with nuclear power, and weather modification. Nor does it mention that if such a scheme for rearranging the landscape can increase recreational opportunities, it can also destroy fish runs and wildlife habitats and inundate existing recreational sites. (Parsons, "NAWAPA. . ." *op. cit.*)

76. *Ibid.*, see News and Views, No. 7.

77. "A further challenge to the entire nation today is the need to provide more work opportunity as an alternative to rising welfare handouts. These new jobs should be oriented toward a purposeful

major national undertaking which is large enough to convince the youth of the nation that their best talents are needed. . . These new jobs might be oriented toward the manufacture of equipment and materials such as major power and pumping units and heavy construction equipment, which would be required in building a long-term major new water system for the west". (Smith, *op. cit.*) 1. "There seems to be no reason why this region (the Canadian Prairies) could eventually not be populated to the same density as is now being found in Western Europe or eastern North America. This would mean a total Prairie population of say 100,000,000," (Kuiper, "Canadian Water Export," *op. cit.*) 3.

78. As Senator Henry M. Jackson (D. Wash.) put it: "To ask an agency whose business is to construct water projects whether it is necessary to divert the Columbia is something like asking an automobile salesman's advice on whether you should purchase a new car." (*Congressional Record*, November 15, 1965, A6556.)

79. Kierans, (*op. cit.*) 91, expects to get around Canadian reluctance to export in the face of potential national needs, simply by recycling the water after it flows to James Bay: "Many Canadians have found it understandably difficult to believe the paradox that is possible to both preserve and develop our water resources by sharing them in this way with others. Nevertheless, within this profound truth and in the technical leadership which is possible to develop in Canada in this field lies the greatest opportunity for the growth of this northern nation." Beck (*op. cit.*) seems to be politically unaware of the longstanding upstream-downstream dispute in the Missouri basin when he suggests taking 10 million out of an average seasonal flow of 13 million acre-feet from the river at this point of diversion in Nebraska.

80. California Department of Water Resources, *The California Water Plan*, Bul. No. 3 (Sacramento: 1957).

81. The case for importation to maintain low flows on the Colorado River against steadily-increasing salt concentration is made by William E. Warne in "The Water Crisis Is Present," *Natural Resources Journal*, IX (January, 1969), 53 - 62.

82. U.S. Department of the Interior, Bureau of Reclamation, "Lake Powell, Jewel of the Colorado," (Washington: Government Printing Office, 1965), 3.

83. See Chapter 5 of this study for a full presentation of the Colorado River Basin Project bills and their outcome.

84. Primarily this means the House and Senate Committees on Interior and Insular Affairs, Public Works and Appropriations. Sixteen of the 17 Senate Interior Committee members in the 90th Congress were Westerners; 17 of the 21 House Interior Subcommittee on Interior and Reclamation members were from Western constituencies. See discussion of Congressional committee membership in Chapter 5 of this study.

85. For an Easterner's viewpoint on where future federal water expenditures should be made, see Maurice K. Goddard, "The East Speaks," *Journal of the Sanitary Engineering Division*, Proceedings of the American Society of Civil Engineers, XCIII (August, 1967), 31-40. Westerner Wayne Aspinall, chairman of the House Committee on Interior and Insular Affairs, has expressed the fear that recent emphasis on urban problems threatens the whole land reclamation program of the West (*Western Water News*, Sacramento XX (January, 1968), 4). Meanwhile, Congressmen in widely scattered parts of the United States claim to have received more mail from their constituents opposing "destruction" of the Grand Canyon than on any other single issue in years.

86. D.F. Peterson and E.A. Engelbert, "Some Reactions of

Conference Participants," *Proceedings of the (Second) Western Interstate Water Conference*, ed. Ernest A. Engelbert (University of California Printing Department, 1966), 118-89.

87. The compelling harmony of natural elements in the hydrologic balance has in the past been cited by theologians as illustrative of the wisdom of nature's God. See Yi Fu Tuan, *The Hydrologic Cycle and the Wisdom of God*, Department of Geography Research Pub. No. 1 (Toronto: University of Toronto Press, 1968).

88. The important Edwards aquifer, for example, leaks significant underground storage from the Neuces to the Guadalupe Basin. See Texas Water Development Board, *The Texas Water Plan*, (Austin, 1968), Part II, 5-11.

89. Ludwik A. Teclaff, *The River Basin in History and Law*, (The Hague: Nijhoff, 1967), 9-11. The Echimamish (the-river-that-flows-both-ways), with barely detectable current for about forty miles, links the Hayes River with the Nelson River in northern Manitoba. It was used by the York Boats of the Hudsons Bay Company in the fur trade. See Eric Morse, *Fur Trade Canoe Routes of Canada, Then and Now*, (Ottawa: Queen's Printer, 1969). 41.

90. An example of stream capture in the West is given in J.H. Mackin, "The Capture of the Greybull River," *American Journal of Science*, CCXXXI (1936), 373-385.

91. F. Leverett, and F.B. Taylor, "The Pleistocene of Indians and Michigan and the History of the Great Lakes," *U.S.G.S. Monograph* 53, (1915).

92. British Columbia, Water Investigations Branch, *Shuswap River-Okanagan Lake Water Supply Canal*, (Victoria, 1966); and R.F. Flint, "Geomorphic Features of the Okanagan Region," *Proceedings*, Geological Society of America (June, 1934).

93. Luna B. Leopold, "Rivers," *American Scientist*, L (December, 1962), 516 - 520.

94. Aldo Leopold, "Lakes in Relation to Terrestrial Life Patterns," *A Symposium on Hydrobiology*, (Madison: University of Wisconsin Press, 1941), 17-22.

95. Norman L. Nicholson, *The Boundaries of Canada, its Provinces and Territories*, Memoir 2, Geographical Branch, Department of Mines and Technical Surveys, (Ottawa: Queen's Printer 1964), 5.

96. For a discussion of the treaties relating to international boundaries and their effects on water use, see L.M. Bloomfield, and G.F. Fitzgerald, *Boundary Water Problems of Canada and the United States* (Toronto: Carswell, 1958), 1-7, for the Canada-U.S. boundary; and Norris Hundley, Jr., *Dividing the Waters* (Berkeley and Los Angeles: University of California Press, 1966), 17-40, for the Mexico-U.S. boundary.

97. Nicholson, *op. cit.*, 67-68.

98. Stephen B. Jones, "The Forty-Ninth Parallel in the Great Plains," *Journal of Geography*, XXXI (December 1932), 357-67.

Jones also gives an account of the boundary farther west in "The Cordilleran Section of the Canada-United States Borderland," *Geographical Journal*, LXXXIX (1937), 439-450.

99. See, for example, some of the fascinating errors which were propagated and which persisted on maps of the 17th to 19th centuries, in Carl I. Wheat, *Mapping the Transmississippi West* (San Francisco: Institute of Historical Cartography, 1957), II and III.

100. Donald F. Putnam, (ed.), *Canadian Regions* (Toronto: Dent & Sons), 371-2.

101. J.W. Powell, *Report on the Lands of the Arid Region of the United States* (Washington, 1879), 22-23.

102. J. Sam Moore, Jr., "The Chamizal Zone-Rivers and Revolutions on the Border," *Southwestern Law Journal*, XVII (1963), 86-101.

103. See Quebec's latest affront to Newfoundland (Labrador) in *Fortune*, February, 1970, 80.

104. Post-war concentrations of people and wealth in the southern portions of two political units as far distant as Ontario and California have led in each case to cries from northerners that their resources were being exploited to serve the south and that they should create a new political province or state of their own. For northern Ontario's latest complaint, see Chapter 6.

105. A more complete description of the administrative dilemma is given in James W. Fesler, *Area and Administration* (University of Alabama Press, 1949).

106. Wallace Stegner, *Beyond the Hundredth Meridian* (Cambridge Mass: Riverside Press, 1953), 315 - 16, 356 - 7.

107. W. Willcocks, *The Nile Reservoir Dam at Aswan and After* (London, 1901), 13 - 26.

108. Inland Waterways Commission, *Preliminary Report*, S. Soc. No. 325, 60th Cong., 1st Sess. (1908), 18 - 25.

109. These are the ideas discussed in Gilbert F White, "A Perspective of River Basin Development," *Law and Contemporary Problems* XXII (Spring, 1957), 160 - 175.

110. 48 Stat. 69 (1933), Sec. 22.

111. Jean Brunhes, "Géographie Humaine de la France," *Histoire de la France*, I (Paris: Hanotaux, 1920), 102.

112. U.S. National Resources Committee, *Regional Factors in National Planning* (Washington, 1935). See discussion of river basin authorities as regions, 106 - 108.

113. Some advantages and disadvantages of basin accounts are discussed by Ernest A. Engelbert, "Planning for Western Regional Development," *Proceedings of the Western Interstate Water Confer-*

ence, (University of California Printing Department, 1966), 49 - 50.

114. The basin commissions are an improvement over earlier inter-agency committees which had been established under executive order only and without separate staff. See Henry P. Caulfield, Jr., "The Water Resources Planning Act of 1965 and Federal-State Collaboration in Resource Planning," *Ibid.*, 143 - 153.

115. Joe S. Bain, "Water Resource Development in California: The Comparative Efficiency of Local, State and Federal Agencies," *Water Resources Management and Public Policy*, eds. T.H. Campbell and R.O. Sylvester (Seattle: University of Washington Press, 1968), 28 - 29.

116. "We have found some of the counties of our states are within one hydrologic region or sub-region, but from the economic data, we have found them to be in an entirely different economic region or sub-region." (Report by Ival Goslin on the Type I Comprehensive Planning Studies for the Upper Colorado Region, Minutes, Western States Water Council, December, 1968, Appendix G.)

117. U.S. Bureau of Reclamation, Pacific Southwest Water Plan (Washington, 1963 (revised 1964)); P.L. 89 - 298: Title I of this *Rivers and Harbors Act of 1965* authorizes the Corps' study to include an area from Virginia to the Canadian border and along the Lower Lakes and St. Lawrence.

118. For a most informative comment on the myths and symbols of river basin development, see Norman Wengert, "The Politics of River Basin Development," *Law and Contemporary Problems* XXII (Spring, 1957), 258 - 275.

119. See Committee on Water, National Research Council, *Water and Choice in the Colorado Basin*, N.A.S. Pub. 1689 (Washington: National Academy of Sciences, 1968): esp. Ch. V.

120. U.N. Department of Economic and Social Affairs, *Integrated River Basin Development*, E/3 - 66 - 1958, 1.

121. Wengert, op. cit., 271.

122. Anthony Scott "Equitable Compensation in International River Basin Development" *Proceedings, Western Agricultural Economics Research Council*, Report No. 10 (1961), 104-105.

123. A recent and excellent criticism of the tendency of international law enthusiasts to perpetrate the error of limiting the perspective of water development to basin considerations is that of C.B. Bourne, "The Development of International Water Resources: The 'Drainage Basin Approach'," *Canadian Bar Review*, XLVII (March, 1969), 62-87. Bourne notes that the federal government in Canada studied the possibilities of diverting the Columbia into the Fraser, and the British Columbian government pursued its intent on the Peace River, both before the Treaty was ratified: "In other words, the Columbia River agreement was not worked out on the assumption that a drainage basin is a watertight unit."

124. *Treaty with Great Britain Relating to Boundary Waters, and Questions Arising Between the United States and Canada*, January 11, 1909, 36 Stat. 2448, T.S. No. 548.

125. "I am sure that Wyoming is not going to concede that the water that originates on our watershed should be taken down the stream for use on lands in some other area just because land down there is more valuable." (Statement by Commissioner Bishop of Wyoming during negotiations for the Upper Colorado River Basin Compact, *Official Board*, Upper Colorado River Basin Compact Commission, 1948, I, No. 1, 27-34.)

126. Henry C. Hart, *The Dark Missouri* (Madison: University of Wisconsin Press, 1957), 105-111.

127. Marion E. Marts, "Conflicts in Water Use and Regional Planning Implications," *Regional Development and the Wabash Basin*, ed. R.R. Boyce (Urbana: University of Illinois, 1964), 147-49.

128. A large number of compacts have been entered into between states on Western rivers, the federal government being a necessary but essentially passive party to them. For a detailed account of each compact, see Widmer, T. Richard, ed., *Documents on the Use and Control of Waters of Interstate and International Streams*, U.S. Dept. of the Interior, (Washington: Govt., Printing Office, 1956).

129. To extend the reasoning, it appears that the Columbia River Treaty negotiations were facilitated by the fact that British Columbia's boundary does stretch to the Divide; otherwise, the treaty might have been precluded by the Columbia-importation ambitions of the Canadian Prairie Provinces.

130. A good example is the *Boulder Canyon Project Act*, 45 Stat. 1064 (1928); navigation was merely an excuse for federal involvement and was downgraded within the terms of the Colorado River Compact which became effective the very next year. In Canada, the federal government retained control of navigation under the *British North America Act* of 1867, Sec. 91(10). The Boundary Waters Treaty, 36 Stat. 2448, T.S. No. 548, between Canada and the United States gives first preference to navigational uses of boundary waters.

131. The riparian doctrine was discarded entirely by the mountain states (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming); but combined with appropriation law in the westernmost (California, Oregon and Washington) and easternmost (North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas) tiers of states of the West.

132. Samuel C. Wiel, *Water Rights in the Western States* (3rd ed. San Francisco: Bancroft-Whitney, 1911), I, 843-849.

133. Corwin W. Johnson and Larry D. Knippa, "Transbasin Diversion of Water," *Texas Law Review*, XLIII (October, 1965), 1036.

134. *Ibid*, 1037.

135. *Coffin v. The Left Hand Ditch Co.*, 6 Colo. 443, 450 (1882).

136. See Wells A. Hutchins, "History of the Conflict Between Riparian and Appropriative Rights in the Western States," *Proceedings, Water Law Conference* (University of Texas, 1954), 106-137.

137. Norris Hundley, Jr., *Dividing the Waters* (Berkeley and Los Angeles: Univ. of California Press, 1966), 21-25.

138. U.S. Attorneys General, *Official Opinions*, XXI, 281-283.

139. Although the rain and snow which feed the river originate in the United States, nevertheless, for countless years it had also flowed as a natural consequence to what is now Mexico. Territorial sovereignty would seem to give as much right to the downstream country to have the river continue in its availability as streamflow as it grants to the upstream state in use. There is no indication that Harmon considered *relative* merits.

140. "Each of the High Contracting Parties reserves to itself... the exclusive jurisdiction and control over the use and diversion, whether temporary or permanent, of all waters on its own side of the line which in their natural channels would flow across the boundary or into boundary waters..." (*Treaty With Great Britain*... , Article II.) The Prime Minister of Canada was reluctant to accept this provision, but felt he had no choice. See remarks of Sir Wilfrid Laurier, Canada, *House of Commons, Debates*, Sess. 1910-11, I, 911-912.

141. See Ralph W. Johnson, "The Canada - United States Controversy Over the Columbia River", *Washington Law Review*, XLI (August, 1966), 681, 719-726.

142. It was not clear until the 1963 U.S. Supreme Court decision in *Arizona v. California* that Congress can, and that in 1928 Congress did, exercise a constitutional right to apportion interstate waters. (373 U.S. 546 (1963)).

143. *Kansas v. Colorado*, 185 U.S. 125 (1902).

144. *New Jersey v. New York*, 283 U.S. 336 (1931).

145. 259 U.S. 419 (1922).

146. 282 U.S. 660 (1931).

147. Nevertheless, as a matter of practical necessity on a river which involved so many appropriators and different priority dates, the court modified its preference for prior appropriation law by a mass allocation to the two litigant states.

148. *Hinderlider v. LaPlata and Cherry Creek Ditch Co.*, 304 U.S. 92 (1938).

149. In a renewal of the *Kansas v. Colorado* conflict, the court declined to make a settlement, but stated: "The reason for judicial caution in adjudicating the relative rights of states in such cases is that, while we have jurisdiction of such disputes, they involve the interests of quasi-sovereigns, present complicated and delicate questions, and, due to the possibility of future change of conditions, necessitate expert administration rather than judicial imposition of a hard and fast rule. Such controversies may appropriately be composed by negotiation and agreement, pursuant to the compact clause of the federal constitution..." [320 U.S. 383 (1943)].

150. U.S. Bureau of Reclamation, *The Colorado River* (Washington: Government Printing Office, 1946), 13.

151. It should also be mentioned that the federal government has occasionally come to the rescue of a compact which is basically unable to solve the problem for which it was intended. The Interior Department's 1964 Pacific Southwest Water Plan was an answer to the problems of both the *Colorado River Compact* and the *Arizona v. California* litigation.

152. California representatives to the Western States Water Council submitted on April 20, 1965, a brief on their "solution" to the area-of-origin problem for all member states to consider. It was entitled "Protection Afforded Areas of Origin in California" and mimeographed for distribution. The council was wrestling with criteria for interregional water transfers. At about the same time, California proponents of Congressional legislation to study the feasibility of importing water into the Colorado Basin drafted the essentials of their state's area-of-origin provisions into that legislation. See Chapter 5, Table 10 for consideration of the provisions in H.R. 4671.

153. Valley residents had no opportunity to argue against the capture of their water rights until the city, moving quickly and quietly, presented them with a fait accompli. Their reaction was then violent, but powerless. Perhaps the most vivid account of Los Angeles' long struggle vis-à-vis Owens Valley water supply is to be found in Remi Nadeau, *The Water Seekers* (New York, 1950).

154. For example, A.B. 607 (1925 Reg. Sess.) and A.B. 247 (1927 Reg. Sess.).

155. Calif. Stats. 1927, Ch. 286.

156. Calif. Stats. 1931, Ch. 720, now codified as Sec. 10505 in the California Water Code.

157. Plumas lies upstream from Butte County on the Feather River; Sierra lies upstream from Yuba County on the Yuba River; Calaveras and Tuolumne lie above Stanislaus County on the Stanislaus River; Fresno and Madera lie above Merced County on the San Joaquin River; and so on. In some of the Mother Lode counties, where an important stream forms a common boundary between rather than passes from one to the other, problems of interpretation arise.

158. Marion E. Marts, "When Can California Join the Union?" *Yearbook, Association of Pacific Coast Geographers* (1963), 10.

159. Calif. Stats. 1933, Ch. 1042.

160. *Ibid.*, Sec. 11, now codified in California Water Code as Sec. 11460. Secs. 11461-3 give further conditions to the watershed-of-origin principle.

161. See P.A. Towner, "Protection for Areas of Origin and Areas of Export in Water Projects: The California Experience," *Proceedings, International Conference on Water for Peace*, (Washington: Government Printing Office, 1966), V, 639.

162. U.S., House of Representatives, *Central Valley Project Documents*, Part I, House Doc. 416, 84th Cong., 2d Sess. (1956), 787-790.

163. California Department of Water Resources, *The California Water Plan*, Bull. No. 3 (Sacramento, 1957).

164. 25 Ops. Cal. Attorney General 8 (1955) and 26 Ops. Cal. Attorney General 81 (1955).

165. P.A. Towner, "Laws Protecting Areas of Origin," address before the Eel River Flood Control and Water Conservation Association, Ukiah, California, October 9, 1964.

166. The reports of all four of these groups are presented and compared in California Legislature, *Report of the Counties of Origin Subcommittee*, Ninth Partial Report by the Joint Committee on Water Problems, (Sacramento: published by the Senate, 1957).

167. "... I don't think there is any north-south conflict. I don't think there is any political conflict. I think we must approach this with reality and we must note that the northern part of the state just does not have the finances without a little lift from the state either on a loan basis or some other way. Now, I say this sincerely because I don't think that at any time the northern part of the state has had that feeling. I find the people very congenial. All they want is adequate water for their necessary uses, but we cannot reach our hand into the sky and find dollars and cents to construct these projects..." (*Ibid.*, 27. Statement by Assemblywoman Davis, member of the Subcommittee and representing a northern constituency.)

168. Calif. Stats. 1959, Ch. 1762, codified as Water Code Sections 12930 through 12944.

169. Calif. Stats. 1959, Ch. 140. These revenues had been set aside for water projects since 1956. Annual accruals are now limited by law to \$11 million (Calif. Stats. 1964, First Extra Sess., Ch. 138).

170. In 1959 the legislature proclaimed that it was the "established policy of the state" that its projects consider the "needs of the area in which water originates" to the point of constructing works for the "reasonable ultimate requirements" of such an area. (Calif. Water Code, Sec. 108) The Burns-Porter Act incorporates by reference the watershed-of-origin provisions of the Central Valley Project.

171. Calif. Stats. 1959, Ch. 1752.

172. Address by the Department Director, William E. Warne, before the North Coastal Counties Supervisors Association, Santa Rosa, California, February 24, 1961.

173. Amador and Calaveras Counties both filed to assert their priorities under the county-of-origin statute against the state releasing from its fillings a volume of water petitioned for by the East Bay Municipal Utility District. The cases were dismissed, however, when the District agreed to pay each of the counties two million dollars settlement for release of their claims under the statute. See Gary D. Weatherford, "Legal Aspects of Interregional Water Diversion," *U.C.L.A. Law Review*, XV (1968), 1310.

174. California, *Statement of Vote*, General Election, November 8, 1960 (Sacramento: California State Printing Office, 1960).

175. *Christian Science Monitor*, March 8, 1970, 18. Proposition 7, a constitutional amendment to increase the state's interest rate on bonds already authorized in the 1960 Development Bond Act, was put to the voters in June, 1970. It passed.

176. Livermore also opposed Dos Rios Dam and argued that environmental spokesmen be given advisory status on state water agencies and commissions. (*Aqueduct News*, Metropolitan Water District of Southern California, September, 1969, 3). Governor Reagan, however, looks upon the rivers of the north coastal region, including the Eel, as "our long-term water bank." (*Aqueduct News*, November, 1969, 3).

177. Op. cit. (1882).

178. "Section 5. The water of every natural stream, not heretofore appropriated, within the State of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the state, subject to appropriation as hereinafter provided. Section 6. The right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied . . ."

179. See U.S. Department of the Interior, Bureau of Reclamation, *The Story of the Colorado - Big Thompson Project* (Washington: Government Printing Office, 1962), especially Chronology, vii.

180. *Ibid.*

181. Charles J. Biese, "Compensatory Storage," *Rocky Mountain Law Review*, XXII (June, 1950), 455-456.

182. *Ibid.*, 455.

183. U.S. Senate, *Colorado-Big Thompson Project*, S. Doc. 80, 75th Cong., 1st Sess., 1937.

184. *Ibid.*, 3-4, 23. Of this capacity, 52,000 acre-feet was designated as replacement for the supply which would have been available naturally to western Colorado users if there were no diversion, and the cost for this storage was charged to the irrigation project on the East Slope. The other 100,000 acre-feet was allocated to the power features of the project and was to be paid from power revenues.

185. Colo. Rev. Stat. 150-5-13. (1937).

186. Biese, *op. cit.*, 457. Thus, not only was the earlier demand of acre-foot storage for acre-foot diverted dropped, but there was no absolute limitation of the amount which could be diverted.

187. Colo. Rev. Stat. Ann. 150-5-13 (2) (d) (1943).

188. *Metropolitan Suburban Water Users Association v. Colorado River Water Conservation District*, 148 Colo. 173, 202, 365 P. 2d 273, 288-89 (1961). This latter is the successor to the Western Slope Protective Association.

189. *Colorado River Basin Project Act*, P.L. 90-537, September 30, 1968, Title V, Sec. 501(f), 82 Stat. 898.

190. 76 Stat. 391 (1962), incorporating House of Representatives Doc. 130, 87th Cong., 1st Sess. (1961).

191. See Upper Colorado River Commission, *Eighteenth Annual Report*, (Salt Lake City, 1966), 100.

192. Neb. Laws 1889, Ch. 68, 6-504.

193. Neb. Laws 1893, Ch. 40, 3-578. Neb. Rev. Stat. 46-206 (1960).

194. 131 Neb. 356 (1936).

195. See Wells S. Hutchins and Harry A. Steele, "Basic Water Rights Doctrines and Their Implications for River Basin Development", *Law and Contemporary Problems*, XXII (Spring, 1957), 296.

196. *Ainsworth Irrig. Dist. v. Bejot*, 170 Neb. 257 (1960).

197. Oklahoma Laws 670, No. 502; Title VIII and IX (1957).

198. *Mottl v. Boyd*, 116 Tex. 82, 286 S.W. 458 (1926).

199. Tex. Rev. Civ. Stat. Ann. 7589-91 (1954). Article 7591 prescribes penalties for violation of articles 7589-90.

200. See footnote 196 above.

201. 392 S.W. 2d 200 (Tex. Ct. Div. App. 1965).

202. A joint report in 1958 by the Texas Board of Water Engineers, the Bureau of Reclamation, the Corps of Engineers and the Soil Conservation Service gave assurance of basin protection. It is incorporated in S. Doc. 111, 85th Cong., 2d Sess., 157-158 (1958).

203. Tex. Laws 1965, Ch. 297, Sec. 3(b), 588.

204. Correspondence from William F. Sanderson, Jr., Administrative Assistant, General Counsel, Texas Water Development Board, Austin, November 30, 1967.

205. Texas Water Development Board, *Water For Texas*, Preliminary (Austin, 1966).

206. *Texas Water Report*, January 23, 1964, 2.

207. Texas Water Development Board, *The Texas Water Plan* (Austin, November, 1968).

208. See Chapter 2, footnote 72.

209. League of Women Voters of Texas, "Voters Guide", brochure undated.

210. *The Cross Section*, a monthly publication of the High Plains Underground Water Conservation District No. 1, carries in its August, 1969 issue a breakdown of the vote by counties. Only 18% of the registered voters turned out statewide; 24% of those eligible in the High Plains voted.

211. Actually, there have been more than eighteen. Others, not recorded in Richard T. Widmer (ed.), *Documents on the Use and Control of the Waters of Interstate and International Streams* (Washington: Government Printing Office, 1968) dealt with specific matters like fisheries and boundary delimitation.

212. According to one critic: "The chief weakness of compacts has been that they have negotiated agreements too precisely and in too much detail, without sufficient information and study of the problems involved. Moreover, compacts have not provided the proper kind of administrative machinery to deal with these shortcomings." See Ernest A. Englebert, "Federalism and Water Resources Development", *Law and Contemporary Problems*, XXII (Summer, 1957), 341.

213. For an account of the conditions in the basin preceding negotiation, see U.S. National Resources Committee, *Regional Factors in National Planning* (Washington, 1935), Chap. 7; and Charles J. Meyers, "The Colorado River", *Stanford Law Review*, XIX (November, 1966), 10 - 12.

214. The Colorado River Compact was approved by Congress, after six out of seven state legislatures had ratified it (Arizona dissented), as part of the *Boulder Canyon Project Act*, 45 Stat. 1064 (1928).

215. U.S. Senate, Committee on Foreign Relations, *Hearings on Water Treaty with Mexico*, 79th Cong., 1st Sess., 1945, 520-523.

216. In 1922, the total average virgin flow of the Colorado River was believed to be approximately 17 million acre-feet. Estimates have since been revised downward to below 14 million acre-feet, but still carry little certainty. See the report of the Committee on Water, National Research Council, *Water and Choice in the Colorado Basin*, Publication 1689 (Washington: National Academy of Sciences, 1968), Chap. 3.

217. *The Colorado River* (1946), 13.

218. The upper basin as defined in the earlier Colorado River Compact included all the drainage area above Lee Ferry, which took in a small part of Arizona. That state was thereby entitled to a minimal allocation of upper basin water.

219. Upper Colorado River Basin Compact Commission, *Official Record*, (Negotiation of Upper Colorado River Basin Compact), 1948, II, Meeting 7, 19 - 43.

220. *Ibid.*, I, Meeting 5, 26 - 32. The Snake River Compact negotiated two years later, however, provides that no water of the Snake shall be diverted in Wyoming for use outside the drainage area except with the approval of Idaho, and Idaho is similarly prohibited from exporting water of the tributary Salt River. (Art. V, 64 Stat. 29 (1950)).

221. *The Colorado River*, 1946, 3 - 5.

222. *Official Record*, II, Meeting 7, 111 - 129.

223. *Upper Colorado River Basin Compact*, 63 Stat. 31 (1949).

224. P.L. 485, 84th Congress, 2nd Sess., approved April 11, 1956.

225. The storage units are Glen Canyon, Navaho, Flaming Gorge and Curecanti. The number of participating projects has increased since the Act was passed. For details on the progress of construction and repayment, see *Annual Reports* of the Upper Colorado River Commission (Salt Lake City).

226. For example, the San Juan-Chama Project will take 110,000 acre-feet of water out of the Colorado and into the Rio

Grande Basin in New Mexico. And the Central Utah Project will divert water into the Great Basin.

227. A good account of federal agency rivalry and the divisive elements which the Pick-Sloan plan was supposed to reconcile can be found in Henry C. Hart, *The Dark Missouri* (Madison: University of Wisconsin Press, 1957), 125, 168.

228. P.L. 534, passed December 22, 1944, 58 Stat. 887 - 8, U.S.C. 701-1b (1944).

229. Widmer, *op. cit.*, 267 - 271.

230. See Bruce Harding, "Water from Pend Oreille: Gravity Plan for Irrigating the Columbia Basin," *Pacific Northwest Quarterly*, XLV (1954), 52 - 60.

231. A full account of the rivalry between the Grand Coulee and Pend Oreille plans and the frictions which ensued among neighboring states is given by Bruce Mitchell, *Flowing Wealth, the Story of Water Resource Development in North Central Washington, 1870-1950* (Wenatchee: Daily World supplement, March 6, 1967), esp. 24 - 29.

232. See George Sundborg, *Hail Columbia* (New York: Macmillan, 1954), 74.

233. See Charles McKinley, *Uncle Sam in the Pacific Northwest* (Berkeley and Los Angeles: University of California Press, 1952), 54. A reaction to federal prerogative at this time took the form of a Northwest States Development Council which collapsed soon after the proposal was withdrawn.

234. U.S. Army Department, Corps of Engineers, *308 Report on the Columbia River and its Tributaries*, 3 Vols. (Washington, 1948); U.S. Department of the Interior, *The Columbia River*, House Doc. 473, 81st Cong., 2nd Sess. (1950). For an analysis of the difficulties encountered in securing more upstream storage, see Marion E. Marts, "Upstream Storage Problems in Columbia River Power Development," *Annals of the Association of American Geographers*, XLIV (March, 1954), 46 - 49.

235. See Columbia Interstate Compact Commission, *First through Twelfth Annual Reports*, (Spokane: 1952 through 1964).

236. Columbia Interstate Compact Commission, *Eleventh Annual Report*, (July 1, 1962 to June 30, 1963), 4.

237. See John V. Krutilla and Otto Eckstein, *Multiple Purpose River Development*, published for Resources for the Future, Inc. (Baltimore: John Hopkins Press, 1958), Chap. 5.

238. See Letter of Transmittal in *The Columbia River* (1946). For discussion of the principle of basin account, see Chapter 3.

239. For example, P.L. 577, passed July 17, 1952, provides the basis for the Secretary of the Interior to study and seek authorization for irrigation of lands in the vicinity of the Chief Joseph Dam Project which could be provided financial aid from excess power revenues. Since enactment of P.L. 577, such aid has

been authorized for the Greater Wenatchee Division and for some extension of irrigation units in the Okanagan Valley.

240. Specifically, from the Minidoka and Pallasades projects in southern Idaho.

241. Remarks of Senator Len B. Jordan of Idaho before the Pacific Northwest Trade Association, Portland, April 12, 1965.

242. Calif. Water Code 1230, Idaho Code 42 - 401 ff. Rev. Code Mont. 89 - 849, Utah Code Ann. 73-2-8, Wash. R.C.W. 90-16-110, Wyoming Comp. Ann. 71-265.

243. "For the purpose of aiding and preserving unto the state of Colorado and all its citizens the use of all the waters of the springs, lakes, ponds, creeks, rivers, streams and watercourses of this state, which waters do not increase with the growth of population and which are necessary for the health and prosperity of all of the citizens of the state of Colorado, and for the growth, maintenance and welfare of the state, it shall be unlawful for any person, corporation or association to divert, carry or transport by ditches, canals, pipes, conduits, natural streams or watercourses, the waters of any springs, reservoir, lake, pond, creek, river, stream or watercourse of this state into any other state for use therein." [Colo. Rev. Stat. 148-1-1 (1963)]

244. 209 U.S. 349 (1908).

245. *West v. Kansas Natural Gas Co.* 221 U.S. 229 (1911).

246. 262 U.S. 553 (1923).

247. Words used by Mr. Justice Holmes, in giving the decision of the court in *Hudson County Water Co. v. McCarter*.

248. See Thomas P. Hardman, "The Right of a State to Restrain the Exportation of its Natural Resources," *West Virginia Law Quarterly*, XXVI (November, 1919), 1-20; also Charles E. Corker, "Water Rights in Interstate Streams", *Waters and Water Rights*, R.E. Clark editor-in-chief, II, 319-324.

249. 221 U.S. 229 (1911).

250. 255 F. Supp. 828, affirmed 385 U.S. 35 (1966).

251. *Ibid.* For the Texas statute, see Vernon's Tex. Rev. Civ. Stat. Ann., 2-74776 (1965).

252. Maine's Fernald Law became effective in 1909 and was repealed in 1955. Nebraska's policy was clarified in *Kirk v. State Board of Irrigation*, 90 Neb. 627, 134 N.W. 167 (1912). Both states based their stand on an assumed hydropower advantage.

253. 88 *Opinions* Wash. Att. Gen. (March 4, 1964).

254. The most complete record of arguments, of course, comes from House and Senate Hearings on the Central Arizona Project, the (Lower) Colorado River Basin Project and the National Water Commission bills, and from the Reports which followed them. These are listed chronologically:

U.S., Senate, Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, *Hearings on S.1658, Central Arizona Project*, 88th Cong., 1st and 2nd Sess., August and October, 1963, and April, 1964.

U.S., Senate, *Lower Colorado River Basin Project*, 88th Cong., 2nd Sess., August, 1964, S. Rept. No. 1330 to accompany S.1658.

U.S., House, Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, *Hearings on H.R. 4671, Lower Colorado River Basin Project*, 89th Cong., 1st Sess., August and September, 1965.

U.S., House, Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, *Hearings on H.R. 4671 and Similar Bills, Lower Colorado River Basin Project*, 89th Cong., 2nd Sess., May, 1966.

U.S., Senate, Committee on Interior and Insular Affairs, *Hearings on S.3107, National Water Commission*, 89th Cong., 2nd Sess., May, 1966.

U.S., Senate, *National Water Commission*, 89th Cong., 2nd Sess., June, 1966, S. Rept. No. 1212 to accompany S.3107.

U.S., House, *Colorado River Basin Project*, 89th Cong., 2nd Sess., August, 1966, H. Rept. No. 1849 to accompany H.R. 4671.

U.S., House, Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, *Hearings on H.R. 3300 and Similar Bills, Colorado River Basin Project*, 90th Cong., 1st Sess., March, 1967.

U.S., Senate, Subcommittee on Water and Power Resources of the Committee on Interior and Insular Affairs, *Hearings on S.1004, Central Arizona Project*, 90th Cong., 1st Sess., May, 1967.

U.S., Senate, *Central Arizona Project*, 90th Cong., 1st Sess., July, 1967, S. Rept. No. 408 to accompany S.1004.

U.S., House, Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, *Hearings on H.R. 3300, Colorado River Basin Project*, (Part II), 90th Cong., 2nd Sess., January and February, 1968.

U.S., House, *Colorado River Basin Project*, 90th Cong., 2nd Sess., April, 1968, H. Rept. No. 1312 to accompany H.R. 3300.

U.S., House, *Conference Report, Central Arizona Project*, 90th Cong., 2nd Sess., September, 1968, H. Rept. No. 1861 to accompany S.1004.

Finally, as the legislative outcome of the House and Senate Conference, *Colorado River Basin Project Act*, P.L. 90-537, 90th Cong., 2nd Sess., September 30, 1968.

255. *Hearings on H.R. 4671*, 1965, 137.

256. Morris K. Udall, "Countdown on the Colorado", address before the Town Hall of California, Los Angeles, December 19, 1967 (reprinted in his *Congressman's Report*, January 15, 1968, 3).

257. In the eleven states of the Columbia and Colorado Basins, the difference between authorization and appropriations for these agencies in 1969 was five billion dollars. See Minutes of the Fifteenth Meeting, March 18, 1969, Resolution - Appendix C, Western States Water Council.

258. "About one-third of the tonnage of all commodities

shipped by rail out of the Columbia River States goes to the Colorado River States." A wealth of commodity and travel statistics are employed by Wilbur McCann to support the "Economic Inter-Dependence of the Western States" (Los Angeles, 1968).

259. See dialog between Senator Jackson and Representative Hosmer in U.S., House, Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, *Hearings on H.R. 7406, Third Power Plant, Columbia Basin Account*, 89th Cong., 1st Sess., September, 1965, 10ff. The preference legislation for Pacific Northwest power marketing was enacted in August, 1964 as P.L. 88-552.

260. The Council was established in 1965 under the sponsorship of the Governors of the eleven contiguous states lying in whole or part west of the Rocky Mountains. Priority in the first two years of its existence was given to criteria for interregional water transfers; this was later realized to be a mistake. See Raphael J. Moses, "Western States Water Council, A Status Report," address before the Western Water Congress, April 7-8, 1969, Wenatchee.

261. Title II, Sec. 207(a) in the 1965 version of the bill.

262. Ernest A. Engelbert, "Planning for Western Regional Water Development," *Proceedings of the (Second) Western Interstate Water Conference*, Corvallis, 1965 (Univ. of Calif. Printing Dept., 1966), 29.

263. Wright Hiatt, "The Western States Water Council," *Northwest-Southwest Water Diversion Issues* (Corvallis, Oregon State Univ., 1967), 105-106. The Pacific Northwest River Basins Commission was established in March, 1967.

264. H.R. 4671, Title IV, Sec. 403, 1965. See Table 10.

265. The following quotation from a letter written by Rep. Udall of Arizona to Rep. Al Ullman of Oregon, dated July 13, 1965, illustrates the "sweetening" approach:

"I would think that this program [of diversion] would have all of these advantages to you and the people you represent: 1. There would be an 8- to 10-year construction program with a total cost of up to perhaps \$2.5 billion. I would think that as much \$1 billion might be spent in Oregon for the aqueduct, plus a related series of dams, pumping plants, interim storage reservoirs, etc. 2. After the construction were completed, there would be substantial, permanent Federal installation dealing with the maintenance and operation of these works and providing jobs for your area. 3. It would be very easy to design these works and create them with such capacity to drop off supplemental irrigation water for areas in Oregon near the main aqueduct. 4. Such a program would inevitably require large quantities of BPA electricity, the sale of which would bring benefits to the whole region and make BPA an even more sound investment than it already is."

Even after the 1968 legislation which prohibited studies of interregional diversion, Raymond R. Rummonds, Chairman of California's Colorado River Board, was promising benefits to the Columbia Basin states as a condition of such diversion. These included compensation for local power generation foregone, increased income from a growing Southwest market, supplemental water to arid parts of the Northwest at low prices, construction and maintenance payrolls. See *Western Water News*, Sacramento, June, 1969, 2.

266. During the Western States Water Council's consideration of principles for interregional water transfer, New Mexico's repre-

sentative took exception to the implication that the states of origin would "sell" surplus water to the states of destination. See Minutes of the Ninth Meeting, September, 1967, 3-4. Otherwise, the matter of a commercial transaction seems not to have been taken seriously, except briefly when California's representative spoke to an enquiry by the National Water Commission on "tribute". (Minutes of the Seventeenth Meeting, August, 1969, 16, Western States Water Council).

267. Chapin D. Clark, "Northwest-Southwest Water Diversion — Plans and Issues," *Willamette Law Journal*, III (Fall, 1966), 252.

268. Letter from Elmer B. Staats, Deputy Director, Bureau of the Budget, to Hon. Henry M. Jackson, Chairman, Committee on Interior and Insular Affairs, Senate, May 10, 1965. This and a similar letter to the House Committee Chairman are included in the 1965 *Hearings on H.R. 4671*.

269. Although the language of the bill itself does not mention recapture, House members from the Southwest were quick to give assurances that the Northwest could indeed get its water back whenever its need for the water developed and whatever the purpose of use. (*Colorado River Basin Project*, 1966, H. Rept. No. 1849, 3.)

270. Clark, *op. cit.*, 251. Additional doubts about long-range protection are systematically treated by Ralph W. Johnson, "Area of Origin Protection for a Columbia River Diversion," Review draft completed as part of a study for the Washington Water Research Center, Budget No. 11-1314 (January, 1970), 32-38.

271. See Minutes of the Ninth Meeting, September, 1967, Western States Water Council. Annex No. 5 lists "Principles — Standards — Guidelines", Annex No. 4 consists of California's objection to the last of these, quoted above.

272. *The Colorado River Basin Project Act*, P.L. 90-537, maintains the earlier versions of area-of-origin protection clauses. (Title II, Sec. 203 [a] and [b])

273. When the House Interior and Insular Affairs Committee reported on July 28, 1966 in favor of H.R. 4671, the four Northwest members (two Democrats, two Republicans) opposed it, while the eleven members from the Colorado Basin states (eight Democrats and three Republicans) all voted for it. Congressional Quarterly, *Weekly Report*, XXIV (August 5, 1966), 1697ff.

274. See Upper Colorado River Commission, *Eighteenth Annual Report* (Salt Lake City, 1966), 45.

275. The influence of conservationists testifying in Hearings and dramatizing for popular magazines, led to more mail opposing "destruction" of the Grand Canyon than on any other single issue many Congressmen have seen for years. See Langewiesche, "What Water Shortage?", *Readers Digest*, January, 1966, 50.

276. Staats, *loc. cit.*

277. Ernest A. Englebert, "The Origins of the Pacific Southwest Water Plan," *1964 Western Resources Conference, Papers* (Boulder, 1965), 154.

278. P.L. 89-80, 79 Stat. 244, and P.L. 89-72, 79 Stat. 213.

279. "The Commission shall (1) review present and anticipated national water resource problems, making such projections of water requirements as may be necessary and identifying alternative ways of meeting these requirements—giving consideration, among other things, to conservation and more efficient use of existing supplies, increased usability by reduction of pollution, innovations to encourage the highest economic use of water, interbasin transfers, and technological advances such as desalting and waste water purification and reuse; (2) consider economic and social consequences of water resource development, including, for example, the impact of water resource development on regional economic growth, on institutional arrangements, and on esthetic values affecting the quality of life of the American people . . ." (Sec. 3[a] of S. 3107)

280. Provision for the Commission was included as Title II of the bill.

281. Upper Colorado River Commission, *op. cit.*, 42-44.

282. Congressional Quarterly, *Weekly Report*, XXV (February 10, 1967), 202.

283. Upper Colorado . . . *op. cit.*, 35-40.

284. See Presentation of Raphael J. Moses at Western Governors Conference, included as Annex No. 5, 6, Minutes of the Eighth Meeting, June, 1967, Western States Water Council.

285. The 1944 Mexican Water Treaty allocated a portion of the Colorado River to that country over California's bitter opposition; see Norris Hundley, Jr., *Dividing the Waters* (Berkeley and Los Angeles: Univ. of California Press, 1966), Chap. 6, The Colorado River Storage Project, an ambitious federal program for translating upper basin allocations into development, passed into law in 1956 with California alone among the Western states, fighting it; see Norris Hundley, Jr., "The Colorado River Controversy: Federal Legislation," *Los Angeles Bar Bulletin*, XXX (1955), 227. *Arizona v. California* ended with a cutback of California's existing use of the lower river to its authorized Compact allocation, and threatened to reduce this further as its neighbors came to develop their shares.

286. U.S., House, Committee on Interior and Insular Affairs, *Hearings on H.R. 1500, Central Arizona Project*, 82nd Cong., 1st Sess., Sec. 2, Part I, 1951, 739.

287. See Resources Agency of California, "Comments of the State of California on the 'Pacific Southwest Water Plan'," (Sacramento, 1963), 7-8.

288. "Countdown on the Colorado," *op. cit.*, 4.

289. Luther J. Carter, "Water Resources: Congress Favors Taking a New Look," *Science*, CLVII (1967), 906.

290. Congressional Quarterly, *Weekly Report*, XXVI (May 24, 1968), 1183-1186.

291. Beyond official governmental reports, only two reasonably comprehensive accounts are available of the organizational and developmental history of the region's water resources. McKinley's work is concerned, appropriately enough with the federal role, to 1949; Bessey deals with regional planning and its contributory levels, in a more recent but less incisive account. See Roy F. Bessey, *Pacific Northwest Planning: A Review*, Bulletin No. 6, Division of Power Resources, Washington Department of Conservation (Olympia, 1963); and Charles McKinley, *Uncle Sam in the Pacific Northwest* (Berkeley and Los Angeles: University of California Press, 1949).

292. A number of alternative routes investigated draw heavily from Oregon water sources. See U.S. Department of Interior,

United Western Investigations, Report on Reconnaissance of California Section (Washington, 1952).

293. Oregon Water Resources Board, *Fifth Biennial Report* (Salem, January, 1965), 23.

294. State Water Resources Board, *Oregon's Long Range Requirements for Water, Summary Report* (Salem, May, 1969), 3. In this study, an attempt was made to estimate future water use for the whole Columbia Basin, including the Canadian portion. Oregon would not become water deficient only if Canada did not avail itself of its flows to any important degree.

295. Idaho Water Resources Board, *Report to the Governor* (Boise, December 20, 1966), Attachment No. 1, 1.

296. Everett V. Darlington, Address before the Western States Water Council, Helena, September 29, 1967. See Minutes of the Ninth Meeting, Annex No. 3.

297. See Remarks of H. Maurice Ahlquist, Director, Department of Water Resources, Washington State, to Pacific Northwest River Basins Commission, Seattle, February 13, 1968. The Department of Water Resources was created on July 1 under provisions of Chapter 242, 1967 laws.

298. See *Digest*, Report No. 2 (Pullman, February, 1967).

299. The Northwest States increased their water expenditures from an average of one-half million dollars in 1965 to one and one-half million in 1968, according to the files of the Western States Water Council (unpublished).

300. See 142-146.

301. The principle of basin account and some of its advantages and disadvantages are discussed in Chapter 3 of this study.

302. Personal correspondence with James T. Harrison, Jr., Counsel, Montana Water Resources Board, Helena, December 4, 1967. Montana has little irrigation potential in the Upper Columbia.

303. Idaho Water Resources Board, *op. cit.*, 1 - 2: "The IWRB took the lead among the Columbia Basin states in formulating the final language of the (Basin Account.) bill. Should this legislation have failed during the 89th Session of the Congress, the Basin Account's future was most indefinite, and the future of several reclamation projects in Idaho would have been jeopardized." The partial account which had existed for a few years already in the Columbia Basin worked only for irrigation assistance in the vicinity of federal power projects. Since most of these were downstream, most of this kind of assistance was similarly limited. See Chapter 4.

304. Idaho's Governor Smylie was insistent on a basin account before he would cooperate with his fellow governors. See *Eugene Register - Guard*, April 27, 1966, 5A.

305. Idaho received the unexpected assistance of House Interior Committee Chairman, Wayne Aspinall of Colorado. Aspinall believed in the principle of basin account, which already existed in one form or another in the Central Valley of California, the Missouri, and the Upper Colorado, because it worked in favor of reclamation which was becoming increasingly hard to justify on its own economic merits. As House Committee Chairman, Aspinall refused to support Jackson's bill for a third powerhouse at Grand Coulee Dam unless Jackson accepted his amendment to that bill, providing for an officially-recognized Columbia River Basin Account. The deal was consummated as P.L. 89-448 on June 14, 1966.

306. "It is declared to be the policy of the Congress that

reclamation projects hereafter authorized in the Pacific Northwest to receive financial assistance from the Federal Columbia River power system shall receive such assistance only from the net revenues of that system as provided in this subsection, and that their construction shall be so scheduled that such assistance, together with similar assistance for previously authorized reclamation projects (including projects not now receiving such assistance for which the Congress may hereafter authorize financial assistance) will not cause increases in the rates and charges of the Bonneville Power Administration. It is further declared to be the policy of the Congress that the total assistance to all irrigation projects, both existing and future, in the Pacific Northwest shall not average more than \$30,000,000 annually in any period of twenty consecutive years . . . " P.L. 89-561 (September 7, 1966), 80 Stat. 714, Sec. 6(3). Idaho's senators appeared satisfied with the compromise; see *Congressional Record*, CXII (July 12, 1966).

307. Correspondence from H.T. Nelson, Regional Director, Bureau of Reclamation, Boise, to George L. Crookham, Jr., Chairman, Idaho Water Resources Board, June 6, 1966 (included as Attachment No. 3, Idaho Water Resources Board, *op. cit.*).

308. Columbia Interstate Compact Commission, *5th Annual Report*, (July 1, 1956 to June 30, 1957), 4.

309. Opinions, Wash. Attorney General, 88 (March 4, 1964).

310. A provision required concurrence of at least three of the states of Idaho, Montana, Oregon and Washington before a commission could be established for the Columbia Basin.

311. P.L. 89-80, 42 USCA, Sec. 1962-1(d).

312. Colorado River Association, *Newsletter*, September, 1966.

313. Executive Order No. 11331, March 6, 1967.

314. These had been instituted earlier under the aegis of the Columbia Basin Inter-Agency Committee, the Commission's federal-state predecessor. CBIAC had no staff of its own and no mandate to prepare a comprehensive, long-range plan for the region as does the new body.

315. According to the chairman of the Commission: "We will have a use for all of the water of the Pacific Northwest. Our present planning effort is not to determine what portion of the water is to be used, but how it can best be used. We will float ships and barges on it. We will use it as passageway and spawning ground for fish, and a resting place for migratory birds. We will swim in it, water ski on it, sail on it, and fish from it. Some will get equal opportunity in just looking at it. It will turn our turbines, cool our power plants, and furnish our industries a basic tool of production. We will drink it, bathe in it, water our lawns and golf courses, and our parks and playgrounds. We will irrigate our croplands — yes, and millions of acres of our forest lands eventually." See Charles W. Hodde, "The Pacific Northwest River Basins Commission," *Northwest-Southwest Water Diversion Issues* (Corvallis: Oregon State University, 1967), 117.

316. *Colorado River Basin Project*, 1968, H. Rept. No. 1312, 42. Also, see *Congressional Record*, May 15, 1968; 3774, 3777, 3792.

317. See recent discussion of this aspect of protection by Ralph W. Johnson, "The Area of Origin and a Columbia River Diversion," *Washington Law Review*, XLVI (1966), 273-275.

318. *Seattle Times*, May 17, 1968, 2.

319. *Colorado River Basin Project Act*, P.L. 90-537, 82 Stat. 885 (1968); see Title II, Sec. 201.

320. *Ibid.*

321. No express provision exists in Canadian law requiring that interprovincial disputes be submitted to a higher authority. The Exchequer Court may hear a case only if the provinces agree to submit to it. This situation is in sharp contrast to the role of the U.S. Supreme Court on interstate river litigation. See Dale Gibson, "The Constitutional Context of Canadian Water Planning," *Background Papers, Victoria Water Workshop Seminar*, (Montreal: Canadian Council of Resource Ministers, 1968), A-3.1. One of the provisions of the 1969 Prairie waters apportionment agreement is that the three signatories agree to use the Exchequer Court for any interpretation they cannot resolve among themselves (section 8 of master agreement); see ref. 363 following.

322. The impact of the Bennett Dam across the British Columbia-Alberta border is, of course, a notable exception. While many water rights in the American West were developed simply by private use and have yet to be recorded in state water administration offices or adjudicated in the courts, such a situation was avoided by early and strict regulations north of the border. Before British Columbia entered Confederation, the Gold Fields Act of 1859 specified licenses for some uses; the 1909 provincial Water Act created a tribunal which, after several years of effort, established or updated the rights to all claimants to water. See H.D. DeBeck, "Present Use of British Columbia's Water," *Transactions, Seventeenth British Columbia Natural Resources Conference* (Kelowna, 1967), 40-41. The Dominion government, which retained control of the Prairie region's water resources until 1930, enacted the North West Irrigation Act of 1894 vesting all surface waters in the Crown and setting out the conditions under which the right to use water could be obtained. See Canada, *An Act Respecting the Utilization of the Waters of the North West Territories for Irrigation and Other Purposes*, 57-58, Victoria (1894), c. 30.

323. 30 and 31, Victoria, c. 3.

324. *Ibid.* sec. 92(10)(a) gives Parliament control over "works and undertakings . . . extending beyond the limits of the provinces." *The Boundary Waters Treaty*, British Treaty Series 1910, No. 23. *International River-Improvements Act*, S.C. 1955, C. 47.

325. Most ad hoc assistance followed crises of one kind or another. Thus in the mid-thirties, the federal government established a farm rehabilitation program in the Prairie provinces and rescued some bankrupt irrigation districts; in the mid-fifties, after disastrous floods in Vancouver, Winnipeg and Toronto, it initiated a shared-cost program with the provinces to provide flood protection. See various Canadian papers, *Proceedings, International Conference on Water for Peace*, 8 vols. (Washington: Government Printing Office, 1967).

326. British Columbia clearly worried American negotiators with the threat to build a Peace River dam to serve its power needs if the U.S. would not agree to substantial downstream benefits payment for storage in the upper Columbia. The province then turned on Ottawa and threatened to pull out of the treaty if its downstream power benefits could not be sold to the U.S. See Ralph W. Johnson, "The Canada-United States Controversy Over the Columbia River", *Washington Law Review*, XLI (August, 1966), 726-727, 744-748.

327. The national governments have power over interstate and interprovincial transportation. Charles B. Bourne considers this problem in "Energy and a Continental Concept," *Canadian Bar Journal*, VIII (June, 1965), 163.

328. Parsons' NAWAPA proposal upset many Canadians with its use of the terms "continental resources" with respect to waters north of the United States. See Ralph M. Parsons Company, "NAWAPA", brochure No. 606-2934-19, (Los Angeles, 1964).

329. Suppose that Canada decided to bring additional water

into the Great Lakes from northern Ontario for its own use. Would the U.S. have an obligation to pay for benefits like cleaner water, navigation and power that would incidentally accrue to it as the added flow passed through the Lakes? The agreement in 1940 by which Ontario Hydro benefitted exclusively from 5000 cfs in additional flow from Long Lac and Ogoki for power generation is a precedent that suggests that the U.S. should pay. See Bourne, *op. cit.*, 167 – 168.

330. See Chapter 1, footnote 17.

331. Alvin Hamilton, former federal resources Minister, spoke strongly in favour of a total energy approach, including water, to improve Canada's bargaining position with the U.S., during a Progressive Conservative party policy seminar at Niagara Falls. See *Winnipeg Free Press* November 14, 1969.

332. "Canada Comes First – Greene," *Ottawa Citizen*, January 16, 1970, 1.

333. An excellent account of the history and relevant consequences of Canada's ban on long-term electric power export is that of A.E. Dal Grauer, "The Export of Electricity from Canada," *Essays in Honour of Henry F. Angus*, ed. R.M. Clark (Toronto: University of Toronto Press, 1959) 248 – 285.

334. *Ibid.*, 252.

335. "We have nothing before us but the suggestion that the Dominion of Canada may, at some future time, forbid this exportation. This Commission must assume that international relations affecting so important a subject as the means of continuing great industries which have grown up in reliance upon the use of this imported power, and as well the interests of the Canadian-producing companies themselves, have become fixed and subject only to such changes as will fully protect the great commercial and industrial interests and rights now served by this power bought from Canada. The time has long since passed when governments proceed ruthlessly from pure national brashness or anger to destroy the settled accepted commercial relations and formally vested rights of persons and corporations." (Arthur V. White, Memorandum Respecting Exportation of Electricity, Commission of Conservation, May 5, 1914, 13.) This American interpretation raised a storm in Ottawa.

336. Grauer, *op. cit.*, 258.

337. O.D. Skelton and T.S. Lyon, *Correspondence and Documents Relating to St. Lawrence Deep Waterway Treaty 1932, Niagara Convention 1929, and Ogoki River and Kenogami River (Long Lake) Projects and Export of Electrical Power* (Ottawa: King's Printer, 1938), 39 – 41.

338. *Canada Year Book* (Ottawa: King's Printer, 1911).

339. During a recent five-year period, Canada realized a net export in 1966 and 1969 and a net import during 1965, 1967 and 1968. The values range between 1% and 3% of the total Canadian electrical energy generated during these years. See Canada, National Energy Board, *Energy Supply and Demand in Canada and Export Demand for Canadian Energy, 1966 to 1990*; (Ottawa: Queen's Printer, 1969).

340. See Announcement of National Policy by Hon. Mitchell Sharp, Canada, *House of Commons Debates*, October 8, 1963, 3299 – 3301.

341. See *Royal Commission on Energy*, First Report (Ottawa: Queen's Printer, 1968), 43 – 53.

342. Canada, Departments of External Affairs and Northern Affairs and National Resources, *The Columbia River Treaty, Protocol and Related Documents*, (Ottawa: Queen's Printer, 1964), 117.

343. On January 1, 1951, proved reserves of Canadian crude oil were 1.2 billion barrels; on January 1, 1969, 8.4 billion. On January 1, 1951, proved reserves of Canadian natural gas were 4.7 trillion cubic feet; on January 1, 1969, 40.7 trillion. Data from Minister of Energy, Mines and Resources in published letter, *Toronto Daily Star*, December 11, 1969, 7. New exploration in the Western Arctic is beginning to add to reserves again.

344. Some see a clear parallel in the two situations: "Our suggestion is that the export of water resources from Canada is, at the present time, in the same raw emotional stage that the export of power was viewed ten to twenty years ago and that economic and technological advancement will finally dictate Canadian government policy." (James A. Beveridge, "The Export of Surplus Water from Canada to the United States," *Canadian-United States Water Resources Problems and Policies*, ed. Leonard B. Dworsky (Ithaca: Cornell Univ. Water Resources Center, 1965), 18).

345. Carl Nickle, president of the Independent Petroleum Association of Canada, made this proposal at the 1969 Progressive Conservative seminar. See footnote 331.

346. See remarks of Right Hon. C.D. Howe, Canada, *House of Commons Debates*, March 13, 1953; 2929.

347. Of course energy fuels recovery and transportation also pose threats to environmental stability and aesthetics. Oil spills into the watercourses of the Mackenzie Basin or offshore may be at least as serious as water losses from the basin which are diverted southward. In 1970, Parliament approved legislation which attempted to address both threats in the Arctic Waters Pollution Prevention Act and the Northern Inland Waters Act.

348. For another view, see Arleigh N. Laycock, "The Rationale of Water Export and Its Implications for Water Resources Research in the North," *Proceedings, Second National Northern Research Conference*. Whitehorse, 1968, ed. J.J. Bond (Edmonton, 1969), 90 – 96. Laycock would risk export now rather than lose the opportunity forever, on the ground that technological change, in desalination, recycling, etc., may gradually take American markets away from Canadian supplies; thus, repatriation would be no problem.

349. The only such scheme to receive a hearing before a Parliamentary committee was Kierans' GRAND Canal. See Canada, House of Commons, Standing Committee on Mines, Forests and Waters, *Minutes of Proceedings and Evidence*, 2nd Sess., 26th Parl., 1964-65, 273-281.

350. Biting at the promise that NAWAPA would make Winnipeg the only four-way seaport on the continent, a Manitoba cabinet spokesman responded: "The idea of locks and canals on the Nelson and the vision of ocean freighters and even passenger ships tied up at the Alexander docks and Selkirk wharfs is certainly a very challenging one... I will support the motion (for a feasibility study)." Motion was carried (Legislative Assembly of Manitoba), *Debates and Proceedings*, April 26, 1966, 2353 – 55.

351. A meeting sponsored by the Water Resources Institute at the University of Alaska in 1967 to consider the availability of Alaskan water for transport south was not conclusive. See Gus Norwood, "Alaska Water Resources – A Strategic National Asset," *Proceedings of the Seminar on the Continental Use of Arctic-Flowing Rivers*, sponsored by State of Washington Water Research Center (Wenatchee, 1968), 66.

352. *Time*, July 1, 1966.

353. Most of these points have been raised by responsible Ministers in *House of Commons Debates*: September 2, 1964, 7575 – 7576; June 28, 1966, 6995 – 6997; April 3, 1967, 14472 – 14475; October 10, 1968, 1022; February 24, 1970, 4006 – 4008.

354. Alberta developed an intraprovincial interbasin diversion plan called PRIME, as an alternative to NAWAPA; see Alberta Department of Agriculture, *1965 Annual Report* (Edmonton, 1966), 101 – 103. British Columbia's resources minister Williston repeated his province's opposition to consider export at the Wenatchee Water Congress, April 7, 1969. Saskatchewan's minister in charge of the Saskatchewan Water Resources Commission said much the same thing in response to a resolution of the Canadian Water Resource Association; see *Reclamation* (C.W.R.A. newsletter), October 1969, 2.

355. Hydrometric network planning studies were begun in 1969 with the assistance of provincial governments and consultants. The reports have shown that the network should be expanded by about one half its present size of 2300 water level and flow stations. A significant part of the overall expansion is recommended for the northern portion of the provinces and the territories. See Canada, Department of Energy, Mines and Resources, *Annual Report 1969-70*. (Ottawa: Information Canada, 1971), 59 – 60.

356. It is frequently said that Canada has 25 to 40% of the world's fresh surface water. Such statements need to be qualified. They refer to accumulated storage in the Great Lakes, other large lake bodies which stretch along the Precambrian margin and uncounted thousands of smaller lakes and ponds in the North. But in terms of what is annually renewable, the picture is not quite that impressive; Canadian rivers discharge not 40% or 25%, but probably closer to 6% of the world's runoff, or very roughly 2 billion acre-feet per year. And when one recalls that the bulk of the world's fresh water is stored below ground, but that so much of Canada is bare of soil cover, impregnated with permafrost and underlain by impermeable crystalline rock or by saline formations, there is indeed some reason to qualify the picture. Still, an export of 1% of the national renewable supply would still exceed the flow of the Colorado River.

357. *Electric Power in Canada*, (Ottawa: Queen's Printer, annually).

358. A seminar was held in Vancouver in December, 1967, to bring together the best minds available for the task of water demand forecasting, but no program emerged out of the seminar. See W. R. Derrick Sewell and Blair T. Bower et al, *Forecasting the Demands for Water*, Policy & Planning Branch, Department of Energy, Mines & Resources (Ottawa: Queen's Printer, 1968).

359. Out of this initiative, joint federal-provincial studies emerged on the Okanagan in British Columbia, the Qu'Appelle in the Prairies, and the Saint John in New Brunswick. See Energy, Mines and Resources *Annual Report 1969-70*, 54 – 56.

360. Captain Palliser, *Journals, Detailed Reports and Observations Relative to the Exploration of British North America* (London, 1863).

361. Saskatchewan-Nelson Basin Board, *Annual Report, Year ending March 31, 1969*, 7 – 10 (terms of reference). This study is to be completed by 1972.

362. See R.E. Bailey, "Recent Progress and Programs – Co-operation in Water Management in the Prairie Provinces", *Proceedings of the Atlantic Water Seminar* (Montreal: Canadian Council of Resource Ministers, 1970), 188 – 190.

363. Saskatchewan-Nelson Basin Board, *op. cit.*, 16 – 17. The study is assessing 55 dam and 23 diversion possibilities according to engineering feasibility and cost only.

364. The signing of Agreements for the Apportionment of Interprovincial Waters on the Prairies by the provincial and federal ministers took place on October 30, 1969, in Regina. The upstream provinces may make a net depletion of no more than half the natural flow of water rising within their boundaries, permitting the

remaining half of the natural flow of each stream to pass into the neighboring province on the east. (C.W.R.A. newsletter, *Reclamation*, X (January, 1970), 1) The southern Prairies is the only major region in Canada which has experienced interprovincial conflict over water consumption of a comparable magnitude to that on Western U.S. rivers. The federal-provincial Prairie Provinces Water Board was created in 1948 to recommend best use of the region's waters and an allocation to each of the provinces. With advisory powers only, it was unable to do more than recommend allocations to specific projects; the provinces finally worked out an overall apportionment among themselves after disputes in the 1950's and early 1960's threatened to impede further water project construction. A wealth of historical material on political objectives is provided in *Report of the Royal Commission on the South Saskatchewan River Project* (Ottawa: Queen's Printer, 1952), esp. Appendix.

365. Standing Committee on Mines, Forests and Waters, *op. cit.*, 326.

366. Announced by the Prime Minister of Canada and the Premier of Ontario on August 5, 1965.

367. See *Exchange of Notes between the United States and Canada regarding the development of certain portions of the Great Lakes St. Lawrence Basin Project* (Washington, October 14, 31 and November 7, 1940). 54 Stat. 2426; G.A.S. 1871; 203 L.N.T.S. 267.

368. An opposition group, "Keep Northern Ontario Water" or "KNOW", has formed in the region. (*Ottawa Citizen*, December 2, 1969.) Earnest doubts have been expressed in Parliament by the member from Thunder Bay; see Canada, *House of Commons Debates*, July 14, 1969, 11210–11211.

369. The I.J.C. was directed on October 7, 1964, to study the merit of regulating Great Lakes levels. The Canadian government, however, reportedly refused to have included any mention of water importation into the Reference (Docket 82).

370. Chicago's present diversion of 3,200 cfs for sewage removal to the Illinois River could be expanded; other centers on Lakes Michigan and Erie could follow suit, draining their sewage into the Ohio and Mississippi Rivers instead of letting it continue to build up in the Lakes. See William C. Ackermann, "Water Transfers – Possible De-Eutrophication of the Great Lakes," Annual Meeting, National Research Council, Washington, D.C., March 11, 1968.

371. Bill C-144, introduced into the House of Commons for first reading November 5, 1969 passed by the House in June, 1970.

372. At least two-thirds of the text is devoted to water quality management.

373. The Conservative government in Manitoba fell shortly after the height of the controversy. A commissioned report on the diversion by the new N.D.P. government reinforced its decision to the project for social reasons (*Calgary Herald*, September 16, 1969). A decision on whether or not to approve a modified scheme is expected late in 1970.

374. In the words of Premier Bennett of British Columbia: "We'll sell the United States hydro-electric power but not water. Even to talk about selling water is ridiculous. Water is our heritage and you don't sell your heritage." (*Toronto Globe and Mail*, July 25, 1965) National feeling sometimes get the better of the engineering profession, as well. In a survey of Canadian engineers' attitudes to NAWAPA, the Supersonic Transport and weather modification, it was found that only in the first case did skepticism prevail over the effects of a breakthrough. Specifically, the respondents feared American domination over Canadian waters. See W.R.D. Sewell, "The Role of Attitudes of Engineers in Water Management", *Attitudes Toward Water: An Inter-Disciplinary*

Exploration, eds. G.F. White and F.L. Strodbeck (Chicago: University of Chicago, publication forthcoming).

375. Calvin T. Watts, "Proposed Diversion of Mississippi River Water From the Viewpoint of the Basin of Origin," *Aspects of the Diversion of Mississippi River Water to Texas and New Mexico*, (Louisiana Polytechnic Institute, 1969), 19.

376. U.S., House, Subcommittee on Irrigation and Reclamation

of the Committee on Interior and Insular Affairs, *Hearings on 3300 and Similar Bills, Colorado River Basin Project*, 90th Cong., 1st Sess., March, 1967. See Statement of Alex D. McDermott, Director, Montana Water Conservation Board, 359.

377. Remarks of General A.G. McNaughton before the Canadian Club in Montreal, October, 1965.

378. Kenneth M. McCaffree, "Pacific Northwest Industrial Development: A Discouraging Note," *University of Washington Business Review*, XIX, No. 5 (1960), 17-22.

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