CONTRARY VIEWS OF THE LAW OF THE COLORADO RIVER: AN EXAMINATION OF RIVALRIES BETWEEN THE UPPER AND LOWER BASINS

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I. INTRODUCTION

The Colorado River arises in the mountains of Wyoming and Colorado and flows 1400 miles to the sea. Its basin covers one-twelfth of the contiguous continental United States.1 It crosses or borders seven states and passes through another country, Mexico. Because "[i]t is the only great river ... entirely within an arid region," Congressman Taylor of Colorado pronounced it in 1928 to be "intrinsically the most valuable stream in the world."2 Its water is exported beyond its drainage area to a greater degree than that of any other American river.3 Over half of the people of the West depend upon it as a source of water,4 although, unlike any other major river, no large city is situated close to it.5

Harnessed and re-directed by a network of dams and diversion projects, vigorously administered by state authorities, and stewarded by the Bureau of Reclamation, the Colorado is "one of the most institutionally encompassed rivers in the country."6 A set of compacts, treaties, statutes and judicial decisions, collectively known as the

law of the river, has developed to govern the River and allocate its water among the Colorado Basin states and between the United States and Mexico. The cornerstone of the law of the river, the Colorado River Compact of 1922, materialized principally as a result of fear of a recurrence of floods that devastated parts of the lower River in 1905-07 and again in 1916. Ironically, though, the condition which has most troubled the law of the River since its inception has been the opposite problem: insufficient quantities of water.

Despite the apparent intentions of the framers of the 1922 Compact, the burden of these deficiencies is often assumed to fall largely on the states of the Upper Basin. As the director of Colorado's natural resources department recently assessed this predicament, "The ultimate problem for the Upper Basin is how to build a future on the right to leftovers."7 Perhaps, however, the more pertinent and fundamental question is really whether the Upper Basin should have to build its future on the right to leftovers, instead of an equal portion of this common resource. The objective of this paper is to explore briefly the salient features of the law of the River and survey the prospects for correcting its most glaring inequities.

II. THE PRINCIPAL PARTS OF THE LAW OF THE RIVER

A. The Colorado River Compact of 1922

The law of the River originated with the signing of the Colorado River Compact8 in 1922. The events which culminated in the Compact make for absorbing history,9 far too extensive to be fully elaborated here. But the broad outlines of the saga at least require mentioning. The annual threat of disastrous floods, dissatisfaction with Mexican control over their bi-national diversion system, and eagerness for a canal that would serve more land at high elevations led the residents of California's booming Imperial Valley to seek a new all-American canal and effective flood control works. The Reclamation Service, directed by Arthur Powell Davis (John Wesley Powell's nephew), regarded the Imperial Valley's agitation as an opportunity to advance its vision of a comprehensive development program for the Colorado, featuring an immense flood-control and storage dam on the lower river, probably at Black or Boulder Canyon, all under the paternal guidance of a growing federal agency. Davis convinced the Imperial Valley leadership of the advantages of his scheme in protecting their proposed new canal. Los Angeles also pressed for a high dam as a source of cheap hydroelectric power and as an aid in its endeavors to tap Colorado River water for municipal use.

With the partial exception of California (which had adopted a hybrid appropriation and riparian system) the appropriation doctrine prevailed in all of the Colorado Basin states. The upper states, particularly Colorado, were

alarmed by the potential effect of the Lower Basin's rapid agricultural and municipal development upon their water use, fearing they would be preempted by prior water rights perfected by California and Arizona. This anxiety was intensified by the Supreme Court's decision in Wyoming v. Colorado, 259 U.S. 419 (1922), which applied the doctrine of prior appropriation to apportion the right to use the water of the Laramie River between Wyoming and Colorado.

It was clear that because of their enormous cost the high dam and all-American canal project could only be undertaken by the Federal Government. It also became clear that due to opposition from the electrical power industry10 and misgivings in other quarters Congressional approval of the project would depend upon the support, or at least neutrality, of the other Basin states. These states, however, were determined to resist the project unless they received satisfactory assurances of their future use of the water of the River. Each camp was amenable to accommodation. In 1921 Congress authorized Federal participation in the negotiation of a Compact, see 42 Stat. 171 (1921), and each Basin state quickly appointed a commissioner. They convened in Washington in January, 1922, elected the United States representative, then Secretary of Commerce Herbert Hoover, as their chairman, and spent parts of the next eleven months in devising a compact.

The Compact divided the entire Colorado River system,

including all tributaries, into an Upper and a Lower Basin. The boundary between the two was set at Lee's Ferry,11 which was considered to be a natural dividing point between the tributaries of the Upper and of the Lower Basin states. At the heart of the Compact is the allocation scheme contained in Article III. Because of their pivotal significance to the subject of this paper, Paragraphs (a) through (d) of Article III are set forth in full:

> (a) There is hereby apportioned from the Colorado River System in perpetuity to the Upper Basin and to the Lower Basin respectively the exclusive beneficial consumptive use of 7,500,000 acre feet of water per annum, which shall include all water necessary for the supply of any rights which may now exist.
>
> (b) In addition to the apportionment in paragraph (a) the Lower Basin is hereby given the right to increase its beneficial consumptive use of such waters by one million acre per annum.
>
> (c) If, as a matter of international comity, the United States of America shall hereafter recognize in the United States or Mexico any right to the use of any waters of the Colorado River System, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b); and if such surplus shall prove insufficient for this purpose, then, the burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin, and whenever necessary the States of the Upper Division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d).
>
> (d) The states of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre feet for any period of ten consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification of this compact.

Although soon after the Compact was signed Wyoming's Compact Commissioner (and subsequently Governor) Frank Emerson congratulated himself and his colleagues upon achieving a "concise ... final form that would not be misinterpreted,"12 the Compact has generated many conflicts. Perhaps the most intractable current issue concerns the relationship between Paragraphs (a) and (d) of Article III. It is frequently presumed that Paragraph (d) allows the Lower Basin to exercise "the first call on the water up to a total of 7,500,000 acre-feet each 10 years,"13 as Herbert Hoover expressed the theory to Arizona's Congressman Hayden in 1923. In periods of short supply, though, such a demand would deny the Upper Basin the 7,500,000 acre-feet apportioned to it "in perpetuity," apparently contrary to the meaning of Paragraph (a).

B. The Boulder Canyon Project Act

Following three unsuccessful efforts in various sessions of Congress, the fourth heavily amended version of the "Swing-Johnson" bill14 was passed as the Boulder Canyon Project Act of 1928, 43 U.S.C. §617 (1976). The statute authorized the construction of the Hoover Dam (which was actually built in Black, not Boulder, Canyon) and of the all-American Canal between Laguna Dam (now Imperial Dam) on the Lower River and the Imperial and Coachella valleys. The Act required the Secretary of Interior to contract for the storage and delivery of water from Lake Mead and for the

delivery of electricity to all sorts of users. It also approved the 1922 Compact and provided that the operation of the Hoover Dam and other works authorized by the Act would be subject to the Compact's terms.

All of the Basin states except Arizona had ratified the Compact in 1923, although in the ensuing years some had qualified or rescinded their ratifications. The Compact had become a dominating political issue in Arizona.15 Populist Governor George Hunt fulminated against it with spectacular results. Arizonans were perturbed by the potential loss of tax revenues caused by the likely preemption of proposed private hydroelectric projects on the Colorado by a Federal plant. They were appalled to find themselves suddenly pitted almost alone against California for a share of Colorado River water without the assistance of the Upper Basin states. They were even more upset by the prospect of the Compact compelling them in the future to relinquish water from the Gila River to satisfy a Mexican treaty obligation16 or perhaps even to irrigate land in California. To Arizonans the Gila had become a sacred river and its use by others a desecration.

The Upper Basin states preferred seven-state ratification, but they had concluded that their interests would be reasonably secure if California were to ratify the Compact and also agree to a limit on its share of the Lower Basin's Article III(a) apportionment. Consequently the Act also

provided that before it became effective all seven states had to ratify the Compact, or that six states, including California, ratify and that California also enact legislation confining itself to no more than 4.4 m.a.f. (million acre--feet) of the 7.5 m.a.f. apportioned to the lower states by Article III(a), plus not more than half of the surplus water unapportioned by the Compact. It also pre-approved any compact which Arizona, California and Nevada might enter into apportioning 300,000 acre-feet of the Article III(a) water to Nevada, 2.8 m.a.f. to Arizona, and 4.4 m.a.f. or less to California, allowing Arizona exclusive beneficial use of the waters of the Gila, and exempting the Gila Arizona's tributaries from any obligation to supply water to Mexico under Article III(c) and requiring that the Mexican burden be fulfilled equally by California and Arizona from mainstream water.

C. The Mexican Treaty of 1944

On February 3, 1944, the United States and Mexico signed a "Treaty ... Relating To Waters of the Colorado and Tijuana Rivers and Of The Rio Grande," T.S. No. 994, 59 Stat. 1219 (1944). Mexico was thought to have been using about 1.8 m.a.f. as of 194417 (as opposed to about 820,000 acre-feet as of 1922)18 primarily to irrigate croplands in its fertile Mexicali Valley, which lies in the same basin as the Imperial Valley. Article X of the Treaty guaranteed an annual delivery of 1.5 m.a.f. of water to Mexico and an additional

amount up to a total of 1.7 m.a.f. if the United States enjoyed a surplus. In the event of extraordinary drought or serious accident to its irrigation system, the Treaty also allowed the United States to reduce the delivery below 1.5 m.a.f. in the same proportion as consumptive uses in the United States were reduced.

At the time all of the basin states, except California, viewed the Treaty with equanimity and supported its ratification by the Senate.19 Hindsight has been much less comforting. "In actual fact, the treaty has proven to be extremely vexatious to all states of the Colorado River Basin and probably will become the subject of protracted litigation. ..."20 There has been a natural tendency to second-guess its negotiators. One theory is that fear of a Japanese invasion of Mexico in 1941 and 1942 had panicked the Federal Government into granting extravagant water concessions in return for military collaboration.21 There is also considerable evidence that the United States traded away water on the Colorado to obtain extra benefits on the Rio Grande.22 However, in 1944, Jean Breitenstein, then attorney for the Colorado River Water Conservation Board, argued that the 1929 Pan American Arbitration Treaty would in any event compel the United States to enter into a similar kind of arrangement.23

D. The Upper Colorado River Basin Compact

The Upper Basin states, plus Arizona, signed the Upper Colorado River Basin Compact in 1948, Ch. 48, 63 Stat. 31

(1949). They were prompted by a 1946 Bureau of Reclamation survey which recommended major projects, primarily in the Upper Basin, and by the Secretary of Interior's announced reluctance to seek Congressional authorization of those projects until the Upper Basin states had reached an allocation of the water provided to them by the 1922 Compact.24

The Upper Colorado River Compact apportions to each Upper Basin state the following percentage of the Upper Basin's total consumptive use of River water per annum: Colorado, 51.75%; Utah, 23%; Wyoming, 14%; New Mexico, 11.25%. Arizona, whose northeast corner drains into the upper basin, was given a flat 50,000 acre-feet a year. "Consumptive use" was defined by Article VI as the man-made depletions of the virgin flow measured at Lee's Ferry. This definition, controverted by the Lower Basin, allows evaporation and channel losses that would have occurred without a state's diversions to be setoff against its depletions.25 Article IV of the Compact adjusts a state's apportionment in the event it has overdrawn in the prior ten years. Reservoir losses are apportioned to each state by Article V.

E. Colorado River Storage Project Act of 1956

Passed despite opposition from southern California,26 the Colorado River Storage Project Act of 1956, 43 U.S.C. §620 (1976), was one fruit of the Upper Colorado River Basin Compact. It authorized construction and operation of dams and powerplants at Glen Canyon, Flaming Gorge on the

Green, Curecanti (newly renamed Wayne Aspinall) on the Gunnison, and a dam at Navajo on the San Juan. In a compromise with conservationists, a proposal to build a dam at Echo Park on the Green was disapproved. The Act authorized the initial phase of the Central Utah Project. It established an Upper Colorado River Basin Fund to which operating revenues would be credited and provided a percentage formula to distribute surplus money in the Fund to each Upper Basin state.

F. Arizona v. California

Arizona grudgingly ratified the Compact in 1944 and then sought Congressional approval of the Central Arizona Project, which envisioned the diversion of 1.2 m.a.f. of mainstream water at Lake Havasu to be used in the Phoenix and Tucson areas. California stalled this enterprise by convincing Congress that Arizona's rights to the water it sought to divert were questionable. In 1952 Arizona brought a suit under the original jurisdiction of the Supreme Court to resolve those rights.27

Contrary to California's contentions, the Supreme Court rejected both the law of prior appropriation and the doctrine of equitable apportionment as the basis for a decision. Arizona v. California, 373 U.S. 546 (1963), held that by passing the Boulder Canyon Project Act Congress had created a means for a statutory apportionment of the mainstem water of the Colorado River among California, Arizona, and Nevada.

Section 4 of the Act, in the Court's opinion, allocated 2.8 m.a.f. of the 7.5 m.a.f. apportioned to the Lower Basin by Article III(a) of the Compact to Arizona, 4.4 m.a.f. to California, and 300,000 to Nevada, while allowing Arizona and Nevada the exclusive use of their tributaries. Half of the surplus water, if any, in the mainstream went to Arizona and half to California. In the event of a shortage of mainstream water, the Secretary of Interior was directed to equitably prorate the deficiency. The Federal Government was awarded reserved rights for its reserved lands in the Lower Basin, and five Indian reservation received about 1.0 m.a.f. of reserved rights water to be counted against the apportionment of the state in which each reservation is situated.

By excluding the tributaries from the allocation, the Court instantaneously vaporized most, if not all, of the "surplus" water above the Article III(a) 7.5 m.a.f. apportionment -- of which California would be entitled to a half share. The Court itself estimated that this particular determination cost California 1.0 m.a.f. and benefitted Arizona by the same amount. 373 U.S. at 567-68. The decision also shifted much more of the Lower Basin's Mexican Treaty obligation to California than otherwise would have occurred.

Arizona v. California has attracted extensive commentary, much of it critical.28 Besides vindicating Arizona,29 it expanded Federal control over interstate water rights at

the expense of state authority and diminished the potency of interstate compacts. Despite express disclaimers of any intent to affect issues between the Upper and Lower Basins, the decision's disregard of Arizona's and Nevada's tributaries in determining how to divide the waters of the "Colorado River System" has aggravated, if not generated, the current controversy over the Upper Basin's Mexican Treaty obligations30 (to be elaborated later in this paper). The Upper Basin is dismayed and the Lower Basin delighted by the notion that, if the Lower Basin's tributaries can be discounted so effortlessly by the Supreme Court for Lower Basin apportionment purposes, the Court might not with similar abandon overlook those same tributaries if it were called upon to decide whether there is "surplus" water under the provisions of Article III(c) of the Compact to be used to satisfy the Mexican Treaty burden. To the extent there is such a surplus, the Upper Basin's Treaty obligation is diminished.

Excluding the Lower Basin's tributaries below Lee's Ferry, the contributions from and allocations of Colorado River water to the Basin states look approximately as follows as a result of the 1922 Compact, the Upper Colorado River Basin Compact, and Arizona v. California:

	Contribution to Flow (per cent)	Apportionment31 of Water (per cent)
Arizona	1	20.7
California		30.6
Colorado	71	24.3

Nevada		2.1
New Mexico	1	5.5
Utah	15	10.8
Wyoming	11	6.6

G. Colorado River Basin Project Act

Arizona v. California led directly to the Colorado River Basin Project Act of 1968, 43 U.S.C. §1501 et seq. (1976). The day after the Supreme Court's decision was issued, Arizona's Senators submitted a bill to authorize the Central Arizona Project. The Colorado River Basin Project Act authorized the CAP at a projected cost of $1.395 billion, and it promised much more.

Congress recognized that the Colorado River system contained too little water to satisfy the Mexican Water Treaty burden and accommodate the growing needs of the Upper and Lower Basins. It concluded that "there can be no lasting solution to the water problems and disputes of the states of the Colorado River Basin without the addition of more water."32 The water of the River required augmentation by about 2.5 m.a.f., and without it, "One of America's fastest growing regions -- the Colorado River Basin -- is in danger of economic stagnation."33 Congress directed the Secretary of the Interior to investigate augmentation of the River, see 43 U.S.C. §1511, primarily by importation from other basins or desalinization. However, at the insistence of Senator Henry Jackson and other representatives of the Northwest, it suspended the examination of water importation possibilities until 1978 (and subsequently extended the suspension to 1988)

Ibid.

Congress also believed that the Mexican Water Treaty had conceded too much because of miscalculations by the American negotiators of the amount of water available, a Federal interest in exchanging Colorado River water for Rio Grande water, and a desire to improve military ties with Mexico and to coax it and other nations into joining and supporting the United Nations through leniency in the Treaty terms.34 Thus, the Act declares "that the satisfaction of the requirements of the Mexican Water Treaty from the Colorado River constitutes a national obligation." 43 U.S.C. §1512. Congress warned that, absent augmentation, "the unresolved issue ... of whether consumptive use of the water from the Gila River in Arizona ... should be counted when computing the amounts of water that may have to be supplied by the Basin States to fill deficiencies to Mexico"35 might well precipitate litigation. The Act declares that the seven Basin states would be relieved of the Mexican Treaty duty as soon as an augmentation plan for an additional 2.5 m.a.f. had been implemented. Ibid.

California recovered from the Congress much of what it had lost from the Supreme Court. The Act directs the Secretary of Interior to administer the CAP so that California never receives less than 4.4 m.a.f. 43 U.S.C. §1521(b) (1976). In effect, then, the Lower Basin's burden under the Mexican Treaty was shifted back to Arizona as the price of

approval of the CAP. To distribute the Federal benefits somewhat more evenly, the Act also authorized one project in Utah and the Animas-LaPlata, Dolores, Dallas Creek, West Divide and San Miguel projects in Colorado at a cost of $360 million. 43 U.S.C. §620 (1976). The Secretary was instructed to proceed "as nearly as practicable ... concurrently with the construction of the Central Arizona Project" and these five Upper Basin projects and to have them completed no later than the completion of the CAP. 43 U.S.C. §620a-1 (1976). Certain administrative concessions were also accorded to the Upper Basin by the Act. The Secretary was directed to calculate and report upon the beneficial uses of River water in each state, including the water of tributaries. 43 U.S.C. §1551(b). He was also required to devise criteria for the storage of water in Lake Powell so that the Upper Basin's Mexican Treaty and Article III(d) delivery obligations could be performed without impairment of its annual consumptive uses sanctioned by the Compact. 43 U.S.C. Section 1552(a)(3). The same provision of the Act mandates that the Secretary release from Lake Powell for certain purposes the water which is not required to be stored according to the criteria; but, except to avoid anticipated spills from Lake Powell, no such releases are to occur "when the active storage in Lake Powell is less than the active storage in Lake Mead." Id. 36

F. Colorado River Basin Salinity Control Act

The Colorado River Basin Salinity Control Act, 43 U.S.C. §1571 et seq. (1976) ("CRBSCA") was precipitated by Mexican protests over salt levels. By 1961 the salt level of Colorado River water reaching Mexico from the mainstream nearly doubled to 2,700 parts per million as a result of discharges of highly saline underground water pumped by the Wellton-Mohawk Irrigation and Drainage District in southern Arizona near the foot of the Gila.37 Mexico claimed this water was ruining its crops. Although the Mexican Water Treaty does not expressly address water quality, the United States began to ameliorate the problem by diluting the salt with greater amounts of fresh water released from storage and by channeling the Wellton-Mohawk discharges around the Mexican diversion point at the Morelos Dam. Interim agreements were entered into with Mexico and further remedial actions undertaken by the United States.38 Then in 1973 the nations signed Minute 242 of the International Boundary and Water Commission,39 which committed the United States to deliver water to Mexico from the mainstream containing on the average no more than 115 parts per million of salt more than the salt content of the water used by the Imperial Valley. That standard would generally limit the salt content of the Mexican water to about 1,000 parts per million.40 In order to implement this agreement Congress passed the CRBSCA.

The CRBSCA initially authorized four salinity control projects and has been amended to authorize numerous other

such projects, eight of which have been finished or are under construction.41 The largest is a desalinization plant near Yuma, Arizona, costing about $500 million and scheduled for completion in 1989.42 Most are located in the Upper Basin. The CRBSCA also sanctions an array of other methods to control salinity, including canal lining, projects to reduce the return flow of particularly saline irrigation water, and the circumvention or deflection of saline water from natural sources. These projects are to be financed by the Federal Government, but repaid in part from money in the Upper Colorado River Basin Fund and the Lower Colorado River Basin Development Fund (which was established by the Colorado River Basin Project Act). 43 U.S.C. §1595.

The Clean Water Act, 33 U.S.C. §1251 et seq. (1976), also pertains to salinity control in the Colorado Basin. It authorized the United States to fix effluent standards governing the amounts of pollutants that can be released from "point sources", such as conduits and ditches, and to control such discharges through a permit system. It also authorizes the United States to control the general water quality of streams, although that is a much more difficult endeavor to accomplish.

No Basinwide authority has been designated by Federal legislation to manage the effort to correct the Colorado River salinity problem. But in 1973 the Basin states organized the Colorado River Basin Salinity Control Forum.

In 1975 the Forum established Basinwide salinity standards and developed a plan of salinity control.43 The emphasis of the plan has been on the construction of the Federally--funded projects authorized by the CRBSCA. The Forum's approach has withstood a court challenge from the Environmental Defense Fund under the Clean Water Act and the National Environmental Policy Act, 42 U.S.C. §4321 et seq. (1976).44

The salinity problem is now perceived to threaten users throughout the entire Basin, although Upper Basin agricultural interests are probably in the least jeopardy.45 Irrigation, storage and often transbasin diversions increase salinity through the processes of salt loading and salt concentrating.46 While the salt content of the River appears to have stabilized for the time being, a long-range solution has yet to be achieved. Further increases in salinity levels could lead to restrictions of water use in both Basins.

III. UNINTENDED EFFECTS OF THE LAW OF THE RIVER UPON WATER USE IN THE UPPER AND LOWER BASINS

A. The Great and Growing Deficiency of Water

Unfortunately, the mathematics of the law of the River simply have not worked: the sum of the parts is greater than the whole. The Compact apportions in perpetuity to the Upper Basin 7.5 m.a.f. per annum; it apportions in perpetuity to the Lower Basin 7.5 m.a.f. per annum and allows it another 1.0 m.a.f. under Article III(b); and the Mexican Treaty assures Mexico another 1.5 m.a.f. for a total of 17.5 m.a.f.

Yet the average virgin flow of the River from 1922-1985 at Lee's Ferry, where the Upper Basin relinquishes water to the Lower, was only 14.3 m.a.f.47 For substantial periods of time during recent decades it has been less. From 1930 to 1985 the flow averaged 13.9 m.a.f. per annum,48 and from 1953 to 1964 it averaged only 11.6 m.a.f. per annum.49

The volume of water emptying into the Colorado River may decline still further in the future. Analyses by the Tree Ring Laboratory at the University of Arizona yielded an estimate that the average long-term flow of the River at Lee's Ferry was 13.5 m.a.f. per annum between 1564 and 1960.50 The lowest ten-year flow during those four centuries was 9.7 m.a.f. per annum between 1584 to 1593,51 and it is to be expected that at some point in the future the flow will again subside to that level or less. Indeed, the worst drought of which researchers are now aware occurred before 1564. Tree-ring studies completed in 1979 indicate that the driest period in the Colorado Basin was from 1130 to 1180 and was probably what drove the Anasazi off the Colorado plateau.52 Furthermore, the "greenhouse effect" may diminish River flows even below projections based on these historical studies. In 1983 a report by the Carbon Dioxide Assessment Committee of the National Academy of Science warned that increased levels of carbon dioxide in the atmosphere could reduce the water supply on the Upper Colorado by 39.6 percent and on the Lower Colorado by 56.5 percent.53

There may be other stresses on the usable supply of River water independent of future meteorological conditions. Salinity controls may at some point effect a reduction in the amount of available water. Saline water emitted by natural springs might be impounded.54 The Colorado Basin occupies the bed of a vanished ocean and is underlain by highly saline shale formations. Irrigation water percolating through the ground tends to leach those salts into the River. Moreover, evaporation from reservoirs serves to concentrate the salt in the remaining water.55 Limitations on irrigation and storage might conceivably be imposed to lower salt levels. Furthermore, the Mexican Treaty deprives the Basin states of water in excess of its stated minimum delivery requirement because of evaporation and channel losses which the United States must sustain. "... the actual burden on the American water supply occasioned by this guarantee is about 1.8 million."56

B. Restrictions On The Upper Basin

If the Compact is interpreted to require that the Upper Basin release 7.5 m.a.f. at Lee's Ferry pursuant to Article III(d), as well as another 750,000 acre-feet pursuant to Article III(c) to satisfy the Mexican Treaty, the Interior Department has calculated that only 5.8 m.a.f. of the Upper Basin's 7.5 m.a.f. Article III(a) apportionment would then be available for Upper Basin use.57 (This number will be regarded as ridiculously high when the 16th century dry cycle is repeated.) An engineering study undertaken by Tipton and

Kalmbach, Inc. at the request of the Upper Colorado River Commission produced a similar result. This analysis concluded that 6.3 m.a.f. of water per annum would remain for Upper Basin consumption if 7.5 m.a.f. were delivered on the average at Lee's Ferry and if no additional water was required at Lee's Ferry to serve the Mexican Treaty.58 However, if the latter assumption were reversed to conform to the Interior Department's outlook, then only 5.55 m.a.f. of water would remain for the Upper Basin. On the basis of the Interior Department's 5.8 m.a.f. prediction, which may be overly optimistic, New Mexico would receive 647,000 acre-feet, instead of its full entitlement of 838,000,59 of the 7.5 m.a.f. Article III(a) Upper Basin apportionment, Colorado would receive 2,976,000 acre-feet instead of 3,855,000,60 and Utah would receive 1,328,000 acre-feet instead of 1,713,500.61 Utah, for one, has apparently already resigned itself to a life permanently within the confines of its shrunken apportionment.62

The Upper Basin has not to date, however, experienced immediate hardships from this limit for the reason that it has yet to try to exploit its full 7.5 m.a.f. apportionment. Development of water uses in the Upper Basin has been "unexpectedly slow." Environmental Defense Fund v. Costle, 657 F.2d 275, 293 (D.C. Cir. 1981). The Bureau of Reclamation estimated Upper Basin consumptive uses in 1981 at 3.840 m.a.f., including 686,000 acre-feet evaporative losses, and

713,000 acre-feet of transbasin diversions in Colorado, New Mexico and Utah.63

However, the projected Upper Basin limits may have already created somewhat subtle repercussions and they are virtually certain to produce direct constraints in the future. As the Westwide Study Report on Critical Water Problems Facing the Eleven Western States cautioned:

> Although the water supply of the river is adequate to meet quantitative needs today and in the years immediately ahead, this does not mean that there are no current problems related to water shortage. To the contrary there are and they are severe. If the Upper Basin States are to develop their resources at a rate commensurate with their expressed aspirations it is a certainty that shortages will develop within a time frame that directly affects decisions which need to be made today. Most resource development undertakings, be they for agriculture, industry, or other purposes, require an assured water supply for at least 40 years to justify making initial investments. The fact that there is no actual shortage of water today nor will there be on in the immediate future is of little comfort to those interest whose future depends upon an assured water supply for the next 40-50 years.64

The Interior Department's Report on Water for Energy in the Upper Colorado River Basin projected that before the year 2000 a 5.8 m.a.f. per annum limit would curtail some Upper Basin water uses.65 That study assumed a level of water use by the energy industry which will apparently not be realized. But the Westwide Study, based on varying sets of assumptions about the intensity of water use, also concluded that the Upper Basin would face restrictions by the year 2000.66 A Bureau of Reclamation probability analysis has

suggested that constraints on Upper Basin water use may be postponed somewhat -- but only until about 2010.67

The Lower Basin currently consumes far more water than the Upper. In 1981 it used about 9.536 m.a.f. from the mainstream of the Colorado River.68 883,000 acre-feet of that was diverted by the Metropolitan Water District of Southern California. Inclusion of the consumptive use of water from Lower Basin tributaries would probably add 2.0 to 4.5 m.a.f. to the total. The gaping disparity between the two Basin's consumption is no doubt caused primarily by the Lower Basin's larger population, greater aridity, warmer climate, and higher demands for water for agricultural, municipal, and industrial purposes.

To some degree, though, it has probably also been caused by the unevenness of Federal development of storage and diversion projects on the lower and upper parts of the River.

> Hoover Dam became the foundation for tremendous economic growth in California by regulating destructive floods, storing irrigation water for fertile desert lands, and supporting the expanding population of southern California with water and cheap electric power.69

With the arrival of the CAP at Phoenix, the lower River has practically reached a state of full development. The Upper Basin has not been so highly favored. Only nine of the 21 projects authorized by the Colorado River Storage Project Act, as amended, have been completed.70 Development of Colorado and Wyoming has lagged particularly. It has been especially disheartening for Coloradans to observe water

from the multi-billion dollar CAP begin to pour into the Phoenix area, ultimately to fill its swimming pools and wash its cars,71 at a time when only two, Dolores and Dallas Creek, of the five projects, authorized as a quid pro quo by the Colorado River Basin Project Act are nearing completion, two, San Miguel and West Divide, have been suppressed, and the fifth, Animas-LaPlata, may be the sole survivor under the Reagan Administration's demand for cost-sharing strategies.72

Opposition from Lower Basin interests may also have widened this disparity. Southern Californians waged a campaign against both the Colorado River Storage Project Act and the Fryingpan-Arkansas Project authorization act73 that impeded their advance through Congress. Uncertainty about the amount of the Upper Basin's apportionment may also contribute to the problem. It may take 25 or more years to complete a water project.74 Development cannot actually begin until the necessary water rights have been obtained. Doubt about the sufficiency of the existing water supply deters progress. For instance, New Mexico's San Juan-Chama project, See 43 U.S.C. §620 (1976), suffered considerable delays while the Bureau of Reclamation determined whether enough water from New Mexico's share of the Upper Basin's apportionment remained to operate the project.75

The future will force restrictions on the Lower Basin, too. Now that the CAP is functioning California already must scale back its delivery contracts with the Secretary of

Interior from their former level of 5,362,000 acre-feet per annum.76 When Upper Basin consumption approximates 5.8 m.a.f., the Lower Basin will receive no more than 8.25 m.a.f. at Lee's Ferry and will be compelled to adjust its use.

But unlike the Upper Basin, the shortage of Colorado River system water does not now threaten to reduce the Lower Basin's use below its Article III(a) and (b) apportionment. According to the current compact orthodoxy,77 the burden of deficiencies is to be borne by the Upper Basin -- although the Lower Basin must tighten its belt, it still retains its apportioned amounts. Indeed, if the Upper Basin is required to provide half of the Mexican Treaty burden at Lee's Ferry, the Lower Basin would continue to avail itself of most of the water of its tributaries, thereby enjoying the use of substantial amounts of water in excess of the 8.5 m.a.f. apportionment. In contrast, the Upper Basin appears to be relegated to accepting "leftovers."

Such inequity was not intended by the 1922 Compact. The principal purposes of the Compact were (1) to allocate the water of the entire Colorado River system equally, with the exception of a 1.0 m.a.f. extra allowance for the Lower Basin to compensate for its tributaries, and (2) to assure each Basin the opportunity to develop its water uses up to the limits of its apportionment without interference from development in the other Basin. The current presupposition

that the Upper Basin should be subordinated to the needs of the Lower violates the principles upon which the law of the River was founded.

D. Faint Hopes For a Resolution

Of course, this, and virtually all the other problems of the Colorado River could be solved by just adding more water. Congress clearly recognized this panacea when it passed the Colorado River Basin Project Act. House Report No. 1312 declared, "The answer to the Colorado River controversy is not to try to divide shortages but to provide additional water."78 The Act called for 2.5 m.a.f. more water and authorized work toward the development of an augmentation plan. In a decade during which the United States asked for, and got, the moon, diverting 2.5 m.a.f. of water from the Columbia River to the Colorado River probably seemed like a small matter. But in the ensuing years harsher economic and political realities have beset this enterprise. Investigations into water importation plans were suspended at first until 1978, and then until 1988. See 43 U.S.C. §1511 (1982) (as amended by the Reclamation Safety of Dams Act, Pub. L. No. 95-578, §10, 92 Stat. 2471 (1978)). It is now unlikely that importation plans will be developed, let alone implemented, in the forseeable future.79 Desalinization of sea water is considered prohibitively expensive with current technology.80 It has been estimated that weather modification programs could increase the water of the Basin by .9

m.a.f. to 1.3 m.a.f.,81 but those efforts remain experimental, if not ephemeral.

Water storage projects do not increase the amount of water, but they do ameliorate shortages by allowing users to manage the existing supply to obtain maximum benefits. However, since 1977 when President Carter withdrew Federal funding for eight major water projects, Federal support for storage projects has receded.82 The available Federal funding has been concentrated on salinity control projects, part of which is paid for out of the Lower Colorado River Basin Development Fund and the Upper Colorado River Basin Fund.

The Colorado River water deficiency might be alleviated to some degree by more skillful management and conservation of water.83 It might also be relieved by cooperative efforts among the Basin states. The Colorado River Basin Salinity Control Forum has managed admirably to deal with the salinity problem without aggravating inter-state conflicts.84 But the states have succeeded here largely because it has been painless for them to unite in support of a program that is centered on increased Federal aid. Federal aid to remedy the deficiency in the amount of River water has already been promised, but not materialized. The impact of the 2.5 m.a.f. deficiency may have to be adjusted by appeal to an established forum external to the seven Basin states.

E. Fundamental Issues

The deficiency of water in the Colorado River has generated two fundamental issues concerning the application of the 1922 Compact:

1. Should the Upper Basin forgo, as Lower Basin observers presume it must, a portion of its Article III(a) allocation in order to deliver to the Lower Basin 75 m.a.f. every ten years under Article III(d); and

2. How should the burden of fulfilling the Mexican Treaty obligation be distributed between the two Basins.

The latter issue, sometimes referred to as the "Gila River Problem", was summarized in a 1979 report to the Congress by the Comptroller General:

> A major dispute exists between the Upper and Lower Basins over supplying the 1.5 m.a.f. commitment to Mexico. The Colorado River Compact states that any required delivery of water to Mexico shall be supplied first from water surplus to the basic apportionment from the Colorado River system (7.5 m.a.f. to the Upper Basin, 8.5 m.a.f. to the Lower Basin) and if the surplus is insufficient, the burden of such deficiency shall be borne equally by the two basins.
>
> The Lower Basin States contend that there is no surplus and the Upper Basin's share of the Mexican treaty delivery obligation is therefore one-half of the total obligation of 1.5 m.a.f. plus one-half of the losses incurred in delivering the water from Lee Ferry to the Mexican border. The Upper Basin states believe that surplus water exists in the Lower Basin and therefore they are not required to release any water to meet the Mexican treaty obligation.85

IV. POSSIBLE AVENUES OF RELIEF FROM UNINTENDED RESTRICTIONS

A. Resolution of the Controversy Under Article VI of

the 1922 Compact

The Upper States could seek relief from the unintended restrictions of the law of the river through a mechanism provided by the 1922 Compact itself. Article VI states that:

> Should any claim or controversy arise between any two or more of the Signatory States ... (b) over the meaning or performance of the terms of this compact; [or] (c) as to the allocation of the burdens incident to the performance of any article of this compact or the delivery of waters as herein provided ... the Governors of the States affected, upon the request of one of them, shall forthwith appoint Commissioners with power to consider and adjust such claim or controversy, subject to ratification by the Legislatures of the States so affected.

Unfortunately, though, this provision would seem not to materially enhance the present prospects for a resolution of the fundamental issues. Each state is given two opportunities to prevent a settlement. Either its commissioner can refuse initially to accept an agreement, or its legislature can withhold ratification. There is simply not now any incentive for the Lower states to deprive themselves voluntarily of a substantial portion of their Compact water in order to ease the plight of their northern neighbors.

B. Federal Legislation Modifying the 1922 Compact

Congress probably possess the power under the Commerce Clause of the Constitution to modify an interstate compact by statute. By ratifying a compact Congress transforms it into Federal statutory law. See Intake Water Co. v. Yellowstone River Compact Comm., 590 F.Supp. 293 (D. Mont. 1983), and Congress, of course, is at liberty to

amend such law. This authority was asserted by Frankfurter and Landis in their celebrated examination of interstate compacts: "If and when circumstances which now call for a solution through compact change, Congress is wholly free to assume control." Frankfurter and Landis, The Compact Clause of the Constitution -- A Study in Interstate Adjustments, 34 Yale L.J. 685, 727 (1925). It was initially recognized by the courts in Pennsylvania v. Wheeling & Belmont Bridge, 59 U.S. (18 How.) 421 (1856), where Congressional authorization of a bridge over the Ohio River was challenged as inconsistent with an interstate compact providing that the river remain free and open to navigation. The Supreme Court sustained the power of Congress to legislate inconsistently with, and thus override, and interstate compact:

> The question here is, whether or not the Compact can operate as a restriction upon the power of Congress under the Constitution to regulate commerce among the several states. Clearly not. Otherwise Congress and two states would possess the power to modify and alter the Constitution itself.

59 U.S. at 433

Congress' power was confirmed in the first suit by Arizona following the six-state ratification of the Colorado River Compact, Arizona v. California, 283 U.S. 423 (1931). In seeking to enjoin construction of the Boulder Canyon Project, Arizona argued that Section 6 of the Act, 34 U.S.C. §617e, which specifies that the authorized dam and reservoir should be used "First, for river regulation, improvement of navigation, and flood control ..." conflicted

with Article IV(a) of the Compact, which subordinates navigational use of the River to domestic, agricultural, and power purposes and which also asserts that the River "has ceased to be navigable." Despite severability language in Article IV of the Compact inviting Congress to withhold its consent to that particular subordination provision without upsetting the entire Compact, Congress approved the entire Compact without reservation. 43 U.S.C. §617.1. Moreover, Section 8 of the Act, 43 U.S.C. §617g, subjects the operation of the dam and reservoir to the provisions of the Compact. In the face of this discrepancy, the Court declared that "the specific statement of primary purpose in the Act governs the general references to the Compact," 283 U.S. at 456, and held that the legislation was valid, even though it was based on a factual premise which the Compact contradicted and was at odds with a Compact directive to which it had declared itself subject. Recently, the power of Congress to legislate with respect to interstate water was broadened by Sporhase v. Nebraska ex rel. Douglas, 458 U.S. 941 (1982).

A slight question about Congress' general authority to adjust interstate compacts unilaterally may linger as a legacy of Poole v. Fleeger, 36 U.S. (11 Pet.) 185 (1837), which held that the Compact Clause is a limit upon the states inherent power to Compact, rather than a grant of power to do so. Consequently, it may be argued that once having given its consent to an interstate compact, Congress is powerless

to revoke the consent or modify the compact. There might also be a more particularized objection to the power of Congress to alter a compact by merely reallocating the rights which the compact has provided to particular states without at the same time making basic changes to the underlying arrangement. Absent extraordinary circumstances, such as a severe and chronic drought in the Upper Basin, or an urgent national need for a crash program to develop Upper Basin energy resources, the Federal interest in simply taking away water from one state and giving it to another may be difficult to justify. Moreover, to the extent that such a transaction would impair the water rights of individual residents of a particular state, it may be a "taking" compensible under the Fifth Amendment of the Constitution.

Nonetheless, the long-standing and detailed Federal involvement in the negotiation of the Colorado River Compact, in the construction and operation of the vast system of dams and diversion works on the River, and in the management and delivery of the water of the River may peculiarly qualify Congress to intervene in the delicate matter of the Compact's scheme for apportioning water between the Basins. This Federal intimacy in the affairs of the River clearly influenced the Supreme Court in deciding in the fourth Arizona v. California, 373 U.S. 546 (1963), that Congress had apportioned the River water among the Lower Basin states by passing the Boulder Canyon Project Act. See 373 U.S. at

551-52.

Although Congress probably has the power to modify the Compact, it is more doubtful whether it has the inclination to do so. In a contest of political might between the Upper Basin states and California, Nevada, and Arizona, the latter must always be expected to prevail. Unless extraordinary circumstances arise, Congress is very unlikely to legislate an adjustment to the Compact.

C. Litigation in the United States Supreme Court

The Upper Basin's brightest hopes of achieving a proper interpretation of the 1922 Compact may lie in a suit under the original jurisdiction of the Supreme Court. See U.S. Const., Art. II, §2. Such a suit, though, would not be free from perils. The Supreme Court might simply decline to exercise jurisdiction. The United States might be deemed an indispensible party, and its consent to be sued would be necessary for the action to survive. See e.g. the third Arizona v. California, 298 U.S. 558 (1936). The Supreme Court also implied that it would have dismissed the third Arizona v. California on the ground that it did not present a justifiable controversy. See 298 U.S. at 565-67. The Court reasoned that Arizona, which sought an equitable apportionment, had not suffered present harm because the Colorado River water available to it exceeded its present water rights and claims. Ibid. In Kansas v. Colorado, 206 U.S. 46

(1907), the Court held that Kansas had not been sufficiently damaged by Colorado's depletion of the water of the Arkansas River to justify apportioning it. Although a suit by the Upper Basin would not depend on the doctrine on equitable apportionment, it might nonetheless founder on similar grounds related to the degree of harm.

If the suit did escape a dismissal, it would probably be slow and expensive to litigate, as is notoriously true of original jurisdiction actions. More importantly, the Lower Basin would not stand idly by. The doctrine of equitable apportionment is riddled with vague, overlapping standards.86 The two opinions in Colorado v. New Mexico, 459 U.S. 176 (1982) and 466 U.S. 310 (1984) contributed fresh ambiguities to the doctrine, but probably it is still fair to say there is still some life in the maxim, "Priority of appropriation is the guiding principle." Nebraska v. Wyoming, 325 U.S. 589, 618 (1945). If it were interjected in some fashion into the suit, the Lower Basin might manage to obtain a decree which would protect its existing level of use and demand and cast the Upper Basin into an irreversibly inferior position. The terror of original jurisdiction litigation is its unpredictability.

V. LEGAL THEORIES POTENTIALLY PROVIDING RELIEF TO THE UPPER BASIN.

A. The Requirement of Article III(d) of the Compact That the Upper Basin Not Deplete the River Below an Aggregate of 75 m.a.f. For Any Ten Year Period

Are there legal theories sufficient to support an action to relieve, at least in part, the Upper Basin from an obligation of Article III(d) not to deplete the flow of the River below 75 m.a.f. at Lee's Ferry for any ten year period? At least three principal theories warrant consideration -- establishment of the equality of the 1922 apportionment, rescission or reformation of the Compact under principles of contract law, and construction of the Boulder Canyon Project Act as a statutory apportionment of water between the Upper and Lower Basins.

1. Construe the Compact according to its plain language and intent.

Article III might simply be construed to subordinate the Paragraph (d) non-depletion duty to the paramount equal 7.5 m.a.f. per annum apportionment as between the two basins provided by Paragraph (a). A ratified compact is a statute, see Intake Water Co. v. Yellowstone River Compact Comm., supra, and the initial guide to the meaning of a statute is its own language. See March v. United States, 506 F.2d 1306, 1313 (D.C. Cir. 1974). The very first paragraph of Article III apportions "in perpetuity" to the Upper Basin, as well as the Lower, "the exclusive beneficial consumptive use of 7,500,000 acre feet of water per annum." By stating this right so prominently and emphatically, Article III seems to accord it primacy over all subsequent provisions, including Paragraph (d). Moreover, for reasons of history described

below, one can fairly say that Paragraph (d) was drafted as a means to implement administration of the equal division.

2. Rescission of the Compact.

In West Virginia ex rel. Dyer v. Sims, 341 U.S. 22, ___ (1951), Justice Frankfurter, writing for the Court, observed, "a Compact is after all a legal document." See also Green v. Biddle, 21 U.S. (8 Wheat) 1 (1823); Trans World Airlines, Inc. v. Franklin Mint Corp., 466 U.S. 243, 253 (1984). "Interstate compacts are not only statutes; they are also contracts. This means that the substantive law of contracts is applicable to them." F. Zimmerman & M. Wendell, The Law and Use of Interstate Compacts 2 (1961).

Contracts may be rescinded and also reformed on the basis of a mutual mistake of fact, although each remedy depends upon a somewhat different kind of mistake.

> When a mistake of both parties at the time a contract was made as to a basic assumption on which the contract was made has a material effect on the agreed exchange of performances, the contract is voidable by the adversely affected party unless he bears the risk of the mistake under the rule state in §154. ...

RESTATEMENT (SECOND) OF CONTRACTS §152. "A mistake is a belief which is not in accord with the facts." RESTATEMENT (SECOND) §151.

a. Mistake of Fact

The amount of water in the Colorado River was obviously a basic assumption on which the Compact was made, and there is little doubt that the states and the Federal Government

were mistaken about it at the time their Commissioners signed the Compact and also when they ratified it.

Indeed, this mistake of fact was so phenomenal as to appear more like a trick of fate. The dendrohydrograph of the Tree Ring Laboratory at the University of Arizona reveals that the years from 1905 to 1931 constitute the wettest prolonged period experienced by the Colorado River Basin between 1564 and 1960.87 Furthermore, the average flow of the River peaked in 1922.88 The principal concern of the Compact negotiators was flood. Arthur Powell Davis cautioned this group:

> Flood conditions in the Imperial Valley are exceedingly acute. ... If large storage within the next few years is not provided at the Boulder Canyon the results will be disastrous.89

A few months later Wyoming's Commissioner Frank Emerson commented upon this menace from a rather different perspective:

> Wyoming and the other Upper States are in a strategic position today that we will never have again. Once means is provided for the construction of a great control reservoir on the lower Colorado the need for support from the Upper States will be largely gone; once the Colorado River bursts through the man-made levees that stand between it and the great Imperial Valley, as it may do any day, public sentiment will force a bill through Congress providing for relief.90

The Compact Commissioners devoted substantial attention to the question of how much water flowed in the River system. The U.S.G.S. had maintained a measuring station since 1902 at Yuma, downstream from all the tributaries.

This data showed the average actual flow to be 17.3 m.a.f.91 Estimates of net depletions above Yuma varied from 3,294,450 acre-feet to 3,782,500 acre-feet,92 and, when added to the actual measurements, they yielded a virgin flow of 20.06 m.a.f. to 21.08 m.a.f. The Commissioners also estimated the actual flow of the River at Lee's Ferry at 16.4 to 17.0 m.a.f.93 They estimated Upper Basin depletions at 2,180,750 to 2,500,000 m.a.f.94 Thus, the virgin flow of the River at Lee's Ferry was calculated to be from 18.6 to 19.5 m.a.f. per annum.

Subsequent statements by the Commissioners after the signing of the Compact repeated these or similar figures.95 Thus, on January 27, 1923, Herbert Hoover wrote Congressman Carl Hayden of Arizona that there would be 4.0 to 6.0 m.a.f. in the Colorado River after both Basins had used their full apportionment of 16.0 m.a.f.96 In 1925 Arizona's Compact Commissioner W.S. Norviel testified before a Senate committee that the virgin flow of the River averaged 20 m.a.f.97

Other witnesses before Congress presented similar data.98 Also, the "Weymouth Report,"99 completed by the Interior Department and submitted to Congress in 1924, determined the total water supply to be 19.7 m.a.f. per annum, which figure also accounted for evaporative losses on the mainstream and the Gila.100 However, in 1928 another official report to Congress, the "Sibert Report,"101 cast

this and prior figures in doubt. The Sibert Report announced that the gauging methods at Yuma had been defective.102 It calculated that the actual average annual flow at Black Canyon had been 12,250,000 acre-feet, and, after adding estimated Upper Basin depletions of 2,275,000 acre-feet, projected the virgin flow at Lee's Ferry at 15 m.a.f.103 The Sibert Report did not account for the inflow of tributaries between Black Canyon and Lee's Ferry. More importantly, it cautioned that it had taken particular care to make its "estimates conservative and safe."104 In any event, Congress was not at all deterred by the estimate, which though significantly reduced from previous figures, nonetheless still equalled the apportionments set forth in Article III(a) of the Compact.

b. Bearing the Risk of Mistake

The more challenging question is not whether a mistake occurred, but whether the Upper Basin bore the risk of the mistake.

> A party bears the risk of a mistake when
>
> (a) the risk is allocated to him by agreement of the parties, or
>
> (b) he is aware, at the time the contract is made, that he has only limited knowledge with respect to the facts to which the mistake relates but treats his limited knowledge as sufficient, or
>
> (c) the risk is allocated to him by the court on the ground that it is reasonable in the circumstances to do so.

RESTATEMENT (SECOND) OF CONTRACTS §154

Although the evidence is not completely uniform105, it appears that on balance the Upper Basin should not bear the risk according to Section 154's criteria. Subsequent oral testimony is inadmissible, but "recourse may be had to the negotiations, preparatory works, and diplomatic correspondence of the contracting parties" to establish the meaning of an ambiguous compact, Arizona v. California, 292 U.S. 341, 359-60 (1934). See also Air France v. Saks, ___ U.S. ___, 105 S. Ct. 1338, 1341 (1985). In order to appreciate this conclusion as to the burden of risk, it is necessary to examine the official Record of the Compact negotiations in some detail.

Twenty-seven negotiating sessions occurred. The first seven were conducted in Washington in January, 1922. The Commissioners reached an impasse and decided to try to compose their differences by taking to the road. Hearings were held in each of the seven Basin states, and after further delays the Commission re-convened at Bishop's Lodge near Santa Fe on November 9. The Lodge's bridal suite was selected as the space for the negotiations, although the ensuing activities therein little resembled a honeymoon only in the coarsest sense. It is probably fairer to say that the negotiations assumed the characteristics of the River itself: swift and direct at points; tortuous and meandering at others; often turbulent, dangerous and unpredictable. The Compact was nonetheless signed on November 24.

In the early phases of the negotiations half a dozen or so basic concepts were advanced and rejected. Perhaps the most serious, presented by New Mexico Commissioner Stephen Davis and heartily endorsed by Arizona's Norviel, was that each state be guaranteed water sufficient to irrigate a certain number of acres, with a mechanism for possible increases at a later point.106 However, the negotiations were soon dominated by a proposal presented by Colorado Commissioner Delph Carpenter107 on November 11. His concept was that the River Basin be divided into two parts108, that the boundary between them be set at Lee's Ferry, and that the entire flow of the River system be divided up between the two divisions. By working upstream from the Yuma measurements, by allowing the Lower Basin the full use of its tributaries, and by neglecting to account for Upper Basin depletions, he reckoned that in order to provide the Lower Basin with one half of all the water in the system the Upper Basin should deliver to it 36 percent of the flow at Lee's Ferry. According to Carpenter's calculations, this translated into a delivery of 6,240,000 acre-feet per annum.109

The negotiations on this subject evolved into a contest essentially between Norviel, on the one hand, and the Upper Basin Commissioners, on the other. Norviel pressed for an allocation based on the total irrigable acreage in each Basin, then grudgingly agreed to the proposition of dividing all the water in the River between the two Basins on a

percentage basis, then on November 14 tried to integrate the two concepts by proposing that the Lower Basin receive an amount at Lee's Ferry equivalent to 65 percent of the virgin flow there, which he justified on the basis of his projections of irrigable acreage in each Basin.110

The Upper Basin demurred to this proposition. Hoover urged and obtained a general consensus that the actual flow at Lee's Ferry averaged 16.4 to 17 m.a.f. per annum.111 He then suggested that the Upper Basin agree to deliver half of the lower figure each ten years -- 82 m.a.f.112

The Upper Basin caucused that evening and the next morning offered to guarantee a delivery of 65 m.a.f. every ten years at Lee's Ferry.113 Stephen Davis presented the Upper Basin's position and defended the offer's modest amount on the grounds that the Upper Basin needed

> a sufficient margin of safety in the figures adopted so that there is reason to believe that the guaranty can be complied with. None of us want to sign a guaranty with the feeling that sometime it would be violated, and I presume none of the southern states want such a guaranty.114

He also explained that the "total flow of the river for the first ten years for which we have measurements amounted to about one hundred and fifty-five million"115 and that the 82 m.a.f. suggested by Hoover, being more than half of that, was unacceptable. The figures to which he referred appeared to be derived from data supplied by the Reclamation Bureau starting in 1899 and using Laguna as the measuring point.116 Curiously enough, they were not set forth in the Record of

the negotiations and they deviated somewhat from the USGS data on which the Commissioners had relied up to that point.

Norviel protested that this proposition would allow over 10 m.a.f. per annum to the Upper Basin and only 6.5 m.a.f. to the Lower, while "our needs are practically even."117 He additionally retorted, "I don't want to put the upper states in the position of guaranteeing anything at all."118 Davis replied, "we don't like the idea of a guaranty any better than you do,"119 but that it seemed inescapable. Norviel then requested 82 m.a.f. every ten years at Lee's Ferry. Hoover provided some support to Norviel's stand by remarking that the Upper Basin's offer was insufficient to cover the Lower Basin's needs, which he estimated at almost 7.5 m.a.f. per annum, including 1.75 m.a.f. for its portion of a Mexican Treaty duty.120 Hoover then astutely identified the essential dilemma confronting the negotiations. "The primary difficulty," he said, "is whether the northern states would be secure in guaranteeing enough to cover the needs of the southern states."121

Norviel proposed that the dilemma be resolved by annually splitting the virgin flow of the River at Lee's Ferry evenly between the two Basins. However, this suggestion, which would have prevented the Upper Basin's current quandary, was quickly abandoned. A consensus emerged that it was simply infeasible because it "would be very difficult, impossible practically" to calculate the virgin flow at the

appropriate time each year.122

Both Basins caucused and conferred with Hoover on the afternoon and evening of November 15. On the morning of November 16 Hoover proceeded to present to the Commissioners a memorandum containing "a series of rough principles upon which we felt we had secured agreement and which should comprise the basis of the compact."123 Although subsequently modified and refined, this document did in fact embody the essence of the final Compact. Paragraphs 5 through 8 of the November 16 draft closely resembled Paragraphs (a) and (c) through (g) of Article III of the Compact. Paragraph 5 of the draft stated in part that "appropriations may be made in either division with equality of right as between them, up to a total of 7,500,000 acre-feet per annum, for each division."124

This approach solved the conundrum inherent in the guaranty scheme by abandoning the attempt to allocate the entire flow of the River. Hoover summarized the new idea:

> In our discussions yesterday we got away from the point of view of a fifty-fifty division of the water. We set up an entirely new hypothesis. That was that we make, in effect, a preliminary division pending the revision of this compact. The seven and a half million annual flow of rights are credited to the South, and seven and half million will be credited to the North, and at some future day a revision of the distribution of the remaining water will be made or determined.
>
> An increasing amount of water to one division will carry automatically an increase in the rights of the other basin and therefore it seemed to me that we had met the situation. This is a different conception from the fifty-fifty division we were

considering in our prior discussions.125

The question remains, though, whether the parties believed that the Upper Basin had been allocated the risk of shortages of water by committing in Article III(d) not to deplete the flow of the River below 75 m.a.f. Probably not. It is significant that after November 15 the word "guaranty" effectively disappeared from the Record of the negotiations. The paramount principle became that, with the exception of the 1.0 m.a.f. extra allowance to the Lower Basin, each Basin would be assured an equal and sufficient amount of water, which aggregated less than the perceived total flow of the River.

More importantly, both Basins believed that a surfeit of water did and would exist so as to obviate any need to allocate a risk. Norviel groused that the 75 m.a.f. obligation was "too low" because it was "less than half of the lowest amount that ever existed."126 Emerson soon after declared to the Wyoming legislature:

> This is an agreement that can surely be performed. Over 18,500,000 acre-feet of water is contributed annually to the river by the Upper Basin, and all of this amount could be once diverted and the return flow would still be sufficient to supply the specified delivery at Lee's Ferry.127

Similarly Utah's Commissioner R.E. Caldwell reported to his state:

> It will be impossible under any conceivable circumstances for the Upper States to prevent 75,000,000 acre-feet going past Lee's ferry in any given ten-year period.

> Should the Upper States divert 180,000,000 acre-feet of water onto the uplands during any ten-year period, there would still be 90,000,000 acre-feet pass out of the return flow to the river.128

Richard Sloan, the legal advisor to Arizona's Colorado River Commission, wrote during this period:

> The Compact is based upon two major assumptions ... second, that there is sufficient water in the river if conserved to meet all the demands for agricultural and business use, both in the upper and the lower basins, and in addition to meet all the probable demands of the southwest. That there is sufficient water for such purposes is no mere assumption, as may be shown upon a study of the river and of various estimates made by the reclamation service and by state engineers. ...129

Davis' earlier claim that the Upper Basin could not safely commit to delivering more than 65 m.a.f. every ten years was probably a bargaining tactic. The measurements he cited were not thoroughly considered during the Compact negotiations, and 75 m.a.f. was less than half of his low flow data in any event. The USGS measurements at Yuma, which the Commissioners did consider at length, indicated a flow of 163 m.a.f. during the lowest 10 years, and that figure excluded consumption of water of at least 5.0 m.a.f. per annum.

The most obvious expression of the Commissioners' confidence in the abundant flow of the River is Article III of the Compact itself. Paragraphs (f) and (g) provide a fairly detailed procedure for the "Further equitable apportionment of the beneficial uses of the waters of the Colorado River System unapportioned by paragraphs (a), (b), and (c)." Furthermore, Article I, to which the Commissioners attached

considerable importance as a statement of purpose,130 declares in pertinent part:

> To these ends the Colorado River Basin is divided into two Basins, and an apportionment of the use of part of the Colorado River System is made to each of them with the provision that further equitable apportionments may be made.

In assessing whether the northern States assumed the risk of mistake, the standard of Section 154(b) of the RESTATEMENT must still be applied. Was the Upper Basin aware of the insufficiency of the stream flow data, but treated it as sufficient nontheless? Again the record is not totally consistent, but on balance, as the statement of Arizona's advisor Sloan implies, both Basins appeared to believe that the available data was complete enough to provide a rational basis for a 10 year delivery commitment. In this respect Carpenter said,

> It was my thought that the twenty-year record that we had will not be improved by more records at this point. And the hydrographers and experts advise me that a twenty-year record on a river is adequate in its completeness and includes enough years to warrant an assumption that the average there deduced would be the average flow of the river in the future.131

Perhaps the clearest indication of this trust in the completeness in the data occurred in the course of a discussion over an annual minimum delivery obligation, which Norviel sought for a time and then dropped. In arguing for a very low figure, Carpenter noted:

> I think I am correct in saying that, when we come to consider the extreme minimum, a 20 year period is not indicative of that one year minimum. We

> have heard engineers says that it takes a 50 year record to reveal a safe extreme minimum, or likewise a safe extreme maximum, but that for general calculation of averages a 20 year record was safe.132

c. Value of Remedy

But, assuming that the Upper Basin could satisfy the elements of an action for rescission, is it an attractive remedy for the Upper states? It would seem not to be. The Lower Basin generally has established both larger and earlier uses of Colorado River water than the Upper. If the Compact were voided and the River equitably apportioned, the northern states would be up the proverbial creek without a paddle.

3. Reformation of the Compact

If feasible, courts prefer to reform a contract, in lieu of rescinding it, due to a mutual mistake. Reformation of the Compact would clearly be a more satisfactory remedy for the Upper Basin.

> Where a writing that evidences or embodies an agreement in whole or in part fails to express the agreement because of a mistake of both parties as to the contents or effect of the writing, the court may at the request of a party reform the writing to express the agreement, except to the extent that rights of third parties such as good faith purchasers for value will be unfairly affected.

RESTATEMENT (SECOND) OF CONTRACTS §155. "The province of reformation is to make a writing express the agreement that the parties intended it should." Id. at comment a. Clear and convincing evidence of the intended agreement and the mistake is usually required. See e.g. Evans v. Hartford Life Ins. Co., 704 F.2d 1177 (10th Cir. 1983).

The agreement that the Compact Commissioners intended to express was that each Basin should be allocated an equal portion of the water of the River, except that the Lower Basin would receive an additional 1.0 m.a.f. to account for its tributaries. They failed to execute this intention because of their mutual mistake as to the effect of Paragraph (d) in relation to the amount of water actually flowing in the River system.

The Commissioners' underlying purpose is manifest in the language of Article III itself. In light of the shortage of water which has persisted since the Compact was signed, attention has become fixated, to the exclusion of all else, on the prohibition in Paragraph (d) against the Upper Basin depleting the flow of the River below 75 m.a.f. every ten years. But the crux of Article III actually lies in Paragraph (a), which states:

> There is hereby apportioned from the Colorado River system in perpetuity to the Upper Basin and to the Lower Basin, respectively, the exclusive beneficial consumptive use of 7,500,000 acre-feet of water per annum. ... (emphasis added)

Thus, the quantity of water apportioned to the Upper Basin was intended to be equal to that apportioned to the Lower, and it was intended to be equal in perpetuity. Nevada Commissioner (and subsequently Governor) J.G. Scrugham noted this latter aspect when during a debate on the length of the time period before the surplus water was apportioned under Paragraphs (f) and (g), he exclaimed, "All that in view of

the fact that you have a permanent guaranty of 7,500,000 acre-feet?"133 The intended equality of the Upper Basin and Lower Basin apportionment was remarked upon by Hoover as follows:

> Now, one of the fundamental things in safeguarding the proper normal development of the basin is the principle of what we have designated, for lack of a better term, equation. I think that principle is proper because, if we did not have it, we simply would have a race between the upper basin and lower basin for accumulation of appropriation rights. And if we can decide on the principles first, that we thrust the equitable division of the river on some future period, second, that we temporarily establish some basis of maximum, and third, that we establish the principle of equation, we reduce the entire problem to one, i.e., the solution of the maximum.134

Stephen Davis also suggested that the "idea of an equation between the two divisions" undergirded the Compact.135

As Hoover indicated, a corollary of the principle of equation, or equality, was that the amount of water apportioned to each Basin be adequate to accommodate its present and future needs and to protect it from the affects of the development of the other Basin. In this vein Carpenter declared:

> The whole theory of the compact is this: That the water apportioned to each basin is adequate not only for its present uses, but for the increase of development within each basin.136

Hoover also remarked:

> ... we make now, for lack of a better word I may call a temporary equitable division, reserving a certain portion of the flow of the river to the hand of those men who may come after us, ... that they can make a further division of the river at such time, and in the meantime we shall take such

> means at this moment to protect the rights of either basin as will assure continued development of the river. (emphasis added)137

Emerson commented at one point upon the need for protection from potential Lower Basin encroachments upon Upper Basin water rights:

> One of the primary reasons Wyoming is in this is to protect itself against any embargo that she feels might be placed upon her future developments. ... We would not subscribe to any doctrine that would mean any race for developments as has been intimated.138

Carpenter similarly stated:

> The State of Colorado could not look with favor upon any plan which would degenerate into a mere contest of speed whereby an unfortunate, an unnatural growth would be forced in one section in order to keep pace with what might be a natural development in another section.139

Indeed, the Compact Commissioners intended what might be termed a double equation: the apportionment of each basin was to be equal, and the apportionment of each Basin was to equal the present and future need of each Basin. This formula evolved because the needs of each Basin from the mainstream were calculated to be approximately equal. It must be acknowledged that the estimates of future water needs for each Basin did vary during the Compact negotiations in sometimes baffling fashion depending on the source, but nonetheless they remained at roughly the same level. The Upper Basin's present and future use was calculated at 6.3 to 6.8 m.a.f.,140 while the Lower Basin was believed to need 5.1 to 6.1 m.a.f.141 for present and future use from the main-

stream.

The Paragraph (d) obligation not to deplete the flow of the River below 75 m.a.f. was a vestige of the Commissioners' earlier effort to divide all the water of the River. If they simply intended that each Basin take the same amount of water from the River, plus an additional 1.0 m.a.f. for the Lower Basin, while reserving the excess for a future apportionment, the question must be asked as to why they bothered to retain it? Hoover, in fact, late in the negotiations urged them to delete Paragraph (d):

> Before we adjourn I want to raise one broad question on this pact, - in Article III, the whole paragraph relates to the minimum flow of water, seventy five million acre feet, and the four million minimum, seems to me to be worth more or less discussion in the interest of both the upper and lower basin. You will recall, in our discussions we originally started in an endeavor to work out a division of the water on the basis of a percentage, and as one corollary of that percentage, we would say from a minimum which was not an appropriation. A percentage of delivery at Lee Ferry. Now, we have changed the entire basis of the pact to allocations of quantities. I might say that in general we have come back to Mr. Norviel's original proposition, except that we have made the division between groups instead of individual states. I think that is considerably of a compliment to Mr. Norviel's perspicacity. And in so doing we now have a situation where a different allocation of water has been made to the upper states, and a different allocation, for a period of years, to the lower states. As a matter of actual realism, that minimum supply will come to the lower states, because it is less than the surplus allocation made to the upper states, and it has this concrete disadvantage, as I see it, to both sides, - it establishes an obligation to control a great river on the part of the northern states, which will be difficult to drill into the heads of laymen as an obligation capable of performance, and as to the lower states its complexion is of giving

> a less amount of water to those states than they will actually receive; but if it were entirely omitted, - the entire paragraph, all discussion in the lower states would revolve around the flow of the Colorado River, not on the minimums here set down, as these minimums have been made less than the normal and expectant flow of the river in order to give security to the upper states in their ability to deliver, and we are directly clouding the mind of the public as to the volume of water with which we are dealing. In other words, it would seem to me, if I were to go before the legislatures of the different states I would rather have the whole paragraph out. By discussion would then be hinged upon the seven and a half million consumptive use confined to the upper states, and the normal flow of the reconstructed river, the twenty-two million feet of water, and I think it would make it much less difficult, and intrinsically lose no water to the lower states. Now, I present both sides of that, as I believe, as being of equal importance to the north and to the south, and ask you to give it a little further consideration. I don't ask any alterations. I haven't the power to do that, but just ask your consideration.142

To this Stephen Davis replied:

> I think as to those facts we discussed them among ourselves and felt that to be very valuable to us. Nevertheless we will be very glad, between now and noon, to consider the matter of the elimination of that clause.143

The clause was obviously not eliminated. Nor were the reasons for keeping it ever set out concisely in the Record of the Compact negotiations. However, several reasons can be inferred therefrom.

First, Paragraph (d) helped to separate the Upper from the Lower Basin more emphatically and to establish more clearly that Lower Basin interests could not secure water rights in any way affecting the Upper Basin. Thus, Norviel said:

> Isn't what is meant by Article III is, an apportionment is not perfected until the water passes Lee's Ferry and no claim could be made that the fulfillment of that apportionment has been had until the water does so pass.144

In this respect Caldwell also observed:

> I think for a practical matter we are almost making two rivers out of one in the Colorado River, to meet a practical situation. We are dividing it at Lee's Ferry, keeping part of it above and part of it below and I believe that would be the popular conception of it at least, and I believe it is the accurate conception.145

Second, Paragraph (d) served to establish that the Upper Basin was not obligated to furnish water to satisfy the Lower Basin's Paragraph (b) apportionment. That water was to be supplied by Lower Basin tributaries.

Third, Paragraph (d) was preserved in the hope that it would lend support to a future campaign by the Upper Basin for major storage dams. The Upper Basin Commissioners emphasized repeatedly during the Compact negotiations that they felt entitled to a dam or dams similar to what the Lower Basin was then avidly pursuing and that some day the Upper Basin would seek them.146 In recent years, of course, the Glen Canyon and other Upper Basin dams were to have been administered to help it meet its Paragraph (d) duty, and the Compact Commissioners appear to have foreseen that function.

Fourth, the Commissioners may have retained Paragraph (d) to clarify the Upper Basin's right to divert all the water of the River, if it could do so, without the necessity of measuring every diversion, just so long as the return flow

at Lee's Ferry equalled at least 7.5 m.a.f. Measurement of depletions was considered a major problem by the Commissioners. Admittedly, this reason is only adumbrated by the Record of the Compact negotiations,147 but, as is shown later, it was presented expressly to Congress.

Finally, the Commissioners apparently believed that Paragraph (d) was subject to modification in the future. Emerson stated,

> if it were found 75,000,000 acre-feet at Lee Ferry were in excess of the amount needed there would want to be a reconsideration of that surely.148

Norviel stated that "I think that would be a very good thing to put that in,"149 and then Hoover and California's Commissioner brought the discussion to a swift conclusion by opining that the authority for such an adjustment was already provided by Paragraphs (f) and (g) of Article III.

What Paragraph (d) was not intended to do was deny the Upper Basin the same amount of water as the Lower Basin receives from the mainstream. It would be just to reform the Compact so that Article III(a) and (d) provide that each Basin is apportioned an equal amount of water and that the Upper Basin is prohibited from depleting the flow of the mainstream at Lee's Ferry below the amount of its apportionment.

4. Congressional apportionment

In Arizona v. California, 373 U.S. 757 (1963), the Supreme Court decided that Congress had apportioned the water

of the Colorado River system among the states of the Lower Basin by passing the Boulder Canyon Project Act. The Court scrupulously avoided any holding concerning the allocation of the water between the Upper and Lower Basins for the reason that no such issue had been presented to it. 373 U.S. at 567. However, the Court did note, "To begin with, the Act explicitly approves the Compact and thereby fixes a division of the waters between the Basins which must be respected." 373 U.S. at 566. The Boulder Canyon Project Act not only approved the Compact, but also subjected the operation of the dams and works which it authorized to the Compact's provisions. 43 U.S.C. §617 g. In a sense the Compact was at the core of the Act, and consequently considerable Congressional attention was concentrated upon it. In determining that the statute had accomplished an apportionment between the Lower Basin states the Court relied principally upon the "congressional debates leading to the passage of the Project Act," 373 U.S. at 568, and its legislative history. Further scrutiny of those same sources reveals that Congress also intended to apportion the water of the mainstream between the Upper and Lower Basins upon an equal basis.

Congress certainly believed that through the Project Act it was effecting an allocation between the two Basins. Thus, Senator Ashurst of Arizona said:

> The bill is an attempt to apportion water, as it approves the Colorado River Compact. ... The Compact proposes to substitute for the water laws based upon prior appropriation and beneficial use,

> the allotment of a definite quantity of water to the "upper basin" and the "lower basin" states.150

In testifying against one of the bills which evolved into the Act, Governor Dern of Utah protested:

> The pending bills pretend to allocate to the upper basin states in perpetuity the amount of water specified in the compact, but we question the authority of Congress to allocate water.151

Senator Hayden of Arizona commented:

> A ratification of the Colorado River Compact, negotiated in Santa Fe by all of the seven States in the Colorado River Basin, will determine for all time the apportionment of water between the upper and lower basins of that stream.152

Moreover, this Congressionally sanctioned allocation was perceived to be primarily at the behest and for the benefit of the Upper Basin. Congressman Taylor of Colorado stated that the first of the Upper Basin states' "three great objects in the enactment of this legislation" was

> To protect and secure their exclusive and conceded right to the 7,500,000 acre-feet of water by the enactment of the seven-state compact into a national and six interstate laws.153

Senator Hayden remarked that "The States of the upper basin are primarily and almost solely concerned with"154 the apportionment.

In identical language, both House Report No. 918 and Senate Report No. 592 stated:

> While the project here authorized is vital to many sections of the lower basin, the bill is no less important to upper basin States. By giving congressional approval to the compact these States are assured in perpetuity of water rights, the value of which cannot be overestimated. ... By 'enthroning the Colorado River compact' it assures

> the States of Colorado, New Mexico, Utah and Wyoming the water rights so essential to their future.155

The Boulder Canyon Project Act and its approval of the Compact were believed by Congress to have been particularly fashioned so as to benefit and protect the water rights of the Upper Basin. Again, House Report No. 918 stated:

> The representatives of the upper-Basin States have prepared and submitted numerous protective devices for their own benefit, every one of which has been incorporated in this bill.156

Senator Johnson of California, co-sponsor of the legislation, proclaimed:

> We write this bill around the compact. We incorporate in it the very amendments that were presented by the upper-basin States. The amendments that are in the bill that refer to the Colorado River compact were written by the men of the upper-basin States, and inserted at their request, and in every conceivable fashion the upper-basin States can be protected, in every way in which we can make this scheme and the lands that are watered by the Colorado from the storage and the regulated flow of that river under these works, subject to the Colorado River compact, we have done in this bill.
>
> ... Even though we be destroyed, into this bill has been written every single, solitary, conceivable provision that will protect the Colorado River compact and the upper basin States.
>
> ... I repeat and repeat how we have endeavored to protect these upper basin States.157

Senator Ashurst asserted that the legislation was designed to guard the Upper Basin's right to whatever water was needed for its long-term development:

> The real purpose of the Colorado River compact, which is referred to in six sections of this bill ... is primarily to conserve for the

upper basin States the right to use water which originates in those States. Those States want to retain the water for use in the future.

On page 710 of the Senate hearings on December 15, 1925, on S. 320, is found the following testimony:

> Mr. Kendrick: Mr. Carpenter, I am not sure whether I understood the full inference about the delay in the development of the lands in the upper basin States. Did you intend to say to the committee in answer to Senator Johnson's question, that the ultimate development in these upper basin States would be delayed for 50 or 100, or possibly, 200 years?
>
> Mr. Carpenter: Yes, sir.

It will therefore be observed that the water is not being reserved to the upper basin States for immediate use.158

In the course of the legislative history and Congressional debates of the Boulder Canyon Project Act Congressmen and Senators from both Basins repeatedly asserted that the statute and the Compact assured forever the same amount of water, 7.5 m.a.f. per annum, to the Upper Basin as Article III(a) of the Compact provided to the Lower Basin. For instance, Representative Swing of California, co-sponsor of the bill enacted into law, said the Upper Basin was "guaranteed" 7.5 m.a.f.159 Senator Hayden said it was "apportioned ... in perpetuity" 7.5 m.a.f.160 and that the bill "reserves the upper basin to fair share of the waters of the Colorado River system."161 Senator King of Utah said that the Upper Basin was "entitled"162 to and "accorded"163 7.5 m.a.f. by the legislation. Senator Ashurst said 7.5 m.a.f. was

"reserved for its perpetual use."164 Senator Pittman of Nevada said 7.5 m.a.f. was "forever to be retained" by the Upper Basin.165 Senator Bratton of New Mexico said the legislation "adjudicated the title" to the Upper Basin to 7.5 m.a.f.,166 and Congressman Taylor said it "awards"167 that amount to the Upper Basin.

Significantly enough, Senator Phipps of Colorado, chairman of the Senate Irrigation and Reclamation Committee and author of a crucial amendment to the Swing-Johnson bill, equated the Upper Basin's 7.5 m.a.f. apportionment with its obligation under Article III(d) of the Compact to deliver water to the Lower Basin at Lee's Ferry. Thus, he said:

> Under it [a 6-state compact] or a 7-state compact, the upper states would be compelled to send down 7,500,000 acre-feet of water in 10 years; or, to put it the other way, they would have for their own uses 7,500,000 acre-feet annually.168

Moreover, Article III(d), the main source of the Upper Basin's subsequent grief, was regarded by Senator Ashurst essentially as a license to the Upper Basin to divert, but not consume, all of the River water. Thus, he said:

> Article III(d) of the Compact provides that the annual flow of the stream in the upper basin may be depleted entirely, provided that from the return flow:
>
> '3(a) The States of the upper division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of 10 consecutive years. ..."169

This view corresponded to the explanation of Mulford Winsor, secretary of the Colorado River Commission of Arizona, who

testified before Congress:

> Practically, I don't think the upper States are limited at all. Theoretically, they are limited to the beneficial use of 7,500,000 acre-feet per annum, but it will never be so possible to ascertain when that amount of water has been used, so that the only real limitation upon them is the obligation to deliver a given quantity of water at Lee Ferry.170

In light of Congress' solicitude for the Upper Basin while "enthroning the Colorado River Compact," its eagerness to assure the Upper Basin all the water required for its future, its perspective on the meaning of Article III(d) of the Compact, it is inconceivable that Congress intended to allocate less water from the mainstream to the Upper Basin than the Lower. The Boulder Canyon Project Act should be construed to apportion equal shares of the mainstream to each Basin.

B. Clarification of the Upper Basin's Duty to Satisfy the Mexican Treaty Burden.

An extended dispute has simmered between the two Basins concerning the satisfaction of the Mexican Treaty burden. At least three particular issues have arisen from this dispute. They are (1) whether the Lower Basin tributaries must be considered for purposes of determining what, if any, water is "surplus" under Article III(c) of the Compact; (2) whether the Upper Basin is required to contribute any water at all toward the Mexican Treaty duty when the Lower Basin's uses exceed its Article III(a) and (b) apportionment and the Upper Basin's do not even equal its Article III(a) apportionment;

and (3) whether, if the Upper Basin is required to furnish water at Lee's Ferry to meet the Treaty burden, it must also supply additional water to compensate for channel losses between Lee's Ferry and the Mexican border, estimated at about 300,000 acre-feet. It appears that the construction of the Compact and the Boulder Canyon Project Act would result in the conclusion that the Lower Basin tributaries must be included in an Article III(a) determination of "surplus." The resolution of the later two questions, though, is less clear.

1. Inclusion of the Lower Basin Tributaries.

The Lower Basin's average per annum use of the water of its tributaries from 1976-80, including possible groundwater overdrafts in the Gila system, has been estimated at 4.5 m.a.f.171 If that quantity, or even the bulk of it, were added to the average virgin flow of the River at Lee's Ferry from 1922-85, the sum would exceed the total of the Compact's Article III(a) and (b) apportionments and would yield an Article III(c) "surplus" sufficient to satisfy the Mexican Treaty burden without a contribution from the Upper Basin, nor, at least technically, from the Lower either. The Lower Basin has contended that its tributaries should not be treated in this manner.

In Arizona v. California, 373 U.S. 546 (1963), the Supreme Court held that Congress by passing the Boulder Canyon Project Act excluded the Lower Basin tributaries from

its statutory apportionment among the Lower Basin states and granted their use to Arizona and Nevada. The Court's ruling occurred in the face of language of Section 4(a) of the Project Act, 43 U.S.C. 617(c), which required, in lieu of seven state ratification, that five states plus California ratify the Compact and that California limit itself to 4.4 m.a.f. "of the waters apportioned to the lower basin States by paragraph (a) of Article III of the Colorado River compact, plus not more than one-half of any excess or surplus waters unapportioned by said compact. ..." Article III(a) of the Compact apportioned water to each Basin from the "Colorado River system" and Article II(a) of the Compact defined "Colorado River system" as "that portion of the Colorado River and its tributaries within the United States. ..." This episode of what might be termed judicial dyslexia172 has emboldened the Lower Basin to claim that its tributaries are also excluded from the determination of whether "surplus" water exists under Article III(c) of the Compact.173 Its position, however, is not supported by other authority. In fact, scrutiny of the Compact, the Project Act, and even Arizona's own past conduct leads to the opposite conclusion.

It should be noted initially that the special master in Arizona v. California found that "Article III(a), (b), (c), (f) and (g) deal with both the mainstream and the tributaries." Report of Special Master Rifkind at 142 (1960). The Supreme Court did not adopt this finding, and it scrupu-

lously avoided a decision with respect to Upper-Lower Basin issues. Moreover, even Arizona v. California implied in dicta that the tributaries were comprehended by the Compact's apportionment scheme. Thus the Court stated:

> ... Arizona, because of her particularly strong interest in the Gila, intensely resented the Compact's inclusion of the Colorado River tributaries in its allocation scheme and was bitterly hostile to having Arizona tributaries, again particularly the Gila, forced to contribute to the Mexican burden. 373 U.S. at 558
>
> * * *
>
> Inclusion of the tributaries in the Compact was natural in view of the upper States' strong feeling that the Lower Basin tributaries should be made to share the burden of any obligation to deliver water to Mexico which a future treaty might impose. Id. at 568

The most persuasive proof that the tributaries are included under Article III(c) lies, of course, in the language of the Compact itself, pertinent parts of which have been quoted above. The Record of the Compact negotiations also affirms this interpretation. Carpenter's beginning proposal was to create two Basins and divide all the water in the River system evenly between them.174 Under this scheme the Lower Basin received much less than half of the virgin flow at Lee's Ferry principally because it was entitled to retain all the water of its tributaries. Up through the Upper Basin's final offer to "guarantee" 65 m.a.f. of water every ten years at Lee's Ferry and Hoover's suggestion of an 82 m.a.f. "guarantee," the Lower Basin's tributaries were reserved for its use.175

This feature changed somewhat when the Commissioners adopted the final concept of apportioning equal shares of some of the River water, including the Lower Basin tributaries, to each Basin and dividing the surplus in the future. In the first formulation of this idea each basin was apportioned 7.5 m.a.f., and there was nothing at all comparable to Article III(b).176 At the 19th meeting on November 19 Hoover emphasized to Norviel the significance of this arrangement during the following colloquy:

> Chairman Hoover: Let's go through it and see if we can understand it. 'The water of the Colorado River System,' which includes the whole drainage basin of the Colorado River in the United States under our definition, and includes the Gila and all the other lower rivers, 'may be appropriated throughout the Colorado River Basin,' which includes the whole area, -- 'without restriction until appropriations in either the Upper Basin or the Lower Basin shall reach 7,500,000 acre feet per annum including the present initiated rights.' Is that clear Mr. Norviel?
>
> Mr. Norviel: If that means all of the drainage in the Basin, old and new, - if that is what it means then I understand it up to that point.
>
> Chairman Hoover: Well, it means everything in the Basin. We have got a definition here of the exact meaning of those Basins, it includes everything.177

A short time later Norviel protested that this scheme meant that the Lower Basin would be entitled to only 4.5 m.a.f. or so of water from the mainstream because Arizona would probably use 3.0 m.a.f. of water from its tributaries, and that the remainder of the Lower Basin's 7.5 m.a.f. apportionment would be available for re-apportionment

among all the states in the future.178 He balked at such a plan, and progress toward a resolution halted. The Commissioners decided to consider less controversial parts of the draft Compact and extracted a promise from Norviel to draft an alternate proposal. Furthermore, all of the Commissioners, including Norviel, approved the final definition in Article II(a) of the "Colorado River System" as "that portion of the Colorado River and its tributaries within the United States."179

On November 20 the Commissioners revisited Article III. Norviel said he had no draft "Because I feel it would not be given consideration. I suggest the Upper states submit something."180 Hoover replied that the Commission ought to adhere to the fundamental concept of Article III which had evolved and then proceeded to describe four rather similar proposals which he said Nevada's Commissioner had devised to try to satisfy Norviel. Three of them were to either maintain the 7.5 m.a.f. apportionments or to allow each Basin the right to use up to 8.5 m.a.f. before a final apportionment occurred. The fourth proposal was:

> Block of 7,500,000 acre feet to be allocated in perpetuity to both upper and lower. In addition title may vest in lower basin to one million acre feet additional consumptive use, at which time another conference may be called by either party to allocate any unappropriated waters up to the limit required. No waters shall be withheld or diverted except for beneficial use.181

All these proposals were referred to the drafting committee. At the next Commission meeting on November 22 it

returned with a draft which was virtually identical to the final Article III.182 It was discussed rather briefly and approved by all the Commissioners.183 No more significant discussions of this subject were recorded. It seems obvious from this sequence of negotiations that all parties had to have understood that the Lower Basin's tributaries were subject to Article III and the Mexican Treaty obligation.

Moreover, Congress' intention in approving the Compact through the Boulder Canyon Project Act was clearly to subject to Lower Basin tributaries to the demands of Article III. Hoover ventured this interpretation of the Compact when responding to Congressman Hayden's 26 written questions, which answers Hayden conspicuously introduced into the Congressional Record.184 During floor debate on the Project Act, Senator Johnson remarked "in this compact the Colorado River basin embraces not alone the mainstream, but embraces the tributaries of the mainstream as well."185 Senator Phipps indicated the same understanding.186 Senator Hayden twice offered amendments to the pending legislation to exempt the Gila, except such return flow as might reach the mainstream, from any obligation under the Mexican Treaty and to allow Arizona exclusive beneficial use of the Gila within the state.187 Both were defeated.188

Finally, Arizona's past conduct, see e.g. Air France v. Saks, ___ U.S. ___, 105 S.Ct. 1341, with respect to this issue was such as to render its current position not only

untenable, but preposterous. In the 1920's and 1930's its view that the Compact included all tributary waters for the purpose of determining an Article III(c) surplus was open and notorious. Governor Hunt inveighed against it on precisely this ground. At the Denver Governor's Conference, called by the Upper Basin states in 1927 to try to settle the differences between California and Arizona, Arizona accepted the Governors' proposed compromise

> but attached a condition to the effect that the tributaries of Arizona must be released and relieved from the burden which might hereafter be impressed upon them by virtue of any treaty. ...189

The governors declined the new proposition.

The secretary of Arizona's Colorado River Commission divulged to the House Committee on Irrigation and Reclamation in 1928 that

> ... it is the ... justifiable fear of Arizona, that under the terms of the compact Arizona would be called upon to supply out of her tributaries the burden of the allotment to Mexico.190

Senator Hayden advised the Senate:

> the primary reason why the Colorado River compact was not approved by the State of Arizona was that the Gila River and its tributaries were included in the Colorado River Basin. The people of Arizona felt -- and justly so -- that they had appropriated and put to beneficial use all of the waters of that stream, and that by remaining out of the compact under no circumstances could the waters of that stream be burdened with furnishing any water to Old Mexico, while by entering the compact they would assume a liability that does not at the present moment exist.191

Furthermore, before the Supreme Court in the second Arizona v. California, 292 U.S. 341 (1934), Arizona even argued that

the Compact Commissioners had agreed that the Colorado River system included the Gila and its tributaries and that

> subdivision (b) of Article III of said compact was intended for and should go to the State of Arizona to compensate for the waters of the Gila River and its tributaries being included within the definition of the Colorado River system ...

292 U.S. at 350-51.

2. Lower Basin Uses in Excess of its Apportionment

The Lower Basin's use of water from the entire Colorado River system was estimated at about 10.6 m.a.f. in 1980,192 far in excess of its Article III(a) and (b) apportionment. The Upper Basin has contended that under the terms of Article III(c) this excess Upper Basin use in and of itself constitutes "surplus" over "the quantities specified in paragraphs (a) and (b)," and that its duty to supply a portion of the Mexican Treaty burden should be diminished to that extent, and, in a year such as 1980, completely eliminated.193

Unfortunately, there is virtually nothing in the Record of the Compact, the provisions or legislative history of the Boulder Canyon Project Act, or elsewhere that either confirms or refutes this argument. Indeed, since the common expectation was of a flow of River water adequate for all needs, it would have been remarkable if this particular issue had been considered.

Unfortunately also, the Upper Basin's position in this respect contravenes the express language of Article III(c), which provides that the Mexican Treaty water "shall be

supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b). ..." (emphasis added). Yet the underlying purpose of this argument does conform to the intent of the Compact Commissioners to equalize the Article III(a) apportionments provided to each Basin and furthermore to match the Upper Basin's Article III(d) delivery obligation to the amount of those apportionments. Consequently, if the Compact were reformed in the manner advocated above, a result similar to what the Upper Basin has urged with respect to this particular issue would be achieved.

3. The Upper Basin's Obligation to Absorb Channel Losses

The Lower Basin has charged that the Upper must deliver at Lee's Ferry not only half of the 1.5 m.a.f. required by the Mexican Treaty, but also an additional amount equal to half or more of the channel loss occurring to that quantity of water between Lee's Ferry and Mexico. The Record of the Compact negotiations, although sparse with respect to this subject, suggests that the Compact should not be interpreted to impose such a requirement on the Upper Basin -- assuming, of course, that the Upper Basin in bound to furnish any water at all to meet the Treaty provisions.

This issue emerged only twice during the Compact negotiations. During the sixteenth session, while discussing Hoover's suggestion that the Upper Basin agree to deliver 82

m.a.f. every ten years at Lee's Ferry, Arthur Powell Davis and Hoover theorized that such a quantity would include half of the Mexican Treaty burden. Norviel then commented that "it should be delivered at the point of delivery,"194 apparently meaning Yuma. Carpenter responded, "Delivered at Lee's Ferry; you already have figured your evaporation of the river."195 Norviel objected to this position, and Carpenter retorted:

> You told us that power was many times more valuable than any other use. We are letting you tear all the fire out of that water clear down to Laguna.196

Norviel replied in effect that the Upper Basin might use the water to generate electricity at some point as well.197 Hoover then appeared to support obliquely Carpenter's position by observing that under his proposal the Lower Basin would receive a "liberal"198 amount of water more than sufficient to accommodate its foreseeable needs.

The issue surfaced again on November 19. During a discussion of complications arising from the Imperial Valley's existing arrangements with Mexico, Carpenter entertained the idea that the Compact might designate that the delivery point of the water due Mexico be at Yuma. The following exchange then ensued:

> Carpenter: Of course, at present the amount passing Yuma would have the effect of imposing an additional burden at once at Lee Ferry that in our minds we had already cared for at that point, which would not be satisfactory I know to, -
>
> Hoover: That would be putting on the upper states half of the burden.

> Carpenter: Which we feel we have already provided for.199

No other Commissioners commented on this point, and Carpenter's notion of relocating the delivery point was subsequently abandoned.

Article III(c) states in pertinent part that "the States of the Upper Division shall deliver at Lee Ferry water to supply one-half of the deficiency. ..." (emphasis added). In light of the statements excerpted above, it is clear that the language specifying Lee's Ferry as the delivery point was intended to relieve the Upper Basin of any duty to compensate for channel losses that occur below Lee's Ferry with respect to the water it provides for the Mexican Treaty. In other words, so far as the Upper Basin is concerned, Lee's Ferry is the point where it delivers to Mexico its half of the Mexican Treaty deficiency, and the fate of that water below that spot is not its responsibility.

VI. CONCLUSION

John Wesley Powell recounted that on June 18, 1869, during the course of his initial odyssey on the Colorado, he and G.Y. Bradley attempted to scale Echo Rock. High up the face of an escarpment the one-armed major achieved a precarious hold in a small crevice and then discovered himself completely struck. "I find I can get up no farther, and cannot step back, ... and cannot reach foothold below."200 Bradley clambered to a ledge above Powell and tried to help,

but his reach was insufficient. He searched for a stick or a branch to extend but could find nothing. Powell commented, "The moment is critical. Standing on my toes, my muscles begin to tremble."201 A slip would have brought a plunge of hundreds of feet to the bottom of the abyss. "At this instance," Powell wrote, "it occurs to Bradley to take off his drawers, which he does, and swings them down to me."202 Powell grabbed Bradley's trousers and was hauled to safety.

It could be said that the Upper Basin's current predicament resembles that described by Powell. It clings precariously to a precipice, and it is stuck, seemingly unable to move in any direction. Much of this paper has been an exercise in holding up and scrutinizing the legal equivalent of Bradley's drawers, checking for tears and loose threads, and observing what needs to be patched.

The substance of the legal theories examined above is, by and large, sound, and it is reinforced by the equity of the Upper Basin's position. But there are also major procedural and perhaps even equitable weaknesses present. The United States may have to be joined in an action against the Lower Basin states, and its consent to suit would be problematic. In deciding the case the court might defer to the policies of the Bureau of Reclamation, which, at least from the Upper Basin's perspective, have often appeared oriented primarily203 toward serving the Lower Basin's insistent demands for water and power. Furthermore, the

disparity between the present uses of the Upper and Lower Basins might weigh against the northern states. Such a result would be ironic, since it was exactly what the Compact was designed to preclude. The Upper Basin may eternally regret its inability in 1968 to parlay support and Congressional approval of the Central Arizona Project into legislation granting real and enduring relief to the northern Basin states.204 So, standing intellectually half-naked before the world, we merely venture that the success of an Upper Basin rescue operation remains to be seen.

FOOTNOTES

1. Arizona v. California, 373 U.S. 546, 552 (1963)

2. 69 Cong. Rec. 9763 (1928)

3. U.S. DEPARTMENT OF INTERIOR, WESTWIDE STUDY REPORT ON CRITICAL WATER PROBLEMS FACING THE ELEVEN WESTERN STATES 154 (1975).

4. Id.

5. Nash, Wilderness Values and the Colorado River in NEW COURSES FOR THE COLORADO RIVER: MAJOR ISSUES FOR THE NEXT CENTURY 206 (G. Weatherford & F. Brown eds. 1986)

6. WESTWIDE STUDY REPORT, supra note 3, at 154

7. Getches, Competing Demands for the Colorado River, 56 U.Colo. L. Rev. 413, 420 (1985)

8. It is set forth in full at 70 Cong. Rec. 324 (1928) and at Colo. Rev. Stat. §37-61-101, among other places. It was the first multi-state compact. Frankfurter and Landis remarked that, "Measured by the vastness of the region and the magnitude of the interests regulated, the Colorado Compact represents, thus far, the most ambitious illustration of interstate agreements." Frankfurter and Landis, The Compact Clause of the Constitution--A Study In Interstate Adjustments, 34 Yale L.J. 685, 702 (1925)

9. For a comprehensive and lively study see N. HUNDLEY, JR., WATER AND THE WEST: THE COLORADO RIVER COMPACT AND THE POLITICS OF WATER IN THE AMERICAN WEST (Berkeley,

1975)

10. As events unfolded, much of the debate in 1928 over S. 728 and H.R. 5773, which the 70th Congress passed as the Boulder Canyon Project Act, focused upon the electrical power industry and its efforts to thwart any substantial, Federally-controlled, hydro-electric plant on the Colorado. Congressman Fiorello LaGuardia declared that "Opposed to this bill there has been the most vicious, disgraceful, venal lobby that ever existed in the history of the world." 69 Cong. Rec. 9775 (1928). Despite its vehement denials, Utah's Congressional delegation was generally thought to have been in league with the electrical power lobby at the time.

11. Lee's Ferry, located in Arizona, had been a traditional River crossing point. Apparently prior to 1922 some or all of its inhabitants had resettled, and there was considerable confusion about its official site. Consequently, the Compact Commissioners decided to specify that Lee's Ferry would be considered to be one mile below the mouth of the Paria River, an Upper Basin tributary. Article II(a), Compact.

12. H.R. Doc. No. 717, 80th Cong., 2d Sess. A125 (1948).

13. 64 Cong. Rec. 2710 (1923).

14. Named after Congressman Phil Swing and Senator Hiram Johnson of California. The first Swing-Johnson bill was introduced on April 25, 1922 and the second on December

10, 1923. Neither were reported out of committee. The third Swing-Johnson bill was introduced on February 27, 1926. It was killed by a filibuster led by Arizona Senator Henry Ashurst on February 22 and 23, 1927. For a history of these bills see H.R. Doc. No. 717, supra note 12, 38-43 (1948).

15. See generally HUNDLEY, supra note 9, at 233-276.

16. The fact that Harry Chandler, owner of the Los Angeles Times, and other wealthy Californians held large tracts of land on the Mexican side of the border during that period was a particular irritant to Arizonans. To increase their exasperation, some of these speculators hired Chinese laborers. The rhetoric denouncing these circumstances was often intemperate. Thus, during the Compact negotiations, George Maxwell, the promoter of the high-line canal scheme in Arizona (the forebearer of the Central Arizona Project), telegraphed the Commissioners to beware of the "Asiatic Menace in Mexico more dangerous by far to the United States of America than the original flood menace." He predicted they would cause "a crushing competition with American agriculture, labor and industry" and even embroil "Southern California and Arizona in an Asiatic War." 1 MINUTES AND RECORD OF THE COLORADO RIVER COMMISSION NEGOTIATING THE COLORADO RIVER COMPACT OF 1922, Sess. No. 14, 2-3 (Washington, D.C., Colorado River Project, Bureau of

Reclamation) [hereinafter cited as 1 RECORD].

17. HUNDLEY, supra note 9, at 296.

18. See 1 RECORD, Sess. No. 6, 70-71. Ironically, water use by Mexican landholders increased in part as a result of the beneficial effects to them of the Boulder Canyon Project Act. See HUNDLEY, supra note 9, at 296.

19. N. Hundley Jr., The West Against Itself: The Colorado River -- An Institutional History in NEW COURSES FOR THE COLORADO RIVER, supra note 5, at 27.

20. Memorandum from Felix Sparks, Director, to Colorado Water Conservation Board, "Synopsis of Major Documents and Events Related to the Colorado River, 8 (July, 1976)

21. Id. See also H.R. REP. NO. 1312, 90th Cong., 2nd Sess., 1968 U.S. CODE CONG & AD. NEWS 3696 (1968).

22. See Hundley, supra note 19, at 26; see also H.R. REP. NO. 1312, supra note 21, at 3695.

23. J. Breitenstein, The 1929 Pan Arbitration Treaty and The Treaty Between the United States and Mexico (Sept. 14, 1944).

24. See J. MUYS, INTERSTATE WATER COMPACTS: THE INTERSTATE COMPACT AND FEDERAL-INTERSTATE COMPACT, 24-25, (National Water Commission Legal Study No. 14, 1971).

25. Indeed, this is often considered to be one of the major bones of contention between the two Basins. See e.g. Getches, supra note 7, at 423.

26. Hundley, supra note 19, at 29.

27. Herbert Hoover supposedly described the Colorado River Compact as a "40-year vacation from litigation." 69 Cong. Rec. 9424 (1928). If so, it was certainly what is sometimes referred to as a "working" vacation. Prior to this time, Arizona had been involved in four major lawsuits relating to the Compact: Arizona v. California, 283 U.S. 423 (1931); Arizona v. California, 292 U.S. 341 (1934); United States v. Arizona, 295 U.S. 174 (1935); Arizona v. California, 298 U.S. 558 (1936). Nor had Arizona been content merely to battle in the courtroom. In 1934 Governor Benjamin Moeur mustered the Arizona National Guard and an Arizona "navy" consisting of one ferryboat to halt the construction of the Parker Dam, which was to serve as the diversion point for the aquaduct of the Metropolitan Water District of Southern California. See Hundley, supra note 9, at 294.

28. See e.g. Hundley, Clio Nods: Arizona v. California and the Boulder Canyon Project Act--A Reassessment, 3 WEST. HIST. QUART. 17 (1972); Meyers, The Colorado River, 19 STAN L. REV. 1 (1966); Trelease, Arizona v. California: Allocation of Water to People, States, and Nation, 1963 SUP. CT. REV. 158, Clyde, The Colorado River Decision -- 1963, 8 UTAH L. REV. 299 (1964); Haber, Arizona v. California -- A Brief Review, 4 NAT. RESOURCES J. 17 (1964); Wilmer, Arizona v. Califor-

nia, A Statutory Construction Case, 6 ARIZ. L. REV. 40 (1964); Sax, Problems in Federalism in Reclamation Law, 37 U. COLO. L. REV. 49 (1964).

29. Under the circumstances, Arizona's victory would seem to exemplify a maxim of the distinguished Colorado attorney and water law expert Raphael J. Moses. Moses' Second Law holds that regardless of the merits of any particular case, the litigating lawyer has a 50 percent chance of winning (or losing) it when he (or she) steps foot in the courtroom. (Moses' first law is the anti-gravitational one: "Water runs uphill to money.")

30. See HUNDLEY, supra note 9, at 313.

31. Getches, supra note 7, at 418.

32. H.R. REP. NO. 1312, supra note 21, at 3688.

33. Id. at 3669, 3687-90.

34. Id. at 3694-97.

35. Id. at 3700.

36. Apart from mimicking the language of the statute itself, the Bureau of Reclamation has not developed these criteria. See Letter from Bob Broadbent, Assistant Secretary for Water and Science, U.S. Department of Interior, to Gerald Zimmerman, Executive Director, Upper Colorado River Commission, 2, March 14, 1986. Some Upper Basin observors worry that a court might subsequently be tempted to regard the Bureau's effective nonfeasance to date in this respect as grounds to

justify its perpetual nonfeasance, thereby negating the statutory directive. The Upper Basin has also been disturbed by the Bureau's release of water from Lake Powell in apparent violation of 43 U.S.C. §1552(a)(3) during years when active storage in Lake Powell was less than in Lake Mead.

37. See Hundley, supra note 19, at 38; Getches, supra note 7, at 462-63.

38. Id.

39. Minute 218, 4 INT'L LEGAL MATERIALS 545 (1965); 55 Department of State Bulletin 555 (1965).

40. Hundley, supra note 19, at 39.

41. Getches, supra note 7, at 464.

42. Id. at 463.

43. Id. at 465.

44. Environmental Defense Fund v. Costle, 657 F.2d 275 (D.C. Cir. 1981).

45. See e.g. COMPTROLLER GENERAL OF THE UNITED STATES, REPORT TO THE CONGRESS OF THE UNITED STATES, COLORADO RIVER BASIN PROBLEMS: HOW TO REDUCE THEIR IMPACT, 30-40 (May 4, 1979).

46. Environmental Defense Fund v. Costle, supra note 43, at 280 n. 16.

47. UPPER COLORADO RIVER COMMISSION, THIRTY-SEVENTH ANNUAL REPORT 24-27 (Salt Lake City, Utah, 1985).

48. Id.

49. Id.

50. C. STOCKTON AND G. JACOBY, LONG-TERM SURFACE-WATER SUPPLY AND STREAMFLOW TRENDS IN THE UPPER COLORADO RIVER BASIN (Lake Powell Research Project Bulletin No. 18, 1976).

51. Id.

52. A. Kneese and G. Bonem, Hypothetical Shocks to Water Allocation Institutions in the Colorado Basin in NEW COURSES FOR THE COLORADO RIVER, supra note 5, at 106.

53. National Academy of Science, Carbon Dioxide Assessment Committee, Changing Climate 423 (Washington, D.C. 1983)

54. See e.g. Getches, supra note 7, at 463.

55. See generally Environmental Defense Fund v. Costle, supra note 42.

56. H.R. REP. NO. 1312, supra note 21, at 3696.

57. U.S. DEPARTMENT OF INTERIOR, WATER FOR ENERGY MANAGEMENT TEAM, REPORT ON WATER FOR ENERGY IN THE UPPER COLORADO RIVER BASIN 11-12 (1974).

58. Id.

59. Memorandum from Felix Sparks, Director, to Colorado Water Conservation Board and Colorado Water Congress Executive Committee, 3 (January 17, 1978).

60. Id. at 7.

61. Clyde, Institutional Response to Prolonged Drought in NEW COURSES FOR THE COLORADO RIVER, supra note 5, at 133-34.

62. Id. at 116.

63. U.S. DEPARTMENT OF INTERIOR, ELEVENTH ANNUAL REPORT, OPERATION OF THE COLORADO RIVER BASIN 1981, 24 (1982).

64. WESTWIDE STUDY REPORT, supra note 3, at 153.

65. REPORT ON WATER FOR ENERGY, supra note 56, 60-70.

66. WESTWIDE STUDY REPORT, supra note 3, 167-70.

67. Statement On The Operation Of The San Juan-Chama Project, Presented by S.E. Reynolds, New Mexico State Engineer, to the Subcommittee on Energy Research and Water Resources of the Senate Committee on Interior and Insular Affairs, 19 (June 12, 1975).

68. ELEVENTH ANNUAL REPORT, supra note 62, at 24.

69. Getches, supra note 7, at 449.

70. UPPER COLORADO RIVER COMMISSION, supra note 46, at 37.

71. See Swimming In Subsidized Water: It Was Brought In For Farmers, But It's Flowing To Arizona's Cities, Washington Post, May 12, 1986, at 10 (National Weekly).

72. See Hornby, Animas-La Plata Project Pits Colorado Forum vs. Interior's Hodel, Denver Post, May 8, 1986, at 10B.

73. Act of August 16, 1962, Pub. L. 87-590, 76 Stat. 389. See e.g. Statement of Congressman D.S. Saund of California in Hearings on H.R. 594 Before the Subcomm. on Irrigation and Reclamation of the House Comm. on Interior and Insular Affairs, 85th Cong., 1st Sess. 155-56 (1957).

74. See e.g. H.R. REP. NO. 1312, supra note 21, at 3688.

75. See Statement On The Operation Of The San Juan-Chama Project, supra note 66; Memorandum from Felix Sparks, supra note 58, at 1-3.

76. Getches, supra note 7, at 468.

77. See e.g. Clyde, Conflicts Between the Upper and Lower Basins on the Colorado River in RESOURCES DEVELOPMENT: FRONTIERS FOR RESEARCH (Western Resources Conference, 1960).

78. H.R. REP. NO. 1312, supra note 21, at 3670.

79. See REPORT TO THE CONGRESS OF THE UNITED STATES, supra note 44, at 22.

80. Id.

81. REPORT ON WATER FOR ENERGY, supra note 56, at 58.

82. See Getches, supra note 7, at 450-52.

83. See REPORT TO THE CONGRESS OF THE UNITED STATES, supra note 44, at 19-20, 23-24.

84. Getches, supra note 7, at 467.

85. REPORT TO THE CONGRESS OF THE UNITED STATES, supra note 44, at 10.

86. For a rigorous critique of the doctrine, see Meyers, The Colorado River, supra note 28, at 49-53.

87. LONG-TERM SURFACE-WATER SUPPLY AND STREAMFLOW TRENDS, supra note 49.

88. Id.

89. 1 RECORD, SESS. NO. 14, at 61.

90. H.R. DOC. NO. 717, supra note 12, at A131.

91. 1 RECORD, SESS. NO. 6, at 89.

92. Id. at 70-79.

93. 1 RECORD, SESS. NO. 16, at 25.

94. 1 RECORD, SESS. NO. 6, at 70-79.

95. For instance, Richard Sloan, legal advisor to Arizona's Colorado River Commission stated the entire River system produced an average of 21 m.a.f. per annum. H.R. DOC. NO. 717, supra note 12, at A66. Utah Compact Commissioner R.E. Caldwell wrote that it produced 20 to 22 m.a.f. per annum, with an 18 m.a.f. virgin flow at Lee's ferry. Id. at A118. Colorado Commissioner Delph Carpenter reported to Colorado Governor Oliver Shoup on December 15, 1922, that the entire River system yielded 20.5 m.a.f. per annum and the Upper Basin contributed 17.5 m.a.f. per annum. 70 Cong. Rec. 578 (1928). In a supplemental report to both the Colorado House and Senate Committees on Agriculture and Irrigation, dated March 29, 1923, Carpenter estimated the average virgin flow per annum at Lee's Ferry at 18,415,842 acre-feet. 70 Cong. Rec. 585 (1928). Wyoming Compact Commissioner Frank Emerson stated that the average flow of water "available for use" in the entire system was 20 m.a.f. per annum, and that the Upper Basin produced an average of 18.5 m.a.f. per annum. H.R. DOC. NO. 717, at A126-27.

96. 64 Cong. Rec. 2711 (1923).

97. Hearings on S. RES. 320 Before The Senate Comm. on Irrigation and Reclamation, 68th Cong. 2nd Sess. 455 (1925).

98. Thus, at the Hearings on S. 728 and S. 1274 Before the Senate Comm. on Irrigation and Reclamation, 70th Cong., 1st Sess. 323 (1928), John Bacon, chairman of the California River Commission submitted a statement that in the average year 13.5 m.a.f. would be available to the Lower Basin after the Upper Basin had consumed its full 7.5 m.a.f. apportionment. Charles Childers, an attorney from El Centro, California, estimated an average virgin flow at Lee's Ferry of 18 m.a.f. Id. at 319. Frank Emerson, in a report to Interior Secretary Work dated January 9, 1928, and introduced at the hearings estimated an average annual virgin flow at Yuma of 21 m.a.f. Id. at 369.

99. It was named after the Commissioner of Reclamation at that time.

100. See e.g. 69 Cong. Rec. 10560 (1928).

101. It was unofficially named after the chairman, Maj. General William Sibert, of the body that wrote it. The official name of this group was the Colorado River Board. It was authorized by S. J. Res. 164, passed on May 29, 1928, and appointed by Interior Secretary Work. See H.R. DOC NO. 717, supra note 12, at 41-42. The Board's report, titled "The Report of the Colorado River

Board On The Boulder Dam Project", was completed on November 24, 1928 and printed as H. DOC 446, 70th Cong., 2nd Sess. (1928). See 70 Cong. Rec. 280 (1928).

102. 70 Cong. Rec. 283 (1928).

103. Id. at 282-84.

104. Id. at 283.

105. Perhaps most damaging to the Upper Basin's position is the second part of Herbert Hoover's answer to the fifth of 26 written questions submitted to him in 1923 by Congressman Carl Hayden. The question and answer are as follows:

> Question 5. Why is the basis of division changed from the "Colorado River system" to the "river at Lee Ferry" in paragraph (d) of Article III, the period of time extended to 10 years and the number of acre-feet multiplied by 10:
>
> * * *
>
> (b) The agreement as to the flow of 75,000,000 acre-feet at Lee Ferry during each 10-year period fixes a definite quantity of water which must pass that point. Under III(a) each basin is entitled to the use of 7,500,000 acre-feet annually. Judging by past records, there will always be sufficient flow in the river to supply these quantities, but in the improbable event of a deficiency, the lower basin has the first call on the water up to a total use of 75,000,000 acre-feet each 10 years. While there was in the commission a firm belief that no such shortage will ever occur, still this provision was adopted as a matter of caution. The period of 10 years was fixed as a basis of measurement, as being long enough to allow equalization between years of high and low flow, and as representing a basis fair to both divisions.

64 Cong. Rec. 2710. Hoover's answer was obviously written subsequent to the conclusion of the Compact

negotiations, and its context is revealing. He was responding to inquiries from a skeptical Arizona congressman. He was well aware of the hostility that had developed in Arizona against the Compact, and he had gone out of his way to campaign for its ratification by the Arizona legislature. See e.g. H.R. DOC. NO. 717, supra note 12, at 35.

106. 1 RECORD, SESS. NO. 6, at 79-81. Resistance to this proposal stemmed in part from a desire by some of the Upper Basin states for parity between the amount of water they contributed and the amount they were to be allocated. In this respect, Carpenter complained (on Colorado's behalf), "Of all the States that furnish much and get little, we are that State." 1 RECORD, SESS. NO. 7, at 131.

107. Able, energetic, and articulate, Carpenter was known, at least to some, as the "Silver Fox of the Rockies," see HUNDLEY, supra note 9, at 134. He was widely credited with providing the impetus for the Colorado River Compact. Arizona Senator Carl Hayden named Carpenter the "father of the Colorado River Compact" and said he was "The man more responsible than any other for the initiation of the idea that there should be a compact between the seven States to determine their relative rights to the water of the Colorado River. ..." 70 Cong. Rec. 164 (1928). The Supreme Court commented that

he "was as much responsible as any man for both the Compact and the contract requirement of §5 of the Project Act. ..." Arizona v. California, 373 U.S. at 610.

108. Hoover subsequently asserted that he had originated the two-Basin idea. H. HOOVER, THE MEMOIRS OF HERBERT HOOVER: THE CABINET AND THE PRESIDENCY, 1920-1933, 116 (New York, 1951). Senator Hayden stated in 1928 during debate on the Boulder Canyon Project Act that "I am told that the suggestion came from Mr. Hoover. ..." 70 Cong. Rec. 163 (1928). The Supreme Court also attributed the idea to Hoover. Arizona v. California, 373 U.S. at 557. However, when he was actually presenting his proposal to the Compact Commission, Carpenter said the two-Basin concept "was advanced before this Commission by Director Davis" and also vaguely credited "various members of this Commission and learned men." 1 RECORD, SESS. NO. 11, at 15.

109. 1 RECORD, SESS. NO. 11, at 15.

110. 1 RECORD, SESS. NO. 15, at 53-54.

111. 1 RECORD, SESS. NO. 16, at 25.

112. Id. at 25-26.

113. 1 RECORD, SESS. NO. 17, at 2-6.

114. Id. at 3.

115. Id. at 2.

116. Apparently they were contained in the "Fall-Davis

Report," officially known as "Problems of Imperial Valley and Vicinity," S. DOC. 142, 67th Cong., 2nd Sess. (1922).

117. 1 RECORD, SESS. NO. 17, at 12.

118. Id. at 10.

119. Id.

120. Id. at 18.

121. Id. at 19.

122. Id. at 25.

123. 1 RECORD, SESS. NO. 18, at 2.

124. Id. at 23.

125. Id. at 32.

126. Id. at 31.

127. H.R. DOC. 717, supra note 12, at A127.

128. Id. at A118.

129. Id. at A66.

130. See e.g. 2 RECORD, SESS. NO. 22, at 167.

131. 1 RECORD, SESS. NO. 12, at 3.

132. 1 RECORD, SESS. NO. 16, at 29.

133. 2 RECORD, SESS. NO. 22, at 147.

134. 2 RECORD, SESS. NO. 21, at 130.

135. 2 RECORD, SESS. NO. 19, at 10.

136. 2 RECORD, SESS. NO. 24, at 233.

137. 2 RECORD, SESS. NO. 21, at 127.

138. 1 RECORD, SESS. NO. 14, at 11.

139. 1 RECORD, SESS. NO. 11, at 37.

140. See 1 RECORD, SESS. NO. 6, at 70-79; 1 RECORD SESS. NO. 11, at 61; 1 RECORD, SESS. NO. 12, at 11; 1 RECORD SESS. NO. 14, at 40-41; 1 RECORD, SESS. NO. 15, at 29-30; 1 RECORD, SESS. NO. 16, at 21-24; 1 RECORD, SESS. NO. 17, at 7; 2 RECORD, SESS. NO. 20, at 62.

141. See 1 RECORD, SESS. NO. 6, at 70-79; 1 RECORD, SESS. NO. 11, at 61; 1 RECORD, SESS. NO. 12, at 11; 1 RECORD, SESS. NO. 14, at 43-44; 1 RECORD, SESS. NO. 14, at 59; 1 RECORD, SESS. NO. 16, at 26; 1 RECORD, SESS. NO. 17, at 7.

142. 2 RECORD, SESS. NO. 22, at 164-65.

143. Id. at 165.

144. 2 RECORD, SESS. NO. 26, at 279.

145. Id. at 295.

146. See e.g. 1 RECORD, SESS. NO. 16, at 7, 15; 2 RECORD, SESS. NO. 21, at 112, 120-21.

147. It was also suggested by Carpenter in his Report to Governor Shoup, December 15, 1922, supra note 94:

> The apportionment of 7,500,000 acre-feet exclusive annual beneficial consumptive use to the Upper Basin means that the territory of the Upper Basin may exhaust that much water from the flow of the stream each year. The aggregate diversions in the Upper Basin are unlimited. The limitation applies only to the amount consumed, and all waters which return to stream are not "consumed." 70 Cong. Rec. 578 (1928).

148. 2 RECORD, SESS. NO. 22, at 143.

149. Id.

150. S. REP. NO. 592, pt. 2, 70th Cong., 1st Sess. 9 (1928).

151. Hearings on S. 728 and S. 1274 Before Senate Comm. on Irrigation and Reclamation, 70th Cong., 1st Sess. 153 (1928).

152. 70 Cong. Rec. 70 (1928).

153. 69 Cong. Rec. 9765 (1928).

154. 70 Cong. Rec. 70 (1928).

155. H.R. REP. NO. 918, 70th Cong., 1st Sess. 15 (1928); S. REP. No. 592, 70th Cong., 1st Sess. 16 (1928).

156. H.R. REP. NO. 918 at 14.

157. 69 Cong. Rec. 7249-50 (1928).

158. 69 Cong. Rec. 6289, 10492 (1928); also S. REP. NO. 592, pt. 2, 17.

159. Hearings on H.R. 5773 Before House Comm. on Irrigation and Reclamation, 70th Cong., 1st Sess. 47 (1928).

160. 70 Cong. Rec. 163 (1928).

161. Id. at 70.

162. Id. at 338.

163. Id. at 164.

164. 69 Cong. Rec. 6289 (1928).

165. 70 Cong. Rec. 386 (1928).

166. 70 Cong. Rec. 173 (1928).

167. 69 Cong. Rec. 9764 (1920).

168. 70 Cong. Rec. 390 (1928).

169. Id. at 315.

170. Hearing on H.R. 5773 Before House Comm. on Irrigation and Reclamation, 70th Cong. 1st Sess. 38 (1928).

171. U.S. DEPARTMENT OF INTERIOR, COLORADO RIVER SYSTEM CONSUMPTIVE USES AND LOSSES REPORT 1976-80, 35-39 (Washington, D.C.).

172. It must be borne in mind, though, that Justice Black, who wrote the opinion of the Court, also served as a United States Senator in 1928 and, in fact, voted with the majority concerning amendments to and passage of the bill that became the Boulder Canyon Project Act.

173. See e.g. HUNDLEY, supra note 9, at 309.

174. See 1 RECORD, SESS. NO. 11, at 15.

175. See 1 RECORD, SESS. NO. 17, at 9.

176. See 1 RECORD, SESS. NO. 18, at 23-59.

177. 2 RECORD, SESS. NO. 19, at 4-5.

178. Id. at 7-10.

179. Id. at 85.

180. 2 RECORD, SESS. NO. 21, at 128.

181. Id. at 130.

182. 2 RECORD, SESS. NO. 22, at 136-45.

183. Id.

184. See 64 Cong. Rec. 2709-13 (1923).

185. 70 Cong. Rec. 466 (1928).

186. 70 Cong. Rec. 335.

187. 70 Cong. Rec. 174, 388 (1928).

188. 70 Cong. Rec. 384, 394 (1928).

189. Hearings on S. 728 and S. 1274 Before the Senate Comm. on Irrigation and Reclamation, 70th

Cong., 1st. Sess. 193 (1928).

190. Hearings on H.R. 5773 Before House Comm. on Irrigation and Reclamation, 70th Cong., 1st Sess. 40 (1928).

191. 70 Cong. Rec. 335-36.

192. COLORADO RIVER SYSTEM CONSUMPTIVE USES AND LOSSES REPORT, supra note 170, at 33.

193. Upper Basin sensitivities over this issue were aroused in 1978 by the discovery that the Bureau of Reclamation had been releasing 750,000 acre-feet per annum of water per annum from Lake Powell and charging it against the Upper Basin's Mexican Treaty obligation under Article III(c). The Colorado Water Conservation Board believed this accounting treatment to be improper since the Lower Basin was clearly using amounts of water well in excess of its Article III(a) and (b) apportionment. The Board did not object, however, to attributing these 750,000 acre-feet releases to the Upper Basin's Article III(e) obligation, which prohibits the Upper Basin from withholding water which it cannot reasonably use. See Memorandum from Felix Sparks, supra note 58, at 5-9; Letter from Colorado Governor Richard Lamm to Harl Noble, Acting Director, Upper Colorado Region, Bureau of Reclamation, February 9, 1978.

194. 1 RECORD, SESS. NO. 16, at 26.

195. Id.

196. Id.

197. Id. at 27.

198. Id.

199. 2 RECORD, SESS. NO. 20, at 60.

200. J.W. POWELL, DOWN THE COLORADO 53 (Promontory Press, 1969).

201. Id.

202. Id.

203. For instance, in a controversial incident in 1964 Secretary of Interior Udall released water from the Glen Canyon Dam to boost power production at Hoover Dam. Lake Powell, at the time, had been only partially filled, and the Secretary's order had the effect of reducing power revenues from the Glen Canyon Dam, which accrue to the Upper Colorado River Basin Fund. See Meyers, The Colorado River, supra note 28, at 22-23.

204. See Getches and Meyers, The River of Controversy: Persistent Issues in NEW COURSES FOR THE COLORADO RIVER, supra note 5, at 57-58.