

MINUTES OF THE

14 TH MEETING

COLORADO RIVER COMMISSION

The fourteenth meeting of the Colorado River Commission was held at Bishop's Lodge, Santa Fe, New Mexico, on Monday afternoon, November 13th, 1922, at 3:00 o'clock P. M.

There were present:

Herbert Hoover, representing the U. S.,	Chairman
R. E. Caldwell, "	Utah
Delph E. Carpenter, "	Colorado
Stephen B. Davis, Jr., "	New Mexico
Frank C. Emerson, "	Wyoming
W. F. McClure, "	California
W. S. Norviel, "	Arizona
James G. Scrugham, "	Nevada
Clarence C. Stetson,	Executive Secretary

In addition there were present:

Thomas E. Campbell, Governor of Arizona
Key Pittman, Senator of Nevada

Edward W. Clark, Joint Commissioner and Advisor for Nevada
Arthur P. Davis, Director, United States Reclamation Service, Department of the Interior and Advisor to Federal Representative.

Ottamar Hamele, Chief Counsel, United States Reclamation Service, Department of the Interior, and Advisor to Federal Representative

C. C. Lewis, Assistant State Water Commissioner and Advisor for Arizona.

R. T. McKisick, Deputy Attorney General and Advisor for California.

Charles A. May, State Engineer and Advisor for New Mexico.

R. I. Meeker, Deputy State Engineer and Advisor for Colorado.

Richard E. Sloan, Legal Advisor for Arizona.

P. G. Spilsbury, President, Arizona Industrial Congress and Advisor for Arizona.

Charles P. Squires, Joint Commissioner and Advisor for Nevada.

Dr. John A. Widtsoe, Advisor for Utah.

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The meeting was called to order at 3:00 P. M. by
Mr. Hoover.

Mr. Stetson submitted to the Commission the following
communication from George H. Maxwell, Executive Director of
the National Reclamation Association.

"TO THE COLORADO RIVER COMMISSION. IN SESSION AT
BISHOP'S LODGE, SANTA FE, NEW MEXICO.

"There should be no effort to force a compact between the
States at this time.

"Flood protection on the Colorado River should not be
delayed by being complicated with any controversy relating
to such a compact.

"The alleged primary ultimate purpose of the creation
of the Colorado River Commission was to expedite flood pro-
tection for the Imperial Valley in California and the Yuma
Project in Arizona.

"Secondary purposes were:

1. Land Reclamation
2. Power Development

"The Imperial Valley and the Yuma Project must have
immediate protection, otherwise both are doomed to certain
destruction. The necessary works for flood protection must be
built without delay.

" The nation will see this necessity and safeguard against
this appalling menace if there is no effort to entangle flood
defense with profit-seeking schemes for land reclamation or
power development.

" The flood menace must not be used as a ' stalking ox'
behind which to conceal a plan to create an Asiatic Menace in
Mexico more dangerous by far to the United States of America
than the original flood menace.

" As between the submergence of the Imperial Valley by
floods and the devastation of Southern California and Arizona

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in an Asiatic War, the loss of the Imperial Valley would be the lesser of the two evils.

" The plan for power development by dropping the regulated flow of the Colorado River back to the bed of the river at the Boulder Canyon Dam to develop power at the dam was subtly conceived to secure the lion's share of the water for the profit of American Land Speculators in Mexico. Once the water has been dropped back to that low level, less than 1,500,000 acres can be irrigated from it in California and Arizona. Water enough to irrigate a larger area than that will go to Mexico, perforce. It can go nowhere else.

" In the Los Angeles Times of October 22, 1922, the public announcement is made that ' when the flow of the Colorado River is equated by means of a dam at Boulder Canyon or elsewhere approximately 2,000,000 acres of highly productive land will be under cultivation, ' and ' a large city at the head of the Gulf of California, where the railroad will bring cotton, cotton by-products, alfalfa, and many other products to be transhipped by steamships to Atlantic and Pacific Ports and to the Orient.'

" In other words, American speculators are planning to annex the Colorado River to Mexico to reclaim over 1,000,000 acres of land now owned by them immediately, below the line in Mexico.

" On this great agricultural foundation a new seaport city is to be built at the head of the Gulf of California, connected by rail with Calexico, to take from Los Angeles the trade of the Imperial Valley and the whole Colorado River country.

" The population on these newly reclaimed lands in Mexico will be Asiatic, paying tribute to Mexico, but constituting an Asiatic City and State, maintaining in America, with Asiatic labor, a crushing competition with American agriculture, labor and industry.

" The battle against this scheme to annex the Colorado River to Mexico to create Asiatic competition in America, will be one of the most bitterly contested conflicts ever fought out to the end in this country. It cannot be compromised. There is nothing that can be made the subject of compromise. It may be years before it is settled.

" Flood protection for Imperial and Yuma must be disentangled from it absolutely and completely. That means that flood protection must be provided otherwise than by the Boulder Canyon Power project, behind which the Mexican scheme is now camouflaged and entrenched, and to which the effort has been made to tie the need for flood relief, like a can tied to a dog's tail.

" The Mexican Alliance has shattered the Boulder Canyon Power Dam Project. The Wyoming Decision in the United States Supreme Court has eliminated the Colorado doctrine as to interstate water rights. The original arguments to sustain the necessity for this Colorado River Commission have been wiped off the slate, any action by it now can serve no useful purpose and will be futile.

" To epitomize- delay threatens the present plans for flood protection from four sources:

1. The inextricable interrelation between the Boulder Canyon Power Project and the establishment in Mexico of a competitive Asiatic City and State.

2. The complexities of the scheme for financing the Boulder Canyon Power Project by bonding municipalities taking power from the dam.

3. The inevitable sustained opposition to any compact between the states, until the facts relating to areas irrigable, character of works and cost of construction are known.

4. The irreconcilable determination to prevent any compact that would under any circumstances diminish the total flow at the North line of Arizona and thereby proportionately reduce the potential power resource in the Grand Canyon of Arizona, which is a stupendous national asset.

" Unless this Commission wishes to endanger the existence of the Imperial Valley and the Yuma Project by delay, it can do only one thing, and that is to defer any effort to force a compact between the States and concentrate all its influence on immediate flood relief, urging upon Congress the necessity for works to control and regulate the flow of the river being immediately built and for a complete survey, investigation and report at National expense as a basis for an ultimate plan for the highest development of all the resources of the Colorado River as a great national asset.

" A plan for immediate national action that will disentangle flood protection from all complications causing delay, and afford immediate and complete safety from flood devastation for the Imperial Valley and the Yuma project, and the entire Colorado River country, is as follows:

1. Adopt the Dayton-Miana River Flood Control Plan on the Gila River and build the Sentinel Reservoir with all possible expedition as an emergency flood protection structure:

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2. Adopt the plan urged in the La Rue Report and build the Bull's Head dam as a similar flood control dam, to hold back the flood of the Colorado River long enough to close a break if one should occur similar to the break of 1906-07:

3. Build the Glen Canyon Dam solely and only as a flood control dam, without any reference whatever to any use of the water for reclamation or power development. It can be built with half the money and in half the time required to build the Boulder Canyon Dam, and will afford complete relief for the entire flood menaced region in Arizona and California.

" This plan removes the flood protection problem of Imperial Valley and Yuma entirely from any complication with the conflict arising from the plans of Arizona and California to reclaim 2,000,000 acres in those states with the water of the Colorado River which it is sought to secure for the reclamation of a similar area in Mexico for the establishment there of an Asiatic City and State for an Asiatic agricultural Colony in Mexican territory.

" There can be no justification for this Commission doing anything that will aid that Americo-Mexican-Asiatic conspiracy against the United States of America; nor for complicating or delaying the relief necessary for the Imperial Valley and Yuma by an adherence to the Boulder Canyon Power project, or by attempting to force the adoption of a compact at this time which is impossible without further surveys and investigations. Those surveys and investigations should be made by the States and the United States through existing agencies. The time is not yet ripe for the creation of any new Commission on the Colorado River. It would merely create complications and do more harm than good causing delays otherwise unnecessary.

" What is desperately needed to end an appalling danger is immediate appropriations by Congress for expenditure through existing national agencies for flood control. An effort to create new machinery now means delay where delay may be fatal to existing communities, cities, towns and farms.

Respectfully submitted,

NATIONAL RECLAMATION ASSOCIATION

By George H. Maxwell,

Executive Director."

Dated November 13th, 1922.

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It was moved by Mr. Carpenter, and duly seconded and
Ward
carried, that Mr. L./Bannister be admitted to the meetings
of the Commission.

MR. HOOVER: We left off before lunch, and the suggestion
was made that we consider the subject of a time limit,--some
period for revision. Mr. Emerson, you think something of that
kind might be well taken up ?

MR. EMERSON: Yes sir.

MR. HOOVER: Mr. Carpenter have you thought about this
phase already ?

MR. CARPENTER: Yes, I considered it very carefully. It is
a subject which might well be discussed. I see no objection to
its discussion.

MR. HOOVER: Have you given any consideration to any
machinery by which the door might be reopened for revision.

MR. CARPENTER: The time limit must be so broad and so
long that it will not force any unnecessary development in
any section in order to keep pace, and if that is provided,
and adequate time is given, then the compact might run for a
certain term of years, and continue thereafter until a call for
a revision should be made by a majority of the states, the
thought being that, at the end of the term, if things were run-
ning satisfactorily there would be no occasion for its
arbitrary expiration. However, if conditions developed that
made it wise that there be a revision or reconsideration of the
whole subject, then, a call could be made and it should be

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obligatory that that call be complied with, and it is thought that might be brought about by providing that all rights that vested within any state, or in either division, between the time of the date of expiration of the compact and the call, should vest subject to the provisions of the existing compact.

After the call has been made, rights should be suspended until the revision had been concluded. That last item being merely an incentive to a united effort on behalf of all of the states to get about the council table.

Of course, any compact we might make now can be abrogated or changed at any time by the same power that makes it. In other words, if ten years from today our efforts should prove to be ^{so}unfortunate that parties should wish to rid themselves of the compact, the same parties that make it may destroy it, but of course, that action would have to be unanimous, and might be difficult.

Roughly, that is about the thought I had worked out. But I feel that nature has such a strong hand in the control of this river, after all, that such a provision is unnecessary. But if it is going to have any psychological or actual value, I see no objection to a time limit, but that time limit should not be short.

The flood menace of the South is fully realized and sensed by all of us. It appeals to us and we desire to formulate some plan to protect the people against disaster. This will result in a fast development below, a forced development, a forced growth,--and this to prevent disaster.

There is no impending disaster above. That country should develop along its natural lines. It is to the welfare of the river that it should not develop suddenly above, and it is to the welfare of the river that it should develop suddenly below. Now, the span of time should be sufficient in the growth of the Basin generally, so that each individual farmer, as well as each individual project should be protected. Thus each may start naturally, and in such a way that when he does develop a new farm or a new project the country will be ready and the returns from the production will be sufficient, so that he may pay for the burden of the development.

Sudden development in the southeastern corner of Utah and the southwestern corner of Colorado, by the use of the Dolores waters, to use an illustration, would be unfortunate now, because no adequate transportation facilities enter that territory. The territory is settled and is in the early stages of development. In ten, fifteen or twenty years, it is probable they will build a project following some series of dry years when distress is felt. Most of our western development has proceeded along natural lines, and has been the result of a famine for water.

To return to the Dolores Project, it will probably be twenty or thirty years before that project comes into full development. It might be earlier. Other like projects should be delayed until transportation conditions are adequate. That is largely an accidental occurrence but makes possible the natural development. It is said, to use an illustration

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that oil has been discovered at Shiprock. That might suddenly cause the building of railroads into that territory, which will then furnish transportation and would promote an earlier development, but that does not insure development, - it is another accidental occurrence, so far as that development is concerned. That will serve to illustrate the reasons why upper development will come gradually. The development will not be all at once. It will be promoted by need.

MR. HOOVER: Mr. McClure, what is your opinion about such devise of this type ?

MR. McCLURE: I am on record in the minutes of a previous meeting favorable to a plan whereby in any compact made, that the time limit for revision, if desirable, should not be short.

MR. HOOVER: That we must have a settled basis for a considerably long term of years ?

MR. McCLURE: That is my suggestion and desire.

MR. HOOVER: The other suggestion of Mr. Carpenter is that all existing rights should be fixed at the date any such revision is called and that thereafter rights should be left open until such time as agreed upon ?

MR. McCLURE: A new start, an opportunity for adjustment, yes.

MR. HOOVER: Mr. Caldwell, what do you think about it?

MR. CALDWELL: I provided for that, Mr. Chairman, in the draft which I submitted. That indicates how I feel about it. Your last suggestion does not quite meet my approval, - we should not go so far as to provide details of revision.

What I suggest may be too incomplete but it is a suggestion.

MR. HOOVER: Read it again.

MR. CALDWELL: " This compact is subject to modification by the unanimous consent of the Basin states." My idea in that was that if we got together on the original compact, we could get together on a revision of it, and I firmly believe we can do that, and safely depend on it, I would be willing to. If I wanted to be suspicious I could refuse to enter into an agreement of that kind on the theory that some state, whose interest might be opposed to the interest of my state, would not consent here, but I am willing to take a chance on the equity and justice of a provision of that kind.

MR. HOOVER: You would make the conference mandatory,--not dependent upon the call ?

MR. CALDWELL: I think that should be done. I would suggest that a conference should be made mandatory upon the request of four states, or more, and that a unanimous decision be required for modification of the pact. Of course, the actual conditions under which it may be modified should meet the just requirements of any international agreement which, of course, is necessary.

MR. HOOVER: Mr. Emerson, what do you think about it ?

MR. EMERSON: Well, my expressions at our former meetings have been primarily against any plan of a time limit that was then suggested. Of course that contemplated time limits

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of twenty to fifty years; and at that time rights were to vest, to become established and be superior to any rights there after, I would be absolutely opposed to any plan of that kind, yet. However, I feel the weight of this, and there probably should be some provision whereby modification can be had, if it is found out that justice would be better served by so doing. I have not any definite plan to suggest. I am willing to discuss and hear discussions. I think I would be willing to accept anything that could be construed as fair to my state.

Of course, one of the primary reasons Wyoming is in this is to protect herself against any embargo that she feels might be placed upon her future developments, the developments to which she figures she may be entitled to by the possibilities of her greatest natural resource,- her water supply. We would not subscribe to any doctrine that would mean any race for developments as has been intimated. Otherwise my mind is open in the matter, and I would be glad to consider any plan that would not defeat the purpose of Wyoming. In listening to Mr. Norviel this morning I was unable to ascertain just what he thought might happen in the upper states. We have not any patent evaporators, or any way to get rid of water unless we apply it to valuable, beneficial uses, and I confess that by raising even wild hay upon the meadows at the head of the Green River, thereby sustaining through the winter the life of some of our stock, we are performing as valuable

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a service as any use of the water Arizona might obtain. Hence whatever water does not come to Arizona, will undoubtedly be used in an equally beneficial way in the upper states. Of course, certain loss should be figured in. In other words, any waters we don't use will come to the lower states. I am willing to consider the matter of a time limit for a reconsideration of this agreement.

MR. HOOVER: What do you say, Mr. Davis ?

MR. S. B. DAVIS: I can see no harm, and I can see no particular advantage. The general declaration that the compact may be modified, of course, creates no power, it is really a statement of what would exist anyway. If we provided for the creation of a new commission, by some provision making it mandatory upon the various states to make it at some definite time, we would probably be one step in advance. On the other hand, that commission would have to act with the consent of the several states, requiring unanimous action, and I really see no particular use to put a provision of that kind in the compact. If circumstances arose where the compact needed changing, it is always within the power of the states to do what is necessary.

MR. HOOVER: It is merely a positive step to make it mandatory rather than simply leaving the matter for spontaneous organization. In other words, it might be years and years before a meeting could be organized to reconsider the compact, whereas, by the mandatory meeting there would be a definite

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reconsideration.

MR. S. B. DAVIS: That is very true, but on the other hand, if anyone of the states, in such position, refused to appoint a commissioner, without the provision in the compact, probably the same state might refuse to ratify the compact. I would not say it is of no use, but I am inclined to think there are matters of far more moment to consider.

MR. HOOVER: On the other hand, conditions might have developed whereby certain states might find they could not use the water. It might be found that the upper states could use more water, and the upper states would thus be forced into the position whereby they were compelled to furnish certain minimum amounts of water, and at the same time it would be obvious to all parties that an investigation and revision should be made.

MR. S. B. DAVIS: I have no doubt whatever in my mind that at some time a revision of the compact would be necessary, and when that time comes it will be revised.

MR. HOOVER: Provision for revision would carry conviction before any one of the seven legislatures in considering the compact, because the technical considerations of the pact are at best difficult to explain and a provision for review stands as an evident correction to error.

MR. CALDWELL: I would like to add to what I said before that we should not provide a definite time at which the revision should take place.

MR. CARPENTER: You understand, Mr. Caldwell, my objection,

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my thought was this that we provide a term --

MR. CALDWELL: You spoke of a term of years ?

MR. CARPENTER: I spoke of a term of years, and that it should continue thereafter until a call by four States. From the time the call by four is made all rights are to remain in suspension, - that is from the time of the call until they are settled between the states by another compact.

MR. HCOVER: Suppose one state had a lone grievance, then, under the call by four members, there would be no method securing a meeting. I am just wondering whether or not a conference should not be fixed, that is, if after a certain length of time that on notice of any one state there should be a conference. That does not oblige any state to agree on a new compact, but at least gives the aggrieved state its proper hearing.

MR. S. B. DAVIS: Of course, it is like an amendment to a state constitution. There are state constitutions automatically calling for a revision after a certain period of years, and a reconsideration and possible amendments. On the other hand a majority of the constitutions contain no such provision. Nevertheless, conventions for amendments are called, and called frequently.

MR. CALDWELL: They all contain provisions providing for a call.

MR. NORVIEL: May I offer a suggestion, that in every form of draft that I have undertaken up to this time I have been unable to get away from the idea that there should be a definite

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fixed time for it to run. Now, under this form that we are discussing, when its foundation is based upon such indefinite information as we have, it becomes imperative to my mind that the agreement shall be definitely limited in time, whether it be long or short. My notion of it is that that time should be fixed not too far in the future. It should be provided that an extension of this agreement may be made at the time by the people then living and who may be appointed for the purpose of looking over the same situation that we are now viewing in the light of the further information and the new conditions that will prevail at that time or, instead of extending, they may revise it. And that time should be a time positive, and not contingent upon the call of one or four states. It was suggested by our Chairman, and I think, in a way, a good suggestion it may be that one of the states may be imposed upon, or may be over-indulged in the future by this compact, and it should not rest on any number, but all should be compelled to come in and act and extend the same compact some further period of years or revise it to suit the conditions then existing.

MR. McCLURE: Did not Mr. Carpenter's suggestion carry sufficient elasticity ?

MR. NORWIEL: The elasticity is alright, but it might be too elastic. I think it should not be subject to a call, but at a definite fixed time, thirty years from the date of signing, or whatever the time might be, this compact ends unless it

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is extended, either automatically or under conditions which may be provided for at this time. If it isn't extended it must be revised. They could get together then and discuss whether it shall be extended or revised or a new compact made.

MR. HOOVER: Suppose it is quite satisfactory ?

MR. NORWIEL: Then it should be extended.

MR. HOOVER: Then isn't it better to have it automatically extended until such time as it is the cause of a grievance ?

MR. NORWIEL: I think that subject to call at that time is quite dangerous, but I think it is an easy matter to put in a provision that the compact shall end at that time unless the extension be made. It would be very easy to extend it if it is satisfactory.

MR. CARPENTER: The provision for a term and call and automatic extension until called, might well provide that the compact shall continue automatically for a period of months, or one year after the call, so that the new compact commission would have time to consider and discuss the whole subject matter before the rights went into abeyance, - that is, all further rights. But the provision of penalty for failure to act should be such that not an unreasonable time after the call should elapse. It might be too severe to say that everything went into abeyance from the call.

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MR. NORWIEL: This condition might be fixed in the agreement, that it might be subject to call by one state, and unless the call is made, then it continues for another definite period.

MR. CARPENTER: When thereafter rights go into abeyance until--

MR. NORWIEL: The contract might read after a certain period the call for revision might be made, whatever time it might be, by one state, and if no state calls, at the end of that period then it automatically goes over for another definite period, again subject to call by one state. I don't think it ought to be subject to call by four states.

MR. CARPENTER: I am thinking out loud along your line, and my first impression, - wouldn't one state, out of ample prudence or caution be tempted to call rather than let it go over for a certain further definite period? So long as everything is going alright - -

MR. HOOVER: Wouldn't it rather encourage the making of a call, if another, say twenty-five year, period were to elapse before a call could be made?

MR. NORWIEL: It ought to be the privilege of the people then to get together and to go over the compact.

MR. CARPENTER: Under my suggestion they would have the privilege of making it one day after the expiration.

MR. CALDWELL: I wonder if we may not approach this in the same way we approached the other matters, - find out, first, whether we can find some method of revising this compact?

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MR. HOOVER: I thought we would get the general consensus of opinion, quite properly, in discussion.

MR. CALDWELL: I didn't know that.

MR. HOOVER: I think everybody agreed to a discussion of some kind.

MR. S. B. DAVIS: If anything should be done, why couldn't it be provided that another commission should assemble say twenty years from now. If there is nothing to be done, well and good, no harm done, and let that arrangement continue along with a new commission every ten years, twenty years or thirty years.

MR. HOOVER: In the recent New York-New Jersey treaty, which I will quote from, the section on that point reads as follows:

"Sec. 7. The right to add to, modify, or change any part of the foregoing comprehensive plan is reversed by each State, with the concurrence of the other."

MR. McCLURE: How many states ?

MR. HOOVER: They are only the two states, but it indicates that even in making that compact they thought they had to have some way of modifying it.

MR. CARPENTER: That merely expresses a right already had.

MR. NORVIEL: Could we fix a compact that would be ratified by the legislatures and Congress without some provision attached to it by which we would be able to get a modification?

MR. HOOVER: I feel it is desirable to have an automatic revision. Just the mere machinery of getting consent for meeting through the legislative bodies, even if all were willing

will be a great task whereas if some automatic clause whereby a commission may be called at some later time were inserted, then it would be simpler.

MR. EMERSON: I believe I would feel that way about it. I would not want to agree to any time limit that would harm rights that had been developed up to that time and vested. However, I feel I might concur in a time limit consideration of this compact, at any time say fifty years from now, or a hundred years from now, when possibly it could be shown how it will work out, without feeling that an injustice was done to any person. I believe we could depend upon the spirit of fair play of the citizens involved, that any adjustments that were felt to be needed would be made. I don't know as I would set any limit of years, as suggested, but would allow an elastic time limit, leaving to the spirit of fair play the question of whether the states shall continue this compact in the same form, or shall draw up another that will not materially prejudice any state or any interest in any of the states, that is recognition shall be given under the new circumstances to present rights and those which shall at that time have become established within the compact, we are now considering.

MR. HOOVER: You could not very well destroy rights that had been established under the compact.

MR. EMERSON: No, you could not destroy the rights, - maybe that is a little strong expression.

MR. CARPENTER: The rights would vest during the term according to the compact.

MR. CALDWELL: I think we should not try to provide the exact things for which the future commission shall meet, except to provide for modification of the compact, if necessary, under then existing circumstances.

MR. S. B. DAVIS: If you want to do away with the necessity of legislative action, you have got to fix a time.

MR. HOOVER: You must fix the right to demand a revision and through the adoption of the pact itself, and this would need be a matter of review through legislation.

MR. CALDWELL: Just briefly, for a short discussion, suppose that, as suggested, the states may be called together at the request of four of the states for the purpose of considering modification.

MR. HOOVER: There are four states in the upper basin, and three in the lower basin.

MR. CALDWELL: Well, say three.

MR. NORVIEL: One might be sufficient.

MR. CARPENTER: Some one of the upper states would probably be willing enough to let the others have a convention if they wanted it.

MR. HOOVER: In that way, there should not be any objection to a call by one or two.

MR. CALDWELL: I think we should have two.

MR. CARPENTER: Would it be reasonable to allow one lone state to force a recurrence of what all of us have gone through, just because some particular people in that state at that moment felt the need of it. That would probably be a little extreme, whereas if two states were similarly affected no doubt the revision might be needed.

MR. NORVIEL: I can see this advantage in having a definite time fixed that at the time of the revision all states would be prepared, whereas, if there was no definite time fixed, none of them would be prepared, and they would have to prepare after the call was made. I think it would be very much better to have a definite time fixed in the compact for a commission, or whatever way they would want to do it at that time. They could then meet together and say that it is working out satisfactorily and we will let it go over another period.

MR. CALDWELL: Another hundred years ?

MR. HOOVER: We could accomplish that by having sufficiently long notice of the call. I should think that some notice of the call might be advantageous because it gives time for development of fact and opinion.

MR. CARPENTER: In the matter of machinery for ascertaining the facts, our present system covers the development of about forty years. Starting from zero we have arrived at our present position. Now it is to be presumed that the present machinery will be more and more perfected, so that a two year period would be adequate time in which to assemble the data for the convention. For example, Mr. Norviel, in my state, administration has developed the fact that it is wise to put automatic registers on every canal along a river like the Platte. If that had been broached twenty years ago it would have been impossible of accomplishment. Now, that would be the natural outcome, a matter of the outgrowth of intense local administration, and

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the facts could be much more readily assembled at the end of this period, whatever it may be, than they are now.

Take Lee's Ferry station, suppose someone keeps track of the estimates and facts at that point, it will be checked by other states, and it will not be difficult to obtain the necessary data at that point.

MR. NORWIEL: We don't anticipate, as Mr. Emerson has suggested, if there was more water going by Lee's Ferry than the compact calls for, that there would be a race for more rapid development above.

MR. CARPENTER: Not unless there was a fear. That is one objection to an arbitrary call and term.

MR. NORWIEL: I can see, however, by not having any arbitrary call we might use up all the water during an arbitrary period and want more.

MR. EMERSON: You should have the opportunity to come in at any time to talk over the compact, and if it worked fairly--

MR. CALDWELL: It should be made by one or two states, according to the way you look at it.

MR. NORWIEL: I think one should be made, if it is to be made in that way, by one state.

MR. EMERSON: Well, if those desiring reconsideration did not have enough support to get two states to make the call; how could you expect to have a successful outcome for the new compact.

MR. NORWIEL: I assume the people then sitting around the table would have a degree of fairness for their fellow men, if the occasion were properly presented at the time to those

present at another meeting like this.

MR. EMERSON: I say you can depend upon the spirit of fair play.

MR. NORVIEL: But I am not in sympathy with the primary law, I think it ought to be brought up at the regular election.

MR. CALDWELL: I think one ought to be able to get the concurrence of two others to have the new compact made.

MR. NORVIEL: Wouldn't that make it necessary to go out and convince two other states, and if those two were unwilling, - wouldn't care about it, wouldn't want it brought up, - then it would be necessary to go to two others.

MR. HOOVER: Wouldn't you have to go to the legislatures?

MR. NORVIEL: That is a matter I am not advised on. I was under the impression that the governor of a state could handle it? Perhaps you would have to go to the legislatures to get a concurrence. That might be the proper form. I am not informed on that matter, whether we could leave it to the governor of the state to concur in the call for the conference, for instance.

MR. HOOVER: Judge Davis, what about that?

MR. S. B. DAVIS: I think the power to appoint the commissioners could be put in the governor. Of course any appropriation for expenses would require legislation;

GOVERNOR CAMPBELL: I don't think this commission could give power to the governor.

MR. S. B. DAVIS: I rather think so, whatever is done here will be ratified by the legislature. It would amount to an act by the legislatures authorizing the governor to act.

GOVERNOR CAMPBELL: Yes, if placed in there, the legislature would ratify it.

MR. S. B. DAVIS: That would be where the authority would come from.

MR. NORVIEL: That would be on the assumption of a definite time.

MR. S. B. DAVIS: Of course, that is the obvious way to handle it. I would not say that it could not be done except in that way.

MR. NORVIEL: Wouldn't it be better if we put into the compact a provision that at a given time the governors of the several states appoint a commission to meet and either to revise or extend the compact ?

MR. S. B. DAVIS: That would be the simplest way.

MR. CARPENTER: I have become convinced that the governors of the states may presume to exercise the power of appointment of a compact commission without legislative act, for the reason that whatever is done, in any way, will have to be ratified, -- and even though ultra Vires, my impression is that if the compact were ratified it would become law.

MR. HOOVER: It would become entirely legal if put in the compact.

MR. CARPENTER: Yes sir. A provision that the call having been made, the governor should appoint a Commissioner, would be just as definite as though a time were set in specific terms.

MR. NORVIEL: That is to say, when the governor in any states gives at any time , -

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MR. CARPENTER: No, I don't mean to be that broad; it amounts to this: Following my suggestion, the terms or time of the compact, to continue thereafter until call is made.

MR. NORWIEL: Who is to make one ?

MR. CARPENTER: One of the states. This compact could provide that, upon that call, the governor could appoint.

MR. HOOVER: He could be put in the same position under that proposal.

MR. EMERSON: The only advantage about requiring more than one state to make the call is that the governor in one state might become panic stricken, or not have just cause to start a movement which would be expensive, and a great deal of trouble, and it is certain that, if he had just cause, he could get the concurrence, at least of two other states. The compact could so be drawn that it would not be necessary to put in operation the legislative machinery to carry out the plan.

MR. HOOVER: How would it be to have two states and the President, or three states ?

MR. NORWIEL: That is all right.

MR. EMERSON: That is all right, fine, but not let it be at the call of simply one party.

MR. HOOVER: The others, the two, by and with the consent of the President, could get the three votes necessary for the call ?

MR. NORWIEL: Yes, that is all right.

MR. CALDWELL: I think that would be a good suggestion.

MR. EMERSON: And no time limit made,--even after a short period, say of ten years, it might need modification. As I say, leave things up to the spirit of fair play, - the average, human spirit that you could depend upon.

MR. NORWIEL: I think that is a good suggestion.

MR. HOOVER: Then in that case, not to have a time limit, but at the call of three, either three states, or two states and the President ?

MR. CARPENTER: I wouldn't concur in that, with the call at any time.

MR. S. B. DAVIS: I still am very much in favor of a definite new commission at the end of a definite period of time.

MR. EMERSON: How are we going to know what period of time to set ?

MR. S. B. DAVIS: Get together and discuss it.

MR. CARPENTER: If there is a provision for the call by the Governor it avoids the necessary legislation at that time, except the matter of providing for the expense.

MR. EMERSON: It seems to me we are pretty sure of the basic fact of sufficient water supply. We rather recognize that from the start, and it doesn't seem necessary that we should set a time limit for revision,--make it ten years or any other short period, - because if we are anywhere near right it probably never will come up.

MR CALDWELL: Why can't we provide that a compact Commission be formed for the consideration of revision of this compact at any time upon the call by the President of the United States. He isn't going to call these states together without consultation with several of them at least in a matter of that kind.

MR. NORWIEL: The President might not know whether everything was going smoothly or not.

MR. CALDWELL: He would find out.

MR. CARPENTER: He might be prevailed upon by one panicky Governor.

MR. CALDWELL: I have some faith in the President of the United States yet, whoever he may be, and I am willing to wager that if any one state should represent to the President that the compact should be changed, therefore a convention called, that he would look pretty thoroughly into the matter in every state to see what the situation might be.

MR. EMERSON: The President of the United States has several other things to do, I think.

MR. CALDWELL: He has several people to do them. We have got him in now with three; would it not be much more convenient for him if he acted alone? That may sound humorous, but it is logical.

MR. EMERSON: I think he is in a good place in with those two others.

MR. CALDWELL: It is agreeable to me.

MR. HOOVER: That is, at any time after blank years, the Governors of any three states concurring, or any two states and the President of the United States concurring, may issue a call for reconvening of this Commission, for the purpose of revision.

MR. EMERSON: That is all right, except the blank.

MR. HOOVER: It comes, more or less, to a continuing compact subject to the call and reconsideration and, therefore, meets Mr. Carpenter's point on that. The point left open is whether this call can be issued tomorrow or whether it cannot be issued for a certain number of term of years. The thought strikes me, and there is really weight to the argument, that this situation could be allowed to develop for a term of years. Viewing it practically, it will be at least forty years before the development of the basin will have taken place to such an extent as to bring up any serious conflict. That is, the physical process of bringing lands under water and building dams and canals and financing them will require a long period. There will be a fairly long time before any conflict will actually arise, and it is desirable, it would seem to me, that there should be peace on the Potomac during the whole of this preliminary period of development at least.

MR. CARPENTER: And no sword of Damocles hanging all the time to precipitate a conflict.

MR. CALDWELL: The combination of time and call by several of the interested parties could easily be made, it seems to me. For instance, we could provide that the call shall not be made before fifty years, say, in any event.

MR. CARPENTER: If I may interrupt you, you might do this. Provide a long term and provide that during the term all the states and Governors may agree on unanimous call.

MR. HOOVER: Well, unanimous would include three.

MR. CARPENTER: I retract.

MR. NORVIEL: I think that suggestion is good, but I don't want to put it fifty years.

MR. CALDWELL: A hundred years then, Mr. Chairman.

MR. HOOVER: Director Davis, assuming a division of the water is made, how long do you estimate it will take for enough acreage to have been developed so that there would be a likelihood of any conflict over this division ?

MR. A. P. DAVIS: That depends very largely upon what the division is. We don't know that yet. If a compact is made such as I conceive will be made by this Commission, I think thirty or forty years, - forty years would be my guess. The question could be better answered after the compact is written than it can be now, but my present guess would be forty years.

MR. HOOVER: I was assuming the case of no compact. Suppose somebody, everybody, got to work and developed the river without any form of arrest, would it be some forty or fifty years ?

MR. A. P. DAVIS: You would get into trouble long before that.

MR. HOOVER: Assuming a normal development, looking at it purely from an engineering point of view, dismissing all legal arrests, how long, from an engineering point of view, before this river could get to such a point of development that there could be any overlap of water rights ?

MR. A. P. DAVIS: That is going to be a long time, because of the margin of water that there is available. If this compact is written so that there is an adjustment a large development can go on. I think it is only by the occurrence of unforeseen things, - things none of us think of now or can think of now, - that an adjustment will ever be required, but is undoubtedly wise to have some limitation in there because we can't foresee everything. I thoroughly agree with the idea of having a provision for revision, but it should be after a period of years so that the sword of Damocles, as Mr. Carpenter says, will not be hanging during the interim and discourage investments. I suggest forty.

MR. EMERSON: It seems to me that point is one that should be looked at in the light of the effect it will have upon the minds of the legislature. A longer time might be favorable, as a matter of fact for Wyoming, still I can well conceive that from the standpoint of psychology it might be better to have a shorter time limit so the legislature won't feel that this generation is acting too much for the generation to follow.

MR. HCOVER: In the form we have it now it doesn't follow that, even if we put a time limit on of 25 years, it would not necessarily end in 25 years.

MR. EMERSON: If we are going to place a time limit on it I don't believe it should be set at too long a term of years.

MR. S. B. DAVIS: It shouldn't be forgotten it can't be revised without unanimous consent anyhow.

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MR. EMERSON: That is always true.

MR. CARPENTER: Secondly, during the term the legislatures by unanimous action, could revise it anyhow, - the legislatures and Congress..

MR. NORWIEL: It seems to me this period should not be set at a longer period than one generation at least.

MR. HOOVER: There is a good deal of conservatism about revamping anything once settled upon, and where people have gotten into harness, I doubt very much if it would ever be called into question until actual conflict had arisen.

MR. EMERSON: What do you think, Judge Davis ?

MR. S. B. DAVIS: We are dealing with some/^{thing} we can't tell how the legislature is going to look at.

MR. EMERSON: That is a very important consideration, how the legislatures are going to look at it.

MR. S. B. DAVIS: From that standpoint we want a shorter term rather than a longer term.

MR. HOOVER: Just to form the debate suppose we put in 25 years and not commit anybody to it,- just to think about.

MR. NORWIEL: That sounds familiar to me at least.

MR. CALDWELL: Let's put in fifty years and think about that too.

MR. S. B. DAVIS: If I was going to vote for 25 or 50 years I would vote for 25.

MR. HOOVER: Mr. McClure, what do you think about it ?

MR. McCLURE:.. Any period from 25 to 50.

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MR. CARPENTER: I might remark that there is a psychology for the short term that we must not overlook. On the other hand, the term should not be so short as to leave a feeling of apprehension in the upper territory that, unless they do something right now, they may be found in want on the day of reckoning.

MR. EMERSON: Aren't you pretty well protected in that, in view of the fact that any future compact would have to be unanimous, so that point is covered?

MR. NORVIEL: It would only be to adjust something that is overlooked at this time.

MR. CARPENTER: I fully realize that all our efforts here could not necessarily foreclose the right to readjust.

MR. HOOVER: I had one idea I didn't mention, and that was that this Commission shall assemble within two years after such call. This I put in so as to give a certain length of notice.

MR. CARPENTER: Let's see if I have in mind your ideas.

MR. HOOVER: At any time after blank years the Governors of any three states concurring, or any two states and the President of the United States concurring, may issue a call for the reconvening of this Commission for the purpose of modification or change of this compact. The Commission shall assemble two years after such call.

MR. NORVIEL: Within two years I should say. Two years would be rather definite. Now as to the period of time; that is the next question.

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MR. HOOVER: I think we might leave that open for debate at another session thus giving us some time to think it over. If we can take that as a tentative arrangement we might then go to the third point, which we deferred in an endeavor to assist in this particular discussion. That was the question of the quantitative division. On that we have agreed tentatively to a ten year average with an annual minimum, but we have not discussed any question of figures.

MR. CARPENTER: Speaking of minimum, during the recess the matter of that minimum was discussed somewhat by Mr. Meeker and myself. Whenever that minimum is considered it must be realized, -and I want to reiterate it, - that the minimum, that the necessity for a minimum results from the penalty visited upon the source. It comes from a drought that strikes at the roots of agriculture in the upper section. The result of that drought afflicting that section is what produces the reduction in the stream. Therefore, the minimum should be of such a quantity that the penalty of the drought will be equally distributed over the whole river system.

I might suggest one factor that might enter into the discussion in view of Mr. Norviel's statement this morning. Practically all of the available lands in the State of Colorado, - I am excluding forest reserve and the areas withdrawn, - are now settled, or being settled, so that the visitation of a drought will affect the people of the entire area in that state. Hence the idea in fixing the minimum should not be to guarantee that the lower division will have enough in low years, because that would be unfair. The idea should be, in fixing

the minimum, to allocate the drought, if I may so term it, among the people of the entire basin, much the same as we allocate the waters in fat years.

MR. HOOVER: In that vein of thought, is it not feasible to determine what water is being consumed in the upper basin and to say something on this line, - that an amount of water shall pass Lee's Ferry as a minimum equal to one-half the total flow of the upper basin ?

MR. CARPENTER: I fear not. It is possible, but there are so many streams that the problem becomes very complex. You have to take into consideration, as I understand, both the inflows and the diversions. This involves a pretty complicated machinery which resolves itself into a matter within the keeping and the conscience of probably a few men in the territory.

If we had one stream, like we do after we get to the canyon, it would be a very simple matter but after you proceed above the canyon the river spreads out like a fan, with all the fibers of a fan, and those branches in turn spread out and they in turn spread out, and so it goes. I wish it were feasible. It is possible. I might point to suggestions from these experts, - not presuming to trespass upon their ground in saying what I have, - but Mr. A. P. Davis and Mr. Meeker could doubtless inform us somewhat along that line.

MR. HOOVER: I was thinking about making concrete your safety clause on/^{famine.} There might always be some hardships from some definite figures unless they are very low.

(Addressing Mr. A. P. Davis ; Mr. Davis, do you think there is any device by which the consumption of water could be judged in the upper basin ?

MR. A. P. DAVIS: Not entirely. I agree with Mr. Carpenter about that. While it is possible of being presumed, it requires such a long series of observations and study of those observations afterwards that the results would be too little to be of consequence or be of use at that time. You want it at the time that you start making these measurements and you wouldn't have it for months and perhaps a year afterwards, because of the large complications and study that would be required. You have got to distinguish the diversion, the application, the return flow and all those details in order to get at the ground of consumption in the upper basin. I don't think it is practical to make that a really vital part of this compact. It is a thing that is very useful when determined. A study ought to be made right straight along and it might be that, by long experience, we would be able to foresee these things to such an extent that it could be made somewhat useful.

MR. HOOVER: You don't see any practical way at all of spreading the famine then ?

MR. A. P. DAVIS: The way of spreading the famine over the upper basin would have to be some such device as suggested if it could be done. But it can be done as between the two basins by fixing the minimum at Lee's Ferry.

MR. CARPENTER: At a low enough figure.

MR. A. P. DAVIS: At a proper figure. Too low would put all the burden on the lower basin, too high would put it on the upper basin.

MR. HOOVER: It comes back more or less to fixing the minimum at Lee's Ferry.

Now isn't it a physical fact that, if there is a shortage of water, that shortage will be felt after the flush flow and not before? In other words, the southern basin will actually develop. In the handling of a given year of famine have the advantage of the bulk of its water before the famine/ the May and June flow is the flow out of which the southern states are going to secure their irrigation water for the season, isn't it?

MR. CARPENTER: Yes sir.

MR. HOOVER: And the important thing to them is the flow during that period.

MR. CARPENTER: It is the period before the real leanness is felt. The water is being used during both May and June.

MR. NORVIEL: I think this will be the condition; that the flush waters will be small and will be the waters that would pass Lee's Ferry on their own account without the minimum flow. Then the continuous melting of the snows above will furnish the ordinary supply for the upper states, but there will be none coming down unless there is some arrangement by which it will be allowed to pass Lee's Ferry in a lean year. Therefore the pinch will be felt below and not above. It will be the flood that will be short and not the flow thereafter.

MR. CARPENTER: In a single year the pinch below will be reflected on the succeeding year because there will be a carry-over from the previous fat year.

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It is only where there is a low cycle of two or three or four lean years that the real minimum will come into play.

MR. CALDWELL: Mr. Chairman, I have been a little misty as to just what you mean by minimum flow. Would this be considered to be what the lower basin wants? That if a reserve storage of say six million acre-feet is provided at or above Lee's Ferry, that they shall have turned into it annually six million acre-feet to be turned down to the lower basin? Would that be considered a minimum to the lower states?

MR. CARPENTER: That is to control it altogether by the storage?

MR. CALDWELL: Yes, that is what I think we will finally have to come to.

MR. CARPENTER: What power have we over the instrumentalities by which that storage might be created?

MR. CALDWELL: Well, first, would that do it?

MR. HOOVER: If the upper states keep a parcel of water, six million acre-feet, ten million or twenty million, on hand in order to make the guarantee good, it would be assurance to the lower states and no doubt would assist them.

MR. EMERSON: We don't know just how we will bring about the building of the reservoir.

MR. CALDWELL: In the first place, Mr. Chairman, it is very probable that such reserve storage above the point, say at Lee's Ferry, would not be necessary for many years, and the reserve might be held at a lower basin reservoir, if it were

constructed, and this would answer the same purpose. That would be at the option of the lower states. I don't think that this would rush the development of the river beyond what should be normal. These structures on the river are ultimately going to pay for themselves, or else we have all miscalculated, and this one can be added and finally paid for in the same manner. Some of us seem to have a very great deal of confidence in the paternalism of the Federal Government. It would be a fine thing if the Federal Government would undertake to control the river to such an extent that we could partition the waters between these basins.

MR. HOOVER: As a matter of physical fact, it doesn't matter whether the storage is in the upper or lower basin.

MR. CALDWELL: I would say except theoretically. Theoretically the upper basin would not want to be held to passing six million acre-feet past Lee's Ferry when that water ought to be, and was, stored below.

MR. HOOVER: That was why I made the suggestion of some sort of retroactive plan, based on the amount that had gone down to storage.

MR. CALDWELL: I think that matter could be settled, but I am wondering whether or not this language should be changed to meet that situation?

MR. HOOVER: As a matter of physical fact again, the flow at Lee's Ferry, even after deducting the present usage from the upper basin, at its worst period has not been less than ten

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million feet in any one year.

MR. EMERSON: Nine million one year.

MR. HOOVER: Nine million one year, but the worst period of three years was ten million.

MR. CARPENTER: Ten million average.

MR. HOOVER: Ten million average. Half of that would be five million. That is after taking care of the present usage in the upper basin.

MR. CARPENTER: But you also must remember that there will be some additional development above as well as below. This will probably reduce that figure somewhat. In other words, the development and benefits above and below should be equally distributed.

MR. HOOVER: The total acreage now in sight within a reasonable period would not absorb more than an additional five million feet even in famine year.

MR. CARPENTER: No. I probably gave you the extreme view. To take four and one half or five million acre feet as a minimum would be to say to the upper territory, in such a year you shall not irrigate by any new projects but you must pass that amount below. If that were reduced to three or three and a half million, then, it would leave a latitude for the growth above.

MR. HOOVER: I was taking the estimated acreage in the upper basin with your estimated consumption and the estimated new acreage and it comes out about five million feet, doesn't it, Mr. Davis ?

MR. CARPENTER: I understand.

MR. A. P. DAVIS: Why no, not that much so far as the estimate in this book is concerned. (Indicating Senate Document 142, 67th Congress, 2nd Session, "Problems of Imperial Valley and Vicinity".) I don't want to unduly put that forward, but that is my opinion, that the future irrigation in the upper basin, as far as I can predict it, is not to exceed two and one-half million acres, which, on a consumptive use of one and one-half acre-feet, which is more, I believe, than they figure up there, results in a use of three and three quarter million. I think three and three-quarters million is abundance to estimate for future irrigation uses up there, and allow half a million or three-quarter of a million acre-feet to be taken out of the basin additional. That leaves four and one-half total.

MR. HOOVER: Five million is a pretty liberal estimate?

MR. A. P. DAVIS: Yes.

MR. HOOVER: In other words, on the famine flow there is still five million acre-feet left at Lee's Ferry?

MR. A. P. DAVIS: Yes.

MR. HOOVER: There probably would be physically that much.

MR. CARPENTER: Mr. Chairman, we must be a little broadness--
in this matter. We can't partition this river with exact

MR. HOOVER: I agree with you. It seems to me that assuming that storage is an issue in the lower river, as it probably will be an issue, the upper states have a right to credit for the water that they may have contributed in excess. Now I am talking against a famine period. If the upper states have

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created a credit through excess flow, which it is within the power of the southern states to have stored they should have some credit in the famine years as against that deposit established in the lower basin.

MR. NORVIEL: That is provided for in that average period.

MR. HOOVER: What we are trying to get away from is the abstract question of a famine. We are talking about minimum annual flow now, - that is whether because you have no provisions for holding it, your idea of a minimum annual flow will be rightfully tempered by the water they may have sent during some previous period to the lower basin in excess of the ten year average.

MR. NORVIEL: Yes, that should be taken into consideration, but there is this contingency in the average of ten years, - the cycle of dry years may not be limited to three but may extend over a longer period than that and unless we have a constant supply of some water our necessities may deplete the supply to such an extent as would be disastrous.

MR. CALDWELL: Mr. Chairman, it seems to me now, - I may not be thinking clearly, - but it seems to me that reserve storage created will take the place of dependence of average flow. It will meet the requirements better than by calculation of average flow. Cut that out altogether and say that there is enough water in the river. We will hold back a certain amount of it, and in the event that it is held back in reserve you are entitled to six million acre-feet of it anyway. We don't need to talk about average flow as far as I am concerned. I am will-

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ing to take a chance on what is in the river, if there is a certain amount of reserve storage for the purpose of supplying the lower basin.

MR. CARPENTER: Mr. Norviel, in following out your line of thought, you fear that a series of several famine years might work disaster below. Isn't it a fact that a series of several years of famine would have first visited the upper territory and worked its inquiry there even before it is felt with you? Therefore, isn't the disaster visited upon both areas? In other words, if the assurance is given that the lower states will always have enough water, the upper states must take the hazard. That is visiting the disaster entirely upon the upper states, isn't it ?

MR. NORVIEL: I know this, that if I were very hungry and should have the first chance at the cupboard I should probably feel more secure than if I were the last man.

MR. CARPENTER: If your arm wasn't long enough to reach the shelves of the cupboard, some of the food would be left.

MR. CALDWELL: Why take a chance of wasting this water to the sea ? Let's hold it back and give it to the lower basin. That is the concern of the whole basin.

MR. CARPENTER: In communities, where reservoir development has proceeded to and approached the nth degree, water becomes the equivalent of gold in the bank and, peculiar as it may sound, is drawn upon and delivered in those districts

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much as money is checked from the bank. It is there, locked up, and is available to all.

MR. NORVIEL: I perhaps ought to ask Mr. Davis a question, first, on the proposition Mr. Caldwell just now raised, " why waste it to the sea ?" Assuming, of course, that we have a large storage capacity below, - I will ask Mr. Davis if the minimum flow of six million acre-feet would supply the present demands on the lower river and waste any to the sea ?

MR. CARPENTER: You are assuming that is all they get.

MR. NORVIEL: Assuming that is all that comes down in one year.

MR. A. P. DAVIS: If regulated, as you say in reservoirs, for the present development. that would be enough/ The present requirement below Lee's Ferry for present development is about four million acre-feet, including the use from tributaries, but I thought your request was for a minimum of five million.

MR. NORVIEL: Mr. Caldwell raised me one more, Well, whatever it is, five or six million, if that were the minimum flow demanded after the reservoir was fairly--

MR. A. P. DAVIS: The present area in the United States irrigated from the main river below Lee's Ferry is 508,000 acres exclusive of Nevada's requirements and in Mexico 190,000. The total amount required now for American lands, including Nevada, ^{is} 2,560,000 acre-feet from the main stream.

MR. NORVIEL: Is that the Imperial Valley and the Palo Verde ?

MR. A. P. DAVIS: From the main Colorado River. Of course that doesn't include what is diverted from the Salt River.

MR. NORVIEL: From the main Colorado itself ?

MR. A. P. DAVIS: Yes. The figure was what would be supplied at Lee's Ferry under Mr. Carpenter's supposition, which was 6,000,000 but the requirement for present development is 2,560,000 in the United States.

MR. HOOVER: All projects in the South including only that for the United States, requires how much more water from the Colorado River ?

MR. A. P. DAVIS: You mean, for full development ?

MR. HOOVER: Yes. How much further water beyond the present supply ?

MR. A. P. DAVIS: I will have to figure a little.

MR. HOOVER: Give us the United States separately.

MR. NORVIEL: 508,000 acres in the United States, excluding Nevada.

MR. A. P. DAVIS: That is the present but the total development was asked for, 1,220,000 acres.

MR. HOOVER: That is Colorado River water ?

MR. NORVIEL: Yes.

MR. A. P. DAVIS: For the area in the United States, 1,220,000 acres at five acre-feet per acre, would be 6,100,000 acre-feet.

MR. EMERSON: Consumptive use was five acre-feet ?

MR. A. P. DAVIS: No, but I am simply giving you that. It is the fact, the present lands do use five acre-feet. I am giving you the fact, that five acre-feet for 1,220,000 acres comes to 6, 100,000.

MR. NORVIEL: What is the estimated acreage of new development in Arizona?

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MR. A. P. DAVIS: About 240,000.

MR. NORVIEL: That would practically be taken up with the Parker project and lands in the Yuma project ?

MR. A. P. DAVIS: And the Mojave Valley.

MR. NORVIEL: The Mojave is only estimated at 27,000.

MR. A. P. DAVIS: That is correct.

MR. NORVIEL: It is all taken up in those few little projects right along the river.

MR. A. P. DAVIS: In other words, it doesn't include Mr. Maxwell's high line.

MR. NORVIEL: Nor my basis. I think, Mr. Chairman, that each of the commissioners should write out his requirements, the actual needs as far as they can be ascertained, with some degree of accuracy.

MR. CARPENTER: Based on good engineering.

MR. NORVIEL: Yes on good engineering, with a degree of feasibility applied to the proposition. Then we can have before us some figures. While in a way I would be willing to take Mr. Davis' figures all the way round, if the others would be satisfied with that, I am not sure but I rather think that we would fall in line.

MR. EMERSON: I think that is a pretty good suggestion. Now probably the only uniform analysis of any kind that has been applied to the river basin has been made by the Reclamation Service and it, with the means and information at hand, has

not
tried to reach a certain estimate. Now, if we are/ going in to allocation of the water to the several individual states in a large way, it seems to me an estimate of the Reclamation Service might be a fair basis to work from. It is in my opinion, going to be a great number of years before we ever reach those figures.

In Wyoming we carried on investigations this Summer again that will enlarge the irrigable area in one project there of some 900,000 acres, still it is going to be a great many years before that project, in all probability, will be economically feasible for full development.

I wish to call attention to the fact that the Reclamation Service has applied the only system of uniform analysis that has been applied to the basin and we might as well give some consideration to those figures.

MR. CARPENTER: Mr. Norviel, I think you are probably laboring under a misunderstanding of the Colorado figures as finally given. Mr. Conklin for the Reclamation Service, and Mr. Meeker for the State of Colorado made a joint investigation of the Colorado River area covering quite a period of time. They did not ascertain many smaller areas. Mr. Meeker continued the investigation upon the/same/basis the succeeding year and also had the cooperation of the water commissioners, - water police, - whose duty it was to aid him. The final figures given by him are the result of the work by Mr. Conklin and Mr. Meeker and then continued into the next season, taking up small detailed tracts scattered over one-half of our state and requiring a very thorough field analysis. This is the reason it was raised from one

million some, to 1,825,000. Have I stated that correctly ?

(Addressing Mr. Meeker)

MR. MEEKER: The work Mr. Conklin and I did was office work. Later, I spent five months in the field checking up the office work and expanding the field work. The figures submitted were not available early in the Winter when we were at Riverside. They were not made available until the March hearing in Denver. They were not completed until that time.

MR. EMERSON: Mr. Chairman, here is the way this thing appeals to me. We are liable to knock out the props from under this whole scheme if we are not a little careful. If each state comes in and presents the acreage that they in fairness and in full protection to themselves think they ought to hand in, it is going to show, if we take some of those acreages, that we haven't got water supply enough. At the same time there isn't a member of this Commission but what believes there is enough water in the Colorado River for all the beneficial uses we are going to find for it. Now, as we are not going to try to allocate this water to the several states, but rather in two big divisions, I think we want to go pretty slow about discussing this proposition on this general acreage basis.

Why can't we consider the system of uniform analysis that has been applied by the Reclamation Service because that doesn't defeat the premise upon which our whole structure is founded. The fact that we believe there is sufficient water for all has always been the hopeful phase of the situation and I believe we want to be rather careful as I say, not to knock

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the props out from under us by consideration of the high figures which would show on the face of them that there wasn't water supply enough for all. I, for one, feel just about the same as I felt in Washington. Wyoming would be willing to take the general analysis supplied by the Reclamation Service, not saying it is accurate for Wyoming, or entirely fair if we were going to apportion upon a basis of allocation of water to each state.

MR. CARPENTER: You mean for the purpose of considering the whole area ?

MR. EMERSON: Yes, for the purpose of considering the whole area. Because we know, when we look at these figures and sum them up as turned in by each state, we would not have water supply enough. At the same time we know in our own mind, and are convinced, that there is water supply enough for all and we don't want to defeat that conviction.

MR. HOOVER: Mr. Davis, this further work that has been done in Colorado and Mr. Norviel's few words, has that amended your views ? Have you given consideration to that ?

MR. A. P. DAVIS: No, sir. The estimates of irrigable acreages we have made in Senate Document 142, have been made upon a uniform basis. There isn't any question but that we could include projects that were not considered feasible and were not included. Just where to set the limit is a matter of judgment. The estimates do include many projects that I personally know, having gone over and examined them and tried to work out something that looked feasible under the provisions of the Reclamation Act, where no interest is charged. In that way I have

checked the estimates in so many states that I believe they are liberal. They are not, of course, infallible, - they have mistakes in them no doubt, they have some errors of judgment, probably, but those are relatively small and the limits of feasibility are set so wide that I think a fair adjustment has been made. The fairness of that can be judged somewhat by the classification we have made. The acreage in each state is separated into four different classes, one that we consider feasible now and others that are dependent upon some future development such as increased value of land but for which we know the water supply is physically available, and which could be built if the money were available.

Now that is the basis upon which these estimates are made. I don't know but that the time will come when a sufficient addition in all the various states could be made to reach up to the limit of the water supply, but at present, on the basis we have estimated, there is a large surplus. I haven't had brought to my attention anything that materially changes the result. The one that looks the most glaring is the one in Nevada, which was chiefly due to the allocation of the waters to the other states where the claim had been made by the State Engineer there was a feasible project. If increased in Nevada it must be decreased in other states and that applies, to some extent, in other places, but not to that striking extent.

MR. CARPENTER: You believe your figures would hold good for fifty years ?

MR. A. P. DAVIS: I feel confident of that.

MR. NORVIEL: Are the same figures in the complete report as in the preliminary report ?

MR. A. P. DAVIS: No, they were modified in various cases.

MR. NORVIEL: Upward ?

MR. A. P. DAVIS: No, not always.

MR. NORVIEL: Well, modified figures are the result of your personal investigation ?

MR. A. P. DAVIS: No, the result after study.

MR. NORVIEL: Not the result of the State Engineers investigations.

MR. A. P. DAVIS: In some cases we got additional information from the State Engineer. We tried to have all the information we could get. In some cases we didn't succeed in getting any in time for publication from the State Engineers. I think there were two cases at least of that kind.

MR. NORVIEL: Well, now, the concentrated effort, then, that you have given to this matter we are now talking about, is centered in this report ?

MR. A. P. DAVIS: Yes, we have got some information now that is later than that report.

MR. NORVIEL: Well, have you that available so that we might have it ?

MR. A. P. DAVIS: Some of it. I haven't it in written form here, but I could by illustration give you one of the cases. Mr. Caldwell is familiar with the investigation that has been carried on on Green River, the results of which were not available to place in the final report.

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MR. NORVIEL: That would make a deduction in Utah ?

MR. A. P. DAVIS: A deduction.

MR. NORVIEL: Of how much ?

MR. A. P. DAVIS: The figure published here is 150,000.
I think that was reduced to about 40,000.

MR. NORVIEL: Then that would be a difference of 110,000
to be taken off the figures that you have ?

MR. A. P. DAVIS: It would in that particular case. We
have some additional information on White River that would
partially offset that. That would be an increase.

MR. NORVIEL: Well, what increase would it be ?

MR. A. P. DAVIS: I think there is about 40,000 acres there.

MR. NORVIEL: An increase of 40,000 ?

MR. A. P. DAVIS: I don't know that that is feasible.
We know there is water for it, that was allocated to Colorado
in the report. It could be used in either state.

MR. NORVIEL: You would hardly add that to your figures?

MR. A. P. DAVIS: It is about in the same class with many
others.

MR. NORVIEL: That is, the addition of the 40,000 on the
White River would be about the same class as the reduction on
Green River ?

MR. A. P. DAVIS: No, I don't mean that. I mean it is
about the same class as some of the projects we have included
in the list where the feasibility is doubtful. That, of course,
is subject to revision. These projects that can be considered
on the basis of land values that we can reasonably anticipate,
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or of which we now know or can reasonably anticipate, the costs of construction, I think are generally included in this. There has nothing come to my attention that would materially modify these figures.

MR. NORWIEL: You feel then with this little change in Utah that so far as your judgment goes the states would be safe in making this allocation of water based upon your figures of new acreage in this basin ?

MR. A. P. DAVIS: In Utah you speak of ?

MR. NORWIEL: Yes, with the changes you speak of ?

MR. A. P. DAVIS: Yes.

MR. EMERSON: I will tell you, Mr. Norviel, right there that if we are going to allocate according to the states I wouldn't be satisfied with the figures that have been set down for Wyoming but if we are going to consider this basin in two big divisions I would be inclined to stand upon the general figures as between the two divisions as the basis to work on.

MR. CALDWELL: In other words, you think the estimates in the other states are large enough to protect Wyoming ?

MR. EMERSON: Yes.

MR. NORWIEL: Figuring on the division of the basin into two divisions.

MR. CALDWELL: I mean the other states of the upper division.

MR. NORWIEL: Mr. Chairman, it seems to me while the acreage estimated by the Reclamation Service in our state is very small, I would like to talk this matter over and see if we

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can't agree on Mr. Davis' figures as a basis of adjudication of the waters between the two divisions. I wouldn't want to say right now, but it may be that we can reach a conclusion based on those figures.

MR. CALDWELL: I think, Mr. Norviel, you can safely consider some of the upper states are just as hesitant as you are in concluding to accept that as a basis.

MR. NORVIEL: Well, if you have anything better to offer I would like to hear it.

MR. CALDWELL: Mr. Davis, 4.4 is what you estimated for the Imperial Valley. I think you estimated something less for Arizona, 3 acre feet if my memory serves me right.

MR. A. P. DAVIS: Three and a half acre-feet for pump lands, and 4.4 for gravity.

MR. CALDWELL: In Arizona ?

MR. A. P. DAVIS: In Arizona, or the whole lower basin from the main Colorado River.

MR. EMERSON: The consumptive use in Arizona would be much less than it would be in the Imperial Valley, would it not ?

MR. NORVIEL: Mr. Davis has included some of the lands as in California.

MR. EMERSON: Return flow.

MR. NORVIEL: The fact is you will get some return flow both in the Imperial Valley and also in Arizona.

MR. A. P. DAVIS: That is one reason that the duty of five was reduced to 4.4.

MR. NORWIEL: What do they use now in the Imperial Valley per acre ?

MR. A. P. DAVIS: About five.

MR. CARPENTER: Isn't it a fact you probably have your figure of acres more accurately down in the lower country, than you do in the upper because of the scattered areas in the upper territory ?

MR. A. P. DAVIS: That is probably true. So far as projects we have included are concerned, they are to rather a high degree of accuracy. These new projects that Mr. Norviel refers to I never heard of before, - I don't know what he refers to. There are physical possibilities that I know of that were not included. Concerning these there is of course a difference of opinion as to whether or not they should be considered feasible but they are, as far as I know what he refers to, work of extreme difficulty. I would like to say in regard to such things as that, that there is a well nigh universal tendency to judge feasibility solely on the cost of construction, which is a fallacy, or only a half truth.

To use, for illustration, Mr. Maxwell's high line, with a distance of 200 miles, air line from the point of diversion to the point of first application, which by the curves, possible curves, would be doubled or more. Some places have been reported where there are three big washes to the mile with numerous little washes between and where the work is nearly all rock. Now that is a matter of tunneling or the construction of very numerous structures, and you can't tunnel it all, of course. A 200 mile tunnel would be utterly out of the question but if you don't

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you have got these numerous structures which every engineer knows give unending trouble in maintenance at connection between the concrete structure and earth, or rock or whatever they connect with, subject to cloud bursts, floods, etc., Now on such a simple project as the Salt River project the cost of maintenance is heavy. It is heavy on the Yuma project and so I conclude, after seeing that country, which I have seen nearly the whole distance at various times, and particularly for this special purpose, I conclude, if that could be built for nothing, it couldn't be maintained and operated at feasible cost.

MR. CARPENTER: Isn't it possible to build similar projects all over the upper territory ?

MR. A. P. DAVIS: We could take a very large quantity of water entirely outside of the basin that I don't consider feasible at all, and haven't considered feasible. You could go through tunnels fifty or sixty or a hundred miles, if those were feasible, - you could take the whole headwaters of the Grand River across onto the Great Plains where there are unlimited lands that need it, but those things I don't consider feasible at all and haven't included.

MR. NORWIEL: Well, we have got to stop some place. I will say the lands I have in mind in the main are in the lower Gila Valley where the Parker diversion might be carried down,--

MR. A. P. DAVIS: It strikes in above the Sentinel Reservoir doesn't it ?

MR. NORWIEL: No, it doesn't go as far up.

MR. A. P. DAVIS: In regard to that I would like to say I don't claim any infallibility of my figures and would be very glad to find a feasible project which will take some of this water that I believe is surplus in Southern Arizona, because it is a splendid place to use it and a fine climate to produce. The Sentinel Reservoir has a possibility of storing Gila waters sufficient to irrigate a hundred thousand acres of land. We have investigated that. We have got surveys of canals, lands and everything of that kind but if one wanted a hundred thousand acres of land they would have to go a long distance in that valley to find it. A great majority of what was examined looked fairly good on the surface but was underlaid with hardpan or was too alkaline, too much alkali in the ground itself for fertility but we did, by going a long way down the river valley, succeed in finding nearly a hundred thousand acres of land. It was scattered and of such quality that the soil conditions alone shed doubt upon the feasibility of the irrigation project. I don't claim there is not a feasible site there. We haven't had it included because it hasn't come into the Imperial Valley problem and I am not willing to say today there isn't a feasible project of a hundred thousand acres in the Gila Valley to be irrigated from that river. I hope there is and I believe some day we can work one out. It isn't feasible today, but one may be worked out in the future. That is the same land you propose to cover with this Parker project.

MR. NORWELL: Part of the same land ?

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MR. A. P. DAVIS: Part of the same land. The diversion of the river near Parker can be raised about 70 feet. There is a great deal of the roughest kind of rock country to be crossed, and it is a long distance to reach the Gila Valley, which greatly increases the cost, of course. I am not saying it is utterly infeasible, but the acreage isn't there to take care of an excessively costly project. I wrote to you that was the most promising thing I knew on the river in addition to the projects published.

MR. NORVIEL: We have investigated to some extent, but just what we can do down there, we do not yet know. And that is one of the reasons why I am falling back upon your figures. We contemplate a soil survey in that region. Before anything very extensive in the way of investigation is carried on, of course we shall have to have a soil survey, or get the soil survey, if there is one made, from the Department. I thought there was one available, but I haven't it.

MR. A. P. DAVIS: I might say in that connection that in the early days, eighteen years ago, when investigating the Yuma Project, we made a survey of a high Canal line- one that doesn't run into the mountains at all - and we made an estimate and concluded it to be infeasible because it gets out of the river bottom country. It is just a series of breaks, nearly all of the construction work requiring drainage crossing every two or three thousand feet, on the average, and that kind of thing is always costly.

MR. NORVIEL: But the canal that we hope to be able to take out or to put the water in, would cover some valleys which

I am informed would not be reached by gravity from the Gila River, - and better soil and better valleys than those being reached by the Gila.

MR. CALDWELL: It seems to me we are getting away from the real issue.

MR. CARPENTER: There is one question that I have been wanting to ask Mr. Davis that would recur to our point of departure. Mr. Caldwell had proposed a flat annual delivery of six million feet. Mr. Davis, assuming that reservoir structures would be put in at Lee's Ferry or in that vicinity for the purpose of making possible that flat delivery of 6,000,000 acre feet to the lower country, would it be possible from your knowledge of the flow of that river to conserve all the flow of that river in the Lee's Ferry Dam and only deliver 6,000,000 acre feet a year and no more ?

MR. A. P. DAVIS: It would not be possible without a very much larger consumption in the Upper basin than I consider possible.

MR. CARPENTER: It keeps piling up and piling up and going over ?

MR. A. P. DAVIS: Yes.

MR. EMERSON: Were we trying to determine what the amount of this minimum flow should be ?

MR. HOOVER: What we are proposing to do here, if we can get to it, is to determine what the minimum flow is - what the average flow is in one instance and the minimum in the other - which would pass Lee's Ferry. That is our main issue and it

looks as if the flow at Lee's Ferry is somewhere about sixteen or seventeen million feet.

MR. A. P. DAVIS: At Lee's Ferry, I think it is something like 16,500,000.

MR. HOOVER: And it looks as if the total demands of the southern territory direct from the River are something like 5,000,000.

MR. A. P. DAVIS: The actual figures are 5,100,000 acre feet. That, excludes the Gila which isn't available for any of this land and also irrigation from other tributaries.

MR. NORVILL: And if the high line canal is put in - I mean the All-American - the Gila where it empties into the Colorado would be available to no one except Mexico.

MR. A. P. DAVIS: The Gila is not available for anything except in its own basin.

MR. NORVILL: So it need not be considered at all ?

MR. A. P. DAVIS: Well, the water can be used in its own basin; but it would cost so much money to provide the necessary storage that it is useless to talk about using it in the Colorado River Valley.

MR. CALDWELL: It may not be under present conditions that you would care to store the Gila and it may not be necessary.

MR. A. P. DAVIS: We can't use it without storage.

MR. CALDWELL: But when you have storage, it will be because there is no water in the Colorado. We are looking to the time when just such an exigency will exist and those things will be

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done quicker if the necessity is imposed than they will be if they get water to those lower regions by imposing penalties upon the upper region.

MR. A. P. DAVIS: The whole thing I am trying to get at is that the Gila River is an expensive storage proposition. We consider it feasible, but it is very expensive. It isn't feasible, to store water on the Gila for the use on the Colorado.

MR. HOOVER: I would suggest that we ask Mr. Davis to make up a new table based on the figures of the Reclamation Service, so that at least we can talk about the same figures. From a treaty point of view, Mexico has no right to call on us for water ?

MR. A. P. DAVIS: No. and I would like to say here while we are on the subject that an investigation has been made of the conditions on the river near the Imperial Valley and I would like to impress upon this board that there is later information than was available when we visited that region last Spring. Then, they had just completed a diversion from the Bee River to the Pescadero. The river was turned through this cut, and is running there now. The river during flood carried a large amount of timber and drift, and ran into a region covered with mesquite, and other brush, and the water spread out and our party had to carry their boat for miles. The drift has clogged the thing up so that the water goes over it in rapids. It has silted to such an extent that the deposit has a depth of over thirteen feet already from one flood season. And even in the channel of the Pescadero that they cut, silt has been built up as high as

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six feet on the sides and that is filling up so rapidly it won't hold but one or two more floods and unless they can extend that channel and continue it down further South they will within a year or two be right back where they were a year ago. Flood conditions in the Imperial Valley are exceedingly acute and I have realized that to such an extent, that I think that is the most important thing that could be done with the Colorado River, - to construct a storage reservoir that will be big enough to control those floods.

If large storage within the next few years is not provided at the Boulder Canyon the results will be disastrous.

MR. NORVIEL: The hope was that the Pescadero Cut would take care of the flow there for eight or ten years.

MR. A. P. DAVIS: Yes, they hoped that it would. But the accomplishment that they hoped for is short-lived. The remedy is a short-lived one.

MR. CALDWELL: Mr. Davis, not to cast any doubt on what you say, but just as a matter of fact the deposits down below there are greater somewhat this year than they may be expected to be next year, aren't they ?

MR. A. P. DAVIS: Why ?

MR. CALDWELL: Because of the amount of stuff that washed out of Pescadero Cut.

MR. A. P. DAVIS: Yes, some was washed out of there; but it has mostly been replaced by deposits in addition to what I spoke of. The water has backed up and deposited a great deal in the cut, and even the banks have been built up higher than their machine built them in building the cut.

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MR. NORWIEL: Didn't the Pescadero Cut refuse to operate at all for a little while and the water go on down to Volcano Lake ?

MR. A. P. DAVIS: Not after they built the dam. Of course they had to build a dam across the river to turn the water into the cut and during that time the water ran down there. They have spent nearly \$300,000 in the present year on this work.

MR. CALDWELL: Mr. Davis called attention to the very acute situation that exists down in the Imperial Valley. I would like to assure Mr. Davis, however, that I don't think he has increased in any particular degree my anxiety for the Valley, because I have been extremely anxious about it ever since I came in touch with the question. It does seem to me, however, that with a provision in the compact whereby after a term of years the compact may be modified, in order to get the protection that is necessary down there, that the lower states as a matter of interest would be willing to concede something to the upper states in the matter of the amount of water that may possibly be retained up there on the theory that water up there that is not used will come down; but water that comes down and is not used, will not go back.

MR. HOOVER: Isn't that somewhat an argument that the peril and distress of the lower states will lead them to concede

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more than they ordinarily would?

The meeting was adjourned at 6:00 P.M. to
meet November 14th, at 10:00 A.M.

Clarence C. Stetson,
Executive Secretary.

The above minutes were approved
at the 27th meeting of the
Commission, Friday afternoon
November 24th, 1922.