

MINUTES OF THE
15th MEETING
COLORADO RIVER COMMISSION

The fifteenth meeting of the Colorado River Commission was held at Bishop's Lodge, Santa Fe, New Mexico, on Tuesday morning, November 14, 1922, at 10 A. M.

There were present:

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

There were also present:

Governor Thomas E. Campbell	of Arizona
Governor Merritt C. Mechem	of New Mexico
L. Ward Bennister,	Chairman of Committee of Interstate Waters of Denver Civic Association.
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.
Ottomar 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.
A. J. McCune,	State Engineer and Advisor for Colorado
R. I. Meeker,	Deputy State Engineer and Advisor for Colorado.
Richard E. Sloan,	Legal Advisor for Arizona.
P. G. Spillsbury,	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 by Mr. Hoover at 10 A.M.

MR. CARPENTER: Mr. Chairman, I would like to ask the privilege of attendance at these sessions of A. J. McCune, State Engineer of Colorado.

MR. HOOVER: It has been moved and seconded that Mr. McCune be asked to attend; All in favor signify by saying aye. The ayes have it, and it is so ordered.

Last evening we were on the discussion of the third one of our main propositions and that was the basis of division of water between the upper and lower basin, and we had tentatively agreed upon a term of years average and a minimum delivery for any one year, and we were discussing the quantitative amount. Before we go on with that I would like to make this suggestion for consideration. That some of our members feel that an accurate division of water at this time is in the nature of a gamble, and that therefore if we can effect certain limitations in the compact which tend to correct the gamble, we meet that possible mistake that we might make at this time, and it was for that purpose that we were discussing yesterday also the question of limitation of term, some positive method of revision. There is another limitation on the risk that would enter into this, and any limitations on the risk makes it easier to arrive at the quantitative question. One would have more courage to arrive at quantities if they are surrounded by safeguards. Any quantitative division is necessarily predicated on storage, and when we come to the problem of

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storage itself, it falls into two phases. First, storage to equate the flow seasonally in the terms of flood control, as we refer to them, and second, to equate the water over a term of years. Roughly, without any accuracy, the storage required for seasonal control is probably somewhere between 5 or 6 million acre feet. The storage required to equate over a term of years is probably say 10 million acre feet. I am not pronouncing this as final terms. If storage were provided in the river for perhaps in the lower basin of 18 million feet, or somewhere thereabouts, we would have an equation of the river over a long period and in order to arrive at an average delivery over a term of years, such as ten years, that equation is necessary in order to give an assurance of regular flow. Now, if the pact were made conditional upon the erection of that storage at some point, (I am not finding any point), but some point that would serve the lower basin, then, it would not seem to me to be necessary to arrive at a minimum annual flow, but that the whole flow could then be - that the one single quantitative figure would be necessary. Mr. Caldwell was thinking on that same line, it is his original thought, in suggesting that there should be in the upper basin 6 million feet of storage, a minimum of that, in order to enable that basin to equate the flow over a term of years. I assume what he had in mind was storage against the annual fluctuations rather than the seasonal control. Whether that storage is in the upper or in the lower basin, it seems to me to be immaterial whether we

we regard a certain portion of the water past Lee's Ferry as being a deposit in the bank, or held above. In other words, the upper states may theoretically have security storage to enable them to carry out the assurances from the upper basin by a deposit in the lower basin. If the whole settlement were made conditional upon the creation of that storage before the compact became binding, then there would not seem to me, any necessity for a guarantee flow for any one particular year, so that we might, on that line of discussion, avoid the whole necessity of guaranteeing a minimum flow for a whole year, which seems to me to be pretty difficult.

MR. CARPENTER: The only data we have to obtain the minimum is from the lowest year. It would be the minimum of the lowest, not the three lowest.

MR. NORVIEL: With reference to the suggestion just made, of the deposit in the bank, it would make quite a bit of difference whether the deposit in the bank were in the upper or lower division because there would be a continual interest to be paid on this deposit. If deposited in the lower, evaporation might be counted the interest, and if the deposit is counted in the lower basin that division in the lower basin would have to pay that interest, and if deposited in the upper, of course, the measurement to be at the point of demarkation, the interest would necessarily have to be apportioned by the upper states, so it does make a big difference, and if the deposit is made 3 years in advance, or 4 years in advance, there would be 3 or 4 years of evaporation which is estimated at 6 feet on the

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surface of the reservoir. This would be a very material matter.

MR. CARPENTER: The excess water stored is on the bottom of the lake.

MR. NORVIEL: Not always, it comes in on top.

MR. CARPENTER: Yes, but it sinks to the bottom.

MR. NORVIEL: You have your exposure just the same. If it were filled up every year, we wouldn't have that continual exposure.

MR. CALDWELL: Eliminating the interest feature, Mr. Norviel, what would you think then, assuming just the storage.

MR. NORVIEL: I still think as I thought yesterday.

MR. CALDWELL: I dont think I have in mind clearly what you thought.

MR. NORVIEL: I dont remember.

MR. HOOVER: That there should be a minimum flow in any one year passing Lee's Ferry of 5 million acre feet.

MR. NORVIEL: I cant conceive of any security without a minimum flow and I see no harm in making the proposition at this time to the upper division.

MR. HOOVER: Supposing that in one year there passed Lee's Ferry 16 million feet, and that your demands, your storage need was, say, 8 million feet, you have a deposit in the bank of 8 million acre feet. Suppose the next year was dry beyond any of our anticipations, and that the upper states only let down 2 million feet. Would it not be a right thing to credit some of that previous deposit in the bank to relief of the upper basin during that especially dry year ?

MR. NORVIEL: Surely; that was one reason why I suggested that we cut this period down to 3 years, and I think that's long enough unless we have a minimum flow. We cannot have any security over a 10 year period with no minimum flow, because there may be a cycle of 5 or 6 years during which time the water may be all used by the upper division within the period of time we may fix in this compact. They would use that water in the hope that the next, or the next or the next year they may make up the deficiency, and it may be possible in the end they would not be able to make up that deficiency, and we would have dried up in the meantime, and we would have no recourse unless we fix one of some monetary basis, and I am not anticipating that they would want to agree to that at this time. As I stated in my statement yesterday, we cannot tell what the future will bring in many different ways. We cannot tell what the upper division has in mind, if any.

MR. CALDWELL: Neither can I.

MR. NORVIEL: We cannot tell what use will be made of the water over and above what we now anticipate, most of us, and we don't know what further use will be made of this water, and it would be dangerous for us below to forego the minimum flow in any period longer than three years, and I cannot agree to it.

MR. CARPENTER: With a minimum flow, the whole question of storage is largely removed, is it not ?

MR. NORVIEL: No, we must have storage below.

MR. CARPENTER: I mean the immediate necessity of storage; The river isn't going to stop when we sign this compact. It will run on and without any change.

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MR. NORVIEL: It must be understood and agreed that this compact shall be inoperative until storage is provided below.

MR. McCLURE: Why should we have it below in order to afford flood control and provide a surplus for irrigation ?

MR. NORVIEL: I dont follow you.

MR. McCLURE: I understood you to say that the storage must be below.

MR. NORVIEL: Somewhere in the lower river. Wherever you want it.

MR. McCLURE: Would it not serve our purpose for flood protection at some point above ?

MR. NORVIEL: Frankly, I cant be interested in any storage above the San Juan for protection below. That matter has been handed over to me from different people suggesting that we take up the proposition of storing in Colorado, Wyoming and Utah, and New Mexico for our protection. I cannot get interested in that at all.

MR. CALDWELL: Isn't that just a little way from the question that we are now trying to handle ? (Addressing Mr. Carpenter) You used the word "control" which I think Mr. Norviel takes in the larger sense. What we are trying now to do is to work out what storage will be necessary to carry over from wet to dry years in order that the lower states may have in any one year a minimum amount.

MR. McCLURE: Would not a deposit of 10 or 18 million acre feet in the upper region solve our problem of flood control?

MR. NORVIEL: During the three years, of course the average must be given us.

MR. HOOVER: Supposing, for instance, that the wet years would be the first two and your third was dry; then you come to the 4th dry year. You are asking then for such a minimum on the 4th year as will fill out.

MR. NORVIEL: Ascending minimum ?

MR. HOOVER: The minimum in the 4th year might be only, say, two million acre feet in order to maintain the third year average, then the next year it might have to be 4 million in order to maintain an average, and if you had 3 dry years you might have to get up to 10 million feet in the dry years.

MR. NORVIEL: Here's what I have in mind - I may not be right, But anticipating a ten million acre feet necessity below the point of demarkation, supposing this year we would receive 16 million acre feet in the reservoir, and next year we receive two, and the next year two, making 20 million acre feet for the three years. It will be readily observed that we will have to drain the reservoir at the end of the second year, with nothing to start on and no water coming down. Now, I don't know what Mr. McClure's analysis of this matter is but it seems to me it is encroaching upon the line of danger and is the point which I suggested yesterday, that it is a place for us to stop, look and listen very carefully.

MR. HOOVER: Supposing you had such a situation that there was a flow of 2 years of only 2 million feet. You have a

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drouth of such stupendous character that both basins will have to suffer. You have to reckon with that. On the other hand if you take the 20 year record of the river we are dealing here with a very extreme situation a hypothetical extreme.

MR. NORVIEL: That's true.

MR. McCLURE: That is my answer Mr. Chairman. The possibility is so remote that California is not fearing it.

MR. NORVIEL: I don't know but I am unable to anticipate what intermountain diversion may be made in the upper states. I don't know exactly what the upper states have in mind, but using the past as a criterion, I imagine that they will undertake to reach the limit in intermountain diversion, and it may be to such a point as would create a desperate condition in the lower division. This in addition to their full development within the basin.

MR. McCLURE: I cannot conceive that such a condition may or will arise within any reasonable period; and the compact, if made, can certainly be revised if any such extraordinary catastrophe should occur.

MR. CARPENTER: Mr. Norviel, the tendency of the people below is to regard the border of the basin as a sort of outer rim, as the rim of a dish. The mountainous areas are largely interior mountain masses and it is physically impossible to penetrate to this interior source if they would, and all they could penetrate would be the mere rim.

MR. NORVIEL: Then, I assume you will be willing to limit

the amount perpetually.

MR. CARPENTER: If it were large enough. I regret to say it appears to me that each time the lower country is considered, it appears to be on the basis there must be a guarantee to them, that they should survive no matter what happens to the upper territory. This is reversing all principles of local justice, to say nothing of interstate justice. The only occasion upon which the lower country would suffer would be when there would be intense suffering above, and we would have no control upon that. The demand should not come, and I am sure it is not the intent on sober thought to make the demand so strong as to say that the lower country must always have plenty of water, and be assured of that no matter what happens above. I think that would be beyond the range of vision of those below.

MR. NORVIEL: Mr. Carpenter, this isn't my draft of the compact. I went over this ground as thoroughly as I knew how alone, and arrived at the conclusion it would be exceedingly/ if not impossible, to ever adjust it in this manner. However, I am perfectly willing to discuss it with you and arrive at a just and equitable apportionment if we can, but I don't like the term guarantee because I don't believe the term guarantee enters into it at all. Legally, we are exactly on the same basis, on the river. The upper division I think ought to get out of their minds that they are guaranteeing to the lower

division anything. We have the same right in the river. I conceive that they have the same right to the water, to take it and use it as any other part of the basin. We are trying to get away from that; get away from what the State of Colorado terms a "Simon Pure" appropriation state, and the law that appertains in the basin always has tried to divide the matter up on another basis. So that the term guarantee doesn't enter into the question. All we are trying to do is to reach an equitable apportionment of the water that is ours and that doesn't belong to one section or another.

MR. CARPENTER: Assuming your premise to be sound, while of course I disagree, isn't your attitude that the assurance for the country below, no matter how terrible a drought, or how great the affliction may be thrust upon the upper territory, which is the only occasion out of which there would ever arise a water shortage at Lee's Ferry, isn't it always your disposition to get assurance for your dry deserts below and ask us to bear the brunt of that visitation of drought, which paralyzes us just as much as or more than the lower country? If I am in error that that is your frame of mind, well and good, I beg your pardon.

MR. NORVIEL: You are forgiven for all your sins up to date as far as I am concerned, but as I said before, this isn't my notion. I tramped over this ground, over every angle to every other point, I think and it is going to be, and is, a very difficult problem to solve.

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The assurance we ask is no more than our legal rights, any other section to the contrary notwithstanding. We ask no more from you than we ask from the state of New Mexico or California or Nevada. We only want what is ours.

MR. CARPENTER: You want the Gila River because it rises in your territory. Supposing we include the Gila so we know where the water supply is. Don't the people of the upper states have as much right to demand that you let the Gila flow in Imperial Valley as you have to ask that we do something?

MR. NORVIEL: You have the right to ask for as much as you. If you have any chance to appropriate any water out of the Gila, can use under the Gila./it is yours. Whatever appropriation you have made out of the Gila is yours and whatever appropriation we can make out of the Colorado is ours. Whatever appropriation we could make out of the Colorado of the unused water is ours and that is all we ask. If we can get it in some other way than by appropriating it, it's up to you to show us.

MR. CALDWELL: I was just trying to get your idea of necessity.

MR. NORVIEL: I gave you my idea on the paper.

MR. CALDWELL: I will make a statement and you can correct it. It is your idea as you stated it that what you want is your legal rights, no more, no less. In which event it does seem to me that we are not here simply for the purpose of drawing up a compact which conforms to the decision of the Supreme Court of the land, and I will ask the Commission if I am correct in that and if that is really necessary.

MR. SCRUGHALL: What do you mean by that ?

MR. CARPENTER: Let me correct probably your thought before the question is answered. The decision which you mention has certain other factors which go with the principle, one of which is that it is incumbent upon the lower states to build their own reservoirs and to see to it that the water does not waste to the sea, - the surplus.

MR. CALDWELL: That's an incident. What is the use of compacting on a proposition of that kind that's settled by the Supreme Court decision. That's my question.

MR. HOOVER: To go back to our original discussion. Mr. Norviel's suggestion was that there should be a minimum flow; that is, in the nature of a guarantee and I am wondering whether or not if this is purely a question of equitable apportionment, one can ask for a guarantee of a minimum flow and whether a famine period does not imply an equitable apportionment for such a period. There is established a state of famine, and you deal with it not as a matter of theory but as a matter of reality and proceed to an equitable apportionment of the entire basin on a basis of a famine rather than in an assured minimum.

MR. CARPENTER: That was my thought in dropping back to the ten year average and that the famine automatically takes care of the situation, but I can well see where other factors along the lines that have developed might make the lower states apprehensive of a deliberate action above, which might add to the famine.

MR. HOOVER: Might project the famine entirely on the lower basin.

MR. CARPENTER: So I am perfectly free to see the value of his suggestion in that regard.

MR. HOOVER: That is in effect a statement that on a ten year average the whole thrust of famine might be put on the lower states instead of the upper.

MR. HORVIEL: That's it exactly. It might be taken care of in this way; in the event of a cycle of dry years the water might be measured in the storage available to the lower division, and an adjustment according to the actual needs within the basin may be made of the flow if that could be done for the particular year or cycle of years, but as Mr. Davis stated that would be exceedingly difficult and expensive of administration. According to my statement in the beginning, I said that the administration of the matter would be practically impossible, and I still insist that I was right. That's the only way that I can see any different arrangement might be made other than a stipulated minimum flow.

MR. HOOVER: If you get a stipulated minimum flow you get a situation of enforcement on the upper basin which implies the same as enforcement on all persons taking water and that amounts to the same administrative control as if you, for instance, declared that in certain circumstances a famine in the basin existed and the same identical control would have to be set up in either contingency.

MR. NORVIEL: I still insist that it is a serious problem to work out, and I don't think it will work by the rule of three as I know it.

MR. CARPENTER: For my part, I don't see any such great objection to the minimum flow as such, if it be contemplated that the drought might be still more severe than any heretofore known, that might be safe guarded by fixing a minimum, and then providing, in certain extreme conditions, or failure of precipitation to a certain amount, that the minimum might be more reduced. Precipitation generally in the country is more easily ascertained than the flow, but I rather dread that because it adds- it burdens the whole agreement with detail. Regarding annual averages it might be possible to arrive at an annual average on the 20 year record. It is perfectly possible at Yuma to have an average annually, but if there be doubt in that regard that could be a temporary figure and actual gaugings could take place at Lee's Ferry as well as Laguna and other points for the next ten years. We could ascertain the result from these figures taken as an average, which puts off the final determination to a later date. The river itself is so large and its flow so bounteous there seems to be more latitude in this river than usually obtains.

MR. NORVIEL: What is the objection, any way, to a short period of three years ?

MR. CARPENTER: You can't get a true average in three years. For example I may illustrate in this way. You, as an official,

if you were investigating the water supply available to a given contemplated project, you would not be content to take a three year record as the basis in your determination of water supply because that three year record might have been in 3 years of unusually heavy flow. Neither would it be fair to force that project to yield to the calamity of taking three years of low flow or two lows and one average. In order to get the amount of water available for say the San Carlos Project, you would want to take the flow of the Gila River for a longer period than 3 years. Three years is more like a spot measurement. It is hardly fair, any 3 year record.

MR. NORVIEL: I think you are talking about one thing and I am thinking about something else. I am thinking about this period which you speak of as ten years.

MR. CALDWELL: That average is predetermined in your mind.

MR. CARPENTER: My suggestion is - we are working from Yuma, we set a definite figure, and then say that we will make an annual average delivery over any ten year period for that amount of water at Lee's Ferry. Some years low and some years higher, but in the sum total of the flow in ten years it would be an average amount.

MR. CALDWELL: May I try to state that so I can understand it? I think your idea, as I get it, is that we have predetermined the average flow say to be 6 million acre feet, and during any ten years that follow from now on, the upper basin would deliver to the lower basin 60 million acre feet, but in

every case it must be a ten year period, advancing one year at a time. The years considered would be the next preceding ten years. Is that your understanding, Mr. Norviel ?

MR. NORVIEL: I must confess I am confused on the statement of the problem.

MR. CARPENTER: I wish you engineers would try to labor with one another to get that clear in your minds and the mind of Mr. Norviel.

MR. CALDWELL: I have to get it in my own mind first.

MR. EMERSON: I thought we reached practically a determination of this principle yesterday; why reopen in this manner this morning ?

MR. HOOVER: It reopened itself because we have to determine first the average flow for ten years and a minimum flow for one year.

MR. EMERSON: I thought we just decided on the principle.

MR. HOOVER: If we can revert back to these two quantities we have to clear up one point straight away, but the suggestion is made here that this is the average flow for the previous ten years. That cannot be the case for the simple reason that the increasing consumption in the upper states will decrease the flow over a number of years, so you could not take the average at Loe's Ferry. You must take a period of ten years, as the consumptive use in the upper states has increased. Isn't that the case.

MR. MERSON: This matter of a ten year period has been clear in my mind, unless I am wrong, we would proceed in taking each ten years by itself, always considering the last ten years, until we reached the point where there was not the total delivery over the ten year period.

MR. HOOVER: If you do so you must add to your gaugings at least the increased consumption of the upper states. That would make it possible to have a progressive ten year average. Supposing the consumption is now 4 million and it increased to ten, then your gaugings at Lee's Ferry are going to be diminished by 6 million feet and you could not take that as an average.

MR. MERSON: Take a ten year period, now, we can come so far within the ten year average delivery that there would not be any chance to violate the compact, but there will come a time when we will have to take stock,-- possibly there will come a time. According to my consideration of the idea, we would proceed with the measurements from year to year, keeping check of each ten years, always considering the last, to gain our average, and whenever it came to the point in a certain year when that year, combined with the last 9 would not hold to the average, it would be up to the upper states to make up the deficiency. I don't see that the increase in consumptive use has anything to do with it.

MR. HOOVER: In this river there was probably 20 million feet, before any water was diverted, and any equitable division

requires a reconstruction of that situation in order to determine what an equitable division is. If you go back to Lee's Ferry and take gaugings from now on and don't consider the increased consumptive use, you are going to have a constantly diminishing flow at Lee's Ferry, and that would not be an equitable apportionment of the river, it would be an apportionment of what is left each succeeding year.

MR. EMERSON: We are going to have a chance for reconsideration and revision of the figures. If you reach a ten year average in the compact, then, if over any period of the last preceding ten years, the upper states deliver that average, there is no default on their part, but, if we do come to the point where during the last preceding ten years they don't deliver that total amount, then, the time of reckoning has come.

MR. NORVIEL: Let me see if I can understand what Mr. Emerson has in mind. You say that the average is adjustable as I take it on the preceding ten years.

MR. EMERSON: You take the last ten years always whenever you are figuring.

MR. NORVIEL: To arrive at what average ?

MR. EMERSON: The last preceding ten years.

MR. NORVIEL: Then it is a changing average.

MR. EMERSON: No a certain average in this compact is fixed. Multiply that by ten and you have the total volume delivered by the upper states in any successive ten years.

MR. NORVIEL: We are now trying to arrive at what is to be delivered, or permitted to go down to the lower division, a specified amount annually or that ten times that amount shall be delivered within the ten years, is that it ?

MR. EMERSON: You have both the average and your minimum at the end of that time.

MR. CALDWELL: I am wondering what will happen when we attempt to describe this to 7 legislatures. My judgment is that we will never accomplish the feat. We will run up against a snag surely. That's only practical, but I think it is important. I do believe if we can so control that river and hold it back that a certain minimum will always be available for the lower states in the dry years, but that contemplates storage. Why not get directly to the matter of storage and face it and name it, talk of it and handle it ?

MR. EMERSON: Any plan contemplates storage.

MR. HOOVER: The compact itself must be predicated on storage, otherwise there is no water. The water has been exhausted in the river now. That flow today is pre-empted. There is no water for division unless we predicate storage. Obviously the compact must be predicated on storage.

MR. NORVIEL: I think the simplest matter is to fix the period within which the minimum amount is to be delivered with a reasonable minimum annual flow.

MR. CARPENTER: The minute you enter upon the task providing for storage, you will develop a sectional psychology.

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A very entertaining and possibly persuasive address could be delivered before this Commission by an informed person to the effect that all storage, all development should take place on the head waters of the stream, and advocates of the upper states are just as strong as any, and it was my thought to get as far as possible from the storage in the compact, to avoid that very conflict, it being incumbent upon the district, the two divisions provide their own storage in their own way and by the instrumentalities at their hands. Now, the only objection I have to the principle, for example, to providing for storage reservoir, - is the dispute that will arise as to location. Some will say that Lee's Ferry is the psychological place in one way for a reservoir as it's at the point of control of the river as it shifts between the upper and lower division. Now, suppose we provide some instrumentality by which that reservoir could be constructed which in turn would be met by the counter defenses of the lower reservoir, which are very persuasive. Others claim that the Flaming Gorge and sites further up would accomplish the result better and bring greater benefit to mankind because of the successive step of development, so you may proceed step by step and expand on this matter of storage. My thought was to provide a certain definite figure now that should be the annual average delivery, or the average annual delivery at Lee's Ferry, taking that over a period of ten years, and you would have some aggregate of ten times that figure, and that was not to be all we were to deliver, that was to be our minimum.

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MR. EMERSON: I would like to ask, do I correctly understand your proposition of ten year average ?

MR. CARPENTER: Yes.

MR. HOOVER: Does it have any alteration in the future ?

MR. EMERSON: Except by a revision of the compact.

MR. HOOVER: The ten year figure is the ten year figure from now back with no alteration by any future gaugings.

MR. CARPENTER: That's my thought.

MR. EMERSON: Except that 25 or 50 years from now, it may be necessary.

MR. NORVIEL: Let me ask, may the amount that is to be arrived at to be delivered during a ten year period, ^{to} be delivered at any time during that ten year period ?

MR. CARPENTER: That would be the case.

MR. NORVIEL: In chunks of 1, 2 or 3 during the period. In any manner at all during the period.

MR. CARPENTER: Yes.

MR. HOOVER: It isn't a progressive average based on ten years from this day.

MR. NORVIEL: I think its a fixed amount.

MR. CARPENTER: In arriving at that figure I take into consideration the 20 year average at Yuma. That amount is to be fixed by ten years back or forward.

MR. CALDWELL: I wonder now if I understand it. First, the amount to be delivered to the lower states is 6 million; you say that is what they are entitled to next year. Based on the 10 years or 20 that have preceded, you have arrived at a figure

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say of 6 million. Next year they are entitled to 6 million
acre feet.

MR. CARPENTER: No, during the next ten years they are
entitled to 60 million acre feet. That delivery may be up
and down.

MR. NORVIEL: That all may be delivered in the 9th year.

MR. CALDWELL: During any ten years you propose to deliver,
then, 60 million acre feet.

MR. NORVIEL: That may all be delivered the 3rd, 5th, or 10th
year.

MR. CARPENTER: Of course it is physically impossible to
ever deliver that water in the 10th year, it would dry up the
river in other years.

MR. CALDWELL: This is just an arbitrary figure. That will
be enough to carry you over ten years. The only thing is you
let some of it go to the ocean, the Gulf of California, and
cannot get it back. If we could agree that you would store
such of that as is necessary or some specified amount, would
that be your guarantee that you are asking for ?

MR. CARPENTER: They, knowing they will get a certain
definite quantity of water, and also knowing that by nature
they will get more, isn't it incumbent upon them to fix and
construct for themselves the instrumentalities by which the
use of that water may be brought about ? Let me say in
connection with that question, in the recent controversy
between Colorado and Wyoming, Wyoming contended that it was
not incumbent upon Wyoming to provide any storage facilities
by which the excess of the fat years might serve for the lean

years in that territory; that if we interjected a new diversion upon the river and cut off the supply, it was incumbent upon us to supply the storage. The court, very rightly, found that that contention was not right; that to each of these divisions should be left the method of conserving the water within its own territory. Now in some cases reservoirs will be constructed at one point and in some cases another. One factor may develop a reservoir this year and another factor, referring to public or private capital, develop a reservoir another year. It may be found as years progress that it is wise to provide a large control reservoir in the lower part of the upper division; well and good when that time arrives. My thought is now to take, if I may use it, the raw river, leaving it to stipulation that a certain flow pass Lee's Ferry not at any particular year, but an average flow over the ten year period. That leaves each of the territories free to pursue its own course in its own way and make its own provision, and takes care of the lean and the fat years, and also takes care automatically of drought and excessive precipitation. I don't have in mind that the upper territory would deliberately construct great reservoirs above which would withhold arbitrarily the water from the country below, because it is so abhorrent to any principle of humanity, it is not within my range of vision. If that is feared, then, we might fix the minimum. That minimum should be so low that we can certainly meet it. That minimum being merely for the purpose of assuring the lower territory against our radical and arbitrary requirements.

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MR. HOOVER: Then the question between you and Mr. Horviel is purely the question of minimum between any one year.

MR. EMMERSON: I would like to apply again this Colorado decision which the lower states look upon as vital for their side. If you study the decision in the Wyoming-Colorado case, you may find that that is not altogether true, that the Colorado River is appropriated. Now it is true no doubt as Director Davis says that the Colorado River at the Imperial Headgate is dry today. It is also true that a large volume of water has passed that headgate this year. Applying the Wyoming-Colorado decision to the Colorado river, the Imperial Irrigation District will have no demand upon any upper division by reason of that fact, ^{that} that river is dry there today. Because during this year a large volume of water has passed by that headgate unused, and the Supreme Court has held that the lower division must provide the storage to take care of the surplus waters of the stream and provide for their low season needs. In that way and in that phase, the Colorado decision is not favorable to the lower states, but does put upon them the burden of reservoir construction. As I conceive the situation, it is founded primarily on the provision for the storage of water to carry the surplus flow of this stream over to those periods of shortage when the water supply may be deficient. If we take a ten year average and with that apply a low minimum flow to the stream, the upper states are doing their part in supplying the water to the lower states and directly in line with the application of your Wyoming-Colorado case by the Supreme Court.

MR. CALDWELL: Within the minimum flow ?

MR. EMMERSON: Yes, within that minimum flow. The minimum flow is largely a guaranty from the upper states, and it is reasonable and I can well see where there should be a stipulation of minimum flow to take care of a two or three year period of low years, in order to spread the famine. The upper states will be affected just as much as the lower states, so the figures must be low; but I believe it would be very proper to establish a minimum yearly flow that we will be able to agree upon, but the average delivery over a period of years is certainly essential, so that the surplus water may be conserved; that must be carried over from year to year and more than one year, in order that the just and most efficient use of the Colorado River may be had. It is my understanding that we practically agreed upon a ten year period of average flow delivery, with the stipulation as to minimum flow, and I would like to have a poll of the states to show whether we could not determine that point. But if we cannot come to an agreement, you will find that the benefits of the decisions in the Wyoming-Colorado case are not entirely confined to the lower states, for the burden of construction of the reservoirs to catch the surplus waters of the stream from year to year is placed on the lower division.

MR. CALDWELL: You know about that from experience ?

MR. EMMERSON: I certainly do, we had a fine time on the Laramie River in Wyoming this season.

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MR. HOOVER: Wouldn't it come, more or less to a question as to the minimum flow? Mr. Norviel has suggested a minimum flow of five million.

MR. NORVIEL: Whatever seven thousand second feet work out, it would be I think between five and six million.

MR. CALDWELL: If the minimum annual flow in acre feet were placed low enough, surely, surely something could be agreed upon, but it occurs to me, by agreement in the compact, if it is necessary, that storage may be provided either above or below Lee's Ferry, say reserve storage. I want to say if reserve storage, which means storage for this purpose, be provided, then the minimum flow can be increased if storage is provided.

MR. MILLERSON: Who would be responsible for that storage?

MR. CALDWELL: I think that is another question, but I have read the Colorado-Wyoming decision in the same way that you have read it, and have remarked, as you have remarked, that it is probably just in that matter, but I think the thing could be handled easily because of the necessity of large storage in the river anyway, either above or below, and it does seem to me that the minimum flow becomes a matter of not a great deal of consequence, after all is said and done, if it is low enough.

MR. MILLERSON: It is just a safeguard, and they wish to have it. But it seems to me that if the upper states agree to deliver a certain amount of water over a term of years, and possibly further agree to deliver not less than the minimum yearly amount every year, it is up to the lower states to pro-

vide means of storage.

MR. CARPENTER: And it is up to them to provide storage as may be necessary, to be sure we deliver our minimum.

MR. NORVIEL: Of course it is necessary that we accept the burden of providing storage below. As I look at it, it is not going to be the easiest thing in the world, - it may not be the easiest thing in the world to provide that storage, but with the assistance of the upper states, not financially, but morally, we are in hopes that we may obtain that storage. The storage alone will not irrigate lands, - I mean storage capacity in the reservoir, if there is no water in the reservoir.

MR. MILLERSON: We are going to agree to deliver the water to fill that reservoir.

MR. NORVIEL: Yes, then unless we can have a minimum flow we may have an empty reservoir.

MR. MILLERSON: We are willing to consider a minimum flow.

MR. CARPENTER: We are willing to consider a minimum flow.

MR. CALDWELL: I didn't get the last remark, I didn't hear what was said the last time.

MR. NORVIEL: We would want to know that we would get that.

MR. HOOVER: To get back to figures, - apparently the flow at Lee's Ferry on an average is about seventeen million feet.

MR. CARPENTER: I think, Mr. Chairman, that is a little high.

MR. HOOVER: Alright, about sixteen.

MR. CARPENTER: Sixteen million, say.

MR. HOOVER: And the upper states have already had the

beneficial use of approximately two million four hundred thousand feet. Mr. A. P. Davis' calculation of their future needs, - I am not pinning anyone to this, but arriving at a hypotheses, - the future need in the upper states is about four million feet. That reaches a reconstructed average of something like twelve million feet passing Lee's Ferry. If you take a drought of years, three, or any number of years, - there was an average, - there was one year that ten million, approximately passed Lee's Ferry, and if the upper states took their full use of four million additional feet, there would still be in the three dry years, six million feet passing Lee's Ferry. However, if they had had their full supply for all of their contemplated needs on the basis of the Reclamation figures, therefore it would not seem to be a very great tax upon them, in fact, they would not feel the effect of the famine on a basis of a minimum flow of between five and six million feet, no famine would have fallen upon them. The famine would only fall, - take the driest years, the worst three years in history, after six million feet had passed, and after they had reached their full development.

MR. CARPENTER: Isn't it also a fact that with respect to the present uses of the Colorado River, those below would not feel the effect of the famine on the river if we only delivered the minimum ?

MR. HOOVER: They would feel the effects of the famine when it got to nine million two hundred thousand ?

MR. CARPENTER: No, when it got below two million five hundred and sixty thousand acre feet.

MR. HOOVER: On the basis of the present total development of the lower river, they would feel the effect of the famine when it fell below nine million two hundred thousand feet.

MR. CARPENTER: But of course with that runs the fact that a failure to deliver in the lowest year would be a breach of the compact, therefore the figures must be below --

MR. NORVIEL: Below the possibility of a breach ?

MR. CARPENTER: Yes; I don't mean unreasonably low, that isn't my thought.

MR. HOOVER: We could also argue the matter on a basis of a fifty-fifty division. I am assuming ten million acre feet running at Lee's Ferry as being the average of the three worst years. Add to that the consumptive use in the upper basin, bringing the total water in the upper basin to twelve million four hundred thousand acre feet; a fifty-fifty division of the water, would call for, roughly, six million feet, and a fifty-fifty division would still allow the lower states a future development as shown by the Reclamation figures.

MR. NORVIEL: Well, we are trying to arrive at a minimum flow now, Mr. Chairman.

MR. HOOVER: But I was simply illustrating where the minimum flow would lead on the actual figures.

MR. CARPENTER: On that last remark, Mr. Chairman, I call attention to the fact that a fifty-fifty division at Lee's Ferry is not a fifty-fifty division of the river.

MR. NORVIEL: Are you changing the subject now ?

MR. CARPENTER: No. It is my thought that the uses during the past twenty years, in the upper and lower divisions, would about compensate or offset, hence we could take the figures

arrived at, and assume that the diminution would compensate, - use that as a basis for figuring. Meantime I would like to know whether it would likely be acceptable to the lower basin. I think it should be reasonable to store the say, sixty million acre feet, that may come down from the upper basin during any ten years to protect themselves against the drought.

MR. McCLURE: Yes sir, we would accept, on the part of California.

MR. CALDWELL: What about Arizona?

MR. NORVIEL: What?

MR. CALDWELL: The water that comes down for a ten year period, sixty million acre feet, or whatever it works out, should be stored by the lower basin?

MR. NORVIEL: The reservoir is to be worked out with the consent and moral assistance of the upper states, with that understanding.

MR. LEMERSON: That is what you get through this compact.

MR. CARPENTER: I think there is not a man in the upper states, and who understands the situation in the lower country, who is not hoping to see a reservoir in the lower river.

MR. NORVIEL: I am glad the heart strings have been touched at last.

MR. CARPENTER: They always have been.

MR. NORVIEL: It seemed to me there was some opposition in the beginning.

MR. CARPENTER: I will say that it seems to us immaterial what instrumentality is used to get it.

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MR. SCRUGHAM: May I make a suggestion? I move that five million acre feet be adopted for a minimum quantity per year, to be permitted to flow past Lee's Ferry for the benefit of the lower basin. I will ask for a poll of the states on it.

MR. HOOVER: For any one year?

MR. SCRUGHAM: Yes sir.

MR. CARPENTER: The minimum year should not be taken as an average of the three, but the lowest known minimum, and the lowest occurred in 1902 before any great development within either the upper or lower basins, which may be said to be nearly a natural minimum, and that was nine million one hundred and ten thousand. Would you modify the minimum in your motion to four million five hundred thousand.

MR. SCRUGHAM: What is the object of such modification.

MR. CARPENTER: Because that is half of the lowest known year.

MR. SCRUGHAM: Why should we take half of the lowest known year?

MR. CARPENTER: Because the minimum means the smallest quantity that will be delivered.

MR. HOOVER: Do you accept the amendment?

MR. SCRUGHAM: No; let us make it five million, then call for explanatory remarks when the poll is taken.

MR. HOOVER: Is there a second to that motion?

MR. S. B. DAVIS: I will second the motion.

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MR. HOOVER: It has been moved and seconded that there shall be provided a minimum annual flow, based upon the flow passing Lee's Ferry, of five million acre feet.

MR. SCRUGLIAN: Part of my motion was that the states be polled.

MR. NORVIEL: We will accept that on a five year average period. We think ten year average period is entirely too long, too long for any purpose in average delivery.

MR. HOOVER: Will you vote no ?

MR. NORVIEL: No, I accept the minimum flow, yes but not on a ten year average. I don't want a ten year average under any consideration.

MR. HOOVER: Suppose we take the motion as it was made, without mentioning the period now.

MR. NORVIEL: What motion ?

MR. HOOVER: The motion is for any one year, the minimum flow passing Lee's Ferry of five million feet ?

MR. NORVIEL: Yes, sir.

MR. HOOVER: What is your vote on that form ?

MR. NORVIEL: Yes.

MR. HOOVER: Mr. Emerson ?

MR. EMERSON: No, believing the amount too high. We already have a year that shows a little in excess of nine million. No doubt there will be lower years in the future, and if, when we have a very low year, as I have stated before, the onus of any shortage that might be felt should be equally borne by the upper and lower states. My suggestion would be four million.

MR. HOOVER: You vote no ?

MR. EMERSON: Yes, I vote no.

MR. HOOVER: Mr. Scrugham ?

MR. SCRUGHAM: Yes.

MR. HOOVER: Mr. Davis ?

MR. S. B. DAVIS: I vote yes, with the understanding that in some way the amount to be contributed by the various states be distributed.

MR. HOOVER: Mr. Carpenter ?

MR. CARPENTER: I vote no, and would vote for four million acre feet for much the same reason mentioned by Mr. Emerson, with the thought that inasmuch as this is the irreducible minimum, and a famine greater than that of 1902 may come, the burden would fall upon the upper territory. That four million acre feet, or five hundred thousand acre feet less than one half of that recorded in 1902, the flow, is a fair figure, leaving in round figures four million acre feet as the minimum.

MR. HOOVER: Mr. Caldwell ?

MR. CALDWELL: I vote no for the reason that I believe that any minimum should be backed up by some reserve storage to maintain it.

MR. HOOVER: Mr. McClure ?

MR. McCLURE: Yes.

MR. HOOVER: Of course unless it is unanimous it is not binding upon anyone.

MR. SCRUGHAM: May I modify the motion, substituting four million five hundred thousand acre feet which is half the
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lowest recorded flow, to be the minimum annual flow past Lee's Ferry.

MR. HOOVER: Suppose we try that out. What do you think about that Mr. Norviel?

MR. NORVIEL: Now, Mr. Chairman, when we are arriving at this figure it must be dependent upon the period of the average, and it is almost meaningless to make anything definite without that, and unless we fix that average period first this would be a mere chance in voting. I can't intelligently vote on it unless I know what the period of average flow is.

MR. HOOVER: I don't quite see that they hang together, because the year indicating the minimum flow of the river, and it does not seem to me it enters into the average flow at all. I don't see how they are necessarily connected.

MR. NORVIEL: Like this, there are, or may be a cycle of three, four or five dry years during which period not more than the minimum flow would come to us. Our storage capacity may be entirely depleted, and yet one or two or three or more dry years may follow that depletion, during which time the minimum flow would be practically the only water available to us, and it would be disastrous then, and the burden of the famine would rest upon the lower basin. It is this other thing that we must keep in mind, that the water that falls on the upper states will be used by the upper states until after the flow has gone by, - until after the full use has gone by.

...say that the users of water will use all they want during the whole season, and then if they are unable to deliver, will simply say the water isn't there, or has not been there, and they can't deliver either the minimum, or any part, in that particular year. This is a problem that will be impossible to figure in the event the water is not sufficient to take care of the needs of the upper states, and will leave a remainder equal to whatever minimum flow we arrive at. If the question is simply as to the minimum flow, leaving to be readjusted the period of the average flow, four and a half million acre feet we will agree to.

MR. HOOVER: I understand we haven't agreed at all on what the average is to be.

MR. NORVIEL: I mean the average period.

MR. HOOVER: The average period, that is entirely apart from the question. And you are prepared to accept four and a half million ?

MR. NORVIEL: That being practically half of the minimum flow as shown by the records.

MR. HOOVER: And not taking into consideration that question at all ?

MR. NORVIEL: No.

MR. HOOVER: Mr. Emerson ?

MR. EMERSON: Yes..

MR. HOOVER: Mr. Scrugham ?

MR. SCRUGHAM: Yes.

MR. HOOVER: Mr. Davis ?

MR. S. B. DAVIS: Yes, with the reservation already made.

MR. HOOVER: Mr. Carpenter ?

MR. CARPENTER: No, with the further objection that if three successive dry years fall upon us, in the third year we would be brought nearer a violation of the compact, and it is not the intention of the upper states to violate this compact, but we expect to live up to its terms, and we do not wish to be placed in the position by nature where we will be compelled to violate it.

MR. HOOVER: You are going on the assumption that there may be worse years than in the past ?

MR. CARPENTER: Yes, and I am also reliably informed that there may be worse ones.

MR. NORVIEL: I would like to have the source of your information.

MR. CARPENTER: I don't care to give that out.

MR. CALDWELL: Worse than what year ?

MR. CARPENTER: 1902.

MR. CALDWELL: That was twenty years ago, and if another dry year were to strike us we would obviously be worse off than we were in 1902, because that was before any great amount of development had taken place, - nearly all of the diversions have been since that time.

MR. CARPENTER: I still think four million feet should be the minimum. Understand when we fix a minimum we fix a point

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beyond which we may not go without a violation of the compact, no matter what the cause, even though it is a cause entirely beyond our control, therefore when we come to fix an irreducible minimum it should be fixed at a point where nature will not compel a violation, or where we, in order to comply, would utterly deprive our territory of water. Therefore, I still believe four million feet should be the minimum.

MR. HOOVER: Mr. McClure ?

MR. McCLURE: Yes.

MR. A. P. DAVIS: I want to ask what your convention is basing this minimum on. It is undoubtedly true any records of the past twenty years, - it may not cover the extreme, but we should remember this, that in a year like 1902 at Yuma was where most of the extreme drought was known, in which the entire southwest, - the whole Colorado basin, as the records show, suffered drought. Below Lee's Ferry the flow would be nearly nothing in that kind of a year, the losses there being the severest, and in a dry year they would be at least normal, and the probabilities are that it would be more. We have no records, practically, before 1901, and below Lee's Ferry the loss is very much greater than above, and the flow greater there than at Yuma, and therefore, I don't think it is an extreme consideration or an extreme conclusion to think there is a great deal more water at Lee's Ferry than at Yuma in that low year.

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MR. HOOVER: Mr. Caldwell?

MR. CALDWELL: No, for the reason I voted against the other.

I may be wrong in this, but I will state it anyway: If we should have, arising from natural causes, - if we should have as dry a year as 1902 fall upon us we would naturally expect a lower minimum than we have because of diversions that have taken place in twenty years that have passed since 1902. Now, I would vote against practically any minimum for the reasons I have stated, because it is not backed up by storage, but I might vote for a larger minimum if it were backed up by storage. I might vote for this minimum if it were backed up by storage, /say this at four million, five million, four and a half million, I might vote for half of the minimum, providing reservoir storage is provided of a figure amounting to say, four or five million feet.

MR. HOOVER: Wouldn't you accept that if this pact depended on and only became operative when this storage was provided?

MR. NORVIEL: I will say as far as Arizona is concerned we will have no objection to that, a storage reservoir to take care of that minimum flow.

MR. HOOVER: Your vote is no, though?

MR. CALDWELL: My vote is no.

MR. McCLELL. Bearing in mind the statement that we each have the privilege of changing our mind on any point, and believing that if and when the upper states stabilize the flow of the Colorado River that the lower states will benefit thereby, I move that the minimum be set at four million acre feet.

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MR. SCRUGHAM: I second the motion.

MR. ELLERSON: That is predicated upon storage, because we are going to agree upon some average flow.

MR. SCRUGHAM: Storage might be built, but not necessarily at any specific time or place.

MR. ELLERSON: I am going to take the privilege of changing my vote.

MR. CARPENTER: I don't think we should provide - -

MR. HOOVER: You can make a compact which becomes operative when storage is provided.

MR. CALDWELL: I am not prepared to say yes to your interrogation. I think we should have the utmost freedom here, and I think I should state, for the benefit of the conference, - I am voting no, perhaps not with enough consideration, that is the best thought I can give now, but I would be very glad to give the matter more thought.

MR. ELLERSON: Can we have this motion which is now before us ?

MR. HOOVER: On the basis of four million feet ?

MR. NORVILL: No.

MR. ELLERSON: Yes. I want to add this one further thought, it may not be new. If we were only figuring on direct flow alone, it might be fair to divide the lowest year there has been by two, thereby putting the burden of storage equally upon the upper and lower division, but so long as some protection, predicated upon storage must be furnished, the minimum flow should be below the average for the upper states.

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MR. HOOVER: Mr. Davis ?

MR. S. B. DAVIS: Yes, with the reservation made.

MR. HOOVER: Mr. Carpenter ?

MR. CARPENTER: Yes, with the further observation, in answer to Mr. Davis, that we are here agreeing to deliver at Lee's Ferry, and predicating our figures here upon the flow of the river at Yuma, and inasmuch as the inflow between Lee's Ferry and Yuma at the time was nil, unless it might be the Gila, and that takes us into the realm of conjecture as to the inflow here, on one side, and loss on the other, but I am willing to vote yes on the four million feet.

MR. HOOVER: Mr. McClure?

MR. McCLURE: I made the motion, yes.

MR. HOOVER: Mr. Caldwell?

MR. CALDWELL: I vote no for the same reason, and I may reserve the right to change my mind if I want to vote yes after reflection.

MR. A. P. DAVIS: The record makes any information, - We have no record of the flow below Lee's Ferry prior to 1902, consecutive record, but we have a record for 1902, and the record for 1902, 1903, and 1904, all years of unusual drought; we have a record for Yuma for 1903 and the flow was a little more than in 1902. It shows a flow on the Gila of only sixty-one thousand acre feet, where the average is over a million, and it shows the next, a Yuma to be twenty-two thousand seven million, which was less than a quarter of the average, and confirms the statement I made, and if you will add

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the normal flow of the Gila to that low year, and take from the other years, we will find it does not materially change the river.

MR. HOOVER: In other words, the Colorado River was more stable in that year than might appear from the figures ?

MR. A. P. DAVIS: Yes sir.

MR. HOOVER: The figure suggested at this time is four million feet ?

MR. McCLURE: Yes sir.

MR. HOOVER: We have in this case Mr. Caldwell in opposition.

MR. CALDWELL: (To Mr. Norvick) May I ask, you voted "yes" to four and a half million feet ?

MR. NORVICK: Yes.

MR. CALDWELL: It is just a matter of amounts with you ? That would leave me alone in this matter.

MR. HOOVER: Yes. As we don't make much progress in this direction, suppose we take up the question of an average period, and see where we stand on that question.

MR. CALDWELL: By "average" we mean a maximum to be delivered during a period of years ?

MR. HOOVER: Yes, an amount to be delivered during a period of ten years, - five years, - seven or three.

MR. CALDWELL: I think the use of that word " average " has been more or less confusing.

MR. HOOVER: The total minimum figure, because you

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couldn't stop the maximum, - that is beyond human means.

MR. NORVIEL: I move the period be fixed at five years.

MR. HOOVER: It being, in a sense of the word, the water during a five year period ?

MR. NORVIEL: During a five year period.

MR. CALDWELL: With a minimum ?

MR. NORVIEL: With a minimum.

MR. S. B. DAVIS: During that period we would deliver a total of five times whatever minimum was agreed to ?

MR. HOOVER: No.

MR. S. B. DAVIS: What does it mean ?

MR. HOOVER: A total in some average which we are to agree upon.

MR. CALDWELL: With a minimum during one year.

MR. S. B. DAVIS: There being no understanding as to what/ ^{that} average is to be ?

MR. HOOVER: Simply a total for the period of years. Will somebody second that motion as to the five year period ?

MR. SCRUGHAM: Yes, I will second it.

MR. HOOVER: And the motion is, I think, to put it properly in this form, that the total to be delivered over, - the total average is to be determined as the total delivered over a period of five years.

MR. SCRUGHAM: We are ^{to} determine the period at this time without figuring the amount, which is not yet agreed upon.

MR. HOOVER: We are to determine that later on.

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MR. CALDWELL: Again I suggest that the word "average" is confusing, because, after all, we are just trying to determine what the maximum amount delivered will be.

MR. HOOVER: It is instead the total minimum, in fact, because we can't control the maximum. The motion is put, for a total minimum to be determined over a five year period. Mr. Emerson ?

MR. EMERSON: No.

MR. HOOVER: Mr. Scrugham?

MR. SCRUGHAM: Yes. However, Mr. Chairman, it would be desirable if we could have some further explanation of the motion.

MR. EMERSON: I take the discharge of the Colorado River at Laguna over a twenty year period, and take one series of five years, - it reads 93, 56, 69, 60 and 98 which indicates that the five year period may very well come when the river would be decidedly below what might be considered a normal flow, therefore I consider the period too short.

MR. HOOVER: Mr. Emerson, if five years were the period it will be less than on a ten year period ?

MR. EMERSON: That is true, it would have an effect that way. The upper states could possibly agree to a five year period with a smaller flow.

NORVIEL:

MR./ It is a flexible volume to be delivered ?

MR. EMERSON: No, a minimum volume.

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MR. S. B. DAVIS: It seems to me the two things almost go together.

MR. HOOVER: I think it would be better to discuss the question of amount first, and the amount would be less over a five year period than a ten.

MR. NORVILL: It would be just half as much.

MR. HOOVER: No, less than that.

MR. NORVILL: That is one of my problems.

MR. SCRUGHAM: A total minimum for five years ?

MR. NORVILL: We are not fixing an amount of water on the five year average, or ten year average, but we are fixing an amount to be delivered, not equally, but an average equal amount during the period that we are to determine.

MR. HOOVER: Not an average, but a total.

MR. NORVILL: Total, -average annual, or total for the period.

MR. SCRUGHAM: A total minimum ?

MR. NORVILL: A total minimum, or average minimum for the year. That is to be fixed in the figures, - during a period of twenty years, as Mr. Carpenter set out.

MR. LEBERSON: No, the twenty years does not have anything to do with it.

MR. NORVILL: Sure it does, basing the average amount to be delivered on this basis.

MR. LEBERSON He just uses the figures in arriving at the figures for the ten year period.

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MR. NORVIEL: He takes this as a basis to work from.

MR. HOOVER: I think we could get at it more intelligently to take Mr. Carpenter's figures for the ten years, then if a motion to reduce the period becomes logical, wouldn't that be easiest ?

MR. S. B. DAVIS: Mr. Carpenter's idea of six million something for a ten year period, a total of six million two hundred thousand ?

MR. NELSON: It is a total amount over a certain term of years.

MR. HOOVER: Mr. Carpenter, I think we might get at it more intelligently to take, from your point of view of a ten year period, and say, if we can agree upon that ten years, then, if any question of a reduction in the time comes up we could work from that.

MR. CARPENTER: The aggregate minimum delivery in a ten year period. I make that motion.

MR. SCRUGGAN: I second the motion.

MR. NORVIEL: Mr. Chairman, the basis of figuring is erroneous, if we are ready for suggestions, the basis of figuring is erroneous in this, that the average of seventeen million four hundred thousand acre feet is the amount as shown by the record in the river at Yuma, - or is it Laguna ?

MR. HOOVER: At Yuma.

MR. NORVIEL: And does take care, or include, - or exclude, perhaps the evaporation of the river at that point, and does include the whole use of the water above that point, but does not exclude the use of the water in the Imperial Valley, and

if we are excluding the use of any water we must exclude the whole use of the water, and therefore these figures would not be a proper basis from which to work, because they leave out possibly the largest single acreage or project in the whole basin, and that must be taken into consideration to base your calculations on.

MR. CARPENTER: As I understand Mr. Horvick, there is quite an area of land from two to three hundred thousand acres, of what I might term overflow land, for want of a better term, in Arizona, along the river between Lee's Ferry and Yuma, from which large evaporation occurs during the greater flow of the river, most of the water being distributed in thin sheets over a large area. As I further understand, if the river is regulated, the water will automatically be withdrawn from a considerable part of this land, so that evaporation must be reduced. In your suggestion you spoke of the Imperial Valley. The amount passing Yuma includes that which is diverted in the Imperial Valley. It was my thought, as to the uses above Yuma in the various areas, that they would largely compensate, not of course exactly, so that we could take the record of a twenty year period as an approximate basis from which to work, if it is thought advisable and proper that my theory of compensation is proper, deductions could be made for those uses in the Imperial Valley, and is an absolutely consumptive use, so far as this river is concerned, the same as tunnel diversion or direct evaporation would be.

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MR. HOOVER: As I understand, your whole basis is a proposal that during this whole period, before any provision, whatever may be determined on, shall be a fifty-fifty division of the water in the basin ?

MR. CARPENTER: As nearly as we can approach it, yes.

MR. HOOVER: And that, therefore, you have taken as a basis here, - Mr. Norviel disagree with the basis because of those debits and credits, is that right, is that the facts ?

MR. NORVIEL: Yes, sir.

MR. HOOVER: When translated back to Lee's Ferry we need to make certain debits and credits to get to the Lee's Ferry basis ?

MR. CARPENTER: Yes, sir.

MR. HOOVER: I would suggest that Mr. A. P. Davis might give us the debits and credits that arise in this situation. For instance, the evaporation problem and the inflow below Lee's Ferry; there is the problem of the increased consumptive use in the northern territory, as they may affect that average at Yuma.

MR. CARPENTER: Increased use, also, in the southern territory.

MR. HOOVER: And perhaps Mr. Davis could approximate what the debits and credits are either way, thus establishing Lee's Ferry as a sort of basis. That might assist very considerably in this direction, because we could get promptly to quantity.

MR. NORVIEL: If I may remark, Mr. Chairman, I have before me here a memorandum which has been worked out by Mr. Hoyt and Mr. Grover, than whom I presume there is no better authority

on the quantity of water during any period, be it one or more years, in the basin, and who, I understand, had access to, and the assistance of the Reclamation Service, than which there is no better authority as to the quantity of land available for irrigation now and in the future within the basin, and they had very carefully, I take it, worked this matter out, disinterestedly, in a purely scientific, cold, calculating manner and method to arrive at a just conclusion, and I believe they are right and I am willing to accept their figures on the division, and I honestly think that it would be just and right to take their figures as a basis of our compact.

MR. CARPENTER: May I ask, not at all to embarrass you, if the conditions were reversed, and the basis you suggest had been reversed as respects the upper and lower river, would you have been just as willing to take their figures ?

MR. NORVIEL: Absolutely. I believe they worked from an honest beginning, arriving at a just conclusion, and as I said, and repeat, we want nothing more than what is just and right.

MR. S. B. DAVIS AND MR. CALDWELL: What would the amount be, based on those figures ?

MR. NORVIEL: The thirty-five sixty-five per cent basis heretofore submitted.

MR. S. B. DAVIS: What I am trying to get at, - Mr. Carpenter has worked out sixty-two million feet --

MR. CALDWELL: As to that matter, the U. S. Geological

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Survey is just as authoritative, - of course, these gentlemen are connected with the Geological Survey, so it is only a question of the way in which they have worked up the figures,- I mean the way in which they have approached it, figuring from a thirty-five sixty-five per cent basis instead of a fifty-fifty.

MR. NORVIEL: I understand that they had the assistance,- I might ask Mr. Davis, whether he knows whether they consulted the Reclamation Service in preparing this ?

MR. A. P. DAVIS: Not to my knowledge. I have no doubt that they used all the data that we have available, but in reaching their conclusion of percentage division, that was as new to me as to your Commission, when it was presented.

MR. NORVIEL: My recollection is quite clear that in talking the matter over with Mr. Hoyt he said they had used all of the Reclamation data that was available in reference to working out this basis.

MR. HOOVER: What are the figures ?

MR. NORVIEL: Thirty-five percent and sixty-five percent. The thirty-five percent figured out as the ultimate necessity for the upper basin, and the sixty-five percent as the ultimate necessity in the lower basin.

MR. EMERSON: In regard to the thirty-five sixty-five per cent basis, they started out with certain facts as a basis, and then took a running jump of thirty-five sixty-five, that is about the proposition as I see it.

MR. CARPENTER: That is apparent from the basis of the figures.

MR. HOOVER: I was hoping to get at the basic figures.

MR. CARPENTER: I think the whole matter of the basic figures is a matter all should consider and review. I myself have been prevented from reviewing them before I came in here, and I have not had time since.

MR. NORVIEL: I think this is the crux of the situation, as I stated before, and we want to be very careful in making our deductions.

MR. HOOVER: I might read the last two paragraphs here, I don't know whether you all have it: (Reading from paper entitled " Press Notice From U. S. Geological Survey " "An equitable division of the water of Colorado River ")

" It is believed that all interests will be fully protected by an agreement that at least 65 per cent of the present flow shall reach the canyon section of the river and that no rights for power or irrigation shall be created in or below the canyon that will deprive the State of Colorado, Wyoming, and Utah of a right to consume 35 per cent of the present flow above the canyon. This allotment should apply for 50 years, after which a new agreement should be made."

Obviously that paragraph is a matter of opinion. The statement goes on:

" On this basis of division Colorado, which contributes 11,800,000 acre-feet to the flow of the river, would retain 4,130,000 acre feet, which, with an average consumption of 1-1/2 acre-feet per acre, would irrigate 2,753,300 acres. It would release to the lower river 7,670^{,000} acre-feet. On the same

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basis Wyoming, which contributes 2,300,000 acre-feet, would retain 805,000 acre-feet, enough to irrigate 536,600 acres, and it would release to the lower river 1,495,000 acre-feet. Utah, which contributes 2,300,000 acre-feet, would retain 805,000 acre-feet, or enough to irrigate 536,000 acres, and would release to the lower river 1,495,000 acre-feet.

" Various estimates have been made of the additional irrigable lands in Colorado, Wyoming, and Utah. These estimates generally come well within the additional acreage for which water would be available under the plan of division set forth above. Furthermore, it is interesting to note that the records at Yuma, covering 18 years, as well as those for other stations, in the drainage basin, show that irrigation has not yet had any appreciable effect on the total flow past the gaging stations.

" By this plan 10,660,000 acre-feet would be released above the Utah-Arizona line, or 9,100,000 acre-feet of Colorado and New Mexico are allowed to use the total flow of the San Juan.

"With an average consumption of 3 acre-feet per acre in the lower basin, the quantity of water allowed to pass through the canyon section will be sufficient to irrigate 3,033,000 acres. This area would include, however, the tracts now irrigated in Imperial Valley, as the diversion for that system is made below the gaging station at Yuma. In addition Arizona would have full use of the flow from Little Colorado, Williams, and Gila rivers, aggregating 1,375,000 acre-feet less

diversion from the Gila in New Mexico or enough to irrigate 425,000 additional acres"

In other words, the acreage provided for in the upper would be about three million four hundred and fifty thousand acres, and as against a probable acreage, including that already in use in the lower basin, not including Mexico, of about ten million; providing here for the minimum use in the upper basin, and allowing for the increase in the lower basin of approximately one million four hundred and fifty thousand acres beyond any known project. In other words, if you are coming into the area of providing for projects unknown there should be the same division with the upper states. The whole problematical development should not be thrown on the lower states, and I presume Mr. Carpenter had that in mind, when he proposed that the division should be on a fifty-fifty basis; in other words, by this plan, all the problematical development would be allowed in the lower states. That goes right to the point we were discussing, and with an equal problematical future development, - that being equally divided between those divisions, that would probably get back to the fifty-fifty division.

MR. ELERSON: That is presumed to be founded on facts.

MR. HOOVER: In other words, the Geological Survey lower division, and no problematical development in the assumes all the problematical development in the/ upper.

MR. CARPENTER: I considered at the time I made the proposal that considering the probable demands the percentage between the two plans would be a very small difference.

MR. HOOVER: I think that would come nearly to a fifty-fifty division if you divide the problematical development between the two basins, instead of a thirty-five sixty-five.

MR. NORVIEL: Well, quite beyond the problematical development, it is hard to arrive at a just increase.

MR. EMERSON: Would it be worth putting a motion to ascertain whether we can agree upon the general principle of a fifty-fifty division ?

MR. HOOVER: Perhaps we would come nearer an agreement if we had from Mr. Davis such a statement as I suggested.

MR. EMERSON: We might agree upon the principle, rather than the quantity.

MR. NORVIEL: I don't think there ought to be anything of that kind in the record, we could not get behind and justify a fifty-fifty division unless based on facts.

MR. HOOVER: What I suggested a while ago, sometimes it is easier to agree upon a method than a principle, and I should think this is one of the cases. I am wondering if Mr. Davis would give that ?

MR. A. P. DAVIS: I can't say without some instructions on which to proceed. As I understand, the problem is translation of the records from Yuma, or wherever they can be found, to Lee's Ferry, and the irrigated land in the Imperial Valley taken into consideration, and any other diversion from the river, and so arrive at the fifty-fifty division. I hope the Commission will be satisfied to accept the measurements as

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made, possibly at Yuma, because if we undertake to do that we can only make a very rough approximation; in our report we have roughly made some reference, and of course, called attention in the text,- but the Imperial Valley development began in 1902, that is the first year they turned the water in there, about 1902 I think, a little in 1901, and there has been more or less irrigation there since that time, and I doubt if we could obtain records of that without great trouble in examining the state records as to such development and use, and I suppose, therefore, for your consideration, as a basis of this argument, that such measurements as are made at Yuma, could be used in translating that back to Lee's Ferry.

MR. HOOVER: Will you, more or less, reduce the debits and credits, in evaporation or use that occur between Lee's Ferry and Yuma ?

MR. A. P. DAVIS: Yes, I will undertake that.

MR. NORVIEL: We are willing to accept Mr. Davis' statement made last evening to offset the inflow below Lee's Ferry and above the Gila, the evaporation between those points.

MR. A. P. DAVIS: I am glad Mr. Norviel is willing to accept that because that could not be very far out either way.

MR. NORVIEL: It would not be very far off either way ?

MR. A. P. DAVIS: No, in my judgment it would be very close.

MR. HOOVER: If we are going to accept the inflow as equal to the evaporation, and translate that up to Lee's Ferry, would that be acceptable to you Mr. Carpenter ?

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MR. CARPENTER: No, I would not say it is. I have great respect for your Reclamation figures, but Mr. Mecker is the one upon whom it will rest to justify our figures to our legislature, and I want him and Mr. Davis to agree in order that we may have no unfortunate kick-back, if I may use the term, later. I just want the facts.

MR. A. P. DAVIS: Might I consult with anyone in making up these figures ?

MR. HOOVER: I would suggest that you consult with Mr. Mecker.

MR. CARPENTER: Whatever you and Mr. Mecker agree upon will be acceptable to me.

MR. HOOVER: In this simplified manner is it likely this will take long ?

MR. A. P. DAVIS: No sir, I don't think it would.

MR. HOOVER: It might be well to adjourn then until such time as the figures are ready, - I would suggest three o'clock.

The meeting adjourned at noon to meet again at three P. M. November 14th.

Clarence C. Stetson

Executive Secretary.

The above minutes were approved at the 27th meeting of the Commission held at Santa Fe, New Mexico, Friday afternoon, November 24, 1922.