

INTERNATIONAL JOINT COMMISSION

HEARING
IN THE MATTER OF THE MEASUREMENT AND
APPORTIONMENT OF THE WATERS OF
THE ST. MARY AND MILK RIVERS
AND THEIR TRIBUTARIES IN
THE UNITED STATES AND
CANADA

UNDER ARTICLE VI OF THE TREATY OF
JANUARY 11, 1909, BETWEEN THE UNITED STATES
AND GREAT BRITAIN

CHINOOK, MONTANA
LETHBRIDGE, ALBERTA.

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INTERNATIONAL JOINT COMMISSION.

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MEASUREMENT AND APPORTIONMENT OF THE WATERS OF THE ST. MARY AND MILK RIVERS AND THEIR TRIBUTARIES IN THE UNITED STATES AND CANADA.

CHINOOK, MONT., *September 15, 1921.*

The International Joint Commission, pursuant to public notice, met in the Blaine County courthouse at Chinook, Mont., at 2 o'clock p. m. Thursday, September 15, 1921, Mr. Gardner presiding.

Present: Obadiah Gardner; Charles A. Magrath; Clarence D. Clark; Henry A. Powell, K. C.; M. A. Smith; Sir William Hearst, K. C., M. G.; and William H. Smith, secretary.

APPEARANCES.

E. F. Drake, Superintendent of Irrigation, Ottawa, Canada.
F. H. Newell, consulting engineer, United States Reclamation Service, Washington, D. C.
Hon. Joseph M. Dixon, Governor of Montana, Helena, Mont.
W. J. Egleston, counsel for reclamation service of Montana, Grand Falls, Mont.
C. S. Heidel, State engineer, Helena, Mont.
George Stratton, United States Reclamation Service.
R. M. Snell, United States Reclamation Service.
W. B. Sands, Chinook, Mont., representing the Water Users' Association of the Lower Milk River.
Thomas A. Everett, Harlem, Mont.
Thomas Dignan, Glasgow, Mont.
Frederick B. Gillette, Hinsdale, Mont.
Herbert C. Anderson, Harlem, Mont.
A. W. Ziebarth, Chinook, Mont.
F. E. Stranahan, Fort Benton, Mont.
William T. Cowan, Montana.
Henry Gerhartz, Shelby, Mont.
Blaine Ferguson, representing State Agricultural College, Bozeman, Mont.

Mr. GARDNER. Ladies and gentlemen, if you will kindly come to order we will proceed with the purposes of this meeting.

I want to say that the International Joint Commission has come out here into your State by invitation of your governor and the memorial of your legislature, and, so far as I am personally concerned, with a feeling somewhat sceptical as to your ability to furnish any information that will show me a way out in the settlement of this knotty question, the measurement and apportionment of the waters of the Milk and St. Mary Rivers.

Before this matter was taken up by the commission it appeared to me to be a very simple and easy one to pass upon, but immediately upon the commission having called a meeting for the purpose of getting the views of different ones way back in 1914, we found that

there was a very serious and wide difference of opinion between the representatives of the United States and the Dominion of Canada as to the meaning of Article VI of the treaty as applied to this particular project. The commission was confronted at once with the very difficult proposition of dividing something, when they did not know what they were to divide. Subsequent to that time we were notified by the State Department at Washington that in the event the commission should make a decision that was not in accordance with the views of that Government the Government would not consider itself bound by it. So you can see at once the difficulty with which the commission was confronted in undertaking to make a decision upon a project and having advance notice that if that decision was not along certain lines it would not be recognized as official on the part of the Government.

I just referred to that for a moment to show you that, so far as I am personally concerned—and I think I may say the same of every other member of the commission—we have no doubt—certainly I have no doubt for myself—about your interest in having a sufficient and abundant supply of water for your operations here. I have no doubt whatever but what the interests of those living across the boundary line are just as intense as ours, but the question that the commission is bothered about is just what was the intent, what was the scope, and what was the purpose of Article VI of the treaty. If you can furnish us any light upon that subject, we shall be grateful to you, indeed.

I have in my hand here a sort of suggestive program that I presume was arranged with an idea to your convenience, and I am very glad to note that the first feature of this afternoon's meeting will be an address by your distinguished governor.

STATEMENT OF HON. JOSEPH M. DIXON, GOVERNOR OF MONTANA.

Governor DIXON. Gentlemen of the International Joint Commission, it is with peculiar pleasure as the chief executive of Montana, which State is so vitally interested in this long-mooted question, that we welcome you to the county seat of one of the principal counties involved in this matter.

We feel especially kindly over the fact that the Montana Legislature last winter unanimously adopted the resolution introduced by Representative Gillette, who sits here within the railing, asking you gentlemen to come to the West to see with your own eyes many of the things that you had heard at Ottawa and St. Paul and Detroit, feeling that you might have a better understanding regarding the practical and human side of the question than you might have had after hearing the arguments of the distinguished counsel representing both the Dominion of Canada and the United States in the hearings heretofore held.

I think this meeting here to-day in many respects is a most memorable occasion. I do not say that cheaply or in the ordinary laudatory phrases that sometimes accompany these meetings. As I saw those school children down in the yard, 400 strong, with their flags and little banners, greeting an international commission representing these two great nations, made up of the same antecedents so far as racial distinctions go, speaking the identical language and sepa-

rated by an imaginary line 30 miles north of here, thinking in the same vein of thought, and interested economically in the same problems, it looked to me like a new departure in our affairs when these two great sister nations could meet here and consider these things in a spirit of fairness and equity and with a full determination to fight out the right as nearly as the limitations of human beings go.

We have just gone through the great World War, allies in blood and language, touching elbows upon the battle fields of Europe. Surely with that feeling and those traditions this commission can not fail of its purpose. I remember, 18 or 19 years ago, when I first went to Washington the Milk River question was then an acute mooted question, although not so much as it is now. I remember meeting the Canadian commissioners 10 or 11 years ago one night at dinner at Ambassador Bryce's house when you gentlemen were first appointed. From that time until now we have talked about this matter. As the question becomes bitter on both sides we all realize that it is more difficult to settle. I know that you gentlemen have heard all of the legal arguments you want to hear. You are surfeited with them. In fact, when this legislation was originally passed at Washington I, for one, never thought there would be any question raised about it. It looked so simple on the face of it we were all happy. There was nothing in the treaty at that time that seemed at all doubtful. I do not think there was any doubt about it until you heard the legal arguments. It ought to have been settled easily and quickly. And for one I am glad the legal argument is past.

I do not intend to worry you with a long address. There are some of the high lights of the situation that I think, in justice to the people of Milk River, I should briefly present and touch upon. Of course, we of the West all know that the water is absolutely the yardstick of measurement for the value of the land. The eastern members of this commission do not appreciate that, or did not before your service on this commission, to the extent that the men of the West do.

You will bear in mind that you are now in a country whose full development is dependent upon the conservation and use of every available source of water supply. While the region is not arid, yet experience has shown that through a term of years success in agriculture can be had only by irrigation. There are millions of acres of fertile land on which crops can be raised occasionally by depending upon rainfall, yet the time of occurrence of this rain is so uncertain that more disappointment than success has resulted. In an occasional year, such as that of 1916, these people did not want irrigation; they had plenty of water, they thought. Such a year has stimulated a wide extension of dry farming, but the failures of successive years have demonstrated that in the long run it is not economically profitable to cultivate many of these great areas of fertile lands without water.

The water supply by which portions of these lands may be rendered permanently valuable comes mainly from the lofty mountain region now included in the Glacier National Park. The streams coming from these mountains and flowing toward the east unite in St. Mary River, which turns northward and crosses the boundary into Canada. The relatively steady flow of this river renders it specially valuable for the development of the lands needing water.

In looking at the map of these small rivers coming from the snowy mountains, the natural assumption is that these rivers should continue east across the high plains, as is the case with the streams south of Glacier National Park. Nature has interposed an obstacle at this part of the mountain front in the shape of a low range of hills. In these hills are a number of small glacial lakes or depressions; from them flow toward the east many small intermittent streams which go to make up Milk River. Although the catchment area of Milk River appears large, yet, because it is low and undulating and has only an occasional rainfall, the flow of Milk River is correspondingly small and uncertain.

Since the country was first settled and its resources explored it has been the dream of farseeing citizens to bring into the broad Milk River Valley the steady flow of St. Mary River in order that it might be used on the vast extent of dry land stretching toward the east. Many surveys were made, but the expense appeared prohibitory until the time came that the Federal Congress began to consider the reclamation act, in the passage of which I was personally concerned. Prior to and during the discussion of this measure examinations were made by the United States Geological Survey, and it was found that the most economical way of controlling the desired water supply would be by a canal heading near the mountain lakes from which St. Mary River flows and crossing the low divide to the headwaters of Milk River.

Then came in the questions which are now before you, namely, those which arise from the position of the international boundary. This has been drawn, as you are well aware, without reference to the topography or streams of the country, cutting across them in such way as to leave the important sources of water in the United States. Thus it happens that although the waters of St. Mary lakes can be taken eastward by canals wholly in Montana, yet the most economical method to be followed is that which permits the water to be dropped into the head of Milk River to find its way across the international boundary into Canada, and then parallel with this boundary for 200 miles before returning to the United States.

It also has been pointed out that even though the water of St. Mary River is dropped into the head of Milk River it is not necessary for this to continue in the channel of Milk River to return to the United States, but it can be diverted upon lands in Canada.

Meanwhile the people north of the boundary have shown equal or greater interest in the use of the waters of St. Mary River. While lands were being irrigated in the Milk River Valley and projects dependent upon larger supply from St. Mary River were being considered, the citizens of Canada were building a large canal system whose head has been located as near as possible to the international boundary.

It has long been evident that there is not enough water in all of the streams combined to irrigate all the lands needing the water; hence has arisen the need of an agreement and one which will permit the largest and best development of such lands as can be supplied.

It is not necessary to discuss the negotiations, but as we understand the matter the contention was raised on behalf of Montana that

all waters occurring within its area are the property of the people of the United States or of Montana, and that, as stated in effect by one of the Attorneys General of the United States, there is no servitude on the waters of the United States in favor of any other country and no legal obligations to permit these to flow into another country. Whatever the exact status may be, this contention has been overweighed by the desire to preserve international comity and good-fellowship. There is no easily applicable rule which can be made to apply to the exact measurement of such good will; therefore, as we recall the discussions as to the division of the waters which flow across the international boundary, these are based upon the very simple assumption that with no rule for guidance each party in interest should have a half of the water. There is obviously no compelling reason other than that such equality in sharing is most easily understood.

The point I wish to emphasize is that having agreed upon an equal division of these waters which flow from one country into the other, the people of Montana feel that they have made a large concession to good-fellowship and are properly insistent that they shall ultimately receive from your hands in all matters of measurement and apportionment the full one-half which belongs to the country and of which every drop is needed in the ultimate development of the dry lands. We feel that we have been more than fair in acquiescing in an equal division of the waters which occur in the United States and flow across the boundary, and that further concessions would be unfair. Moreover, we believe that recent developments and the intense interest displayed in the matter demonstrate that all such measurements and division should follow along very simple lines of procedure and not be complicated by attempts to control water in one country for the benefit of the other.

As time goes on we are finding that more and more of our half of the water may be used near the point of origin. It has recently become apparent that irrigation in the United States can begin on the lands of the Blackfeet Indian Reservation almost from the time that the water is taken out of St. Mary River, and can be continued through the reservation by an "all-American canal," turning southward in the United States, to the lands along Cut Bank Creek. These are now partly included in the Cut Bank irrigation district. To the east are other lands needing water. That is to say, it is possible, although not economically desirable, to divert the ordinary flow of St. Mary River to the dry lands of Montana, not merely in the Milk River Valley but in that of Marias River, thus avoiding its passage through Canada.

The matters to which I hope to direct your attention are in part new, in the sense that they have become prominent recently because of the new developments and need of care in the distribution of the waters of the streams flowing across the State boundaries. They emphasize the importance of an early and positive decision by you of the questions which have been brought to your attention. Further delay in deciding these questions affect as never before the formation and activity of irrigation districts which include thousands of acres of irrigable land in Montana. Such delay is holding back the creation of opportunities for homes for self-supporting citizens.

To us the questions at issue appear to be simple and direct. We have not only agreed to let our neighbors in Canada have half the water naturally flowing across the border but, more than this, we have been generous and have acquiesced in letting Canada have first opportunity to take from the steady flow of St. Mary River a portion of its half of the water available, leaving to Montana first choice in the less dependable Milk River; but our neighbors seem to wish even more than this half so generously conceded by us. There is a limit, however, even to the most altruistic of acts, and that limit must be set and rigidly observed. "Good fences make good neighbors," and it is for you to designate clearly and carefully these limitations, so that progress may be made within these lines, utilizing to the greatest advantage for both countries the waters which are thus defined.

The contentions of our Canadian brothers, as we understand them, amount practically to setting aside the terms of the present treaty regarding the waters flowing across the boundary and rewriting the provisions of the existing treaty. As we understand the matter, there are two contentions definitely recognized by you; one that the equal division of the waters applies not to those flowing across the boundary, but to all of the waters which may be found within the watersheds of the two rivers, even though the ownership and control of these have never been brought into question.

Another contention apparently raised since arguments were presented to you is that the inequality shall be further emphasized by giving Canada the priority of 500 second-feet or portions thereof and not counting this in the equal division, but dividing equally the waters in excess of the prior claims.

In each of these cases we regard this as an attempt practically to rewrite the terms of the treaty and as efforts to induce your commission to go beyond the plain duty of measurement and apportionment according to the understanding reached in the existing treaty.

Another proposition relatively new to us has been brought forward informally, to the effect that as the best storage sites are in the United States there might be some provision by which the waters to be used in Canada could be held in the United States. I think I voice the feeling of our citizens that any such arrangement will be highly objectionable because it will bring about complications which might prove extremely obnoxious. Simplicity and equal division will tend to promote and maintain good feeling between the countries, but any complicated arrangement which can not be easily understood and put into effect, without argument, must inevitably lead to misunderstanding. The very fact that upward of six years have elapsed since the first hearings on what to us seems a very simple matter indicates in itself that other questions more complicated might consume indefinite time, with resulting irritation to our citizens.

If it should be shown that water can be held in the United States by reservoirs built by the Reclamation Service, then such waters might be sold directly to irrigation districts in Montana or Canada under some simple, definite business agreement, avoiding what we most fear, namely, the interposition of commissions or committees with their opportunities for debate.

Even if all the waters are conserved and divided there will not be enough for rival claimants, and under these conditions, as above indicated, we anticipate endless misunderstanding unless the most simple and direct business dealings are adopted in this difficult matter.

As matters now stand, there is really only one important point of division of the waters, namely, that where a portion of St. Mary water is taken across the divide to the head of Milk River. In the measurement and division of this water it is necessary to anticipate by days or weeks what will be the probable condition of the weather over extensive tracts of country. After water is turned into the St. Mary Canal to go to the Milk River Valley, upward of two weeks may elapse before it gets to the lands where it is needed, and during this two weeks there may be extreme changes in temperature and rainfall. Even to measure and apportion water at this one point there are many complications to be considered.

If other points of division, especially with reference to stored waters, were to be included, it is readily conceivable that more uncertainties will arise. This point is offered for your consideration, not with any reflection upon the ability or interest of any body of men concerned but to indicate frankly and freely the feeling of the great body of citizens whom I am attempting to represent.

Appreciating that it is your desire, as at first stated, not to hear argument of counsel for any country or interest, I have endeavored to present in this statement, in the simplest form possible, my conception of the desires of the people of Montana. These are summed up in the words prompt, simple, definite decision, permitting action by our citizens leading to the full ultimate use of every drop of water which falls in the State or which naturally flows into it, and at the same time dealing fairly with our neighbors.

I hope that before this trip, with this newer viewpoint obtained at close range and with a full desire on the part of all the commissioners—and I have no mental reservation whatever, gentlemen; each man on this commission is inspired only by the one spirit of trying to solve this question equitably. In coming down this morning I had some informal discussion with one member of the commission. I hope that some of the questions there raised may be brought into fuller fruition. I know the contention of some of the attorneys that have argued before this commission that the nationals on one side must assume a certain position and that the nationals on the other side, imbued with a possible latent patriotism that may direct their mental processes more than they imagine, may lead us into the danger of becoming deadlocked. I hope this will not happen.

The suggestion that if the commission can not determine this question it must be referred to some official tribunal by the Governments at Ottawa and Washington does not appeal to me. Where could Canada and the United States find a tribunal that could hear and determine these questions with the same degree of equity as this tribunal composed of three former Members of the United States Senate and three distinguished members of the Canadian Government, who have the facts and who have nothing but the kindest personal and international feelings?

As I said to one of the members of the commission this morning when the question was suggested, "If you gentlemen fail, it means

that Canada and the United States have got to turn to South America or to Europe for the selection of a tribunal. No citizen or national within the British Empire and no citizen of the United States could sit on such a tribunal. We would have to turn to a tribunal whose language we could not speak and who could not understand us except through interpreters. I think it would be a fatal conclusion of this matter if these six men can not arrive at some positive and fair and equitable division of the waters of these two rivers." I have full faith that you can. The rivers are interlocked. The spirit of that treaty is that the two countries shall determine the most economical and efficient use of their intermingled waters. Surely the engineers can work out some solution that is fair and equitable and that will carry with it the unanimous recommendation of these six men. Suppose we do have to go outside of the fixed letter of the law? Suppose you gentlemen in arriving at a solution have to write in possibly a new section not authorized and refer it to Ottawa and Washington for ratification. A unanimous report from this commission will carry full conviction at both Ottawa and Washington. There is no question about that. They know nothing about it. You do. In the name of a hundred years of peace and amity between these great nations, in the name of the friendship that has got to prevail and will prevail, every man along the Milk River and in Montana sincerely hopes and prays before you gentlemen that the Milk River question will forever be a thing of the past. I thank you.

Mr. GARDNER. I do not know whether it is the intention of those who arranged the order of exercises here to have the speakers follow in the rotation given on the program, but I will venture to call as the next speaker Mr. Thomas Dignan, of Glasgow. If there is any other order of procedure that you prefer, we shall be glad to follow it.

Mr. DIGNAN. It is my understanding, Mr. Chairman, that Mr. Thomas A. Everett, of Harlem, was to follow the governor. Is Mr. Everett present?

Governor DIXON. I wish to say, gentlemen, that Mr. Everett formerly represented these counties both in the House and afterwards in the Senate of Montana, and that he has lived here for 30 years.

STATEMENT OF MR. THOMAS A. EVERETT, OF HARLEM, MONT.

Mr. EVERETT. Mr. Chairman, I would like to know what the commission wants to hear from me. As I understand it, I am to represent, in my humble way, the farmers of the Milk River Valley, being one of them; but I have not had a chance to consult with any of the gentlemen who have the program in charge nor with the commission. Of course, I would like to enlighten the commission in any way that I can as a farmer of the Milk River Valley, and I would like to know exactly what you wish to hear from the farmers here.

Mr. GARDNER. That is a pretty hard question to submit to me. We want to extract from you all the information you have.

Mr. EVERETT. That would take a long time, unless I know exactly what kind of information you want.

Mr. GARDNER. Well, I will say that we would like to have whatever information you may be possessed of that would be of any material assistance to the commission in enabling it to come to a decision on the apportionment of these waters under Article VI of the

treaty. Outside of that, as the crux of your argument, I am willing that you should exercise some latitude and wander somewhat afield, if you please. But that is the one thing that we are mostly interested in—the meaning of Article VI of the treaty.

Mr. EVERETT. If the gentlemen of the commission please, is it my opinion as to the construction of the treaty that you want?

Mr. GARDNER. Well, yes; although I give you advance notice that it will be considered for what it is worth.

Mr. EVERETT. I think I was one of the gentlemen who was influential, in a certain way, in getting the first preliminary survey made from the St. Mary into Milk River. I had been over that divide between the St. Mary and the Milk River, and it occurred to me that it was entirely feasible to turn the water of the St. Mary River into Milk River. That was before the first appropriation was made for a tentative survey to determine the facts. That was before there were any appropriations of the waters of the St. Mary in Canada or in the United States from Milk River.

The treaty came a long time after that. You will remember that the St. Mary project was started long before the treaty. It never occurred to us in the Milk River Valley that there would ever be any controversy over the waters. We understood that between this country and Mexico at least it had been settled that the water rising in a country belonged to that country if it desired to utilize it, and that no other country had any claim upon it. I do not think that that has ever been changed. But we found that there was a physical difficulty in getting the St. Mary water into the Milk River without letting it run through Canada. It could be done, but it would be very expensive; and it would be expensive enough—nearly all the settlers could stand—even if allowed to run down the Milk River. And so our Government took it up with the Canadian Government to get permission to run this St. Mary water down the Milk River through Canada, not that we believed that the Canadians ever had any right to the water; we never felt that they had a right to the water. The parties who drew up that treaty consulted with the farmers of this valley frequently, and I was one of a committee appointed by our farmers from this valley to consult with them. It was finally decided in that treaty, which you have before you, that the waters of the Milk and St. Mary Rivers were to be divided equally between the two countries. But there never was a question in the minds of the commissioners from this country or in the minds of the settlers in this valley that that water was to include any waters except international waters.

Now, as I understand the controversy that has since been raised, it is this: Is that treaty to deal only with international waters, or is it to deal with waters entirely inland, waters that never cross the boundary and never could by any physical means be carried across the boundary unless you ship it across in cars or haul it across in trucks? We never dreamed that such waters as that would ever come into controversy; and when the treaty stipulated that the waters of the two rivers would be divided, we naturally construed that to mean the international waters of the two rivers, or waters which if allowed to run their natural course would cross the international boundary at some point. Since then we understand that it is the contention of our Canadian brothers that the two streams are to be measured at

their mouths, and that the annual flow of the two streams is to be taken into consideration in computing the estimate of the flow of the two rivers.

As you know, the St. Mary River is a river that runs the bulk of its water during the irrigation season. The Milk River is a river that runs practically no water during the irrigation season. I have been irrigating for nearly 30 years and have found its flow during the irrigation season is perhaps one-tenth of its annual flow, certainly not more than that. If you measure Milk River at its mouth you will find that from a half to two-thirds of its annual flow, counting its flood water when the snow goes out in the spring, never at any time crosses the Canadian boundary but is water rising entirely within the United States and flowing through the United States into the Gulf of Mexico.

I understand that it is the contention of our friends across the line that all of this water should be measured in arriving at the total flow of the two rivers. Fortunately for them, the St. Mary River changes its name soon after crossing the boundary and is called the Belly River, there being practically no tributaries arising in Canada and flowing into it. So if they measure the St. Mary River at its mouth they measure nothing but national water, while if they measure the Milk River at its mouth they measure from a third to a half international water and all the rest wholly inland water of the United States.

If this contention is sustained by the commission we might as well lay no claim to St. Mary water. In my judgment, we might as well let the Canadians have it all and we would take only Milk River water, which we always had, anyway, except the little amount that comes from Canada, because it is purely inland water of the United States.

The contention that all of this flood water of Milk River is to be measured is ridiculous to us farmers, for the simple reason that there is no physical way by which it could possibly be utilized. There are no reservoir sites in which it can be stored, except the reservoir sites near the mouth of Milk River, Nelson River, and the Bowdoin Lakes. Those reservoirs are near the mouth of the river. The territory between those reservoirs and Chinook or Havre could never be watered by water stored there. The Chain of Lakes reservoirs would run no water except water coming from across the line. All of the streams—and there are some large ones—running nearly as much water as Milk River itself during flood time, come in just this side of the reservoirs, like the Big Sandy Creek, Clear Creek, Box Elder Creek, all mountain streams from the Bear Paw. All of that water must of necessity be waste water. It goes out while the snow is going off and when no irrigation can be had and when no irrigation is needed. When the time comes to irrigate our land, when our crops are burning up, the water is all in the Gulf of Mexico. But they want us to measure all that water and then divide it with Canada in order that they may divide the St. Mary water with us; or if we take all of that water they want all of the water of the St. Mary.

We feel that there should be no compromise. We want to stand absolutely upon the treaty, construing it that the waters of the two streams are to be measured at the international boundary. If it is

not construed in that way, in my judgment it might just as well be thrown overboard—we have no treaty; the Canadians have it all. We have built great storage reservoirs on St. Mary; we have built an expensive canal and syphon across the river; we have built expensive works in the Milk River Valley that are absolutely thrown away, and we are back where we started; they have the water and we have nothing, because our reservoirs would be of no use to us; our lands would be of no use to us, and we might as well quit. That is exactly the way we feel about it.

Another contention, I understand, is about the prior rights of the two rivers, the St. Mary River and the Milk River; that they want their prior right, two-thirds of the natural flow of the St. Mary, and we will take a prior right of two-thirds of the natural flow of the Milk River during the irrigation season, and that then the remainder of the waters are to be divided equally.

But as we understand the treaty, and as we understood it at that time, those prior rights are only for the purposes of using the water when no more is being contained in the streams. When the streams increase their flow until there is more water, then the water is to be absolutely divided equally between the two countries. That construction of the treaty we believe to be absolutely just. We believe that the treaty is quite plain in that respect. We do not believe that Milk River should be measured at its mouth. We believe that if the Milk River had been the headwaters of the Missouri and the St. Mary River had been the headwaters of the Saskatchewan; in other words, if the Milk River had been called the Milk River to the Gulf of Mexico and the St. Mary River had been called the St. Mary to Hudson Bay, the language in the treaty would have been exactly the same, because you would naturally infer that nothing but international waters were to be discussed in the making of that treaty.

The members of the commission that drew that treaty would naturally infer that nothing but international waters were to be considered. When our Congress and the Canadian Parliament, or whatever body over there ratified the treaty, they would naturally infer that nothing but international waters were under discussion. I can not see for the life of me how anyone could construe the treaty in any other way; and we never dreamed in this valley that the question would ever be raised in any other way or we certainly would never have gone ahead with all the trouble and the expense and the years of waiting to get a division of the water in any other way.

I think if the gentlemen of the commission knew this country as we know it, knew the use of the water as we know it, knew the absolute necessity of water as we know it, and knew the instability and the uselessness of the flood waters of Milk River as we know them they would realize, as we realize, that the idea of measuring all of those waters is absolutely ridiculous, absolutely impracticable, and would absolutely drive every settler out of Milk River Valley.

We tried irrigating here for a long time when we had the whole flow of Milk River. We had all that came from Canada and all that came from the United States. We had half of the water of the St. Mary River and the Milk River treated as one stream from their mouths; we had all of that before we ever undertook the St. Mary and Milk Rivers projects. Before our Government ever touched it or ever came into the valley we had all of that water. We tried to

utilize it; we utilized all we could of it; and we were starved out. We had only about 25,000 acres in the whole valley out of 200,000 acres, and we could not put another acre under irrigation because we had no more water.

Now, I understand as they want to construe the treaty that is all the water they want to give us, the same water we always had before there ever was a treaty. It was our people that agitated the treaty because we wanted an additional water supply for Milk River Valley. We wanted the right to turn the St. Mary down the Milk River Valley. That was the reason for the treaty.

MR. CLARK. Will it disturb you if I ask a question at this point?

MR. EVERETT. Not at all.

MR. CLARK. During the irrigation season what is the natural flow of the St. Mary River as it crosses the boundary?

MR. EVERETT. Do you mean the average for a number of years?

MR. CLARK. During the irrigation season.

MR. EVERETT. I have not the figures just at present. The Reclamation Service has them. I have them at home, but I have not them here, and I could not just say.

MR. CLARK. It has been a little difficult to get an accurate estimate.

MR. EVERETT. Mr. Newell or Mr. Stratton of the Reclamation Service can give you that information much better than I can; but I know it is many, many times the natural flow of Milk River during the irrigation season.

MR. CLARK. I think there is no question about that in the mind of anyone.

MR. EVERETT. I have found that about half the time the natural flow of Milk River during the irrigation season was nothing.

MR. CLARK. I think there is no question about the relative flow, but there is a question in my mind as to the ordinary flow of the St. Mary River. Perhaps it will be brought out later on.

MR. EVERETT. Yes; you can get that information from those gentlemen. But I do know that the St. Mary in the spring of the year is a comparatively insignificant stream as compared to the Milk River. The Milk River, when the snow goes out in the spring, is a mighty river for about 30 days and then it is done for the year, unless some extraordinary rains come after that. It is a river that you absolutely can not depend upon to irrigate with except through storage. It is a most discouraging river, as my friends from Chinook and Harlem know from 25 to 30 years' experience. It is absolutely useless to try to farm by using the natural flow of Milk River to irrigate the lands. Are there any other questions?

MR. GARDNER. How long have you been operating your farm lands by irrigation from Milk River?

MR. EVERETT. I have been operating my farm for 31 years, but not all of the time from Milk River; I have been operating about 26 or 27 years from Milk River.

MR. GARDNER. During that period of 27 years how often were you short of water?

MR. EVERETT. I should say that we were short all of the time with the exception of three or four years during that period. During three or four wet summers we had plenty of water; all of the rest of the time we were short, although not entirely without water. We

always got a portion of the crops, but we were always short before the irrigation season was over, with the exception of three or four years.

Mr. GARDNER. Did that condition prevail throughout the whole valley, as far as you know?

Mr. EVERETT. Yes. Our canal was one of the first in the valley. There were three or four canals that were in practically the same condition. We frequently divided the water.

Mr. GARDNER. I think that is all. We thank you very much, Mr. Everett.

I would suggest that some one here indicate the order in which the speakers appear. You can do it very much better than I can, because you are better acquainted.

Mr. Walter SANDS. I think you might follow the program as we have it here. Perhaps there are some that wish to respond.

Mr. GARDNER. Mr. Dignan.

STATEMENT OF MR. THOMAS DIGNAN, OF GLASGOW, MONT.

Gentlemen of the International Joint Commission and gentlemen of the Milk River Valley and of Montana: Taking the standpoint of a farmer in reference to the division of the waters of this Milk River controversy by one who has lived in this valley for nearly 20 years, who has been vitally interested in its development, who has watched its progress from the very inception of the reclamation work in this part of Montana; who is vitally interested in the treaty, who has studied its provisions, and we had reached the conclusion that the question of the international waters had been settled, and I wish to assure you when this proposition came up again as to the interpretation placed upon the treaty, we farmers of this valley were bewildered. We finally reached the conclusion that it was impossible for us to understand the English language. We thought it was so plain that it was impossible for anyone to misunderstand its meaning, but we find that we were wrong. We find that when great specialists and when the most eminent lawyers of both countries commenced to discuss it, the impression has been conveyed to us that we did not understand the English language. But, as farmers, we for one moment never imagined that there was any discussion only on international waters. It was impossible for us to comprehend that the streams east of the so-called Vandalia diversion dam, which is nearly 50 miles west of the mouth of the Milk River—that came in from the north and south, and some of it during the flood season, during the run-off of the snow water—were to be measured and taken into consideration when it was utterly impossible to utilize the waters in any way, shape, or manner under the present construction scheme of the irrigation practiced in this valley or State.

It appealed to us, further, as ridiculous that all of the streams north and south of the Milk River from the international boundary over to the Missouri Valley had been prior appropriations by settlers; that there had been dams constructed. This water had been utilized for many years, at least by farmers and stockmen, before the Milk River project was ever thought of or dreamt of, and on many of the streams there are adjudicated water rights—adjudicated in the early nineties, 1894 and 1895—in this valley and tributaries to the river. Then, behold our bewilderment when we have

been notified that all of the streams that the farmers in this valley and its tributaries have owned by prescription, owned by complying with the water rights of this State—and some of them have utilized them for more than 30 years—do not belong to us; that they belong to Canada. That is one thing, among the many, that we can not understand; and that is why we insist that the waters of this country belong to us. We are willing to do anything we can to assist Canada with any water that we do not need for development. But what is more fearful to us, what we view to-day with great danger—we are only on the eve of development of this valley—is that we have only got to the point that we are able and in a position to utilize this water. We have been waiting for this water for many years. We did not know whether we were going to have our ditch work and our reservoir constructed so that it can be used; but about four years ago at Glasgow we commenced to receive some water. We have a unit there of approximately 25,000 acres, and it is nearly flat. We are able to receive water—in fact, over nearly every acre of the 25,000 acres water can be delivered, as I understand, next year.

On the eve of our proposed development, when we were ready to go out and cultivate our lands, reclaim them from their wild state, we are confronted with the great problem that we have no water. We have been working 20 years, as I may say, to receive the waters. We are peculiarly situated. There are vast areas on each side of the Milk River Valley—that is, from the Milk River Valley north to the international boundary—and for more than 100 miles south of the Milk River are vast tracts of land than can never be farmed. It is practically only suitable for grazing purposes. There is no better grazing land in the entire country than we have on those great strips that can not be used for farming—that is, for dry farming or any other system—and the result is that in years past there have been large herds of cattle and sheep grazing upon them. We have great areas of summer range, but the problem is to secure sufficient hay and feed to winter our cattle. We had reached the point where we felt that that problem was being solved. Only two years ago this State spent approximately \$40,000,000 for hay and feed alone to bring our herds through the severe winter. We were looking forward to the time when this entire valley could be put into alfalfa, into corn. It is a recognized fact that the best alfalfa land in the entire country is in this Milk River Valley. There are many places in the South where they can raise a larger number of crops—seven, eight, and even more per season—but we can raise here from three to four (never less than three and oftentimes four) crops, and in the four crops we can harvest nearly as much per acre as they can on the southern projects or any other projects in the entire country. With this condition and with the view of placing this valley into feed, this problem of feeding our cattle and sheep we felt almost was solved. We were looking forward to the day when this valley would become a great feeding station. We pledged our land, every foot of it; we have pledged our credit; in other words, we have entered into a contract with our Government and pledged the entire acreage that can be brought under irrigation in this valley for the payment of it, and to-day we are confronted with the problem that we can not have water. If we can not get the water, as Senator

Everett said, we might just as well move out. There is nothing left for us but our indebtedness to pay. We have labored for years. As I say, we have put up our credit; and many of the men have gone out and dug the ditches with their teams, as they did several years ago before the present system of construction was inaugurated. To-day we must quit this, providing the interpretation as placed on and asked for by the Canadian Government be accepted.

We are looking forward for many years of development, and it will take many years to develop this valley and bring it up to the point of a peak production. Perhaps we could get along for a few years with what water we could get from the Milk River by constructing additional storage reservoirs, but when the time comes for intensified farming, when every foot of this valley and its tributaries can be put under cultivation, then we have got to have this water or otherwise we might just as well quit to-day and not go further. I do not wish to continue further.

Mr. GARDNER. May I ask you a question right there: As you are aware, during the final settlement of this question, the commission has issued tentative orders from year to year for the utilization of the water of those two streams. What I would like to inquire about is: Has the supply of water that you have had in this valley during, say, the past three years, been ample for your purposes?

Mr. DIGNAN. The supply, I might say, during the season that the ditches were operating—the ditches to begin with were new, and the season was short for irrigating, because the ditches would leak, and seepage, with the result I do not believe that all got the water that they wished to. But the problem is, a very small acreage was irrigated during the past three years, and if the entire acreage now that can be irrigated is irrigated, then from henceforth it will be absolutely necessary to utilize the entire amount of water.

I might say that for three years, or two years in fact, this project has been under construction, and the Government has been putting in the laterals, and it was only up till this year that the so-called Glasgow unit was in position to receive water on nearly the entire part of it—that is 25,000 acres.

Mr. GARDNER. And that 25,000 acres embraces what proportion of your entire project?

Mr. DIGNAN. The entire project will embrace approximately 200,000 acres if we can get the water.

Mr. GARDNER. That includes the whole stretch of the valley?

Mr. DIGNAN. Yes. But up until now we have been irrigating comparatively only a small part of the land that can be irrigated.

Mr. GARDNER. To what extent could you expand beyond your present usage of water without additional storage?

Mr. DIGNAN. It is necessary to construct storage to conserve our flood waters. In other words, the flood water runs off here in March and April and is of very little value as a general irrigation proposition, except only for hay; but for alfalfa and other crops we must have opportunity to mature the crops in June, July, and August.

Mr. CLARK. Where could you construct storage on Milk River besides away up at the head?

Mr. DIGNAN. There is Chain Lakes, which will protect this part west of here, and then storage on Beaver Creek, which the project

has under consideration, and then there is, I understand, storage at other places. It is necessary. Of course, I could not say as to the engineering problem.

Mr. CLARK. Could sufficient storage capacity be provided on the Milk River to satisfy the needs of the Milk River Valley?

Mr. DIGNAN. I do not think so. In my own judgment, I do not think it. Of course, that is an engineering problem. I presume the officers of the Reclamation Service are able to give that information.

Mr. POWELL. Looking at the map on the wall, where does the irrigable land, moving upstream, end?

Mr. DIGNAN. As I understand, on this map the yellow is the land that can be irrigated.

Mr. POWELL. Above that it is not irrigated?

Mr. DIGNAN. The yellow-colored area there is the area that can be irrigated in this valley.

Mr. CLARK. Of course, you know nothing of the engineering problems?

Mr. DIGNAN. No.

Mr. POWELL. There are one or two questions I would like to ask you, suggested by an article I saw in a paper this morning about a meeting held down at Malta, and the general idea prevailing in that meeting was that under the régime of the commission or, at any rate, during the last few years, that Canada had taken all the water out of the Milk River. That, you know, is an entire mistake.

Mr. DIGNAN. That is not true.

Mr. POWELL. Canada has not had a foot of the water of the Milk River for the last four or five years.

Mr. DIGNAN. It is my understanding that Canada has been utilizing about 1,000 feet of the water of the St. Mary.

Mr. POWELL. I am speaking of the Milk. Canada has used no water of the Milk River at all during the last four or five years.

Mr. DIGNAN. Of course, in Milk River in the irrigating season there would not be any water to use.

Mr. POWELL. I know. The additional water that you want you wish to draw from the St. Mary River?

Mr. DIGNAN. The St. Mary River construction is carried from the St. Mary over to the Milk River.

Mr. POWELL. What quantity of that water in the shape of second-feet of the flow would you require?

Mr. DIGNAN. Well, now, I would not be in a position to state that.

Mr. POWELL. If you are not, I will not go into it.

Mr. DIGNAN. I am not an engineer. I presume Mr. Stratton here or Mr. Newell can give you that information.

Mr. CLARK. That representation on the map in blue, is that Chain Lake Reservoir?

Mr. DIGNAN. Proposed Chain Lake.

Mr. GARDNER. Mr. Fred Gillette.

**STATEMENT OF MR. FREDERICK B. GILLETTE, OF HINSDALE,
MONT.**

Mr. GILLETTE. Gentlemen, I was in the legislative assembly last winter, and I was responsible for the introduction of the resolution which has, perhaps, had some effect in the bringing here of this

commission at this time. While the resolution was under discussion there was no difference of opinion—our members of both houses were unanimous in their belief, which follows identically the remarks of Senator Everett and other gentlemen here who contend that the treaty relates only to the international waters; that the division should be at the point of last entrance at the boundary. The contention that the waters of the Milk River should be measured at its mouth did not appeal to us, and we rather resented it, for the reason that the State of Montana has not waived any of its jurisdiction over the waters originating in the State.

Regarding a statement that the chairman, Mr. Gardner, has made in reference to the fact that the decision of the commission is not binding upon either country if found unsatisfactory to them, we do not believe that the Members for Montana in Congress will sustain an adverse decision which would permit a division of Milk River at its mouth. The people of Montana and the United States have resisted a bitter propaganda during many years—the last seven years in particular—which had for its purpose our interference in the domestic affairs of Great Britain. It would appeal to us as being very much the same thing if Canada insisted on entering the United States and demanding a division of waters in our State, which is purely a domestic affair. That was the consensus of opinion in the legislature last winter in regard to the proposition.

Mr. GARDNER. You understand, of course, that the duty of the International Joint Commission in connection with this matter is administrative, and it is simply our duty under the treaty to apportion and divide this water.

The question that we are confronted with is the difference of opinion that has appeared before the commission as representing the United States and Canada as to what the treaty means. That is our difficulty. It is not as if it were a matter in which the commission has final jurisdiction. If it had been, my thought is it would have been settled a long time ago. We did not like to render a decision and then have it set aside. We are a little jealous about that.

The next speaker is Clarence Nelson, from Saco.

Mr. SANDS. He is not here.

Mr. GARDNER. Then the next to call upon is Mr. Kilduff, of Malta.

(No response.)

Mr. GARDNER. Is Mr. Jones present, from Dodson?

(No response.)

Mr. GARDNER. Mr. J. C. Kronk, of Coburg?

(No response.)

Mr. GARDNER. Mr. Anderson, of Harlem.

STATEMENT OF MR. HERBERT C. ANDERSON, OF HARLEM, MONT.

Mr. ANDERSON. I do not believe I could enlighten you on anything more than has been said on the matter, so that you may pass on to the next one.

Mr. GARDNER. Mr. Ziebarth, Chinook.

STATEMENT OF MR. A. W. ZIEBARTH, OF CHINOOK, MONT.

Mr. ZIEBARTH. I do not intend to say anything, because I could not say anything but what has already been said on the subject.

However, I merely want to call the attention of the commission to this map. This is a map prepared by the Reclamation Service, I think. I do not know whether you all understand just what it represents. This here [indicating] is the international boundary. This heavy line [indicating] around the outside represents the Milk River drainage basin. This in yellow [indicating] represents the 189,900 acres of irrigable land in the Milk River Valley.

Mr. CLARK. How much of that is under irrigation now?

Mr. ZIEBARTH. Water, I understand, is obtainable for about 80,000 acres of that at this time.

This here [indicating] is the Milk River. That [indicating] is the Chain Lakes Reservoir, and over here [indicating], which is the dark green line, represents the St. Mary drainage basin. Here [indicating] is St. Mary Lake and St. Mary Canal crossing the St. Mary River at this point [indicating], entering the north bank of Milk River at this point [indicating], and from there east flows into Canada, and Milk River runs through Canada for a distance of about 214 miles, I believe.

The purpose of preparing this map was to give the commission a better understanding of its physical features there, and our purpose largely was, of course, to show that the large proportion of the drainage area of Milk River was in the United States and consequently are United States waters.

Mr. GARDNER. That yellow tract on the upper corner of the map is irrigable land in Canada?

Mr. ZIEBARTH. Land now irrigated, I understand, in Canada.

Mr. MAGRATH. Did I understand you to say 189,000 acres as to which the water is available?

Mr. ZIEBARTH. Well, the ditches are complete for that much land. I do not think there is water sufficient to irrigate all that land, but the ditches, I believe, are complete for that much land.

Mr. MAGRATH. That is total area that is being irrigated in the valley?

Mr. ZIEBARTH. Yes.

Mr. MAGRATH. And that water that is available is directly taken from the St. Mary Lakes now?

Mr. ZIEBARTH. Yes. The Reclamation Service people are here and can give you more information. Mr. Stratton has all that.

Mr. CLARK. Where is Chinook located on that map?

Mr. ZIEBARTH. Chinook is the town in large figures here.

Mr. GARDNER. Can you tell what the length of the Milk River is if it was drawn in a straight line?

Mr. ZIEBARTH. Yes. I have not got that. We have it, I believe, in this booklet that was prepared by the Reclamation Service.

Mr. POWELL. What is the length and what is the breadth of those rectangles on your map—miles each way?

Mr. ZIEBARTH. Those are townships, 6 miles each way.

Mr. GARDNER. Mr. Charles Ling, of Havre.

Mr. SANDS. Mr. Ling, I believe, is also at the State fair to-day.

Mr. GARDNER. Mr. F. E. Stranahan, Fort Benton.

STATEMENT OF MR. F. E. STRANAHAN, FORT BENTON, MONT.

Mr. STRANAHAN. Gentlemen of the International Joint Commission, I do not desire to become tiresome or to bore you by repeating what may have been said here to-day or what you may have heard in years past, and I may not be able to add much. I have only to make a few observations.

I was born in the far West, and have never been out of it. I know a great deal of the problems of the West. I know that before you gentlemen can fully appreciate the situation, from which you can make a fair decision, it ought to be that you might know of the science of irrigation. To our shame, be it said, Governor, the great State of Montana fails in her agricultural colleges or elsewhere to teach this wonderful science of irrigation. A great length of time ago Archimedes used to raise water from the rivers and apply it to the land; and ever since Archimedes irrigation has been a science on the face of the earth, and yet there is no college that I know of anywhere that teaches this science so vitally important to the West.

In order for you gentlemen, in my estimation, to determine what that treaty means you must put yourselves as near as may be, mentally, in the position of those who framed that treaty—to take to yourselves, if you can, the intent of its framers. We may assume that they intended to form a contract, knowing what was necessary to irrigate the lands. We who know by experience what is necessary for irrigation know that we must have perennially dependable, serviceable, and controlled waters. We must know that at the proper season when the water must be applied to the land to raise our crops that we are privileged to go to the head gate and open it and let loose a sufficient amount of water to irrigate those lands.

A good many years ago I had a large family of little sons, and I had visions of raising them in the farm life followed by their ancestors for 200 years in the United States. I purchased a farm 40 miles below in this valley. Those sons to-day have been educated in agricultural colleges, but we have been obliged to abandon that beautiful farm down the valley, I think the most beautiful land I ever saw. No landscape gardener could have laid out the land with greater precision; but we have been obliged to abandon those lands and abandon for the time being the hope of irrigating them; and those sons are now grown men and operating other farms in this State.

We have this farm [pointing to map] of 320 acres down here, just at the headquarters of the Dodson Dam. Here comes a flood-water stream down from the North, but it is not a dependable stream. The waters are not controllable, and from long experience I know the enormous cost of building up an irrigated farm in the West; and the conditions are such there from those flood-water streams that no private enterprise could possibly stand the expense and stand the hazard by spending enormous sums of money in the attempt to control the waters. In my judgment, those in that portion can not be impounded, and it is impossible to control them. It is useless to spend a large sum of money to attempt to irrigate those lands from those flood waters. In ordinary seasons the flow will not last longer than perhaps 10 days. It is true that there have been appropriations on those streams, water-right filings, but that was for the purpose of catching small portions of the water and irrigating the natural

grasses indigent to the country—the wild grasses that grow there. You will appreciate the fact that it would be impossible to till those lands, plow them up and put your dikes there, let your water flow down when those grounds are frozen, all of your plowed lands, and hold and impound your waters there on plowed land. It would be impossible to irrigate in that way.

If you can appreciate then, gentlemen, what was in the minds of those people when they created that contract; whether they intended then to divide the perennially dependable serviceable waters, and if they did, then we must have those perennial waters divided without taking into consideration these uncontrollable waters.

It seems to me that the contention of our brethren from the North is very much like the old American story of two partners who went out hunting. There was to be a division of the spoils of the chase, an equal division, when they returned at night.

When they arrived home that night they found that one had brought in a crow and the other had brought in a turkey. Now, these partners—one was white and the other was Indian—and the white man said to the Indian, "You take the crow and I will keep the turkey, or you keep the crow and I will take the turkey." And the Indian said to the white man, "Why, sir, you don't talk turkey to me at all." Now, the crow is represented by the Milk River and the turkey by St. Mary, and we, if you gentlemen please, are supposed to occupy the position of the Indian.

Mr. GARDNER. The last gentleman whose name I have here is Mr. Sprague, Box Elder.

Mr. SANDS. Mr. Sprague has kindly consented to let Senator Cowan take his place. Mr. Cowan is president, I believe, of another system on the Marias.

STATEMENT OF SENATOR WILLIAM T. COWAN, MONTANA.

Mr. COWAN. Gentlemen of the International Joint Commission, this honor has been rather unexpectedly conferred upon me, and I imagine the information I have to impart from the talk that I desire to make will perhaps be more pleasant to myself than to the members of the Milk River Valley who live here, and may not contain very much information which may enlighten you in regard to this question.

I remember 16 or 17 years ago, when I was younger than I am at present, coming down to Milk River Valley and joining the Milk River Irrigation Association, with the hopes that the people up in our particular territory would participate in the activities of the Reclamation Service. It happened I lived up in what is called the Big Sandy Valley. I believe I can possibly show you on this map.

The Marias River comes down here at the lower part. When this controversy was first taken up between the international governments, President Roosevelt announced that in case it was impossible to come to a satisfactory decision between the United States and Canada in reference to the division of the waters of the St. Mary and Milk Rivers, or that we could not obtain our just proportion of the waters of Milk River, that he would bring the water of the St. Mary River by an all-American route through the Cut Bank Creek, drop the same into Marias River, bringing it by canal

system to the St. Mary Lakes and thence into the Big Sandy and into Milk River.

Investigation was made in 1902 and 1904 by the Reclamation Service, and disclosed it was entirely possible by construction of a dam on this point in the Marias River to obtain a storage reservoir of 452,000 acre-feet. Lonesome Prairie Lake, this natural depression on the Lonesome Prairie, would contain approximately 200,000 acre-feet, making a total storage capacity of 650,000 acre-feet. Under that system of irrigation there would be approximately 250,000 acres of land irrigated in the valley of the Big Sandy Creek. And the only thing I would desire to bring to the attention of the people of the Milk River and to your honorable body is the fact that we should have an early decision in regard to the division of those waters, so that the people in this section of the country can make their arrangements and adjust themselves accordingly.

It is entirely feasible for us to build a reservoir in the Marias Canyon and in the Lonesome Prairie Lake which will irrigate this land tributary to the Big Sandy Creek, and in my humble opinion, while I am not an engineer, I believe we can supply a considerable portion of water to Milk River. Engineers connected with the Reclamation Service have told me that approximately 75 per cent of the water that is used above in irrigation finally finds its way back in the streams below.

Mr. GARDNER. You mean that the possible storage of water that you speak of would be entirely separate and independent of the St. Mary?

Mr. COWAN. Absolutely. The Marias River rises on the east side of the Rocky Mountains and is fed by streams approximately similar to the streams which feed the St. Mary River. Marias River has this difference between it and most of those streams which are fed from plains country, that the melting of the snows in the Rocky Mountains during the irrigation season, during the months of May and June, make the Marias River larger at that time than at any other season of the year. The United States Reclamation Service has kept a gauging station at Shelby Junction, which drains at that period approximately 2,000 square miles of territory, and if my memory is correct the average flow of that stream during the average irrigation season is approximately 335,000 cubic-feet during the months of the irrigating season, and with this enormous storage reservoir in the Marias and in the Lonesome Lake it might possibly be the solution of this problem in case the decision went adverse to the interests of the Milk River people.

In making this talk, gentlemen, it may seem strange I would bring to your attention a matter of this kind, when such enormous expense has been gone into by the United States Government in the storage reservoirs upon St. Mary Lake, but I think it would be advisable in the interests of both countries to have an early decision in regard to the rights of this water, so that we will know exactly where we are at.

Mr. DIXON. Point out on the map where this all-American canal would diverge from the St. Mary and where it would drop into Marias and finally into the Milk River.

Mr. COWAN. As I understand it, it would bring the water from the St. Mary Lake, bring it across Indian reservation and turn it

into Cut Bank Creek. The nature of that country is entirely unknown to me. I could not state it definitely just where this is to take place, but as I understand it practically all of our share of the St. Mary water could be used in the Blackfeet Indian Reservation, and those streams drawn down into the upper reaches of the Marias River and others down into this territory, and point of diversion would be approximately here.

Mr. GARDNER. Under that proposition you would tap the upper St. Mary Lake?

Mr. COWAN. I do not think it would be necessary to transfer any water from the St. Mary Lake into the Marias. From my experience, living in that country for 33 years and observing that stream in the spring and summer months, I imagine there is water there to irrigate our territory and furnish considerable surplus to come down on the Indian Creek.

Mr. CLARK. Would the stream, in your opinion, supply storage for the reservoirs that you describe?

Mr. COWAN. Not being an engineer, I would not be in a position to state definitely; but there is a tremendous amount of water that comes down the Marias River during flood season—April, May, and June.

I have had considerable experience in irrigation, operating an irrigated ranch of 2,000 acres, and our system of irrigation is practically the same as this would be, only on a very small scale. Practically speaking, the waters of the creek from which we obtain our water supply are all approximately above it. In theory we have no actual water right. In actual practice, by the use of our reservoir, we find we have as much water as our more fortunate ones who are prior proprietors. The enormous storage capacity of Marias Canyon, 452,000 acre-feet, makes it a quite desirable proposition in my mind.

Mr. GARDNER. Of course, that is entirely outside of the question that confronts the commission, but since you have opened it up I should like to get your opinion as a business proposition. Which would be the more costly, to develop that storage system that you speak of or the full capacity of the St. Mary and Milk River possibilities?

Mr. COWAN. Why, this would be very costly. There would have to be a dam 195 feet high built across the canyon of the Marias. Of course, with the later engineering development—a hydraulic-filled dam, syphon overflow—the cost of that construction would be very much less than it would be at the time the Reclamation Service first undertook the construction of projects in this territory.

Mr. POWELL. What would be the length of that dam at the top?

Mr. COWAN. If I remember correctly, approximately 324 feet.

Mr. POWELL. Have you any estimated cost of the work?

Mr. COWAN. An estimate was made by the engineer of the Great Northern Railway in 1914 at the request of the people living in Marias irrigation district, and he put it approximately \$7,000,000 for the construction of the dams and canals and to irrigate the 200,000 acres of land in the Big Sandy Valley.

Mr. POWELL. Where is the mouth of Marias River?

Mr. COWAN. It empties into the Missouri River down at a town called Chapell, about 10 miles northeast of Fort Benton.

Mr. POWELL. Is the character of the riparian land below the site of the proposed dam such as to warrant its use for irrigation purposes?

Mr. COWAN. The bulk of the land which would be irrigated would be over in the Big Sandy Valley. The character of the land is the very best. A gentleman came through that country checking up the work of the Reclamation Service, and he told me that we had perhaps the best land for irrigation that there was any place under any of the reclamation projects of the United States.

Mr. POWELL. Would not it be that the riparian owners below the dam would be adverse to the project of diversion over the Milk River territory?

Mr. COWAN. The water gets into the Missouri River.

Mr. POWELL. Into the Milk River?

Mr. COWAN. The Marias River empties into the Missouri. There are very few ranches below the site of the dam on the Marias River. If they obtain water at all it must be by pumping, but a very very small amount of water is used for irrigation below that point.

Mr. POWELL. Then it is not irrigable from the river?

Mr. COWAN. It is not irrigable from the river. The river is not navigable, and what effect it would have upon the Missouri River and the rights in regard to that river I would not say, but I do not think the storage of the water would interfere particularly with the navigation of the Missouri River.

Mr. MAGRATH. As a matter of fact you are referring to the old location by the Reclamation Service—speaking of the dam across the Marias, which is dealt with in the third annual report of the service?

Mr. COWAN. Yes.

Mr. MAGRATH. You said a moment ago that the service had a gauging station at Shelby Junction. You did not mean that.

Mr. COWAN. Yes.

Mr. MAGRATH. At Shelby Junction?

Mr. COWAN. At the town of Shelby—probably 7 miles south of the river.

Mr. MAGRATH. I thought the junction was away from the river?

Mr. COWAN. Yes.

Mr. MAGRATH. Is it where the railway crosses the river?

Mr. COWAN. Somewhere close. I have never been close to it.

Mr. MAGRATH. It is more to have the record correct that I am referring to it.

Mr. GARDNER. Mr. C. E. Frisbie, of Cut Bank, is the next speaker on the program.

Mr. SANDS. Mr. Frisbie is not here, but Mr. James A. Johnson, president of the Northwestern Irrigation Association, is here and will be glad to speak.

Mr. GARDNER. Is Mr. Johnson present?

(No response.)

Mr. SANDS. Perhaps Mr. Henry Gerhartz will take his place. Mr. Gerhartz is the engineer for the Two-County project, with headquarters at Shelby.

STATEMENT OF MR. HENRY GERHARTZ, OF SHELBY, MONT.

Mr. GERHARTZ. I do not think I have any knowledge which would be of any particular benefit to you on this question that you have before you. The only thing that I might say something about is the question that Mr. Cowan just brought up, and that is the use of Marias River to irrigate the lands close to the Milk River.

As Mr. Sands has said, I am the engineer for the Two-County irrigation district. This is a project to irrigate 200,000 acres by stored water of the Marias, and we have a prior right to the waters that he was speaking about, as lands which slope toward the Milk River. That is about the only point that I could make, I think, that might have any effect on the question you have under consideration.

Mr. GARDNER. As I understand it, you mean that you would interpose objections to their diverting that water?

Mr. GERHARTZ. We have prior rights on that stream, and, of course, we intend to protect them. Of course, whatever water got back into the stream would be available for people living farther down the stream.

Mr. SMITH. What sort of prior rights have you to waters that have not been appropriated?

Mr. GERHARTZ. We have our filings and we have used due diligence in making our surveys and doing such other work as we have had. The field surveys are completed and the plans are practically all made. We expect to have our bond issue authorized this fall, and as soon as we can sell we expect to start construction work. Senator Cowan said that 75 per cent of the waters would naturally return to the stream. Of course, if that is so they will have a lot of water down the Marias; but I would not say, and as far as I know I have never seen any figures to tell, how much water did really return to the stream from the waters that were diverted to the land and used for irrigation. I do not know of anything else that I can tell you, because I am not familiar with this particular project.

Mr. POWELL. What is ordinarily adopted by the engineers as the percentage of the return?

Mr. GERHARTZ. I would say somewhere around 30 per cent. That is just my own idea. We have a gauging station established now. We are measuring the waste waters, or the waters that we turn back into the stream on the Valier project; but the station has only been established two years, so we have no knowledge that is of any benefit to us as yet. We will eventually have knowledge as to how much of that particular water returns to the stream.

Mr. CLARK. I suppose you can not determine that accurately until all the lands are thoroughly under irrigation.

Mr. GERHARTZ. That is true, and we have to take it over a period of years.

Mr. CLARK. I suppose when that is determined the only real loss of water is that which is lost by evaporation.

Mr. GERHARTZ. Yes; and a certain portion that stays in the plants. That is, if you grow alfalfa a certain amount of that water is taken up by the roots and remains in the hay, and, of course, that amount of water will eventually be lost, in the same way that water that is taken up through the roots of other plants is evaporated through the leaves.

Mr. CLARK. Yes; when I spoke of evaporation I included all that.

Mr. POWELL. Is not the percentage dependent to a very large extent upon the care or protection of irrigation?

Mr. GERHARTZ. That is undoubtedly true with respect to waste water. Of course, a project which is planned so that there will be practically no waste water would certainly have less waste than a project which had its ditch full of water and when it looked like rain the farmers quit irrigating. But on the particular project that I spoke about we have a reservoir at the lower end of it. That is a secondary storage and the water goes back into it. It also depends somewhat upon the soil condition. Where there is a gravel subsoil a great deal more water will be lost by seepage than through other soils. If there are no further questions, I thank you for your attention.

Mr. GARDNER. I find on the program that the State agricultural department is represented by Chester C. Davis.

Mr. SANDS. Mr. Davis is at the State fair to-day, Mr. Chairman.

Mr. GARDNER. The agricultural college is represented by Mr. Blaine Ferguson. Mr. Ferguson, I am glad you are here.

STATEMENT OF MR. BLAINE FERGUSON, REPRESENTING THE STATE AGRICULTURAL COLLEGE, BOZEMAN, MONT.

Mr. FERGUSON. Gentlemen of the commission, I have been sent out by the State agricultural college at Bozeman, to instruct any of the farmers of northern Montana that need instruction in irrigation. I have been here during this last summer. I have had occasion to go north all over the drainage basin of the Milk River that is within the State of Montana. I have found many varying conditions. Where there has been no irrigation—that is, on the dry farms—we find that agriculture is very uncertain; it is so uncertain that, in my opinion, it is almost hazardous to put in a crop of grain or anything else if there is not some preparation to water the ground artificially. But where there has been water applied to the ground before the crop was planted, or even in the preceding fall, if the ground in the northern part of Montana here can be filled with moisture at one time during the year and the moisture absolutely stored in the ground, we are nearly assured of a crop, and a good one. It means the difference between a 2-bushel crop and a 40-bushel crop.

In the Milk River drainage basin I have had occasion to instruct a lot of farmers in the way to build small reservoirs upon these dry coulees, where the water runs off in the spring before the ground has thawed out, and impound the water in small reservoirs, etc., but that work has just started. There are some advantages that the farmers can gain from this, but I would say that they are small in proportion to the territory that it takes in. The amount of water that goes down the Milk River can not be stored within the drainage, and most of the water would go off in the spring run-offs that we could absolutely not take care of.

With this periodic stream we have to have these extensive storage facilities, and the farmers are not in a position to put them up. If we have to depend on this periodic run-off we can not get very far in the irrigation of the land.

I believe that is all I have to say unless there are some questions.

Mr. STRANAHAN. Was there any run-off this spring in these coulees?

Mr. FERGUSON. There was none to amount to anything, but we understand that that is very exceptional, because in most years there is a great deal of run-off. There was some run-off this spring on some of the coulees and some of the dams got full, but there were very few. There are only about 3 years out of 15, as I understand it, when there has not been sufficient run-off to fill every reservoir that could be put on these dry coulees.

Mr. GARDNER. I find on the program that the State of Montana is to be represented here by the Hon. Carl Riddick. Is Mr. Riddick present?

(No response.)

Mr. GARDNER. Is the Hon. W. J. McCormick present?

Mr. SANDS. No, sir; he is not present either, Mr. Chairman.

Mr. GARDNER. As a last resort we have the district engineer, Mr. Alexander Middleton. Is Mr. Middleton present?

(No response.)

Mr. GARDNER. Gentlemen, I have exhausted the program as outlined. I find myself in the position of the new minister who just moved into a neighborhood and was called upon to preach the funeral sermon of a very wicked character that had died in that locality. When the minister found what he was confronted with he became so embarrassed that he said: "Ladies and gentlemen, being a stranger here, having had no acquaintance with the deceased, and knowing nothing about his characteristics or his virtues, I have decided to make this an open meeting, and I now invite anybody to make remarks." After a few moments had elapsed a gentleman got up in the rear of the room and said: "Mr. Minister, if there is no one here who wants to talk about this corpse, I would like to have a few minutes to speak on the tariff." So we will have to leave it with you people now. I have gone the limit of my resources. I will invite anyone to speak that wants to submit any views to the commission. I notice a gentleman on my left here that was unfortunate enough to have been in my company on the way up here. He is, I believe, one of the reclamation officers of the United States. I would ask if he can give us some light on this very dark subject?

STATEMENT OF MR. GEORGE STRATTON, UNITED STATES RECLAMATION SERVICE.

Mr. STRATTON. Mr. Chairman and gentlemen of the commission, if I may be permitted to do so, I will go over near the maps, as I think I can answer one or two questions that have been asked.

In regard to the storage possibilities on the Milk River, coming down the stream in this country, the Chain Lakes storage is proposed, represented by this blue spot here, of about 240,000 acre-feet capacity. That is on the main stream in the Milk River itself. The Chain Lakes are in township 35 north, 12 east, and adjacent townships.

Then there is a reservoir proposed on Beaver Creek at township 38 north, 32 east, of about 50,000 acre-feet capacity. No work has been done on that yet. That is not on the Milk River. It is on a southern tributary, but is directly on that tributary.

Then in township 32 north, 32 east, there is the Nelson Reservoir, which is an inland reservoir and a natural depression in the topography. It has been constructed to 25,000 acre-feet capacity and is in use to that capacity. We are now enlarging it to 70,000 acre-feet capacity. That is not on the main stream; it is not fed directly by any stream; but is fed by diverted water through the Dodson South Canal to the Milk River and passing it down here for 45 miles. That canal is now built to a capacity of 500 second-feet, and it is proposed to build it to a capacity of 900 second-feet. Those are the storage possibilities in this country aside from the St. Mary storage.

Mr. GARDNER. What would they represent in the aggregate in acre-feet?

Mr. STRATTON. Three hundred and sixty thousand acre-feet. One of the gentlemen here was asked about the possibilities of storage of all the flood water running off here in the spring. This stream will handle, to some extent, the flood water of this stream, but there are these streams coming in here [indicating on the map]. Here is Frenchman River and also Rock Creek.

Mr. MAGRATH. You are referring to streams that come from the north?

Mr. STRATTON. Frenchman River and Rock Creek come from the north.

Mr. SMITH. They cross the international boundary line?

Mr. STRATTON. They both cross the international boundary. Those streams both deliver below any reservoir possibilities on the river. They both do deliver in Vandalia Dam, so some of the water which comes down in the summertime is available at Vandalia Dam, but that which comes in the spring can not be stored and passes on downstream.

Mr. MAGRATH. Can the greater part of that water that passes in the early spring be put to beneficial use?

Mr. STRATTON. When the snow is going off the greater part of it can not be put to beneficial use.

Mr. DRAKE. Is there any possibility of holding that water back in the streams themselves in their upper courses?

Mr. STRATTON. There is some small possibility there, not very much in the aggregate, so far as I know.

Mr. DRAKE. There are no really good reservoir sites?

Mr. STRATTON. No. The best I know of is up above here on Rock Creek. That, however, is a small reservoir. I have been there, but I have not any figures on it; its capacity is possibly 5,000 acre-feet. However, that is merely a guess.

Mr. DIGNAN. Is it a fact that all of the waters during the irrigation season are appropriated and used by private concerns?

Mr. STRATTON. Yes; they are all used by the Rock Creek Canal Co.

Mr. POWELL. That is a Montana organization, is it not?

Mr. STRATTON. Yes, sir.

Mr. POWELL. With its domicile here in the State of Montana?

Mr. STRATTON. Yes; it is a local organization right around Hinsdale.

Mr. GARDNER. Do you know anything about the average flow of the Frenchman River during the irrigation period?

Mr. STRATTON. Yes; it is very small. There is a small irrigation system, perhaps 5,000 acres, takes off from Frenchman Creek near

its mouth. They are rather crowded on that to get water. It is not a good dependable supply for that small area. Of course, in the spring a large amount of water passes there, but in the midsummer, at the time when they want water for cultivating crops, that stream is practically dry.

Mr. POWELL. The average during the irrigation season does not exceed 20 or 30 second-feet, does it?

Mr. STRATTON. No, sir; it would be less than that.

Mr. CLARK. Mr. Stratton, can you give me the information which I asked for a few moments ago in regard to the dependable flow of the St. Mary River?

Mr. STRATTON. I am not so familiar with the St. Mary River as I am down in this country. My territory is here east of Milk River. But I will say that the St. Mary starts with a comparatively large flow early in the season, say in June, and that diminishes through July and August. I have an idea that perhaps on the 1st of August its ordinary flow might be somewhere around 400 or 500 second-feet. I would not want to state that very positively.

Mr. DRAKE. It is a little more than that.

Mr. MAGRATH. Mr. Stratton, can you tell us what the filing against the St. Mary River was by the Reclamation Service? Mr. Bien in his testimony said that he would give us the information, and I have not been able to find it.

Mr. STRATTON. You want the amount in second-feet of water that was filed on?

Mr. MAGRATH. Yes.

Mr. STRATTON. I can not tell you that off-hand, sir; but I will look that up and see that you get the information. I personally made that filing, but I can not tell you now the amount.

Mr. MAGRATH. Will you ascertain also the date of the filing? Am I wrong when I say it is all the available flow?

Mr. STRATTON. No; I think you are right. I made a filing in 1912 there. I posted that notice myself. The language of that, as I recall it, would state a certain number of acre-feet or second-feet from the St. Mary River and its tributaries. I am pretty hazy in my mind as to what it did say.

Mr. MAGRATH. We can get that information?

Mr. STRATTON. Yes; I can obtain that information for you, and will do so.

Mr. MAGRATH. Now, you are speaking of the Chain Lakes Reservoir. What is the estimate of the cost of that reservoir?

Mr. STRATTON. That thing is under design at the present time, and I have not an estimate of cost that is reliable enough so that I would care to make it public. It will be a comparatively expensive reservoir. There are a million and a half yards of earthwork contemplated. It is a dam 70 feet high and 2,500 feet long, approximately.

Mr. MAGRATH. It is an earth dam?

Mr. STRATTON. It is an earth dam.

Mr. MAGRATH. Can you give us any information as to the storage at the St. Mary Lakes?

Mr. STRATTON. I might perhaps give you a little, but I would prefer that you ask Mr. Snell for that information. It is up in his territory, and he can give you more correct information, as he is

more familiar with that country. It is in his district and not in mine.

Mr. POWELL. Have you any data covering the flow of the southern tributaries to the Milk River?

Mr. STRATTON. Yes, sir; we have data on some of them.

Mr. POWELL. Would you be kind enough to let us know what you have, beginning lower downstream and going up in regular consecutive order? I have been hunting for that information for years.

Mr. STRATTON. That is being assembled for the last few years, since one of the members of the commission particularly requested it, and Mr. Lamb, of the Geological Survey, is getting that. The Geological Survey does this stream gauging rather than the Reclamation Service.

Mr. POWELL. That is not the first stream?

Mr. STRATTON. No. I do not think there is anything on these streams down below—

Mr. POWELL. Those lower ones that you passed over are not available for any purpose?

Mr. STRATTON. No; there is no available data on those.

Mr. POWELL. Strike the first that can be put to beneficial use.

Mr. STRATTON. On Beaver Creek we have had gauging readings for a number of years past.

Mr. POWELL. What is the average flow of the stream? I am speaking now of the flow during the irrigation season.

Mr. STRATTON. It is practically nothing. I was up that stream within a week, and it was dry. That is a fairly typical condition.

Mr. MAGRATH. But Beaver Creek comes in south of Nelson Reservoir.

Mr. STRATTON. Yes; it is just about due south of Nelson Reservoir, but there is a hill between it and Nelson Reservoir.

Mr. POWELL. Where is the confluence itself with the Milk River?

Mr. STRATTON. It is near Hinsdale and about 6 miles above Vandalia Dam.

Mr. POWELL. In range 36?

Mr. STRATTON. Yes, sir; in range 36.

Mr. POWELL. Now take the next to the left.

Mr. STRATTON. Here is Peoples Creek. There is a gauging station maintained on that.

Mr. POWELL. What is the average flow on that during the irrigation season?

Mr. STRATTON. That is usually dry in the irrigation season at this point.

Mr. POWELL. Now, the next one.

Mr. STRATTON. The next one is White Bear Creek, and I think there is no gauging station on that creek.

Mr. POWELL. Is the flow negligible there in the irrigation season?

Mr. STRATTON. Yes, sir; it is negligible in the irrigation season.

Mr. POWELL. Now, the next one.

Mr. STRATTON. The next one is Snake Creek, on which there is a gauging station maintained during the irrigation season.

Mr. POWELL. What is the flow?

Mr. STRATTON. The flow is practically nil.

Mr. POWELL. You say "practically nil." Give use some figures within which you mean the observation of your remarks to apply.

Mr. STRATTON. Nearly always the reports that I see coming in state that there is no flow, or that there is a flow of about one-half a second-foot. Occasionally there is a rain down there and it runs up a flood.

Mr. POWELL. Yes; a cloudburst or something of that kind. Now, take the next to the left.

Mr. STRATTON. You are getting up now where I am not so familiar with them. That one [indicating] I do not think there is a station on. This one is Clear Creek. There is a station on that one.

Mr. POWELL. There are some good streams that flow from the Bear Paw Mountain Range. What are those?

Mr. STRATTON. This is one that comes from the Bear Paw [indicating]. At the mouth, which is where I am speaking of—

Mr. MAGRATH. What range?

Mr. STRATTON. That empties in range 18. That flows but little in the irrigation season, but there are quite a number of ditches taking out above here.

Mr. POWELL. Could you give us some estimate of the subtraction?

Mr. STRATTON. No, sir; I could not. Some of these men who are familiar with the country could perhaps do that.

Mr. POWELL. Are the men present?

Mr. STRATTON. Mr. Sands, do you know that country?

Mr. SANDS. Yes, sir; fairly well.

Mr. POWELL. Can you give us that information, Mr. Sands?

Mr. SMITH. First I would like to ask Mr. Stratton a question, if I may be permitted. Mr. Stratton, all this flow of which you are speaking goes from the south into the Milk River?

Mr. STRATTON. This flow that I am speaking of now is from the south; yes, sir. That is my understanding, that you desired to consider the southern portion, Mr. Powell?

Mr. POWELL. Certainly. Now, what is the next one?

Mr. STRATTON. This is Box Elder. I think there is a station on that.

Mr. POWELL. What is the flow of that stream?

Mr. STRATTON. It is in about the same class as Clear Creek. There are diversions upstream on it, but, so far as I know, at the mouth it contributes but little during the irrigation season.

Mr. CLARK. What is the purpose of your gauging a stream where all the water is gauged and used above the station?

Mr. STRATTON. We have the matter of the division of water in two divisions of the project here as to the natural flow of the river and the St. Mary flow of the river. This country around Chinook is entitled at the present time to the natural flow of the Milk River. They have that water right from their old rights, but for supplemental flow from the St. Mary they pay an acre-foot charge. It is necessary for us to determine what the flow of the Milk River separated from the St. Mary River is in order to determine the charge against these districts up here. For that purpose it is necessary for us to know what these streams contribute or if they contribute anything.

Mr. CLARK. I understand now.

Mr. STRATTON. That is why we keep stations on those streams if there is no flow there.

Mr. POWELL. Have you exhausted the southern tributaries?

Mr. STRATTON. There is the Big Sandy coming in up here [indicating].

Mr. POWELL. What is the average flow of that stream during the irrigation season?

Mr. STRATTON. There is some flow there, I think. That is, it is distinguished from some of these others that you might say are absolutely dry, but 5 or 10 second-feet would be large for an average estimate on that.

Mr. POWELL. That is the last one?

Mr. STRATTON. Yes. This is a flat country up here [indicating], and you may say there is no run-off in the summer time.

Mr. GARDNER. Where is this flat country of which you speak?

Mr. STRATTON. It is in the vicinity of the Chain Lakes Reservoir.

Mr. POWELL. There are no flows into the lakes except the one above—the Milk River.

Mr. STRATTON. None except the Milk River.

Mr. POWELL. Taking the summation of the flow of these southern tributaries during the irrigation season, what would they total—more than 50 second-feet?

Mr. STRATTON. In my opinion, they would not.

Mr. CLARK. What would they total during the year?

Mr. STRATTON. I could not give you a figure which would be worth anything on that without going through the records and taking that information off. But the flow while it is large for a few days lasts but a short time in the spring.

Mr. POWELL. Are you acquainted with what might be called the hydrometric conditions of this country?

Mr. STRATTON. To some extent.

Mr. POWELL. What is the average rainfall of that portion of Montana which is the watershed of the Milk River south from the stream?

Mr. STRATTON. There are, so far as I know, no rainfall stations as you get back out of the valley. The stations along through the valley here have an average of about 13 inches.

Mr. POWELL. How about the northern portion, between there and the boundary line?

Mr. STRATTON. There are no stations maintained except through the valley.

Mr. POWELL. Have you any idea what it is?

Mr. STRATTON. I do not think it varies greatly.

Mr. POWELL. Is there any difference in degree in the aridity between the tract to the north of the Milk River and the tract to the south of the Milk River?

Mr. STRATTON. I do not think there is. Of course, that is in general. In one year you get a more humid condition in one spot than in another, but in general I think it averages up about the same, as far as the north and south go.

Mr. POWELL. You are not able to speak comparatively of the tracts to the west of your big reservoir?

Mr. STRATTON. No; I am more concerned with this. My personal knowledge is through the valley, not as you get back away from the bench.

Mr. POWELL. Now, just another question and then I am through. I want something more than mere opinion. In your judgment, based on facts which you have, you say that the larger flow during the irrigation period is from the north via the affluence of the Milk, or from the south via the affluence of the Milk River?

Mr. STRATTON. It is from the north, I think. These streams, Battle Creek and Lodge Creek, do contribute some water throughout the season.

Mr. POWELL. There seems to be a little discrepancy, if my recollection serves me correctly, with respect to these streams that have their sources in the Bear Paw Mountains. It has been represented to us that these streams have almost not a glacial source but a snow source in these mountains, and the flow keeps up longer in the summer time and they have a better flow than any other tributaries. Is that correct?

Mr. STRATTON. Mr. Sands, can you answer that question?

Mr. SANDS. That was the suggestion that I made, Mr. Powell, that they did do so; but the water is all diverted before it reaches the Milk River; it never reaches the Milk River during the irrigation season.

Mr. POWELL. It would not make any difference to us in making up our judgment, assuming that these streams had to be brought into account in the general marshaling of the water, whether they were owned by private people or by the Government. The question is what quantity of water is used there by the Americans, whether individuals, companies, or the Government, as against the quantity used in Canada by either individuals, companies, or the Government.

Mr. SANDS. That would be very difficult for us to determine, for the reason that there are nearly 3,000 diversions from the Milk River wholly within the United States, and we have made only a very few gauging stations. It is one of the reasons we brought you here—to show you that it would be almost impossible to measure all those diversions and take them into account in making the equal division that the Canadians suggest.

Mr. POWELL. Mr. Sands, would it be fair to assume that the flow-off would be the same per mile in the case of your land to the north of the Milk River as in the case of your land to the south of the Milk River?

Mr. SANDS. But I think that the rainfall would be heavier in the Bear Paw and in the Little Rocky Mountains than on the prairie here.

Mr. POWELL. Would it be appreciably heavier?

Mr. SANDS. Yes; quite appreciably. I think the reports from the Bear Paw give a much heavier rainfall there than right here in the valley. That would be true also of the Sweet Grass Hills and of the mountain ranges that you have in Canada that are within this district.

Mr. DIGNAN. Is it a fact, Mr. Stratton, that we have years here when the average precipitation exceeds fully 7 inches during the entire year?

Mr. STRATTON. Yes, sir. The precipitation at Malta in 1909, I think, was slightly over 7 inches. At Malta in 1917 it was about 8.7 inches.

Mr. DIGNAN. That was for 12 months?

Mr. STRATTON. That was for 12 months.

Mr. CLARK. Does that include snow and rainfall?

Mr. STRATTON. Yes, sir. It is given in this table here by months so it can be taken off during the irrigation season.

Mr. GARDNER. Does your record show that that is an unusual condition?

Mr. STRATTON. Yes, sir; that is less than the normal. Perhaps I should not say unusual, but it is less than the average.

Mr. GARDNER. I understood you to say that the average was about 13 inches.

Mr. STRATTON. About 13 inches.

Mr. GARDNER. That would, of course, mean that in a good many years it is in excess of that.

Mr. STRATTON. It shows on this table for March 12.93 for an average of 16 years, varying from a maximum of 20.8 to a minimum of 6.32.

Mr. CLARK. What precipitation do you consider up here is sufficient for a crop? I am speaking now with reference to the possibilities of dry farming.

Mr. STRATTON. I would rather some farmer answer that question.

Mr. MAGRATH. Mr. Stratton, what is the total area in this Milk River Valley that is capable of irrigation from the Milk River itself? I am not speaking of lands on the tributaries or the waters of the tributaries. What is the total area? It has been given to us before. The statements previously presented varied a great deal. You said a moment ago you were familiar with the valley here, and I want to get at the facts.

Mr. STRATTON. The total area that we plan to eventually irrigate under the project is about 190,000 acres.

Mr. MAGRATH. Will that cover all the land in this valley that can be irrigated from that stream? Is that a fair and reasonable statement? That is what we are after.

Mr. STRATTON. Yes; if I understand your question, I think that is right; that that is all that can be irrigated in the valley.

Mr. MAGRATH. By waters from Milk River?

Mr. STRATTON. Yes. It would be possible to extend and take in lands which are not taken in under that system. For instance, there are, perhaps, 20,000 acres of land lying to the north of the Milk River through this country north of Saco and Hinsdale.

Mr. MAGRATH. North of what?

Mr. STRATTON. North of Saco and Hinsdale, on the north side of the river.

Mr. MAGRATH. Can that be irrigated by the tributaries coming from the north?

Mr. STRATTON. No, sir; that is not included in our project or any contemplated project, public or private, here.

Mr. MAGRATH. Is it in the valley?

Mr. STRATTON. It is in the valley and it would be physically possible to divert water from the Milk River over that land. It was formerly included in the project, but it is no longer contemplated that we will build it.

Mr. CLARK. What was the cause of rejection, the expense?

Mr. STRATTON. That was one reason. The question of water supply entered into it also, and the matter of the desire of the land-owners. It is largely privately owned land, and the owners were not anxious to encumber their lands to pay for the cost of it. All those things contributed to eliminating it from the project.

Mr. DRAKE. Mr. Stratton, I realize that the figures in respect to irrigable area must change from time to time as your plans develop. You have accounted for an area of 20,000 acres. My recollection is that some few years ago the area for the project was given as 219,000, whereas now it is given as 189,000, and you have accounted for about 20,000 acres lying in the Saco district. Where was the other eliminated?

Mr. STRATTON. There has been considerable eliminated by working down the individual areas and getting down to the actual area in each farm unit. That accounts for considerable reduction. There is also, I think, some reduction in some lands in connection with the height of the canal. As you work on any irrigation project the longer you study it the less number of acres you get in it.

Mr. DRAKE. I quite appreciate that, as we are having the same difficulties you are. I just wanted the information.

Mr. POWELL. How about the freshet flow in the spring of the year? What is the elevation of the stream here, we will say, at Chinook?

Mr. STRATTON. That is, whether it stays within the river banks or gets out of them?

Mr. POWELL. No; but what is the resultant increase in elevation of the surface of the river here?

Mr. STRATTON. I would say likely it rises 20 feet in elevation here during the spring floods at Chinook. Would you agree with that statement, Mr. Sands?

Mr. SANDS. Yes, sir; sometimes more than that from the bottom of the river.

Mr. POWELL. It would take an immense reservoir to contain all that flow.

Mr. SANDS. A 20-foot dam would not be so high, but the trouble would be in taking care of all that water when it comes down and spreads out over a large territory.

Mr. POWELL. Now, to-day, as I understand you and the other witnesses, the United States receives all the waters that flow within this large area shown on the map by this heavy purple line. That is correct, is it not?

Mr. STRATTON. By that you mean that the Reclamation Service receives and distributes those waters?

Mr. POWELL. No; I am not saying that they make use of them, but I am saying that the water is there for the Americans, whether it can be made use of or not.

Mr. GARDNER. Is there any diversion above the boundary on the Frenchman River?

Mr. STRATTON. Yes; there are diversions on the Frenchman and on the tributaries, Battle Creek and Lodge Creek.

Mr. POWELL. Yes; I should have included those, which I did not do.

Mr. STRATTON. Those are small diversions, so far as I know them, but there is a considerable number of them.

Mr. POWELL. Outside of those small diversions, my remark is true, that all the water in that watershed included within the area shown in purple on the map goes to the United States.

Mr. STRATTON. Yes; that is all in the United States.

Mr. SANDS. Mr. Chairman, we have with us Mr. Newell, who has really been with this project from the very first. He knows more about it than all the rest of us put together. We have every confidence in Mr. Newell, and I feel confident that whatever he says or does for us will be just the right thing, and if we could hear from Mr. Newell, I am sure the people present would appreciate it.

Mr. GARDNER. Mr. Newell, will you kindly give us your views on this matter?

**STATEMENT OF MR. F. H. NEWELL, CONSULTING ENGINEER OF
THE UNITED STATES RECLAMATION SERVICE.**

Mr. NEWELL. Mr. Chairman, I have had the pleasure of appearing before the commission, and I think I opened the case by a preliminary statement at St. Paul when you first took the matter up. My recollection is that mine was the first general statement of the conditions. Since that time—seven years ago—there have been a good many changes and developments, and, as stated by Mr. Stratton, many of the things that we thought we could do and many of the areas that we thought we could irrigate have been gradually eliminated. There have been no other essential changes since that time, excepting in those details, and I would be very glad to answer any questions so far as I can. It is a subject that I have been studying at intervals with considerable continuity of interest since 1888 or 1890, and I have followed the developments as far as they could be made plain.

The only point that I might care to emphasize at this time that might interest you is the possibility, as brought out by Senator Cowan, of reverting again to the all-American canal line. I have just been over the ground to look again at the feasibility of it from an engineering standpoint. It is not as difficult as we thought at first because we have already built other similar lines. But it might interest you, as the question has been brought up, to know that it is considered feasible to extend the St. Mary River Canal, which now leaves the St. Mary River on the west side, crosses it, comes into the low hills at the head of Milk River, and comes over and discharges into the North Fork of Milk River, and then the water flows through Canada. Now, it is physically possible before that water discharges into the North Fork to intercept it and take it around on the North Fork through a rather deep cut into the Middle or South Fork and then cross that Middle or South Fork and come across the divide into the Cut Bank and then out of the Cut Bank into the irrigation district in the vicinity of the town of Cut Bank and east as far as might be desirable. That is simply one of the things that might be done at large expense, if it were considered necessary or desirable to utilize more of St. Mary River water in the United States. engineering standpoint. It is not as difficult as we thought at first and on reexamination it seems to be quite feasible, although it would not be an economical use of the water in St. Mary River; it could be

used cheaper through the present Milk River. This would be a revival of the old all-American canal.

The situation I think you have very clearly in mind, and I hardly think it is necessary to thresh old straw unless there are some questions that may be brought up that are of interest to you gentlemen.

Mr. CLARK. Mr. Newell, I think you made an investigation at one time and reported the estimated cost of construction for reservoirs for the St. Mary River water at the foot of the lakes.

Mr. NEWELL. May I ask Mr. Stratton or Mr. Snell for that information? Those estimates when originally made were very small, and all estimates for all construction work have very greatly increased since the original rather preliminary estimates were made; but there has been since a rechecking which I would hardly dare give from memory without corroboration.

Mr. CLARK. I am asking that question on the assumption that storage will be the ultimate solution of this whole question.

Mr. NEWELL. I may say that whatever the cost may be it is well within the value of the water; that is to say, no matter how large the estimate of the cost might be, it would still be well within the economical value of the water when stored.

Mr. CLARK. That is, if the individual were able to pay for it?

Mr. NEWELL. Yes.

Mr. CLARK. Of course, there is a time when the charge upon land for water becomes so large that it is not an economical value.

Mr. NEWELL. In that connection I would like to insert in the record the fact that when this work was to be started and the reclamation act was debated in Congress we estimated that about \$20 an acre was as much as the land would stand. Since that time our ideas have very greatly increased. Again and again people have come to me, even within a few days, and said: "If we can get a dependable supply of water we can easily pay \$100 an acre under easy terms to the Government without interest."

As a matter of fact, on the Valier project, a private project west of here, the charge for water is \$60 an acre, and that is not to be considered excessive, as they have already sold upward of 80,000 acres at prices approaching that amount.

Mr. POWELL. Do you mean that those figures would be supplemented by an annual charge?

Mr. NEWELL. An annual charge for maintenance is an additional charge.

Mr. POWELL. What is the average annual charge?

Mr. NEWELL. It will range from a dollar an acre-foot up to \$2, or possibly more on storage projects.

Mr. GARDNER. Just what do you mean by the \$60 per acre? Does that mean the purchase price of the land?

Mr. NEWELL. That is the purchase price of the water rights. The land itself under the Carey Act sold at \$1.50 per acre. The water rights are \$60 per acre.

Mr. GARDNER. Is that an exclusive charge, or is that an annual charge?

Mr. NEWELL. That is the total charge, paid in 14 annual installments, with interest.

Mr. GARDNER. Then it is in perpetuity following that?

Mr. NEWELL. Then for all time the maintenance and operation must be paid by the owner of the land.

Mr. SMITH. You mean by the \$60 an acre, Mr. Newell, that that is a permanent water right for that price?

Mr. NEWELL. Yes, sir.

Mr. SMITH. And that permanent water right runs with the land, and the owner contributes his part of the expense of keeping up the project?

Mr. NEWELL. Exactly.

Mr. POWELL. Maintenance, renewals, and repairs?

Mr. NEWELL. Yes, sir; maintenance, renewals, and repairs are then an annual charge on top of the first cost of the water.

Mr. CLARK. Mr. Newell, perhaps you can give me the information I have been soliciting as to the normal flow of the St. Mary to the boundary during the irrigation season.

Mr. NEWELL. The normal flow, as I recall it—and I would ask Mr. Drake or Mr. Snell to correct me if I am wrong—is during the irrigation season something over a thousand cubic feet per second, rising at times to two or three thousand, or even more, but dropping toward the end of the irrigation season to 500 or less.

Mr. CLARK. Then an absolute appropriation of 500 cubic feet per second at times during the irrigation season would absolutely absorb the entire flow of the St. Mary?

Mr. NEWELL. Yes, sir.

Mr. MAGRATH. Does it not get down, Mr. Newell, to a little over 100 second-feet in certain areas?

Mr. NEWELL. I doubt if it gets much below 300, but Mr. Drake, I know, has that right in his memory.

Mr. CLARK. I would like to have that in the record, if Mr. Drake has it.

Sir WILLIAM HEARST. We have all the accurate tables.

Mr. DRAKE. You have the tables before you. I can only corroborate what Mr. Newell says, that it sometimes, in the latter part of the season, goes down as low as 200 or 300 second-feet. That does not occur as a rule, and in the years in which it does occur it does not happen until probably late in August.

Mr. MAGRATH. I was under the impression that it has been down to about 125. It is a question of memory, but we have the tables.

Mr. DRAKE. You have them in that compilation that was compiled by engineers on both sides of the line up to and including 1917.

Mr. SMITH. Mr. Newell, have you a record, or do you know what is the flow of the Milk River across the international boundary line during what you know as the irrigation season?

Mr. NEWELL. We have a very accurate record, which is published in the volume of river flow, and my recollection is that during the irrigation season the flow of Milk River at what we call the eastern crossing drops to between 100 and 150 second-feet, and sometimes even less. It becomes almost dry at that point. I will insert in the record the actual figures if you will permit me.

Mr. SMITH. I did not know it was in the records. I would not have asked you had I known it.

Sir WILLIAM HEARST. Mr. Newell, during the same period that you were giving for the eastern crossing what is the flow of the eastern tributaries?

Mr. NEWELL. The eastern tributaries come in east of the eastern crossing, and, as stated by Mr. Stratton, the flow is very nearly nothing. That is to say, it would be 1 or 2 second-feet, because all of the water that is available at that time is diverted by the small ditches, of which there are about 3,000, taking out of those tributaries.

Sir WILLIAM HEARST. I am speaking of the flow at the international boundary. You gave us, as I understand, the figures for the Milk River at the eastern crossing. Now, I have asked you for the figures during the same time at the international boundary of the eastern tributaries. How do they compare?

Mr. NEWELL. The eastern tributaries crossing the international boundary at about that time are flowing perhaps 10 or 20 cubic feet per second, most of the flow being taken by the small diversions in Canada, and relatively little water coming across into the United States during the irrigation season.

Mr. MAGRATH. Will Mr. Drake confirm that, Mr. Newell?

Mr. NEWELL. I would be very glad if he would.

Mr. DRAKE. I am afraid I could not confirm that.

Mr. NEWELL. I will amend it.

Mr. DRAKE. A comparatively small amount of the flow of those northern tributaries is diverted for use in Canada. At the time this case was first heard at St. Paul the Canadian engineers estimated the total run-off of those five northern tributaries as 190,000 acre-feet per annum. That was the best information we had at that time. I well remember that one of the United States engineers, Mr. Connor, took exception to that figure and said that he thought 140,000 acre-feet would be nearer the mark. The records were subsequently checked up by engineers from both sides of the line and published in that remarkably expensive but very useful volume referred to by the chairman, and it was found that to the end of 1917—I am speaking now roughly from memory, but I think I am nearly correct—

Mr. SMITH. And of the irrigation season or annual flow?

Mr. DRAKE. The annual flow. It was 237,000 acre-feet. That calculation was rechecked just a few days ago, because the years since 1917 have been abnormally dry, and the average now has been reduced to approximately 207,000 acre-feet.

I would not attempt to say what portion of that occurs during the irrigation season, except to say this, that during the winter there is very little run-off from any of those streams. The bulk of the run-off occurs between, say, the 15th of March and probably the 1st of May.

Sir WILLIAM HEARST. How does the total run-off of these tributaries at the boundary compare with the run-off in the main Milk River at the eastern crossing?

Mr. NEWELL. I am afraid I could not give you that information offhand. I do know that the main Milk River at the eastern crossing is sometimes practically dry. That is also the condition at the same time of the year, so far as these northern tributaries are concerned; but it is a fact that the main Milk River at the international crossing is sometimes a raging stream, and that is also true of these northern tributaries. Many a man has found that true to his sorrow when he attempted to ford them.

Mr. SANDS. Mr. Chairman, when we first conceived the idea of asking the commission to come out here, in a letter to the commission I asked that before the hearing we have a concise statement of the claims made by each of the parties. I did so with a view of knowing exactly what the argument was to be about. But up to this time I confess that I do not know exactly what the Canadians claim. It is very possible that we think they claim more than they actually do. We, unfortunately, had to take the affirmative or be heard first in St. Paul, because the hearings were in this country, I presume, and, unfortunately, I think we are appearing first in this hearing, and up to this time we have not had any concise statement of the exact differences between the United States and Canada.

We have here with us Mr. Drake, of the Reclamation Service of Canada, who, I have no doubt, could give us a statement of what they do actually claim. It is possible, as I say, that we have misjudged them and do not understand what they do claim, and if it would be appropriate I would ask to have a statement from Mr. Drake. We would be very glad to hear it, and, perhaps, after hearing it we would have a more friendly feeling toward the Canadians in that respect.

Mr. GARDNER. Do you offer yourself a sacrifice?

Mr. DRAKE. I think that is practically what it would amount to, and I am reluctant to do it, for the reason that there should not be any doubt in the world as to what has been claimed on behalf of Canada, if one will simply take the trouble to read the written record and the statement made by counsel representing the Canadian Government. The statement has been made fully, and it has also been made very concisely. I do not think it would be appropriate for me, not being counsel representing the Canadian Government, to attempt to restate that, because it is on record, nor do I think it would be appropriate for me to attempt to support it by argument when so many very exhaustive arguments have been made by Colonel MacInnes, by Mr. Tilley, and by others, who very directly and authoritatively represented the Canadian Government. It would hardly be proper for a layman to attempt to interfere in a matter of that sort which has so fully been covered by lawyers.

Aside from that I would like very much to discuss the problem with Mr. Sands, but hardly in this way.

Governor DIXON. I would like to ask Mr. Newell, representing the United States, and Mr. Drake, who, I understand, is Canadian engineer, if they could agree on a statement to this commission as to how much extra water could be impounded, and at what probable cost, on the St. Mary watershed, and how much could be impounded, and at what probable cost, on the upper reaches of the Milk River. To my mind that is a very important factor in the settlement of this dispute. I have an abiding faith that if we would turn our attention on both sides of the line to conserving the waters that now run in waste to the sea in both of these rivers we might solve this question to the satisfaction of both Canadians and people of Montana.

Mr. POWELL. That is complete solution by storage?

Governor DIXON. Yes; and that may be the solution instead of these technical legal arguments by the attorneys. I would like to ask Mr. Drake.

Mr. DRAKE. Governor, if your remarks are addressed to me, I can only say that I agree with you absolutely that the control of flood waters now going to waste is the crux of the whole situation. It is not so easy—in fact, it is impossible now—to answer either of your questions definitely. I think it is impossible for anyone at present to say just to what extent and at what cost it is possible to conserve either flood waters of the St. Mary or the flood waters of the Milk and its tributaries, because, as you thoroughly understand, the conservation of waters on tributary streams is of just as much consequence as the conservation of water in main streams themselves. Taking all these watersheds, comprising these two streams and their tributaries, storage is the solution of the problem.

I think if the commission has the power to order a very complete investigation and report on that, and if the two Governments could subsequently agree to store those waters, they would have gone a long way toward solving a question that up to the present has not been satisfactorily solved.

Mr. GARDNER. As a matter of opinion on your part, do you think that is a practicable business proposition to impound a sufficient amount of water on these two watersheds to take care of the irrigation of all irrigable lands within the two watersheds?

Mr. DRAKE. No, sir; I don't think so. I think there would still be some lands for which there would be no water available.

Mr. GARDNER. So that if all the water was impounded that it would be possible to impound there would still be some lands unprovided for?

Mr. DRAKE. I am satisfied, no matter what the solution of this question may ultimately be, that there will be some lands in Canada the owners of which will want water for and can not get it, and the very same condition will exist in Montana.

Governor DIXON. Approximately, how many acre-feet of water could be conserved in St. Marys drainage basin on our side of the line for which there is practical storage possibilities?

Mr. DRAKE. I don't know that exactly. The engineers of the United States Reclamation Service have made many studies of storage possibilities there and have made many estimates as to the quantity of water that might be stored, but there has been some uncertainty in their minds as to the stability of the foundation upon which a dam must rest. I heard Mr. Davis, the chief engineer—Director at present of the Reclamation Service—say—at least I understood him to say; I would not like to make the statement positively—that he believed it would be possible to store a great deal of water in St. Mary Lakes; that even if the foundation were somewhat porous and some water did seep through it the water that seeped through would still be usable, because it would flow down the channel of the St. Mary River and could be used in Canada; and he did not think the seepage would be sufficient to seriously endanger the construction itself. I think that statement is correct.

Mr. NEWELL. Yes.

Governor DIXON. I would like to ask Mr. Newell regarding this same matter: From your knowledge of 25 years, what is the possibility of practical storage of water around St. Marys, within reasonable cost, to help fortify the situation on both sides of the line?

Mr. NEWELL. There is no question in my mind from the engineering status, but what it will be practicable to store in St. Mary Lakes or tributaries—two St. Marys—practically all of the available flow. There may be occasionally flood flows of an extraordinary nature that it would not pay to store, but, if I may refer to a little ancient history, when this matter was under discussion between the two Governments, Dr. W. F. King, astronomer of Canada, and myself were asked to make a broad engineering study, such as I believe that Mr. Drake and myself could make, or other American engineers, with advantage to both countries. And the fundamental proposition on which we acted was this: That it would be a practical and economic crime, you might say, not to store every available drop of water that could be stored economically, or to deprive one country of water which it could use, simply because of the existence of this arbitrary line of division. On that we attempted to formulate a policy, you might say, that was ultimately embodied in the treaty with Great Britain. But I still believe that wherever the water occurs and can be held economically, it should be held and utilized in whichever country it can be used to the best advantage.

I believe we might accept that as a broad principle, and if we did I believe that men acquainted with the situation could sit down—engineers—and work out, perhaps without any regard to what our ideas might be of the treaty, to work out an ideally perfect scheme, and then see to what extent it can be made to conform to the conceptions which have grown up regarding the actual intent of the treaty. Do I answer your questions?

Governor DIXON. Yes. Now, of course, this ultimately leads to participation in costs by both Canada and the United States in the saving of this extra water. You have at the lower St. Mary a tentative plan, have you not?

Mr. NEWELL. Yes.

Governor DIXON. That was worked out years ago. How many acre-feet could you store there?

Mr. NEWELL. My recollection is something like 200,000 acre-feet. As much, at any rate, as the lake at normal times of water on Swift Current would hold.

Governor DIXON. How much approximately has the action of the United States in building the reservoir that you have at this time on the St. Mary conserved?

Mr. NEWELL. Well, virtually there are about 70,000 acre-feet, in round numbers.

Governor DIXON. And by the building of Sherburne Dam you have already added 60,000 acre-feet to the water supply?

Mr. NEWELL. Yes.

Governor DIXON. You can add 200,000 acre-feet?

Mr. NEWELL. Approximately; in round terms.

Governor DIXON. Would that exhaust the storage possibilities there?

Mr. NEWELL. So far as we know, it would.

Mr. CLARK. That between St. Marys and international boundary?

Mr. NEWELL. Yes. As I understand it—and Mr. Drake will verify it—that possibly there is some storage north of the boundary which may still further conserve the waters of St. Mary River for use in Canada; and I think we discussed in a general way a practical

scheme that might be rather involved, that would store water in Canada and even then contribute back to Milk River because of the very peculiar topography, but that is very involved; what you might call an interchange of courtesy.

Mr. DRAKE. That is quite true, though.

Mr. POWELL. What are the storage capacities on the northern side of the boundary line with respect to the St. Mary?

Mr. DRAKE. I do not think I could give you the precise figures. Roughly, the situation would be that just about at the point where the St. Mary River crosses the international boundary, or within a mile or two of that point, a dam could be constructed that would back the water up some little distance into the United States, but would raise the height sufficiently to permit of a diversion canal being taken out to the east. Water could be carried thence to what are known as St. Mary Lakes and to the reservoir which we call Tailorville, and from there to a further reservoir called Lumpy Butte. I would say, roughly, the combined capacity of those three might be 75,000 acre-feet. Then there are other possibilities I would not care to discuss now, because they involve a great deal of complicated engineering, but water could be stored in what we call Milk River Reservoirs, which lie, roughly, say, in township 6 of range 22—somewhere in that neighborhood—and it is possible to take water out of those last-mentioned reservoirs and turn it eastward into Verdigris Coulee, which runs from northwest to southeast, crossing just a little north of Milk River Station and then running down to Milk River. By means of a dam constructed in Verdigris Coulee, water diverted from either Milk River or St. Mary River could be stored—part of it could be used in Canada and part of it could be rediverted through the channel of the Milk River for use down in Montana.

Mr. POWELL. What is the extent of the storage there?

Mr. DRAKE. Approximately 100,000 acre-feet. More than that—140,000 acre-feet.

Mr. POWELL. That gives 470,000 additional.

Mr. DRAKE. There are great possibilities, but these possibilities involve huge expenditures, and they would all have to be studied very carefully.

Governor DIXON. Are they more expensive than the original St. Mary storage on the American side?

Mr. DRAKE. Relatively, I think they would cost more for the quantity of water stored. It is usually much cheaper to store water by a dam across the stream itself than it is to divert water from the stream for storage elsewhere, because in the latter case you have to rely on flood water and have to construct an enormous canal and utilize a considerable volume of water that flows only for a short time.

Governor DIXON. What would be the cost, approximately, of 25,000 acre-feet storage at St. Mary that Mr. Newell's staff made some report on some years ago?

Mr. DRAKE. I don't know, sir, and even if I had the figures in my mind, which I have not, I would much prefer that the United States engineers would give them.

Governor DIXON. I would like to ask Mr. Newell that. What would it cost to create 25,000 acre-feet more water up there?

Mr. NEWELL. My impression is—and I would like to correct it in the record—that it cost between \$5 and \$10 an acre-foot for storage.

That is on a broad impression. Now, as you know, all estimates are usually exceeded, because we discover unknown conditions—undiscoverable conditions until the ground is opened. We have estimated the storage there originally, I think, at about \$2 an acre, but because of the very uncertain foundations our estimates have gradually run up; but if I will be permitted I can put in the exact figures in the testimony when it is written out.

Governor DIXON. How high a dam?

Mr. NEWELL. We have figured on 40 feet and sometimes higher. The question of the height of dam is governed by the height of water that will stand against the foundations, and which because of its pressure will force its way through the foundations. There will always be a certain amount of water going through these gravel foundations; and if the quantity is small and velocity is small—say a foot a day or so—the foundation will be perfectly safe, and water which passes down in course of years will be used; but if we add very materially to the height, of course, that would increase the velocity through the foundations and imperil the structures; so that it is a balancing of very unknown conditions at present.

Mr. MAGRATH. The estimates that your Reclamation Service gave—three successive annual reports—respecting storage in St. Mary Lake was 250,000 acre-feet at a cost of \$250,000, which would be \$1 per foot.

Mr. NEWELL. That is entirely too low.

Mr. MAGRATH. You think it would be \$5?

Mr. NEWELL. It would be as much as that because of changed labor conditions and our larger knowledge of what it actually has cost for such work.

Mr. MAGRATH. The proposed dam—I think his honor the governor has put his finger on this proposition in the proper place—the proposed dam is an earth dam?

Mr. NEWELL. Yes.

Mr. MAGRATH. Do you still think an earth dam would be suitable there?

Mr. NEWELL. It is a question. We have talked of an earth dam simply because that material is in the vicinity, and we have also considered the question of putting down a cut-off wall of concrete, and the question then is foundation on which to rest that cut-off wall. We have built some dams with cut-off wall resting on piles, and it is one of those questions which is still debatable—what would be the best form. But my general belief is an earthen dam under those conditions.

Mr. MAGRATH. Assuming a cost of \$5 an acre-foot and loss in seepage, do you think it is a sound economical proposition for the lands, either here or in Canada, to be charged with such a cost?

Mr. NEWELL. There is no doubt in my mind but what it is sound economical cost.

Mr. MAGRATH. At the \$5?

Mr. NEWELL. Yes.

Mr. MAGRATH. Or \$10?

Mr. NEWELL. Yes, or even \$10. That is an inconceivable cost but would be a reasonable one considering the value of those lands as we develop the use of them.

Mr. CLARK. How much water is required for irrigation purposes per acre?

Mr. NEWELL. Under methods of irrigation here a very little amount. They have been using perhaps an acre-foot or so and sometimes as much as 2 acre-feet, but they have been giving in this part of the country often not more than one irrigation—sometimes two—and as they cultivate more intensively it will bring up a larger use of water.

Mr. MAGRATH. Of course, I always had in my mind that the reservoir in St. Mary River—which was dealt with in your annual reports, giving a dollar an acre-foot—that if that was a reasonable price, then probably the work would cost twice as much to-day, but I did not think of five times as much.

Mr. NEWELL. I am merely advancing that as a figure.

Mr. POWELL. Mr. Davis made an estimate of the cost?

Mr. NEWELL. Yes. We have some revised figures.

Mr. POWELL. His estimates are considerably in excess of your figures.

Mr. NEWELL. I do not bear them in mind.

Governor DIXON. As merely a far-fetched suggestion to the commission itself, is it possible to create an international corporation to do this work and divide the new water practically created by these storage possibilities—to be fed out to Canadians on one side and American farmers on the other?

Mr. DRAKE. I do not think I quite caught the purport of the remarks.

Governor DIXON. I suggested possibly a wild notion. Would it be possible to solve this question by creating an international corporation—if such a thing were possible—to do this work along the boundary, charging pro rata to both parties?

Mr. DRAKE. Would not it be more practical to have first an examination made to determine the extent to which the waters could be conserved and the approximate cost, and then to have the two Governments agree to share the cost between them in proper proportion, and leave it to each Government thereafter to dispose of the store of water assigned it as might be found best? I only made the suggestion because the idea is a new one.

Mr. SANDS. In regard to that proposition, I believe, speaking for the farmers of the valley, that they would feel that in any added burden they at least ought to be consulted, and I presume they would be, but I do not believe they would be very favorable to any added cost for extreme measures in conserving that water up there. If it would be possible to get the Federal Government to assume that burden, it might be all right, but I do not believe the farmers here would consent to have an added burden unless absolutely necessary.

Governor DIXON. Possibly Washington and Ottawa might be glad to contribute to this in order to get rid of this age-old controversy. It might be cheaper than a commission in the long run.

Mr. GARDNER. For the information of the water users up through here, I would like to say that when this matter was first to be taken up by this commission we made application to the Interior Department asking that the engineer that was to be designated to measure these waters in connection with the engineer selected by Canada be designated especially to the use of the commission and to be paid by the commission's appropriation, and that request

was not granted. I simply speak of that to show that had that been done, whatever engineering expense that has been attached to this project up through here would have been paid by the appropriation of the General Government instead of being imposed upon the individual water users of this project. The commission undertook to have that brought about, and it was not granted. I may say that in connection with the Lake of the Woods investigation that has been done.

Governor DIXON. You have a new Secretary of the Interior now.

Mr. GARDNER. Yes, but they were changed once during that period of time. The practice in the examination of the pollution of boundary waters was also followed out in that way—that the engineer selected to do the work was designated to act directly under the control of and to be paid by the commission, but in this particular case that request was not granted.

Mr. SMITH. I would suggest to the governor it does not arise so much from the change of Secretaries as it does from the general economic condition of the country at this time. There was a great spasm—and a very just one—a great spasm of economy, and it looks like, from the present burden of taxation, it has got to remain a matter of strict economy by the National Government; and however strict the Secretary of the Interior may be, I may say there is a certain committee called the Committee on Appropriations that we would have to change as well as the Secretary before we can get anything like liberality at this particular hour, and I think it is not only true of our country—I do not speak for Canada, but it is certainly true of the balance of the world.

Mr. GARDNER. If I were at liberty to suggest and make a mandatory order, I would require the governor of the State and the Director of Irrigation in Canada to get together and submit a plan to me that I apprehend would be workable, that would be equitable, would be fair, and it would be fairly satisfactory to everybody concerned; but if I should issue such an order, I understand that either or both would refuse.

Has anyone else anything they want to present to the commission at this time? I do not want anyone to go away from here and be able to say they were not given an opportunity to express themselves.

Mr. DIGNAN. Mr. Chairman, Mr. Sands has been very interested in this discussion in its entirety, and if not imposing on the commission we would like to hear from him.

Mr. GARDNER. I admonish you that you are not to appear as attorney here.

Mr. SANDS. It is very late, and I appreciate the fact that you have heard a great deal this afternoon. I only want to take up a moment's time with a proposition that ought not to take that. There has been a great deal of discussion here this afternoon without, to my mind, any definite knowledge of what the differences are. We do know that there is a difference of opinion between the United States and Canada concerning the boundary or the division of the water at the boundary.

As one of the early irrigators here and one of the early stations of the valley, we knew at the time we were consulted relative to the division of the water on the terms of this treaty that, as Mr. Everett

said, it referred to the international boundary waters. The first intimation we had that that was not the understanding of the Canadians was in 1915. We felt when we made that concession that gave to the Canadians half of the waters, realizing, as we did, 80 per cent of the waters that we are dividing—that is to say, the waters that cross the international boundary line—that 80 per cent rises in the United States, and we conceded to the Canadians 50 per cent of that—50-50 proposition—upon the understanding and for the sole purpose of having the privilege of running the water through the Milk River for 220 miles. In addition to that, we agreed by the terms of the treaty to pay to the Canadians any damage they might sustain. Under that treaty—or you might call it a compromise which we had at that time—under that compromise the Canadians were to lose nothing. They were to simply give us the privilege of going through there. We felt we were giving them a great deal at that time, but we were willing to compromise for the reason that we wanted to turn that water through there. We did not want to turn it over into the Missouri basin and bring it back again. We compromised again, but in 1915 the proposition was again raised, and since that time there has been a suggestion that we compromise again. We feel that we compromised enough then.

In 1915 we had to appear in St. Paul, at which hearing Mr. Hammond and myself were sole representatives from the Milk River Valley. At that meeting, as we understood when we went there, the only controversy, the only question, was as to whether the water should be measured at the boundary or whether it should be measured through the mouth, and that was the principal discussion there. Before we closed, however, there was one other principle advanced by the Canadians, I believe, and that was that the flood waters should be taken into consideration in determining the flow. In other words, the total cubic feet of water that fell, or acre-feet of water that fell into this watershed, should be considered in determining the division. That was not urged very much by the Canadians, but that was one of their further suggestions at that time. We advanced the theory that it was the low-water stage—not even the average, but the low-water stage that we were considering. That was the only time that a question of controversy would arise respecting these waters was in their low-water stage. Since that time there have been new questions raised, as I understand, by the Canadians; the question of priority. At the hearing at St. Paul we were asked what our views were respecting that question of priority. Now, as you understand, the Canadians are entitled to three-fourths of the priority—three-fourths of the St. Mary River. We are entitled to priority of three-fourths—500 cubic feet—in the Milk River. Now, three-fourths of 500 cubic feet priority in the St. Mary River is very valuable, because the St. Mary River always, or nearly always, carries at least 500 cubic feet, and three-quarters of that priority is about 375 cubic feet. So that the Canadians would always be assured of 375 cubic feet from St. Mary, whereas in the Milk River it is very seldom during irrigation there is 100 cubic feet, and our priority of three-fourths of 500 cubic feet amounted to very little. So that in that respect the Canadians would have very much the best of us on that priority, viewing it from any standpoint.

But since that time, I understand from a tentative suggestion of compromise offered last spring by the Reclamation Service of Canada, that they are not now claiming that this priority, the water taken out under those priorities, shall not be considered in determining the measure of the division of one-half; that if there is 500 cubic feet of water in St. Mary River the Canadians are entitled to take out 375 cubic feet of that water, and we would get 125 or approximately that, and if there is, say, then 100 cubic feet in Milk River, which would be large, we would be entitled to take full 100—because they would not be entitled to get any of that—we would only then be getting 225 cubic feet, while they would be getting 375.

Mr. DRAKE. May I interrupt you? All these contentions that were advanced on behalf of Canada were made in 1915 at the St. Paul hearing, and no new contention of any kind whatsoever has been advanced since. The record will bear that out.

Mr. SANDS. Pardon me, I was there and I have since looked at the record with that in view, and I thought perhaps you would recall whether that contention was put forward by the Canadians at that time. I do not know of any contention suggested at that time because it came entirely new to me, and I do not speak for myself, but other members of the American section that were there had the same view—that it is an entirely new proposition.

Mr. DRAKE. I have a copy of the record at the hotel, and I shall be very glad to show it to you.

Mr. POWELL. I think I can settle that myself for you. If you will look at the record at St. Paul you will find where I myself examined or put a series of questions to Mr. Wyvell, who was counsel of the United States, as to the view of the prior appropriation. There was another gentleman there—I have forgotten just what his name was—who took a different view, a stronger view than what Mr. Wyvell did; and a great majority of the men who said anything at all about it—and they did not say very much—was rather wiggly between the two extreme views.

Mr. SANDS. My understanding is there was no objection made at all to our view of it; that is to say, that the priorities were to be considered in determining the equal division; and it certainly came to me as a surprise, and I say I then talked with other members that were there at St. Paul, and it also came to them with surprise, and I think the record will bear me out that no objection was made by the Canadians to our contention in that respect. At all events, I believe, for the benefit of the people here, that is one of the present contentions—whether the priorities taken out shall be considered in determining the measurement of the equal division. The illustration I have given shows that in that event it would give the Canadians considerably more water than 50 per cent.

Mr. POWELL. If you would allow me to supplement, I am not certain at that meeting, but either at that meeting or next. You were present at both?

Mr. SANDS. I was not present at Detroit.

Mr. POWELL. If you will look at one or other of the records you will find that Judge King expressed, and strongly expressed, the view that was held by the Canadians in respect to prior appropriations.

Mr. SANDS. Judge King was not at St. Paul.

Mr. POWELL. I can not distinguish between the several meetings—what was said at one place and said at the other. He was the counsel for your department having charge of this matter—the recognized counsel—and he took that view, and he expressly said that he differed with the rest.

Mr. SANDS. Well, it is possible that he did; but I do not feel we should be bound by it.

As I said before, those are two of the contentions, and the question of whether the flood water should be considered or whether it should be normal flow or low flow was the third proposition. There is also one other proposition that has been advanced, and I think, too, this is recent—I do not believe this was discussed in St. Paul—and that is the question as to whether our priorities should be considered in the North Fork or Battle Creek or Lodge Creek and Frenchman. Now, Milk River, as I said before, does not flow a full 500 cubic feet during the irrigation season. If we may supplement the flow from the North Fork, Lodge Creek, and Battle Creek, and Frenchman sometimes, we might get that full 500 feet from it, and we could take out our priorities. Very seldom, but we can do it sometimes. Sometimes there is a very good flow in Battle Creek. I take it we are entitled to take our priorities out of Milk River and out of tributaries which cross the boundaries.

Sir WILLIAM HEARST. You do not agree with Judge Turner?

Mr. SANDS. I do not know what Judge Turner's view might be. That is my view.

Sir WILLIAM HEARST. I assumed probably you had read the record.

Mr. SANDS. No, sir; not that record.

Sir WILLIAM HEARST. If you read the Ottawa argument, you can plainly see where he puts his view.

Mr. SANDS. That Ottawa argument was not published. I was not there.

In any event that is another question that has come up, and which, speaking for myself at least—I do not know what Judge Turner might have said—but, speaking for myself, I think we would be thoroughly entitled to consider the North Fork and Frenchman and Battle Creek in determining our priorities, and be entitled to add that to the flow of Milk River itself in order to get our share of those priorities in order to partly equalize the smaller flow of the Milk River and its tributaries as compared with the St. Mary.

As I take it, there are those four propositions before the commission, and, as I said before, I am sorry there is no very concise, definite statement here, such as pleadings, which we have in court, which would direct the attention of the commission to the exact matters in controversy, and that we who have the affirmative here, who are having our hearing the first, might know definitely what the matter in controversy is. As I said before, we went to St. Paul without any knowledge beforehand of any controversy at all scarcely, except perhaps we had heard incidentally that the Canadians claimed that they should measure the water at the mouths of the streams rather than at their head:

One of the purposes in calling you gentlemen here was to show you the vastness of this territory here and to show you the impossibility—I say impossibility—and impracticability of determining what is the

flow of all these streams that rise in the Bear Paw and Little Rockies and on the prairies here.

I have a statement of the Reclamation Service, which I will put in the record, showing that there were nearly 3,000 diversions in 1912, and that was practically the same as in 1909, at the time this treaty was negotiated.

In order to determine what share of the water the Canadians should have and what part we should have it would be necessary, if we adopt the contention of the Canadians, to measure all those diversions in order to determine what would be the flow at the mouth, because, of course, you would not expect us to divert that water. We would have to make 3,000 calculations every day if we were to divide that water, covering a territory of 500 miles long. We would have to put a man at practically every one of those places. It would take at least two weeks to get that data together so as to determine what share of the water Canada should have and what share of the water the United States should have, if the contention, as I said, that the water to be measured at the boundary is to be followed out. It seems to me that that contention and that that fact ought to be a very potent factor in determining the intention of the parties at the time this treaty was made. Surely they could not have intended that 3,000 men would have to measure these waters every day in order to determine what the division would be. It does not look reasonable that they would expect it. On the other hand, they would only have a few measuring stations along the boundary and, necessarily, of course, on the headwaters of Lodge Creek, and Frenchman, and Battle Creek, and at St. Mary Lake. That would be practicable. So that it looks to me from a reasonable standpoint that the men who made this treaty could not have intended that from this vast territory to have different measurements to determine what the division should be based upon.

Another feature of it, too, seems to me very strong, and that is the cost of such a system of measurement. It would take 3,000 men to do it, 3,000 people to measure these streams in order to know what the diversions would be. The cost would be excessive, and it would be every year an annual charge. The cost would be so much that it seems to me unreasonable that these people who made this treaty ever contemplated that they would go to so much trouble to determine what was the flow of those streams south of the boundary that never reach Canada.

You are wanted here to see the vastness of this territory, to see the impossibility, and, as I said, the impracticability of such a system of measurement. You were also invited here with the hope of showing you the streams, showing you that they were entirely dry at this time of the year, which is a little after our irrigation season, but that the streams themselves are of such a character that they are not suitable for irrigation unless supplemented by some other source, usually from the mountains. If we had all the flow of water that would naturally come down Clear Creek and Beaver Creek and those other streams from the mountains, it would amount to something in the Milk River. The flow has all been diverted and seldom reaches the Milk River itself, so that we can not count on anything of this water source of supply in the mountain region. It

would not be sufficient, but it would help a great deal. However, that has all been diverted. Now, our only source of water supply is in the St. Mary River. We are willing to give the Canadians any water that we can without serious loss to ourselves, but our irrigation plants here have already cost us all that we think we can possibly stand. We do not feel that we should go to a great deal of extra expense to create these reservoirs for the purpose of further assisting our neighbors across the boundary. If there is any way by which they can conserve water at their own cost, we have no objections. We are glad to assist them. We believe in the irrigation of the arid lands on both sides of the line, but we do not believe we should have added to our cost any considerable sum of money in order to afford the Canadians a further irrigation of their lands. The water rises on the United States side and we think we are first entitled to that and ought not to be burdened further than is necessary.

Mr. MAGRATH. Supposing you go elsewhere along this international boundary, Mr. Sands, and the water rises on the other side. Would you say the Canadians would be justified in taking the water from you if they considered that they had a prior filing against it? Because along the international boundary that exists between these two countries the water does not always flow north; you can find places where it flows south. I would rather not discuss this question, but it would be very unfortunate if the people of Montana misunderstood the attitude of their neighbors. We are neighbors and we want to live side by side in the best relations. I am sure that is what animates you here, as I know it is what animates them. And you seem to speak as though you are not familiar with what the Canadian viewpoint is. Am I right in that?

Mr. SANDS. Yes, sir; you are right; I do not thoroughly understand their viewpoint yet.

Mr. MAGRATH. I do not want to be put on record, but I would be very pleased to explain it to you as I understand it.

Mr. SANDS. That was the reason that I asked that Mr. Drake explain their viewpoint. I think it is possible that we may not be quite as far apart in our views as we think. But I was basing my proposition upon the claims put forth last spring by Mr. Drake. We did not have any official notice of those claims; they were not made a part of the record, and I think they were withdrawn. So we have not any official notice of their claims, but at that time, I know, at least the four contentions that I make were before those two gentlemen, and I take it that those are a part of their claims.

Mr. GARDNER. I would say, Mr. Sands, that there were several propositions considered tentatively that were just simply put forward with the idea of determining, if possible, some mode of settlement, but they were not authoritative and they were not in the record. They were just simply matters that came up to see whether some suggestion might lead into some channel whereby we could come to an agreement and settle the thing. On the other hand, there were propositions that came from Mr. Drake and Mr. Davis and several others. I think I submitted one or two off hand myself. They are not a part of the record but just an attempt to find some way of getting an equitable settlement.

Mr. DRAKE. Mr. Chairman, I think in justice to myself and in view of the fact that my name has been brought into this as having made certain proposals I should make a very brief explanation.

The commission had been attempting to settle this question and had been using its very best efforts to that end. They had not at that time been able to reach any unanimous decision as to the merits of the case, and Mr. Davis and I were invited, not as representing the United States Government and the Canadian Government but unofficially, to see if we could not suggest some method of dividing these waters that might be found acceptable to the Governments of both countries. The proposals which were made by Mr. Davis were his own. The proposals which I made were my own. Neither of them was based upon the provisions of the treaty, but they were merely attempts to get together; and I do not know whether the Canadian Government would have supported any proposal that I made, and I never understood for one moment that Mr. Davis believed or had reason to believe that the United States Government would support him. The proposals, as Mr. Sands has said, were withdrawn. They are not a part of the record. It was simply an attempt to get together. It was very much along the lines, if I may be permitted to say so, of Governor Dixon's suggestion a moment ago that something should be done in an endeavor to harmonize these conflicting views.

There is just one other explanation that I would like to make. Mr. Sands has referred to the very great number of individual irrigation or water rights on the southern tributaries of Milk River and the practical impossibility of determining the flow of the streams because of the necessity of measuring each of these separate diversions, as well as measuring the amount of water that flows out of the mouth of the streams. That there are undoubtedly many such diversions and that some measurement should be made of each of them in order to determine the total run-off of each watershed is true, but the very same condition obtains and has obtained for many years with respect to these northern tributaries which have their rise in Canada, Lodge Creek, Battle Creek, White Water Creek, Frenchman River, and Rock Creek. All have their rise in Canada and in practically every instance there are a great many individual water rights on those streams. Notwithstanding that, the Canadian officials have measured those streams with sufficient accuracy to be able to tell you what amount of water flows off at the boundary, or would flow off at the boundary if it were not diverted for use in Canada, and in order to do that we have had to measure all of these separate diversions. We wanted to do it because we as a Government grant the water rights and we want to know what amounts of water are being taken and whether the waters so taken are being used. So we have an arrangement with the owners of the ditches whereby we place a gauge rod in each diversion ditch and that gauge rod is read and compared by the owner of the ditch or our own men, or our own men visit these ditches from time to time and measure the diversions. In that way we have a fairly accurate record of all the diversions. It is only in that way that we can determine the total run-off of the stream. And if that thing is possible on a very large scale in Canada, it should be possible to obtain similar results here.

Mr. SANDS. In answer to Mr. Drake's suggestion that it would be possible, we submit that it would be possible to measure those streams, but we do not admit that it would be possible to measure them and to get reports within a reasonable time to the commission that is going to make this division. We would have to have telephones or telegraphs. It would be almost impossible to get such reports within a reasonable time to the commission that would divide this water.

The diversions made upon the Frenchman and other streams are very small compared with the diversions made on the other streams down here. And why would the people making that treaty have added to their burden the measurement of the waters that never go into Canada and are not in controversy?

Sir William Hearst has suggested that Judge Turner at one time took a different view from my own regarding the priorities on Frenchman River and Battle Creek. I do recall that Mr. Walsh, in letters to me and in conversation with me, has taken the same view that I do, that our priorities should be included in all of the streams that flow into the Milk River from the north to determine our priority in the Milk River. If Judge Turner has taken a different view, it differs very much from Mr. Walsh's view, and, while I do not know what Judge Turner said or what his views might be, I do know that Mr. Walsh does think and believes from a legal standpoint that we are entitled to take into consideration these northern tributaries in determining our priorities.

I have not anything further to suggest, except that I do wish the commission, if they stay over here to-morrow, would allow us to take them out in the cars here in order that they might see some of our streams and see how vast is our territory here and how difficult it would be to follow out the suggestion made by Mr. Drake that we measure all these streams.

Mr. POWELL. There is just one thing I would like to say, because there is a possibility of ill feeling being created, or, if it has been created, a possibility of its being intensified, by the presentation of an ex parte statement. I am not going to decide here and now which is right or which is wrong. When you talk about Canada taking or your giving Canada a certain amount of water of the Milk River—whether Canada is right or wrong, I am not going to say—there are two views of international law with respect to that. One is that the riparian owner of the State below is entitled to have the water flow down to him with its natural quantity subject to diminution along its course for domestic purposes. That is one view. The other view is that that is not a right; it is a mere matter of comity, and that the sovereignty of the State up above entitles it to the ownership of the water. Whether right or wrong, those are the views of the latest authors on international law. Your States and England are two countries with respect to which I might say that by inheritance they are of a land-grabbing disposition.

Mr. SANDS. Particularly England.

Mr. POWELL. Yes; especially England. It is more noticeable there. But I am going to say this, that neither the United States nor England, both great peoples, with their immensely ramified trade and their complicated civilization, can say that we are inconsistent in our duty with respect to this. England took this course for the United States in respect to the St. Lawrence River: "You are not

entitled to use the St. Lawrence River; it is absolutely ours." England backed down from that and entered into an agreement with you that the United States had the right to use the St. Lawrence for the purpose of navigation to the sea.

In the case of the Ashburton treaty, or the Webster-Clayton treaty, as the Americans call it, as late as 1842, the same thing occurred in the case of the St. John River. England again put up that contention and again backed down, and to-day the American commerce has exactly the same right as the English commerce to navigate that portion of the St. John River which flows entirely and exclusively through Canadian territory.

If you will read the precedents of international law, or consult the work of your very eminent jurist, Mr. Moore, in his digest of international law, you will find that both countries have been entirely inconsistent. There is the difficulty. If Canada was right, the water was hers; if the United States was right, the water was hers. That matter is not for us to decide.

Mr. SANDS. The treaty has already determined that.

Mr. POWELL. The treaty has determined that. That is not for us. The treaty has substituted a question of contractual obligation for one of jurisprudential obligation which would rule where a treaty was not made. Our duty is a very simple one—to decide the meaning of the treaty, and that alone.

To show you the great difficulty with which we are confronted, I may say this: That if language on the face of it could mean anything, the language of that treaty must certainly be clear. It says:

The high contracting parties agree that the St. Mary and Milk Rivers and their tributaries (in the State of Montana and the Provinces of Alberta and Saskatchewan) are to be treated as one stream for the purposes of irrigation and power, and the waters thereof shall be apportioned equally between the two countries.

Now, Canada says the natural language there is the two-river system, and you say no; it is not the two-river system; a part of the rivers and only a fractional part of the part it applies to. I am not saying that you are right or that you are wrong, but I am mentioning the very difficult question for you to consider. You meet the Canadian contention by saying, "We have a right to go back into the history of the negotiations and show you conclusively that the contention of the high contracting parties was clear and distinct, that only waters crossing the boundary line should be divided." The Canadians take the ground that that would be contrary to the rules of law.

It is a very serious question, a question to be decided soundly and according to the principles of law which govern your empire and our empire, and as far as we are concerned we may not meet with the approval in what we do of both sides, but I can assure you of one thing, that this commission will endeavor, if forced to an adjudication, to decide on what they believe to be right as God has given them the power to see right, and it is to be hoped I think generally that the very best feeling should prevail and all animosity or warmth of feeling should be left out in a case of this kind and the matter be decided in a calm, cool, deliberate atmosphere of judicial action.

Mr. SANDS. Just one thing further, gentlemen. This matter has been dragging since 1915. It is a matter of serious consequence to us because it retards the development of this valley. We would like to have the matter determined as soon as possible. I am not criticizing the commission, because I think our Secretary of State at least was greatly responsible for a large part of this delay. I do know that by an unfortunate letter, which has been referred to here, he did say at one time that any decision reached would not be accepted. I think that letter has been withdrawn. We did our best to get him to withdraw that letter. I was in Washington twice and took such steps as we thought would bring about a change right away, but it was not brought about. The matter has gone for six years, as I say, and I believe the people here would appreciate an early decision. If it is not possible to reach a decision, then we would respectfully suggest that the matter be referred back to the two Governments, and that some other tribunal from perhaps other countries that are not interested at all endeavor to try to settle it for us. We would like to have as early a decision as possible.

Mr. CLARK. You are no more desirous of that than the commission itself.

Mr. GARDNER. Is there anything further that anybody wishes to say?

Mr. EVERETT. There is just one thing that has not been brought to the attention of the commission that it seems to me has been overlooked. It is a serious matter in case the commission should decide to measure all of the streams running into the Milk River above its mouth, and that is with reference to this Bear Paw country. None of the gentlemen seemed to think of this matter. In my judgment, it is the most important of all.

These streams, beginning with Big Sandy Creek and taking in Box Elder Creek, Beaver Creek, Little Box Elder Creek, Clear Creek, and Lodge Creek, all of those creeks are vast mountain streams, running the year round with an abundance of irrigation in the mountains. They practically all sink before they get to the Milk River. Those streams have been appropriated from 25 to 30 years, and they are raising all kinds of crops in the mountains, especially thousands of tons of alfalfa, to feed the sheep in that country. It is one of the biggest sheep districts in the United States. Every inch of that water has been used for at least 25 years. I arrived here many years ago, before any of it was taken out, and in anything like a dry year none of it came into Milk River. I know men who had ranches at the mouths of those creeks, who took them up expecting to get water from the mountains, but the streams went dry at the mouths and the land was not very valuable. This was before the water was appropriated in the mountains. A careful estimate of the flow of those streams in the mountains during the irrigating season is twice the amount of water that comes down through Milk River through Canada. If you decide to measure all of those streams, those become prior rights and our Canadian friends may insist upon our taking all our prior rights out of the Bear Paw and the Rocky Mountains, and we will not have any water at all from the main stream of the Milk River. There are at least 50,000 acres of land irrigated in those mountains from those streams. We have prior rights in our canals to those irrigators in the mountains, and

we thought of going up there many years ago and when our ditches were dry and making them turn down the water. We did so on some of these creeks and the water never got down.

If you are going to measure Milk River at the mouth, they will insist that that water if let alone would flow into Milk River; that they are tributaries to Milk River. They are, but you who have lived in the mountain countries of the West from Canada to Mexico know that we have as fine mountain streams as you could get anywhere. They go into the desert and the sand and the gravel and the shale. These streams are in exactly that condition. But you could not convince our friends from Canada that if that water were not appropriated it would not go into Milk River, and we will be compelled to measure it, and when we measure it we will have more water up there than ever comes down from Canada through Milk River during the irrigating season. That will mean that we will trade 50,000 acres of irrigible land in the Milk River Valley to the Canadians for those 50,000 acres that are irrigated around the Bear Paw Mountains, and never a drop of it could under any circumstances come into the Milk River unless you carried it in through a pipe or a cement-lined ditch.

Mr. POWELL. Your Canadian friends across the border will have mighty little to do with that. The commission will handle that.

Mr. EVERETT. Even if the priorities do not come in, it would only apply to measuring the water of the Milk River.

Mr. POWELL. That is a matter for the commission, to marshal and measure the water, but what we are after now is to know what waters are to be marshaled and measured.

Mr. EVERETT. Do I understand, then, that this Bear Paw water would not be measured? That is still an issue, is it not?

Mr. POWELL. No; that is not an issue.

Mr. EVERETT. That is settled?

Mr. POWELL. No; because we have not reached that. The point is this: What waters shall the commission divide? Not how they are going to divide them, except on prior appropriations.

Mr. EVERETT. But what I am getting at is that there is water that never under any circumstances comes into Milk River. How are they going to divide that?

Mr. POWELL. We can give that proper consideration when it comes up.

Mr. GARDNER. Does anybody else desire to address the commission before we adjourn? I think that I appreciate somewhat the difficulty with which the commission is confronted. It is not a question of what are the possible storage facilities of these two watersheds. It is not a question of whether Canada is going to get an advantage in the division or the United States is going to get an advantage. The question for the commission to determine is, What were the intent and purpose of the treaty? What was in the contract? With everybody disputing as to what its meaning was—and we have no fountainhead that I know of to which to go to tell just what the agreement in the treaty was—you can see that it is something of a problem for the commission.

Now, I only call your attention to these things to show you that the commission is not unmindful of the wants and needs of the water users in the Milk River Valley or in Canada, and I would like to

inquire again whether or not the tentative orders that the commission have issued in the past two or three years respecting the division of these waters have not been as nearly fair and equitable to you people here in the Milk River Valley as we could consistently make them until there is made a final decision and appropriations of these waters.

As one member of the commission, I wish to say that I feel very glad of the opportunity to come back here into your great State, where I was so very happily and pleasantly received and entertained a little more than a year ago.

Now, if there is anybody here at any time in this vicinity that has well-defined ideas that will assist me as a member of this commission in coming to a clear, unquestioned conclusion in my own mind as to what the high contracting parties meant when they entered upon the agreement set forth in Article VI, I would like to hear them. But we have come here and found the same divergence of mind that we have found everywhere else, and I question if there are a half dozen men in this room that could be selected, unless they were all neighbors and their interests were exactly alike, that would agree instantly as to just how the water should be divided. I thank you for your attention and the good attendance that you have made.

(Thereupon, at 6.25 o'clock p. m., the commission adjourned to meet at Lethbridge, Alberta, on Saturday, September 17, 1921.)

LETHBRIDGE, ALBERTA, *September 17, 1921.*

Pursuant to adjournment, the commission met in the courthouse at Lethbridge, Alberta, on Saturday, September 17, 1921, at 10 o'clock a. m., Mr. Magrath presiding.

Present: Charles A. Magrath; Obadiah Gardner; Henry A. Powell, K. C.; Clarence D. Clark; Sir William Hearst, K. C., M. G.; M. A. Smith; and William H. Smith, secretary.

APPEARANCES.

- V. Meek, Commissioner of Irrigation, Ottawa.
- E. F. Drake, Superintendent of Irrigation, Ottawa, Canada.
- F. H. Newell, consulting engineer, United States Reclamation Service, Washington, D. C.
- W. J. Egleston, counsel for reclamation service of Montana, Grand Falls, Mont.
- C. S. Heidel, State engineer, Helena, Mont.
- George Stratton, United States Reclamation Service.
- R. M. Snell, United States Reclamation Service.
- G. R. Marnoch, chairman of the Irrigation Development Association of Lethbridge, and vice president of the Western Canadian Irrigation Association.
- W. H. Fairfield, superintendent Dominion experimental farm, Lethbridge, Alberta.
- H. S. Allen, Raymond, Alberta.
- F. S. Leffingwell, Warner, Alberta.
- Lawrence Peterson, Taber, Alberta.
- Chris. Jensen, Magrath, Alberta.
- Roi W. Risinger, New Dayton, Alberta.

Mr. MAGRATH. Gentlemen, we will now come to order. This is the first occasion upon which the International Joint Commission has met in Lethbridge, an organization called into existence by a very notable contract entered into by the people of Canada and the United States through their respective Governments by a treaty signed in January, 1909.

I suppose few more notable documents exist than this treaty, a copy of which is now before me, giving as it does to three citizens of the United States and three citizens of Canada certain judicial and other rights in both countries, regardless of the international boundary.

Neighbors have their controversies, and the courts of the several nations exist for dealing with such differences. Unfortunately we find that controversies grow with increase in population. You have had evidence of that fact in this Province within the past few days by certain additions to provincial legal machinery. In other words, the millenium does not appear to be reaching us very rapidly.

That condition of the human make-up which causes neighbors in a community to disagree will equally cause international neighbors to disagree, especially where their business and other interests are growing more intimate from day to day, as unquestionably is the situation between the United States and Canada. And it is to deal with such differences and such difficulties that this commission has been called into existence.

Now, in respect to the issue before us, namely, the division of the waters of the St. Mary and Milk Rivers, for those who do not understand the nature of those differences I will very briefly refer to them.

Article VI of the treaty reads as follows:

The high contracting parties agree that the St. Mary and Milk Rivers and their tributaries (in the State of Montana and the Provinces of Alberta and Saskatchewan) are to be treated as one stream for the purposes of irrigation and power, and the waters thereof shall be apportioned equally between the two countries.

The contention of the United States is that that language means that the waters which flow across the boundary of those two streams and their tributaries shall be divided equally between the two countries. The contention of Canada has been that the commission is to take into account the waters of the two watersheds in the two countries and divide them at such points where it is practicable. So that there will be available for both countries equal amounts of water. There is a wide difference, as you can see, between the two interpretations. Then the treaty goes on and says:

But in making such equal apportionment more than half may be taken from one river and less than half from the other by either country, so as to afford a more beneficial use to each.

There is no contention over that, but in this latter part there is, the language being:

It is further agreed that in the division of such waters during the irrigation season, between the 1st of April and the 31st of October, inclusive, annually, the United States is entitled to a prior appropriation of 500 cubic feet per second of the waters of the Milk River, or so much of such amount as constitutes three-fourths of its natural flow, and that Canada is entitled to a prior appropriation of 500 cubic feet per second of the flow of St. Mary River, or so much of such amount as constitutes three-fourths of its natural flow.

The contention of Canada in this case is that the priorities are to be taken out by each country from the respective streams and the balance of the water divided equally between them. The contention of the United States is that the priorities are to be taken out of the half share of each country. A very wide difference again.

We have had as a commission three different hearings; we have had arguments from leading counsel from both countries; and the farther we travel along the road the greater our difficulties became. We have had delays owing to changes and vacancies on the commission. We have had one of the Governments tell us that if we did not agree to the view held by it our decision would be of no effect. That held us up for about two years. We have called in the officers of the Reclamation Services of both countries. They have labored faithfully to help us find a solution, but without results.

The State of Montana asked us for a hearing. We were at Chinook two days ago and gave them a hearing, and we decided to do the same with you people here. We are here for that purpose this morning, and I think I can say to you that we have reached the point where if we fail at a very early date to solve this knotty problem we will send it back to the two Governments and ask them to be good enough to tell us what they mean by the language contained in Article VI of the treaty.

That is about all I have to say in opening the meeting, gentlemen. You appreciate that your neighbors on the other side of the line feel as strongly as you do in respect to these waters. They have a local viewpoint and doubtless you have a local viewpoint, but I am quite confident from past experience in this district among you gentlemen that you will take a very liberal view of the situation and that you will always remember that you are good neighbors and it is desirable to reach a fair and reasonable settlement in connection with this controversy. It was very gratifying to the members of this commission at the meeting at Chinook the other day to hear the Governor of Montana speak in a broad, generous spirit in regard to this question. He urged us to do all in our power to bring this question to a settlement, and I can assure you that that has been the wish of the commission from the first. I can further assure you that we have not delayed. We have been just as anxious as you have to reach a settlement, but the difficulties have been great.

Now, I am going to take the liberty of reading to you a letter which has been placed in my hands from the premier of the Province addressed to this commission. It is as follows:

OFFICE OF THE PREMIER,
Edmonton, September 16, 1921.

GENTLEMEN: Information has reached the government of the Province of Alberta that it is the intention of your commission to sit in the city of Lethbridge at 10 a. m. to-morrow, Saturday, September the 17th, in connection with the question of the division of the waters of the Milk River and the St. Mary River.

The question itself is one between the Governments of Canada and of the United States. The case has, according to our information, already been quite fully presented and argued. It therefore is not the desire or intention of the government of Alberta on the occasion of this sitting of your commission within the Province to present any further material. I wish, however, to take the opportunity of bringing to your attention the fact that an early decision in regard to the Milk River and St. Mary River is earnestly hoped for by the government and the people of the Province of Alberta.

It is a fact, and one which will doubtless be evident to you after your visit to the Province, that irrigation development is entirely at a standstill until your commission makes its decision.

The success and, in fact, the necessity of irrigation in the territory served by these streams has been amply demonstrated. The Reclamation Service of the Dominion of Canada has made very complete surveys of the territory. The provincial government has provided very complete machinery for the formation and administration of cooperative irrigation districts properly supervised. The lands are practically all occupied and the people almost unanimous in their desire to proceed to form districts and construct their irrigation works. Nothing further can be done until your commission reaches a decision and it is known what water is available. Each season sees water of tremendous value passing down the streams and going to waste. In the meantime unfavorable conditions for dry farming render existence for settlers precarious.

Your sitting in Lethbridge will enable you to ascertain these conditions for yourselves, and your visit is therefore appreciated. I desire to express the hope that you will take the opportunity to get full information, so that an early decision may be reached.

Yours very truly,

H. GREENFIELD.

Now, gentleman, the meeting is open, and I understand that it is the intention of Mr. Marnoch to address the commission.

STATEMENT OF MR. G. R. MARNOCH, CHAIRMAN OF THE IRRIGATION DEVELOPMENT ASSOCIATION OF LETHBRIDGE AND VICE PRESIDENT OF THE WESTERN CANADIAN IRRIGATION ASSOCIATION.

Mr. MARNOCH. Mr. Chairman and members of the commission, I have to introduce myself by saying that my name is G. R. Marnoch. I am chairman of an irrigation development association which embraces the farmers and business men of the territory surrounding Lethbridge. I am honorary vice president of the Western Canadian Irrigation Association, an association which takes a wide view in regard to irrigation matters and holds yearly meetings in alternative years in British Columbia and in the prairie Provinces, and I was until a few months ago, when I retired from that office, president of the Board of Trade of the City of Lethbridge.

It has always been and still is the desire of the members of that board of trade to be thoroughly interested—and, indeed, we can not help being—in the progress of our agricultural industry, because we realize that it is our chief industry in this Province.

Before I proceed with the few remarks that I wish to make I should like to direct the attention of the commission to these maps, which give some general idea of the extent of irrigation development in this Province of Alberta.

The map is rather dim, and I think the only use we can make of it is for the commission to have a little examination of it afterwards. It represents a territory of about 180 miles square. Here, gentlemen, is Coutts [indicating], where you crossed the line into Canada yesterday. Here [indicating] is Lethbridge. Calgary is up in the quarter here [indicating]. That is about 150 miles from Lethbridge, roughly speaking. You will see that a very large part of that area is covered, or can be covered, by irrigation development. The areas marked in yellow show that portion that is under development now. The canals are all constructed and these farther northern areas are proceeding very rapidly. This portion [indicating] around Lethbridge and Raymond and Magrath is the old development under the

St. Mary River water, with which you are familiar. These other blue areas over here [indicating] are those areas that can be served by an extension of the use of the St. Mary water. There are other districts. This one in green [indicating], for instance, to the northwest of Lethbridge is the Lethbridge northern district, containing 100,000 acres of irrigable land, and upon which construction is proceeding very rapidly now. There are two other districts farther west and southwest of Lethbridge, one of which is moving toward construction, and the other will be very shortly. This one farther south [indicating] containing about 25,000 acres of irrigable land and the other to the north of that about 50,000 acres.

Sir WILLIAM HEARST. From what streams will the waters be obtained for these districts which you have last mentioned?

Mr. MARNOCHE. They come from the Belly River, which is not under discussion.

Mr. POWELL. Have you any color design on the map representing the tract that will be served by the St. Mary River and the Belly River?

Mr. MARNOCHE. There is a slight difference in the color. The portion indicated in blue here represents the areas that can be served by a further extension of the uses of the St. Mary water.

Sir WILLIAM HEARST. That is, you have marked in blue the portion that can be served by St. Mary water?

Mr. MARNOCHE. Yes, sir.

Mr. POWELL. Where are the two extension tracts from the north and northwest? How are they served?

Mr. MARNOCHE. They are served from the water of the Bow River.

Mr. POWELL. That river passes through Calgary?

Mr. MARNOCHE. Yes. We have another map, to which we will refer later on, and which shows more clearly the St. Mary water.

Mr. CLARK. What is your total area covered by the St. Mary, or sought to be covered by it?

Mr. MARNOCHE. I would like Mr. Drake to answer that question.

Mr. DRAKE. Very roughly, 350,000 to 400,000 acres, besides the tract that is irrigated from the Alberta Railway & Irrigation Co.'s canal. That tract comprises about 130,000 acres.

Mr. POWELL. What feeds that canal?

Mr. DRAKE. The St. Mary River. If Mr. Marnoch will pardon me, the Lethbridge northern district, to which he refers as containing about 100,000 acres, is not irrigated from the St. Mary River but from the Old Man River, the waters of which are not in controversy.

Mr. CLARK. I am referring only to the portion marked in blue, the amount which has to be covered, if covered at all, by the St. Mary River.

Mr. DRAKE. From 350,000 to 400,000 acres aside from the tract now being irrigated, which is about 130,000.

Mr. POWELL. The Old Man makes its rise in the Rockies?

Mr. DRAKE. Yes, sir.

Mr. SMITH. As I understand it, the yellow portion represents the land now ditched and having water already on it.

Mr. MARNOCHE. Yes, sir.

Mr. SMITH. How much of the land represented by the yellow portion of the map is now receiving water?

Mr. MARNOCH. Do you mean the tracts that are served with St. Mary water?

Mr. SMITH. I mean the St. Mary River.

Mr. MARNOCH. That is fully developed.

Mr. SMITH. All of the yellow portion?

Mr. MARNOCH. Yes, sir; all of the yellow portion is served from the St. Mary. This other portion is served from the Bow River.

Mr. SMITH. What does the extreme northwestern section of that map represent; lands irrigated from the St. Mary?

Mr. MARNOCH. No, sir; lands irrigated from the Bow River.

Mr. SMITH. The portion served by the St. Mary is only the lower portion?

Mr. MARNOCH. Yes, sir; and excluding anything west of this line [indicating]. That is shown more clearly on that other map.

Mr. SMITH. The yellow portion is irrigated from the St. Mary River?

Mr. MARNOCH. Yes, sir.

Mr. SMITH. And that portion represented in blue is susceptible of irrigation from the St. Mary River?

Mr. MARNOCH. Yes, sir.

Mr. SMITH. And that is where you wish to extend the water when you get enough of it?

Mr. MARNOCH. Yes, sir.

Mr. SMITH. How many acres are included in the yellow to which you have referred?

Mr. MARNOCH. Roughly speaking, 130,000 acres.

Mr. POWELL. Is that yellow tract which now utilizes the water—expressing it that way—is that continuous or are there elevations and depressions, the depressions being covered and the elevations not being reached?

Mr. MARNOCH. The general lay of the land is very favorable to the use of irrigation. There are not many depressions that are not covered.

Mr. POWELL. It would be substantially correct, then, to say that it is all covered?

Mr. MARNOCH. That portion marked in yellow is covered. Now, I would like to say that our Dominion Government has made very, very close surveys of all those areas.

Mr. POWELL. Before you pass to that. These lower tracts, other than the blue, from what source do you propose to flood or irrigate those?

Mr. MARNOCH. We hope that as a result of the commission's sitting here and of those negotiations, if they go forward, that were suggested by Governor Dixon, that water may be gotten from the St. Mary River to water those tracts.

Mr. POWELL. Do you contemplate that it would draw any water from the Milk River for irrigating any of those tracts?

Mr. MARNOCH. For this small tract here [indicating] around Milk River and Warner, that little piece only of all those, would require some water from the Milk River.

Mr. CLARK. About 20,000 acres?

Mr. MARNOCH. About 20,000 acres.

Mr. POWELL. And those two irregularly shaped tracts to the east of that, from what source would they derive water?

Mr. MARNOCH. We hope that they may also get water from the St. Mary River.

Mr. POWELL. Where is the St. Mary River indicated on that map?

Mr. MARNOCH. Here is where it crosses the international boundary and it winds down as I indicate.

Mr. POWELL. And you think they can carry the water away over there?

Mr. MARNOCH. Yes. There would be some local reservoiring necessary to take care of the flood waters and make the best use of them.

Mr. POWELL. You contemplate getting it through, however?

Mr. MARNOCH. Yes, sir.

The people of this Province as a whole have, through the action of their Government, placed their seal upon the order for progress of all rightly conceived irrigation development. The Alberta government has fully guaranteed the bonds for the construction of the Lethbridge northern irrigation district, which it is estimated will cost about \$5,000,000. Bonds have actually been sold for \$1,500,000, and construction is proceeding very rapidly. Other projects are likely to proceed very shortly. I have mentioned this so that it may be noted that, in talking of further irrigation developments, such as may be proceeded with whenever this international question is settled, we are not talking academically but very practically.

We are very glad to see the International Joint Commission here in Lethbridge, although we had not thought of asking them to come here.

Our case is complete. We feel that we need not attempt to add anything in the presentation of the case as made at previous hearings as to the meaning and intent of the treaty. We feel entirely satisfied that justice will be done.

I should like to refer to some of the wise words of the late Mr. Tawney, one of the United States members of the commission during the hearing at St. Paul in 1915. He said:

It must be apparent to everyone that in this matter the commission has an exceedingly delicate and important problem to deal with. This commission has been created not only for the purpose of settling disputes which may arise between either country or the people of either country, but also for the purpose of preventing disputes between these countries and these peoples, and so far our efforts have been attended with unusual and most gratifying success. There has hitherto been no difference of opinion among the members of the commission, and there has been no feeling of irritation between the people of the two countries who have appeared before the commission. I know that it will be the effort of the commission to consider the record which has been presented to it in this case, regardless of whether we agree with this side or with that, and to work out the best solution we possibly can. As Governor Glenn has well said, we are not the representatives of either Government, we are constituted judges for both Governments, and each of them has an equal right to expect from us diligence and integrity of purpose in reaching the very best judgment we can in respect to questions of difference that may divide the people on both sides of the line in respect to this or any other matter within our jurisdiction.

Again he said:

It has been the effort of the commission to afford the people of both countries every possible opportunity for conference among themselves, with a view to reaching a common understanding with reference to any matters of difference that might exist between them or between the Governments.

Further, he remarked that—

Thus far the International Joint Commission has approached the consideration of almost every question that has been submitted to it, not as partisans or litigants or contestants but more in that spirit of friendship and cordiality that should have, and always has existed between these two countries, and we are glad to say that that has been the spirit in which those appearing before the commission have always considered and conducted themselves throughout the hearing.

I would just like to remark now that I do not assume for a moment to speak for the Canadian Government or for the Canadian Reclamation Service, but I am just trying to place before you the plain view of the people of this district.

It can hardly be said that we are unduly impatient for a settlement of this important question that is before the commission, and I would like to take a moment or two to make some references to the chronology of the situation.

Our Montana friends, by their disclosure at Chinook of what they honestly believe to be the history of the case, indicated some serious misconceptions which should be cleared up. Their minds appear to go back only as far as the treaty made in 1909 and ratified in 1910. That is only a decade ago.

But the history of this matter really goes back a quarter of a century; and during all that time Canada, far from being an aggressor, seeking what did not belong to her, has consistently stood for clear understanding with her neighbors to begin with, and for the greatest possible development of benefits to be derived from waters available for irrigation, to end with.

The Canadian Government took up this matter with the United States for the first time as far back as in the early days of 1896, and then made the suggestion that an international commission might be appointed for the purpose of bringing the two countries in conference on matters relating to international waters. The members of the commission will remember (it is printed in the record of the St. Paul hearing on page 57) that Canada received the reply that the United States did not lack interest in this important subject; made reference to the communication from Canada as a courteous request, but gave the answer that expression could not be given to the views of the United States Government upon the subject at that time.

What caused that suggestion to be sent from Canada was quite evidently the proposals that the Galt interests in Lethbridge had in mind with regard to irrigation development on some of the lands belonging to the Canadian Northwest Co., which later on became the Alberta Railway & Irrigation Co., and later still was acquired by the Canadian Pacific Railway Co. The purpose that that Canadian company had in mind was purely one of business progress in their undertakings. The company was founded originally to develop the coal resources, then very undefined, around Lethbridge. As the coal became available in increasing quantity from the mine the company had to build narrow-gauge railways to get the coal to market. The policy of the Canadian Government then was to encourage such early development by granting lands to companies that were enterprising enough to build such railways, and thus the

company became owners of considerable tracts of land. Nothing had been done at that early date to develop grain farming, and the directors of the company wisely conceived the idea of getting the lands under irrigation. The Galts were people of Scotch descent, and we may presume that the caution which was inborn in them caused them to make diligent inquiries as to the absolute safety from interference in regard to the prime source of the water supply; and we may conceive that they were satisfied from the nature of the reply from the United States that there would be no such interference. They duly got their appropriation rights recorded with the Government of Canada.

The company had its early financial troubles, and, in fact, the construction of the canals would have been impossible if the company had not been able to make arrangements with some of the people belonging to the Mormon Church in Utah who were induced at one and the same time to assist in the construction of the canals and to colonize the lands. It sounds ridiculous nowadays to recall the fact that these first farmers from the United States actually acquired their lands at the price of \$3 per acre, one-half of which they drew as grub-stake pay, the other half being carried to their credit as a land payment.

What I have said is surely all that is required in corroboration of the statement that I make that the Galts wanted the water for actual irrigation development; and that they acquired their rights at a time when the United States had no notion whatever of utilizing any of the St. Mary water.

The Canadian canal was put into service in 1900; one of our Lethbridge residents showed me the other day copies of the original telegrams that came down the narrow-gauge railway lines service regarding the advent of the water.

We heard some references at Chinook, I think, to riparian law in European countries, and, although I am not learned in international law and am not a lawyer, it is generally understood that it would be a very extraordinary thing for one European country to divert into another watershed water from a stream that should continue on its own watershed into another country; while on this continent, or at least as far as the United States and Canada are concerned, we agree on the fundamentals of irrigation law and the undoubted rights of prior appropriation.

The first public reference in the United States Reclamation Service reports to proposals to divert St. Mary waters on the south side of the boundary line appear to give full recognition to Canada's prior right, for in the third report, 1903-4, of the United States Reclamation Service, page 280, you will find the paragraph:

To thoroughly settle the question of water diversion from St. Mary River and Milk River, it will probably be necessary to come to some international agreement with Canada. This country [the United States] has the advantage of storage in St. Mary Lakes by the construction of the St. Mary Dam, in which the flood waters of this stream can be conserved and afterwards used for irrigation purposes. An agreement might be made with the Canadian Government to allow to pass down without diversion the water turned into the Milk River on condition that the Canadian canal from St. Mary River will be furnished sufficient water from the St. Mary Reservoir.

When later on the actual diversion of the St. Mary water into the Milk River watershed was proceeded with by the United States with-

out reference to Canada, it appeared to us as being so very unfriendly that our people built the Milk River Canal in Canada in self-defense. That canal, of course, was never used, and we do not think it was intended at that time to be used; but it seems that that drastic action following upon action of the United States in diverting St. Mary water was needed, and at last produced the effect of warning our United States neighbors that the negotiations we had suggested in 1896 should be opened.

Later on, as we know, the treaty came into being in 1909 and was ratified in 1910. Then we have all these long hearings and arguments at St. Paul in 1915; Detroit, 1917; Ottawa, 1920; the meeting at Chinook on the 15th, and here we are to-day in Lethbridge.

I have just made this rapid survey of some of the high points so that the commission may note that our knowledge of the history of the case goes a good deal further back than the view of it that was put before you by our Chinook friends on Thursday and so that the commission may understand me when I say firmly that we may just as well make a stand now.

Our Chinook friends seem to think that everything happened after the treaty was made, but our view is that as far as compromise is concerned we went as far as we could in accepting the treaty and the compromise that was made in it.

We feel that no judicial tribunal can translate it to give us less than we now have.

But—and this is the big but—if ways and means can be suggested for a better and fuller use of water that are now, to our shame—the shame of two great Nations—being allowed to run to waste, we, the people on this side of the boundary, are very ready and willing to welcome such proposals as were suggested on Thursday that would lead to a fuller and more profitable use of the available waters by both countries, and we would be very glad indeed to learn that they were being carefully considered by the Governments.

We were very much impressed, those of us who were able to be at Chinook, by the spirit of fairness that was so ably expressed by Governor Dixon of Montana, and we are hopeful that the tentative suggestion thrown out by him will receive careful and, above all, prompt attention.

Mr. POWELL. Maybe I misunderstood you, but you made reference to communications between Galt and the Americans with respect to an assurance as to the use of the St. Mary River.

Mr. MARNOCH. No; I do not think I made any reference to communications between Galt and the United States; but, of course, the international question had been mooted by Canada in 1896, and my inference was that Galt was satisfied from the reply that was received that there would be no interference whatever with the St. Mary water.

Mr. POWELL. That is what I am referring to. Have those writings been preserved, or were they merely oral communications?

Mr. MARNOCH. I think you will find them all set out very extensively in the record.

Sir WILLIAM HEARST. Mr. Marnoch refers to the diplomatic correspondence between the Government at Washington and the Government at Ottawa. He has drawn the deduction that the Galt interests

would not have gone on with this development had they not been satisfied as to what their rights were.

Mr. MARNOC. Yes, sir.

Mr. CLARK. Let me ask you this question: Suppose the entire flow of the St. Mary River were allowed to cross the boundary into Canada. Would that flow, the natural flow, be sufficient to irrigate all the lands you have in contemplation irrigating here?

Mr. MARNOC. I think so. That is an engineering question which I would like to refer to Mr. Drake or some of his officers. I am neither a lawyer nor an engineer.

Mr. DRAKE. No, sir; it would not.

Mr. CLARK. You would have to supplement that by storage?

Mr. DRAKE. Not only would we have to supplement it by storage, but by the flow of other rivers to the west, the Belly River and the Waterton River.

This is what would happen, sir: You would have to take water from the Waterton River over here [indicating on the map], bring it across to the Belly River here, and bring that in turn across to the St. Mary River, and then take out the combined flow of these streams and by means of a system of canals and reservoirs irrigate this land to which Mr. Marnoch has referred.

Mr. POWELL. Would those united streams afford an ample supply for that purpose?

Mr. DRAKE. It would depend upon what you mean by "ample supply." All the flow of all those rivers would be insufficient to irrigate all the land that is irrigible and that needs to be irrigated, but it would go some distance.

Mr. MARNOC. Mr. Chairman, I would like, if you will permit me, to take the office of official introducer now. I would like to say that the next speaker, Mr. W. H. Fairfield, is superintendent of the Dominion Experimental Farm at Lethbridge, a farm of very considerable extent which conducts research work and demonstration in irrigation farming and dry farming to the very great profit of the settlers in this district. Mr. Fairfield has been in this district ever since irrigation water first came down and is fully competent to give you information as to the development which has taken place under it. All of the people in this district, the farmers especially, have great confidence in Mr. Fairfield.

STATEMENT OF MR. W. H. FAIRFIELD, SUPERINTENDENT DOMINION EXPERIMENTAL FARM, LETHBRIDGE, ALBERTA.

Mr. FAIRFIELD. Mr. Chairman and members of the commission, I do not propose to take up very much of your time. There were just two thoughts that it occurred to me I might bring out. One was the development and the reason for the development of the sentiment in favor of irrigation which is so thoroughly unanimous among the farmers in this end of the Province; and the other was to give you some facts in regard to what it really means to the farmers in the way of difference in the amount that they can produce on their dry and irrigated lands.

During the decade just preceding the war the Canadian Northwest was favored with a big settlement, a large immigration. This part of the Province received its share of this settlement, with the result

that practically all of the lands in the southern portion of the Province, or the area that we are particularly interested in this morning, was really settled up, and all the area except the irrigation scheme of the Alberta Railway & Irrigation Co. was developed under dry-farming conditions.

Although the farmers met with favorable seasons, there were a number of seasons where their results were very disappointing. They had the opportunity of observing the results that were obtained on the irrigated lands in the Lethbridge district or under the Alberta Railway & Irrigation system, with the result that the sentiment grew from year to year very strongly in favor of irrigation. In fact, the dry years have really culminated in the last four or five years that have been extremely dry; until now the farmers, although they came here not as irrigating farmers but with the idea of raising grain or trying dry farming, are absolutely unanimous in their determination to utilize all of the water that is available to them in the streams passing through the land.

As Mr. Marnoch has said, I have had charge of the Dominion Experimental Farm since it was established here, something over a dozen years ago. Half of that farm of about 400 acres is devoted to experiments in dry farming. The other half can be irrigated, and we are carrying on investigations trying to solve the problems that confront the farmers on irrigated lands.

We have compiled in the form of tables the results that we obtained from the same crops grown under the best dry-farming system that we could adopt and under irrigation. To save time, I will pass around copies of the table showing the comparative results.

(The table above referred to is as follows:)

Comparative results in crops grown on dry land and irrigated land at the experimental station, southern Alberta, giving yields per acre.

	Wheat (Marquis).		Oats (Banner).		Barley (Sweet Chevalier).		Peas (all varieties).		Potato (Irish Cobbler).	
	Dry land.	Irrigated land.	Dry land.	Irrigated land.	Dry land.	Irrigated land.	Dry land.	Irrigated land.	Dry land.	Irrigated land.
	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>
1908.....	29	43	80	88	55	61	19	19	92	235
1909.....	31	40	56	77	44	69	19	19	159	605
1910.....	11	23	21	68	12	54	12	33	103	521
1911.....	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	23	39	356	508
1912.....	28	50	77	145	41	77	31	62	296	501
1913.....	25	52	73	115	50	93	41	42	195	483
1914.....	24	54	49	113	25	90	19	52	400	495
1915.....	63	94	143	81	86	80	53	50	283	447
1916.....	48	71	118	157	64	79	46	37	475	530
1917.....	28	48	66	128	40	82	23	48	157	465
1918.....	14	62	24	104	17	91	16	48	93	505
Average 11 years.....	30	53	70	108	43	78	27	41	237	487
Increase due to irrigation:										
Bushels.....		23		38		35		14		250
Per cent.....		77		54		81		51		105

¹ Hailed.

In all cases (except potatoes) the results are obtained from 1.60-acre plats. On this account the yields are higher than would probably have been the case had the fields been larger. The comparative results are no doubt the

same—i. e., the per cent of increase due to irrigation is the same as would have been the case had the fields been larger. On the dry land the crops were in all cases planted on summer fallow land. On the irrigated land the grain crops were grown on land that had raised a hoed crop of some kind the year previous, and the potatoes were usually planted on grain land.

Mr. FAIRFIELD. One of the reasons for compiling this table was that some of the farmers said, "In wet years we get marvelous crops. What are we going to get in dry years?" Everybody knows that irrigation pays. But by taking the average of 11 years from 1908 to 1918—and I might say that the last 3 years have not been added to this because the results would show up the dry-land farming worse—you will note that in those 11 years we have an increase of 23 bushels of wheat, 38 bushels of oats, 35 bushels of barley, 14 bushels of peas, and practically double our potato yield.

This was with the crops with which the dry-land farmer was dealing. The dry-land farmer could not successfully produce forage crops in the same way that he could produce grain, and no comparisons were made with the growing of alfalfa or timothy or anything of that kind.

I merely mention this to indicate to you just why the farmers in southern Alberta are so unanimous in wanting to get irrigation.

As has been mentioned, there is a large area of over 100,000 acres to the west of the city which is served entirely by an all-Canadian scheme that is being developed at, roughly speaking, about \$50 an acre. The provincial government is guaranteeing the bonds for this project, which is well under way. The only reason that the area in the southeasterly direction from Lethbridge has not been developed is because there has been this contention in regard to the water.

I think some of the farmers that will address you will impress you far better than I can with the way they feel in regard to the matter. We have had very dry seasons and the farmers feel that unless they can get irrigation water and develop some of this land by irrigation—I do not know whether it is safe for me to say that a good many of them will move out, but I can safely say that they realize that they are in a most serious predicament unless more development can be carried out with irrigation. I do not think that I have anything further to say.

Mr. POWELL. Does the irrigation of a portion of a farm enable you to make use of the balance in the way that you otherwise would be unable to make use of it? Does it assist the unirrigated portion?

Mr. FAIRFIELD. Yes. If I may answer that in another way, it increases the value of the other. If the farmer could take his average results for 10 years, he would find that in some years he would have bumper crops and in others his crops would be very poor. It is not human nature to save enough money from the fat years to carry one through the lean years, and the result is that during those dry years the farmer is in a bad position. If there were 25 per cent of his land irrigated, he would have insurance on that. That would carry him over, and consequently would make farming on dry land profitable.

Mr. POWELL. That is what I had in mind, that this would throw him over the critical periods and enable him to make use probably of the unirrigated portion, which otherwise would not support him.

Mr. FAIRFIELD. I think that is one of the biggest advantages that many of us had in mind, just that point that you have brought out.

Mr. CLARK. Mr. Fairfield, I call your attention to your 1915 statistics here, where there is a misprint or an exception to the rule. You have noted 143 bushels under the dry farming of oats and but 81 bushels under the irrigated farming of oats.

Mr. FAIRFIELD. Yes, sir; that is exactly true.

Mr. CLARK. What is the explanation of that?

Mr. FAIRFIELD. Our oats grew so heavy on the irrigated lands that they lodged and we could not harvest them.

Mr. POWELL. Just as a matter of curiosity, is that the very limit of production of your prairies under the most favorable circumstances, that one hundred odd bushels per acre?

Mr. FAIRFIELD. In explaining those figures I might say that we never started with an idea of comparing the lands irrigated and dry lands. We operated the farms as two distinct farms, and we did not attempt to make any comparison between them. But when this question came up a few years ago in going back over our records to get these data we had to get some crops grown every year; we had to take it from small plots rather than from our fields, and these are the yields from small plots, all the same size and all the same crops for the entire length of time. The yields would be higher from those plots than from our field conditions, but we assume that the percentage of increase would remain the same.

Mr. CLARK. Mr. Fairfield, we have rather come to the conclusion that dry farming is a progressive science and that it is really a business to which the farmer must be educated either by his own experience or otherwise. Has your experience up here taught you that in successive years dry farming with the same amount of moisture might increase the yield so it would become more profitable as the years go by from the knowledge that a man got from his experience from year to year? Do you get my meaning?

Mr. FAIRFIELD. Yes. We certainly know more about dry farming now than we did 20 years ago. If this land had been settled up 25 years ago with the methods that the farmers ordinarily followed then, that is, not using the summer fallow, they would have had the results that they get now; but, on the other hand, to offset that, we began with the virgin fertility which has been stored up for countless years, and we have that to benefit our first crops. That will offset, in a measure, the knowledge that we will gain by experience, but certainly we are gaining and it will be possible, we hope, to produce more on dry land in the future than we are able to do now.

Mr. POWELL. Are your prairie lands which are unfertilized showing, as time goes by, any diminution of productiveness?

Mr. FAIRFIELD. Not in fertility; they are in the physical texture. We can not follow the same methods because soil drifting comes in and we have to use different crops which to-day appear to overcome that condition.

Mr. POWELL. Rotation of crops, I suppose.

Mr. FAIRFIELD. Yes, sir.

Mr. MARNOCH. Mr. H. S. Allen is present. He presents the case from Raymond. He is chairman, I think, of the board of trustees of the irrigation district formed there, called the "Southern Irrigation District."

STATEMENT OF H. S. ALLEN, OF RAYMOND, ALBERTA.

Mr. Chairman, members of the commission, you have been so many years trying to solve this problem that I do not know that I can help you out very much this morning, but I can perhaps tell you how our people feel about it.

My name is Allen, and I am chairman of the Southern Irrigation District. That is a little district that is formed down near that lower yellow spot there [indicating on map]—takes in all that blue around that little yellow spot, out 20 miles south of here.

Mr. MAGRATH. Tributary to Raymond.

Mr. ALLEN. It includes Raymond. That is about 20 miles south of here, and we have under irrigation there about 10,000 acres, but it is not enough. We have in this new irrigation district that has been formed about 190,000 acres, about half of which could be irrigated if we had water. It is a question of water, and that water would come from the St. Mary or perhaps be supplemented a little, as Mr. Drake suggested, from these other rivers. You understand, when they have shown you the map, there is not enough water around to irrigate this whole country. If we had every drop of it it would only irrigate a little bit of the country, and, as a gentleman suggested here, we will always have to practice dry farming to a certain extent.

I came from the United States. I am an American by birth and a Canadian by adoption. I have been here 33 years. When I came here from Montana, Alberta was just a field of grass. We could go out and cut grass any place, and, of course, they could get hay any place, and irrigation in those days was not such a factor as it is at the present time for the country, because cattle could live out on the range all winter. You know our ranges are getting depleted, and it does not come back very quick, and we need irrigation to produce fodder for the winter so that when we get a bad season like we had two years ago we would not have to import hay from Washington and pay \$60 a ton; and the people just now have woke up to the fact that they need all the irrigation they can get.

I have watched the development of the Alberta Railway & Irrigation system for the last 20 years. I was connected with the building of the canal 23 years ago, and our people erected that. I am a Mormon and we came and introduced irrigation in this part of the country. We had so much grass then that we did not know how to appreciate water 20 years ago, but we do now. And so our people here, when they formed this southern irrigation district nearly two years ago, had nearly 200 families vote on the proposition, and they all voted to form the district, which would ultimately lead to the opening of the land, in order to get water if there is water available. But there is a good deal of water running down the St. Mary River and Milk River that goes to waste, and the farmers feel that this question ought to be settled, and that the people in Montana ought to get all the water they are entitled to, and ways and means ought to be provided to store it up so that every drop of it could be used. It is too bad to see St. Mary River water running down there in May and June that goes to waste. There ought to be reservoirs some place, and if the St. Mary River could be reservoired over in the

United States then you get some in the summer time, it would be the thing.

I am told that the Milk River could be reservoired in Canada. Canada could not get the direct benefit of it, but the United States could, and it seems to me you can arrive at some equitable distribution of those waters and some system devised whereby all those waters could be used. I know how the friends down in Montana felt when I was down there in 1915, and I visited Chinook and met some of the leading men there, and also at Hinsdale, where they had a little bit of irrigation scheme, and down at Everett also, and they were very much excited when we were building this Milk River canal, because the United States was then building a canal to take some of the water out of the St. Mary River, and, of course, the Alberta Railway & Irrigation Co. thought they had to protect themselves, and they built the Milk River canal, and those people were very much excited for fear that we would take all the Milk River water, and I suppose they are anxious to have this matter settled, and we would like to have the matter settled in some equitable way, because we are ready for it, and the country needs it.

That, in brief, would be our situation here. As I say, we in this country, as in Montana also, will have a lot of dry farming for years and years to come, because all of the land can not be brought under irrigation, but if they could bring all land possible under irrigation and produce good forage crops, hay, and things of that kind, why it would help to tide over bad years and also provide feed for the winter.

Mr. CLARK. In the district of which you speak, of which you have been most intimately connected and you have irrigation, what has been the cost of your irrigation there—that is, the initial cost of putting water upon the land, not upkeep?

Mr. ALLEN. It seems almost like a fairy tale. We could buy that land 20 years ago for \$3 an acre with water rights.

Mr. CLARK. That was with the water rights?

Mr. ALLEN. Yes; with water rights. The Alberta Railway & Irrigation Co. put that canal through almost 21 years ago, and a lot of our people came here and agreed to establish three settlements in this country, one at Magrath and Raymond, and put 500 people there to try and develop this scheme. The Alberta Railway & Irrigation Co. paid them half land and half cash, and that land was valued at \$3 an acre, with the water right to it, and it went begging in those days; but we woke up recently to the value of that land, and now we would be willing to pay \$50 an acre, or more than that, perhaps \$75 or \$100 for land with water.

Mr. CLARK. Those of you who had foresight have done reasonably well?

Mr. ALLEN. Yes; if we had a little foresight. We used to have some wet years; the hills were all covered with grass and cattle and horses could winter out all winter, but that day is past, and the grass has gone and the ranges are being depleted and we have got to do something else.

Mr. POWELL. To what do you assign the decline of grass growth—climatic change?

Mr. ALLEN. No; covering it with cattle. When this native grass is eaten out it takes several years to get back again, and now it is eaten up every year. When we came here the whole country was covered with a mat of grass, and then below all dried grass that had been lying there for many years, and that protected the roots, and, of course, they had not many animals to eat it off; only a few had ranches when we came here 33 years ago. The more the grass is eaten off the poorer it becomes, because weeds come up and take the place of the grass.

Mr. POWELL. There is one thing I would like enlightenment on. You are aware that the irrigation period under the treaty does not coincide with the practical irrigation period. It commences earlier in the season and continues later in the autumn. You are aware of that?

Mr. ALLEN. Yes.

Mr. POWELL. Does your remark about the waste water in the St. Mary apply to the practical irrigation season, or is it applicable only to what we might call the theoretical irrigation season as prescribed by the treaty?

Mr. ALLEN. Well, in the springtime, about May, the St. Mary River is very, very high. It is a regular torrent sometimes, and, of course, that is in May, and people are not irrigating very much then. Well, if they are irrigating there is plenty of water, and if that could be conserved in some way in a reservoir—

Mr. POWELL. Take the month of July; Senator Gardner and myself were up there in the early part of July, and there was quite a raging flood then in the St. Mary. That is about 1914. Well, now, take this last summer in the month of July and month of August and early portion of September—was there water going to waste in the St. Mary?

Mr. ALLEN. Not very much then.

Mr. POWELL. Practically all utilized?

Mr. ALLEN. Nearly all.

Mr. POWELL. As a practical man, what is your suggestion as to the remedy? There is only a certain amount of water to be divided between the two countries and neither one can get enough. What is your suggestion to help out the difficulty?

Mr. ALLEN. The water ought to be reservoired some place. We have a somewhat large reservoir near Raymond sufficient to hold 50,000 acre feet. If that water could be diverted in May and June, when high, why, it would probably be stored up there for later use.

Mr. POWELL. So that your solution is storage?

Mr. ALLEN. Yes.

Mr. CLARK. Did I understand you to say the reservoir was already provided?

Mr. ALLEN. No; the site is there.

Mr. CLARK. Natural conditions existing?

Mr. ALLEN. Yes. And as I say, I am told—however, the engineers would have to answer that—that down toward the Verdigris Coulee, toward the Milk River at Warner, there is a very large reservoir that the flood waters could be run into. It would not serve any Canadian land, but could be taken out later and used in the United States.

Mr. CLARK. I understand from Mr. Drake that that was feasible but it would be very expensive.

Mr. DRAKE. It would be somewhat expensive compared with some of the others, but within reason.

Mr. ALLEN is not absolutely correct as to the Verdigris Reservoir. Some of the water stored in it could be used in Canada, but only a small part. The major portion would be more useful to the United States.

Mr. SMITH. You speak of the flood waters that are wasted on the St. Mary River in Canada. Have you any available reservoir sites where you could keep and impound this wasted water?

Mr. ALLEN. We have one near Raymond that holds about 79,000 acre-feet, and one a little farther south that holds 17,000 acre-feet—that would be 96,000 acre-feet, irrigating approximately 49,000 to 50,000 acres.

Mr. SMITH. Has there been any estimate made of the cost of storing that wasted water?

Mr. ALLEN. There is an estimate of about \$40 an acre, perhaps \$50; but you see we can not go ahead with that until this question is settled.

Mr. SMITH. How was that ascertained—under present conditions?

Mr. ALLEN. Yes.

Mr. SMITH. All you want is permanency of present conditions; you could store that up at \$50 an acre, from your experience with irrigation in the Southwest. It would be a very valuable investment?

Mr. ALLEN. We think so. Of course, it would necessitate the enlargement of the A. R. & I. canal. Under present unsettled conditions they would not want to do that, and perhaps the Government might say they would not guarantee our bonds.

Mr. SMITH. I appreciate that. On the Milk River, you say, there are several reservoirs that could be used for the United States, if built?

Mr. ALLEN. I understand so.

Mr. SMITH. You can not estimate at what cost per acre?

Mr. ALLEN. Well, Mr. Drake could perhaps tell you that. They say the water would almost run in itself if they put up an earth dam.

Mr. SMITH. As I understand, that is in a measure a torrential stream, as we call it.

Mr. ALLEN. Yes.

Mr. SMITH. Impossible for the farmers to use it without having a proper place for the reservoiring of those waste waters—it is incumbent upon the condition you express, and as I know them to exist on the other side of the line, it is almost criminal to let any water go to waste.

Mr. ALLEN. It is in this dry country.

Mr. SMITH. Well, it is worse when you get to a drier country. I am naturally somewhat interested in knowing at what cost both the American and Canadian people could take advantage of those flood waters.

Mr. ALLEN. Our estimate is between \$40 and \$50 an acre.

Mr. SMITH. Have you an estimate on the other side, at which the water could be stored on the Milk River, for instance?

Mr. DRAKE. No, sir; we have no such estimate regarding the cost of using stored water from Milk River in the United States. That

figure could best be obtained from the Reclamation Service. I only want to say this, that the storage of flood waters, either from the St. Mary or Milk River, is relatively much more costly in Canada than in the United States, for the reason that in the United States—particularly in the St. Mary Lakes—on the upper St. Mary River, and on Chain Lakes on the Milk River, the storage occurs in the stream itself, so that it is only necessary to put a dam across the stream itself and hold back the water. That is much cheaper ordinarily than to build a very large diversion canal to take the flood waters during a short period of time away from a stream for storage in a reservoir not on the stream, so that our storage is relatively much more costly than yours.

Mr. SMITH. Depending largely on the distance of your impounded waters from the place of its proposed use?

Mr. DRAKE. Quite so.

Mr. SMITH. The further it goes the more waste?

Mr. ALLEN. Yes.

Mr. SMITH. I can not see what sort of dam you would put across a torrential river—say like the Gila in my State—like the Salt River, like the Rio Grande, if there is any such formation here in the material—I am not acquainted with the geological formation of it—if there be any such formation there, it would be impossible (if they are similar) to build dams at different places that would stand the torrent of flood water. It will wash out any one we can put in. Therefore, they had to construct enormous \$10,000,000 and \$15,000,000 dams to hold the waters of those streams at all. If the Milk River is anything of the same character, it is impossible by damming the stream in its course. It would be impossible to make it a success on account of the waters that would come down and tear the dams out; and whether the Milk River is of that condition, Mr. Drake, or those acquainted with it, could probably tell.

Mr. DRAKE. The engineers of the United States Reclamation Service are quite satisfied that it is possible to construct a dam across the Milk River by means of which some 240,000 acre-feet of the flood waters of that river can be impounded or held back. That is in what they know as Chain Lakes Reservoir; that is a little way south of the international boundary.

Mr. SMITH. Is that in the bed of the river?

Mr. DRAKE. Practically in the bed of the river or in a long valley immediately parallel to that river.

Mr. GARDNER. I understand from you, Mr. Allen, that you have been here as a pioneer previous to the development of any irrigation?

Mr. ALLEN. Yes.

Mr. GARDNER. I would like to ask, if you please, in your judgment what percentage of this irrigated tract was developed previous to the negotiations between the two countries with respect to the agreement in Article VI of the treaty?

Mr. ALLEN. Well, I am not posted on all figures, but over 100,000 acres. This A., R. & I. system was built over 21 years ago. They began it in 1898. Most of the development took place and construction work in 1899 and water turned in in 1900, 21 years ago, and practically all of that, nearly all of it, was under irrigation before that time, before the treaty was entered into in 1909.

Mr. GARDNER. And before there were any negotiations or controversy between the two countries?

Mr. ALLEN. Yes, sir.

Mr. POWELL. Is it contemplated to take the entire flow?

Mr. NEWELL. The plan contemplates taking the entire flow except possibly some from very extraordinary flood years, but it will be able to the highest economical limit to take what might be called the ordinary flood flow. There might be a few extraordinary flood flows that will get by.

Mr. POWELL. The flood flow there is about 20 feet?

Mr. NEWELL. Yes.

Mr. POWELL. And you would build it sufficiently high to arrest that additional 20 feet in height?

Mr. NEWELL. Yes; take the entire flow of the river under normal flood years.

Mr. SMITH. In order to construct the reservoir of which Mr. Drake or Mr. Newell is now speaking, what would be the size of the dam? What would be the nature of the material you would have to use?

Mr. NEWELL. It is not a regular dam and not comparable with a reservoir dam in Arizona, but it is built of soft earth or sand or gravel formation, so that it must be a very broad dirt dam, built of material in that vicinity, in which there is very little, if any, rock, and of such width as to insure its safety. At all times there will probably be a small percolation of water under foundations.

Mr. SMITH. Foundation of sand or earth?

Mr. NEWELL. Sand and gravel.

Mr. SMITH. Have you any idea how deep that gravel goes before it touches the underlying rock?

Mr. NEWELL. My recollection is that we have bored down several hundred feet without reaching rock.

Mr. SMITH. It is bound to seep through.

Mr. NEWELL. Yes; but that seepage will not be lost, because it will return to the river.

Mr. SMITH. Except perhaps it might affect the dam itself.

Mr. NEWELL. The movement through will be so slow, at perhaps a foot a day, that it will be no imperiling.

Mr. SMITH. Percolate rather than flow?

Mr. NEWELL. Yes.

Mr. CLARK. It might imperil the safety of the dam?

Mr. NEWELL. No; it will be built of such width that a slow percolation will not carry through any material; will allow a certain amount of clear water to escape, which in turn will go into the river and be recovered by another stream below.

Mr. POWELL. That is like percolation that asserts itself in springs a considerable distance away from the head?

Mr. NEWELL. Yes; in rather what we call seams; no distinct body of water but a general wetting of the ground along the river.

Mr. SMITH. On Milk River below that proposed dam, what is the formation of banks and how deep are they?

Mr. NEWELL. The whole country here is glacial formation—material brought from the north and deposited in irregular masses of clay with a few bowlders in them, and that glacial blanket of the country is often 700 feet or even 1,000 feet in depth, and in that

glacial blanket these streams have cut their channels and are depositing sand and gravel on which we must build any structure that is erected.

Mr. MARNOCH. Mr. F. S. Leffingwell, a progressive farmer from the Warner district, will give the commission some information.

STATEMENT OF F. S. LEFFINGWELL, WARNER, ALBERTA.

Mr. LEFFINGWELL. I am here to represent the districts of Warner and Milk River. I would say it would have been a very easy matter to have had a great number of people here to-day only for the fact that they are very busy with their threshing, but I can say that they are absolutely unanimous in their wish for what irrigation it is possible for them to get in the Warner and Milk River districts. We have always understood that it might be possible, through the decision of this commission, to give us about 20,000 acres of irrigation, and that would be a portion or tract of land of about 80,000 acres, practically one-quarter of the land under irrigation. This would be a great help to us for the reason, as has already been mentioned here, that while we are making quite a success of our dry farming, at the same time these dry years, quite often followed by hard winters, the feed for our stock is very scarce in the wintertime. We have been compelled to pay as high as \$50 a ton for hay that was shipped from the Province of Quebec in order to winter our stock. That is certainly a great hardship, and it would be overcome if we could have a small percentage of our land under irrigation, and it would also be a great help to the town sites of both Warner and Milk River, as they would both come under the 20,000 acres, and about 15 miles of the ditch necessary has already been completed, and with some repair work, such as some flumes and the dam in the Milk River, why we could get this irrigation very cheap—I believe one of the cheapest projects in southern Alberta.

Mr. CLARK. That ditch was constructed some years ago?

Mr. LEFFINGWELL. Yes. I have a 1,500-acre farm partly on this side of the ditch, and I, as well as my neighbors, are anxious to get what irrigation we can from it, and I may say if this 15 miles was put in working order and the dam was completed as it was when first constructed and water from the Milk River was turned into it, it would go directly into the reservoir site on the Verdigris Coulee without any further expense whatever; if water was turned loose at the end of the ditch it would follow the natural waterway in the Verdigris Coulee.

Mr. CLARK. Why was that built and never used?

Mr. LEFFINGWELL. It was built at a time when there were no settlers in the country, and the settlers that came in there came from the United States, from Minnesota and Dakota, Iowa and Michigan, where we have no irrigation and we did not know that irrigation would ever be necessary; but after several years of experience in this country we are very much in favor of a portion of the land being put under irrigation, and we are very sure that it would be very practical and very desirable in making permanent homes and better conditions under which we would live.

Mr. SMITH. Do I understand it is a natural reservoir?

Mr. LEFFINGWELL. Yes; it would require a dirt dam and the location where the dam would be—of course, I am not an engineer, I have not investigated from that standpoint—but my observations lead me to believe that it is a very heavy clay soil at this dam site and the banks of the coulee are very high, and the dam would not be a very long dirt dam. It is a natural dam site.

Mr. SMITH. What flood waters would that reservoir take in?

Mr. LEFFINGWELL. It would take in waters from the Milk River and from the land tributary to this Verdigris Coulee, which parallels Milk River at a distance from it about 10 to 15 miles.

Mr. SMITH. In order to divert the water from the Milk River to get it into that, it would then be necessary to dam the Milk River?

Mr. LEFFINGWELL. To repair the dam that was put in there at one time and repair the ditch would be all the work that would be necessary.

Mr. SMITH. What effect would that have in the lower flow of the river at low season of the year?

Mr. LEFFINGWELL. That would depend on what time of the year the water was taken from the Milk River. If taken very early in the season during flood-water times, I do not think it would take any of the water that is being used, but if taken later, taken later in the season during the irrigation season, I don't know. I think it could be so constructed as to let the water through except when it is desirable to hold it back.

Sir WILLIAM HEARST. Your idea was simply to divert the flood waters and allow the ordinary flow in low-water time to pass down the river?

Mr. LEFFINGWELL. Yes, sir. That would enable us to hold and impound the flood water; but this flood water could not be used on the tract of land I refer to, that lower blue tract of land [indicating]. It could be used in both the United States and Canada. Could be used farther east in Canada or be taken back into the Milk River. This Verdigris Coulee empties into the Milk River.

Mr. DRAKE. I am sure Mr. Leffingwell does not want to be understood as saying that flood waters only taken out of the Milk River would be useful in irrigating the tract of land around Warner, that 20,000 acres?

Mr. LEFFINGWELL. No; the flood water that would be taken and put into this Verdigris Reservoir could not be used upon that tract of land that I have reference to, but that would have to come directly from the Milk River.

Mr. SMITH. My attention was not directed so much to the land to be irrigated as it was to the water to be diverted. The only problem that occurred to me was that a dam across there that would fill a reservoir on this side would be difficult to construct, unless you had a gate that you could open when the flood waters had passed, to let complete and undisturbed flow of the Milk River go along.

Mr. LEFFINGWELL. The dam was completed at one time, and I do not think at that time that it took the water out of the Milk River in low-water time at all. I do not think it took any water unless it was the wish of the one that was in control of the dam. But the 20,000 acres would be of great benefit to the people living on that tract of land, and they are absolutely unanimously in favor of getting what

irrigation they can have and, of course, very anxious to get it as soon as they can.

Mr. POWELL. You are aware, of course, that the function of the commission is simply to see to the delivery of one-half of the totality of the two streams to Canada and has nothing to do in the way of following that up and making distribution.

Mr. LEFFINGWELL. Yes, sir; but we feel that we would get a perfectly square deal and get what we are entitled to, which is not a very large percentage of Canada's share.

Mr. POWELL. You will trust to your fellow Canadian citizens to do justice to you?

Mr. LEFFINGWELL. Yes, sir.

Mr. MARNOCH. Mr. Lawrence Peterson, a member of the legislative assembly and farmer of considerable experience in the district around Taber, a little to the east of Lethbridge.

STATEMENT OF MR. LAWRENCE PETERSON, TABER, ALBERTA.

Mr. PETERSON. Mr. Chairman and members of the commission, when I came to Lethbridge it was more for the purpose of hearing the deliberations here this morning than to take any part in them. I heard one of the commissioners state that the attendance was rather small here. There is not a hall large enough in Lethbridge to hold those who are interested in the deliberations of this commission, and they have followed with considerable interest the sittings and possibilities of solution of this question. In fact, the conventions that we have held in the last number of years have been very enthusiastic until they bumped up against the question of the division of the waters between the two countries and then we have had to halt, and I am sure that we are all delighted that the thing seems to have taken new life and possibility of some solution to the question. I take it that the commission will propose a solution to the question that will be satisfactory to the two countries.

I happen to be fortunate enough to have water on my own lands, having received water last year from a reservoir that waters some 17,000 acres, and the reservoir is capable of watering, I think—possibly Mr. Drake will correct me—but something like another 100,000 acres of land from the Chin Coulee Reservoir. It is a splendid place for reservoiring water and could be used to great advantage.

Mr. POWELL. What is the origin of that water?

Mr. PETERSON. It comes from the St. Mary and through the Alberta Railway & Irrigation system, and is a kind of tail end on their system, and is stored in that reservoir and taken out to water this 17,000 acres of land. Many of the people down there thought when our system was put in they would also have this extended to cover this other 100,000 acres, but it is held up until decision is rendered.

There was a question that came up in connection with the statement made by Mr. Fairfield in connection with oats raised upon dry land—I don't know when the comparison was taken—but 1915 was a very extraordinary year, a year in which I do not think irrigation would have benefited this part of the country. It seems to me we will not have many years like 1915. That is one reason why the yield from unirrigated land was greater than irrigated land. I have been here myself something near 20 years, and that was an exceptional year.

We have had one or two other years that we have had dry farming with considerable profit; but, as was stated, these dry years come quite regularly, and are very severe in spells, making it impossible for the farmer to produce an average that would make it so that you can live here with any degree of certainty, and unless he can get a portion of his farm under irrigation, why it seems like it is working a great hardship on the farmer to try and make a stay of it.

Another thing in connection with dry farming here. While scientific methods and cultivation of the soil, of course, have helped a great deal, here of late seasons we have run into a condition with winds that have prevented tilling our soil like we would like to do it from a scientific standpoint for the purpose of dry farming. When you bring irrigation in connection with that, we overcome this wind proposition, that it does not act on the soil like it does with a farm that has been farmed successfully under the dry method.

I do not think I need say anything further; but people throughout the country here in the southern part by the thousands are anxious to have this question settled, so that we will know what steps to go in the furthering of our irrigation extension. There are many thousands of acres here that are simply waiting for the decision of this commission, and there is no Government or company that is willing to undertake extensive works in connection with it until they know where they are at in the division of those waters.

Mr. CLARK. What amount of water do you estimate is necessary on your land for proper irrigation?

Mr. PETERSON. Per acre?

Mr. CLARK. Yes.

Mr. PETERSON. The Dominion Government have decided to allot $1\frac{1}{2}$ acre-feet. That is 18 inches. It was 2 acre-feet, but I think they reduced it one-half foot.

Mr. CLARK. In your own judgment, without reference to the allotment or laws of the Dominion, what do you estimate is the most beneficial amount?

Mr. PETERSON. That would vary somewhat. You take our irrigation system here this year, I take it we would use considerably over that amount. It was so dry, and being the first year of irrigation it would possibly take over $1\frac{1}{2}$.

Mr. CLARK. I am speaking of your own farm.

Mr. PETERSON. I think likely in the land I irrigated I might use over that amount, but I am in hopes another year I will not take so much because it is saturated to a good depth from the first irrigation.

Mr. GARDNER. Mr. Drake, I understood Mr. Allen to say that previous to the negotiations for the treaty there was about 100,000 acres on the St. Mary stretch under irrigation. I would like to ask you, in your judgment, what percentage of the natural flow of Milk River would have been required during the irrigation period to irrigate that land—the St. Mary I am talking about.

Mr. DRAKE. If 100,000 acres of land were all irrigated throughout one season, it would require approximately 200,000 acre-feet of water, and my impression is, although I would not make this as a positive statement, that during the irrigation season the average flow of St. Mary River would be approximately 600,000 acre-feet, so that the

complete irrigation of this 100,000 acres would have taken approximately one-third of the total average flow of the stream. Those statements, as you quite understand, are mere approximations.

Mr. GARDNER. What would that represent in second-feet, approximately?

Mr. DRAKE. There is not any use in attempting to convert it back into second-feet. We can only deal with the total product of the river in terms of quantity. We do that by reference to this quantity as so many acre-feet.

Mr. POWELL. Mr. Drake can do it in his head in a moment.

Mr. DRAKE. Say it would flow between 400 and 500 second-feet.

Mr. POWELL. The commission has made tentative orders for a series of years annually, dividing the waters between the United States and Canada or between Montana and southern Alberta—how, in practice, have those orders worked? I am not looking to the future.

Mr. PETERSON. You mean those orders that have been in operation during the last number of years?

Mr. POWELL. Yes.

Mr. PETERSON. There has been no attempt during flood waters to make any division, because we all have had plenty. I live just a short distance from the St. Mary River, and although the Old Man River empties into it, I have seen the St. Mary when it was practically dry during the dry portion of the year—that is, July and August, although during the same years that we might have a wet spell that will swell those streams in those dry months.

Mr. POWELL. My point is this: Do you know or do you not know how the people have been satisfied with the operation of our tentative orders for the last four or five years?

Mr. PETERSON. I do not think the people generally have any way of being considered in the matter because the C. P. R. have had the operation in the southern part here of the only canal system that we had, and when we could not get water, why we just simply referred the matter to them, and so far as any other scheme, why they have been all in the air.

Mr. POWELL. The man to ask is the administrator of that department of the C. P. R.

Mr. PETERSON. Yes.

Mr. DRAKE. Will you permit me to make a correction for the purposes of the record? I said a moment ago it would have taken about 400 second-feet to irrigate that. I want to make the correction that it would take about 800 second-feet.

Mr. MARNOCH. Mr. Chris Jensen, of the city of Magrath, who farms in the vicinity of that progressive city.

STATEMENT OF CHRIS JENSEN, MAGRATH, ALBERTA.

Mr. JENSEN. Mr. Chairman and gentlemen of the commission, I am delighted in having the honor to represent the city that is named after your honorable chairman, and I suppose to him I should charge my coming to Canada.

The people of Magrath are very much interested in this discussion that is going on here to-day. I myself have been in the country somewhere near 18 years. After living here for two years I soon

saw the necessity of having water on the land, with the result that we acquired a small piece of land that had water rights along with it.

I am unable to say anything in addition to what has been said, only this: That as far as the farmers are concerned in our district we know that in order to live in Canada, and live right in Canada, that we must have water on the land. To illustrate, last summer our crop came up very nicely, and one of my neighbors had a very nice stand of wheat, and he was looking forward to reaping a harvest when harvest time came. Suddenly these west winds came up and we had a number of dry days and weeks, and I remember sitting in his house when he came into his home and he said to his wife, "Well, mother, I have just come in to tell you that the shoes and stockings of our dear little ones have vanished for the winter, that we have no way now of providing food and clothing for our children," simply because—

Mr. CLARK. That was an unusual year?

Mr. JENSEN. Well, it has not been unusual for the last four years. I think that is about the condition that prevails around our particular part of the district. As has been pointed out here, our provincial government has adopted the policy of guaranteeing the bonds of any irrigation district that can show that they have an ample water supply. We have organized a district down where I am with the hope of getting water on our land. Dry farmers down there have done very little. In 1915, 1916, and 1917 they made substantial gains financially. The last four years we have all been slipping down and down the ladder until the banks are beginning to question whether we are right in the upper story or not. The banking system is carried on a little different here than in the United States, and they have their head offices in Montreal, and they can not tell what is going on here, and they begin to wonder what is the matter. When they come out here we have a chance to explain these matters to them and point out to them that it is really no fault of the farmers, but the elements have gone against them, and they must have some support, and the only support we can see that is going to stabilize things is this water. The Government has adopted a policy that is going to help us. The Dominion Government has done our surveying free of charge, but the question comes, What about this division of water between the United States and Canada? The people in our district say to me: "We are talking about this thing 15 or 16 years, and we will all be dead by the time this is settled, and it is a bad thing to bring up our children under conditions where their little minds are being discouraged all the time." They lose nip, and they lose this stick-to-it power, begin to get discouraged, and its not like bringing children up under conditions where there is thrift all the time. We farmers who live down along the St. Mary River see year after year an immense amount of water going to waste, and we are led to believe by our engineers that there is a supply of water there provided we can store it up. When we come to them and ask them why they do not get busy and store up this water, they come back to this old question again of the division of water.

So, gentlemen, all I have to say is that we are certainly anxious, and very anxious indeed, that this troublesome question be settled. As you have pointed out, it is a serious proposition, and we want to say to you gentlemen that it is a serious proposition for people

to raise families and live in a country where they can not go right straight along from year to year.

Mr. CLARK. Have your climatic conditions during those years affected your irrigated land as to the crops produced?

Mr. JENSEN. Yes, sir.

Mr. CLARK. Did you produce the same crops during those years on your irrigated land as you produced on the same land in other years?

Mr. JENSEN. During the very dry season when we had no rain to speak of land properly irrigated will produce just as much per acre as though we had plenty of rain.

Mr. CLARK. What was the actual practical result during the dry years?

Mr. JENSEN. During the dry years people who have irrigated their land properly probably received 30 to 40 bushels to the acre.

Mr. CLARK. And is that what they received in normal years?

Mr. JENSEN. In rainfall years there is 35 to 40 bushels.

Mr. CLARK. The point I want to make is simply this: You have had four lean years where you have had comparative failure upon your dry land. Now, during those same four years what has been the same practical result on your irrigated land? Has it made any difference on the yield of this land?

Mr. JENSEN. No; when we had sufficient water, but when irrigated properly the crop has been the same each year. By irrigating our land here in Canada in the fall of the year we get very substantial crops next year. The last four years has been the same; there has been no difference that I can tell.

Mr. SMITH. There is one question. I would like to ask you: When you speak of waste waters, overflow of waters, whatever decision that this commission should finally arrive at, will not there still be that waste of water if it is not impounded?

Mr. JENSEN. If it is not impounded?

Mr. SMITH. Yes.

Mr. JENSEN. That water will have to be impounded to take care of it.

Mr. SMITH. Then my suggestion was, if it was not too much expense for the farmers to bear that under the present distribution—temporary, of course—whether it would not be economical to impound that water anyhow, knowing that there would be always flood waters in the St. Mary and always flood waters in the Milk?

Mr. JENSEN. I think it would be a good plan to impound.

Mr. SMITH. Why could not it be impounded anyway on either side, notwithstanding the decision of this tribunal?

Mr. JENSEN. Here is the proposition as we look at it on this side—I may be wrong—but suppose we as farmers would go to work and impound or make arrangements to impound a certain amount of water on this side of the line, and meantime this decision is in doubt, we do not know what would happen when the decision was finally rendered. Suppose it might be adverse to Canada, then all the money we expended would amount to nothing. That would not be the worst part of it; our people would be encouraged to come in and locate on and surrounding the reservoir sites, and if that decision was adverse they would probably have to move out.

Mr. SMITH. I appreciate the argument, but I am looking at present conditions. Notwithstanding this decision or any decision we

can possibly make, we can never stop the waste of flood waters in those two rivers without impounding it somewhere. Why can not both sides take advantage of it by building a reservoir?

Mr. JENSEN. I think that would be a good idea.

Mr. MARNOCH. Mr. Risinger, of the town of New Dayton.

STATEMENT OF MR. BOI W. RISINGER, NEW DAYTON, ALBERTA.

Mr. RISINGER. Mr. Chairman and gentlemen, I take exception to Mr. Marnoch's remarks as to the town. I think it would be very hard to find that through a high-powered glass. I am not from the town; I am from the country. However, there is not very much in the matter of detail that I feel I can bring before you, but there are a few things having to deal with the case in general that I would like to mention very briefly. One is that we have not come here making a great demonstration to-day. I think the very evidence of the fact that there are not hundreds of people here, that there are a few representatives, should bear weight with you in that it shows we are organized and have representatives appointed to take care of our problem. We are organized and prepared to do business, and we have been for some time. There has been quite a little missionary work going on in the past few years previous to this organization, and of all men Mr. Marnoch, who has addressed you and in whom we repose the greatest confidence and who has charge of our negotiations, has done more than any other. He has devoted years without pay to the accomplishment practically of this one purpose. As president of the board of trade he took care of the interests of Lethbridge generally, but those interests were determined to be so intimately bound up with the progress of agriculture in this section, and the progress of agriculture finally became so that it was dependent upon irrigation development, and because of these series of events the greater part of Mr. Marnoch's attention was devoted to the furtherment of irrigation in this district; and for that reason I hope that you will take pains to give all the weight that you can to the things that he has brought before you, as he represents, as one voice, practically the whole of southern Alberta.

We do not want to appear to be here in the sense of asking for the development of isolated territories. We think that this irrigation will benefit not only the people who have water applied to their land but that it will be of great general benefit over all of southern Alberta. As one instance, western Canada now, and Canada as a whole wherever they produce cattle, are having difficulty in finding a market for these cattle that they produce, being cut off from stock market in the United States. Our lighter cattle, our half-finished cattle as they come off the ranches of the West, find no market. They are not beef such as may be shipped profitably to England, and at present we have no facilities to fatten all those cattle into prime beef so that they will stand the journey to England and be slaughtered there on arrival as beef. The development of this irrigation here in the south and the growth of alfalfa and coarse grains will provide a place for the finishing of thousands of cattle from all parts of Alberta; especially the south half, and from Saskatchewan. That is what we are looking forward to. The practical farmers here are looking forward to the development of these irrigated areas as im-

mense feeding grounds. That will not only benefit ourselves but will benefit the live-stock industry over a larger area by far than that to which the water is applied. And not only that, just providing of feed in the south, but it will make cheaper feed and feed that is available to the dry farmers that will never be affected directly by the use of water on their land, who are unable to get it, in that they can get feed and be able to carry on over these dry seasons at not as exorbitant an expense as they have been subject to heretofore.

I think that you will find that the spirit here in the West is one of getting together rather than that of a contentious nature. We have no contentions with the citizens of Montana. We have been so placed here that we can appreciate exactly their difficulties and sympathize with them. We want settlement and we believe that they want settlement, and we believe that whatever settlement is arrived at will be fair; but we want to be so placed that we can go ahead with these developments on both sides of the line and be able to remain in the country and to view our future with some measure of assurance rather than one of extreme doubt. We have investments here, not only of a financial nature, but our families are growing up here and we want to be able to keep them here; we do not want our homes disrupted because of those periodic spells of depression due to lack of returns from our efforts and the consequent discouragement that prevails, as already has been mentioned. We want to have an assured future, and we feel that the thing now to do is to develop the use of this water to the fullest extent, and the thing that has already been brought up just recently—as to what might be done with those storage waters. We think that our main object now should be that that take place, and that the waters be divided in some equitable manner, stored waters as well as the run of the river, between the two countries for their mutual use. We want to see the waters used. We are not here for any other purpose than to see this water used and used on both sides of the line, but we are anxious that it be done at the earliest possible moment.

Mr. MARNOCH. Mr. Chairman, I had hoped that there might be some representative of the pioneers from the districts farther out; but, as you know, the arrangements of the commission coming here were made very hurriedly; we thought perhaps you might not get here until Monday, and consequently some of the farmers who live farther out have been prevented from being present, but the case has been very well presented by those gentlemen who have spoken.

I would like to suggest, Mr. Chairman, that you should ask if anyone else wishes to present anything, because we do not want to blanket anyone who has anything useful to say.

Mr. MAGRATH. We have exhausted the list that was placed before me. Is anyone else present who would like to say something? We would be very pleased to hear you.

Mr. MARNOCH. Before you close the proceedings I should like to say that the citizens of the town would be very glad indeed to provide you with automobile transportation to take you around to see anything in the district, particularly in connection with irrigation, that you are interested in.

We are gratified, I am sure, that the commission has been here to-day, and we hope very sincerely that some solution will be worked

out whereby this matter can at least be brought to a point and we may know we can proceed to further irrigation development.

Sir WILLIAM HEARST. I would like to ask Mr. Drake a question or two if I might.

Mr. Drake, when Mr. Marnoch was explaining to us the irrigable lands shown on the map that he produced, he referred particularly to the areas shown in the west there [indicating], which I understood from him would be watered, or it is expected that they would be watered from Waterton River and Belly River. I also gained the impression that the intention of the department was to eventually intermingle these waters with the waters of the St. Mary and carry them farther east and store them in order to complete the system that your department has in view. I would be glad if you would, for my information at all events, explain more fully than perhaps Mr. Marnoch did the scheme of irrigation in mind and just what is proposed to do with the waters of the Waterton River and Belly River in the connection I have indicated.

Mr. DRAKE. I am very glad you asked the question, and I would personally like nothing better than to answer that myself, but I would suggest that Mr. Meek, the Acting Commissioner of Irrigation, who is here, has more detailed and precise knowledge of the intricate problem than I have, and you might be glad to have him explain the situation and perhaps illustrate it not only by the map which is before you but by this map which I have before me, which is our latest working map.

You have stated the situation in brief very clearly. It is proposed that all the available sources of water supply shall be utilized and the waters of these streams shall be mingled and taken out to the eastward upon the lands that are to be irrigated.

I hope you will ask Mr. Meek to give you that information and illustrate it by the map.

Sir WILLIAM HEARST. If Mr. Meek will be good enough to do that, we would be grateful to him.

Mr. MEEK. In addition to the water we are contemplating using from the St. Mary River the other sources of supply are, first, the Waterton River.

Mr. CLARK. Excuse me for interrupting just there, but the lower map represents, as I understand it, the same land that is represented on the upper map?

Mr. MEEK. The lower map represents the development of the Milk and St. Mary Rivers and the Waterton and the Belly Rivers. The upper map represents all the irrigation development in Alberta.

The land on the upper map would be this blue area and the yellow area in the vicinity of Lethbridge and Raymond.

Mr. MAGRATH. And the upper map is the map with which Mr. Marnoch was dealing in the earlier part of the meeting?

Mr. MEEK. Yes. In using the Waterton River we have a storage site at Waterton Lake. That is a lake about 6 miles long, 3 miles of which are in the United States and 3 miles of which are in Canada. It is possible by a dam at the lower end of Waterton Lake to store 140,000 acre-feet of water, and then by a diversion canal some distance below this Waterton Lake the waters of the Waterton River can be carried over to the Belly River.

Sir WILLIAM HEARST. That dam that you speak of, would that involve the raising of Waterton Lake in the United States as well as in Canada?

Mr. MEEK. That would involve backing water up into the United States. Then the water from the Waterton would be augmented by the Belly River and carried across the Blood Indian Reserve and across the St. Mary River and into reservoir sites out on the prairies.

Sir WILLIAM HEARST. Is that Waterton Lake what you would call a mountain lake?

Mr. MEEK. That is right in the mountains.

Mr. MAGRATH. Is there any outlet on the American side?

Mr. MEEK. There is no outlet on the American side that I know of.

Mr. POWELL. It joins the St. Mary below the border?

Mr. MEEK. The Waterton River runs into the Belly River and into the Old Man River.

Mr. CLARK. Does the Waterton River have its rise in this lake that you speak of?

Mr. MEEK. The Waterton rises in the United States.

Mr. CLARK. But what I want to understand is whether or not the lake is the source of the water?

Mr. MEEK. The lake is; yes.

Sir WILLIAM HEARST. A part of the lake is north and a part south of the international boundary, the lake emptying north?

Mr. MEEK. Yes, sir.

Mr. POWELL. I understood you to say that you would divert the water from this reservoir into the Belly River. You meant the St. Mary, did you not?

Mr. MEEK. No; the Waterton River.

Mr. POWELL. It runs into the Belly River now?

Mr. MEEK. Yes; but we can not use it.

Mr. POWELL. Oh, I see.

Mr. MEEK. It has to be diverted higher up river to get it at a sufficient elevation to cover the lands.

The total irrigable area that we have considered feasible at the present time to develop from these three rivers is, approximately, 580,000 acres. There are two small schemes surveyed already from the Waterton and the Belly Rivers, and on the Belly River there is the United irrigation district, which covers 23,000 acres, and from the Waterton district 60,000 acres.

Mr. GARDNER. What do the colored portions of that map represent?

Mr. MEEK. The green portions are the lands which are already irrigated from the Alberta railway and irrigation system and the red areas are the proposed extensions of that system to these three rivers.

Mr. POWELL. What does the white interior portion mean; that which is not irrigable?

Mr. MEEK. The white portion is at too high an elevation or for some other reason is not irrigable.

Mr. CLARK. What proportion of that water that would be required there would be obtained from the Belly River?

Mr. MEEK. I think the total water that we estimated could be used from the Belly River was 200,000 acre-feet, approximately.

Mr. CLARK. And how much from the Waterton River?

Mr. MEEK. I am speaking entirely from memory, and I can not say that that is exactly true.

Mr. CLARK. What I wanted to get at really was how much additional water would you require from the St. Mary River to cover your proposed plan. Do you get my meaning?

Mr. MEEK. All these schemes depend on storing flood water, and also upon how much of that flood water it is economical to store to irrigate these lands.

Mr. CLARK. You have no means of estimating, then, how much of the flood waters of the St. Mary would be required?

Mr. MEEK. We know the total amount that would be required.

Mr. CLARK. Have you ascertained how much you can store of the Belly River water?

Mr. MEEK. Yes. We estimate that we could store 37,000 acre-feet of the Belly River.

Mr. CLARK. And how much on the Waterton River?

Mr. MEEK. On the Waterton River the provision of a dam at the end of the lake 40 feet in height would store 40,000 acre-feet, but there is an international question there.

Mr. CLARK. I am not speaking of the international question; I am trying to find out how much storage you would require on the St. Mary River to accomplish your desired purpose. How much storage would be required there?

Mr. MEEK. We have no storage directly on the St. Mary River, but there are—

Mr. CLARK. Just eliminate the international boundary entirely from your mind, if you can. What I am trying to get at is how much St. Mary storage water would be required to supplement your storage water of the Belly and the other rivers to cover your project as contemplated.

Mr. MEEK. We have not that information. We consider all the three rivers, together with storage sites on the river and the storage site out on the prairies. We contemplate using the Raymond Reservoir up to 19,000-acre feet, the Milk River Reservoir up to 79,000 acre-feet, the Chin Reservoir up to 100,000 acre-feet, and the Verdigris up to 140,000 acre-feet.

Mr. CLARK. Have you not any way of estimating how much of that storage you can provide on each of the rivers?

Mr. MEEK. We can use all these storage reservoirs out on the prairies from any one of those rivers, and when the water is out in the St. Mary—

Mr. CLARK. How much storage will the flood water of the Belly River provide?

Mr. MEEK. Approximately 200,000 acre-feet. That is the total flow.

Mr. CLARK. I guess I can not make myself plain. Go right along.

Mr. MAGRATH. Were not those storage reservoirs given at the St. Paul hearing?

Mr. DRAKE. Yes, sir; they were given, but, like the figures of irrigable areas, they have been subjected to change as we got further information.

Mr. CLARK. Is there any way of ascertaining at this hearing how much water can be impounded from the flood waters of each of those

rivers, and how much is required to irrigate this proposed area, Mr. Drake?

Mr. DRAKE. That is wholly a question of cost. The rivers produce certain volumes of water. If you are prepared to spend enough money you can usually manage in some way to hold those rivers.

Mr. CLARK. Here is my idea: You have laid out a scheme providing for so many thousand acres of land. You must also have figured out the sources of supply.

Mr. DRAKE. We have.

Mr. CLARK. That is what I am trying to find out, how much of that supply would come from the waters of the St. Mary River, how much from the Belly River, and how much from the waters of the others. In other words, that question enters into the question of united construction of reservoirs by the two countries.

Mr. DRAKE. Yes, sir, it does; and, as you of course quite clearly realize, in making our calculations we have been largely influenced by the matter of cost. What will it cost us to conserve for utilization a certain proportion of the waters of these streams? Mr. Meek can tell you the capacity of the canal taking water from the Waterton River across to the Belly River. That will represent in part our estimate of the available use of flood water. But there are two factors there. First of all, there is the question as to whether or not and under what conditions we might be able to use Waterton Lake as a storage reservoir. That, as you are probably aware, is not only a question to be decided by the Government of the Dominion but it is also an international question, because a part of Waterton Lake lies on the United States side of the line within the limits of one of your national parks. That portion of the lake which is within Canada is within the limits of one of our national parks. It is a question as to whether or not, or subject to what conditions, we might be permitted to store 140,000 or 150,000 acre-feet of water there.

Mr. CLARK. And yet you have taken all of those matters into speculation in figuring on the amount of land?

Mr. DRAKE. Yes, sir.

Mr. CLARK. I want to know where your speculations have led you.

Mr. DRAKE. We have assumed that that there is a possibility of storing 140,000 or 150,000 acre-feet of water in Waterton Lake. We have assumed that that storage might be utilized in part twice over and that we might be able on the whole to hold back there about 200,000 acre-feet of water. Then, we have planned a canal which will take that stored water, together with the natural flow of the stream, across to Belly River.

Mr. Meek can give you the exact figures now. We take that across to the Belly River. There we have no facilities for storage. We merely have a dam which will permit us to divert not only the flood water of Belly River but the flood water of the Waterton River diverted across there. We pick that up and take it across to the St. Mary River. The amount of water which we contemplate getting from the Belly River will be represented by the difference in the size of the canal coming from Waterton over to Belly and the size of the canal that will run from Belly over to St. Mary. That will represent the volume of water which we hope to get out of the Belly River itself. Then, that water taken over to the St. Mary River

can be dealt with in either of two ways. I have not got all these details in my mind, because there are matters that have been worked out by our engineers throughout the season and the studies are not complete, but, roughly speaking, the waters can then be dealt with in two ways—either by an impounding dam in St. Mary River itself, a considerable distance north of the boundary, or by merely a dam which will permit of these waters brought over from the west being turned into that river and then taken out at a high elevation and carried eastward to reservoirs which have been referred to.

Now, the amount of our storage is represented by the capacity of those reservoirs. That after all is the true answer to your question as to how much of the waters of these several streams we can use. Just from memory, the Raymond Reservoir will hold 18,000 or 19,000 acre-feet, the Milk River Reservoir will hold 79,000 acre-feet, the Verdigris Reservoir will hold 140,000 acre-feet, and the Chin Reservoir can be made to hold about 102,000 acre-feet. The total, whatever that may be, will represent the total volume of flood water which we hope to be able to use.

Mr. CLARK. I think we are both trying to get the same thing, but we do not understand each other. Supposing by international agreement or consent a dam were built there to the full capacity to which you hope you might build it at this international lake, Waterton Lake, and you utilized that water; then you supplement that by water from the Belly River and you use that, and then the United States should build a dam at the lower part of St. Mary Lake. How much storage water in St. Mary Lake would you have to add to your Waterton and Belly water to irrigate this land?

Mr. DRAKE. I really do not know that it is possible to answer the question. There is a physical limitation to the amount of water that could be stored. I would not like to undertake to answer that in a specific way, because, as has been pointed out to you a good many times, there is infinitely more land that requires irrigation—

Mr. CLARK. I am speaking of these projects.

Mr. DRAKE. I imagine, roughly—and I say this subject to correction later—that if it were possible to hold 250,000 acre-feet of water, or to build a dam creating a reservoir of 250,000 acre-feet capacity in St. Mary Lakes, to be used jointly for the advantage of the United States and Canada, that that might solve the problem.

Mr. CLARK. How much of that 250,000 acre-feet would Canada need? That is what I am trying to get at.

Mr. DRAKE. When I said "used jointly" I meant to say that we share equally in the storage.

Mr. POWELL. As I understand it your scheme contemplates the utilization of storage and natural flow of the Belly. It contemplates the utilization of storage and natural flow of this water?

Mr. DRAKE. Yes.

Mr. POWELL. How much would you have to draw from the St. Mary system supplemental to that to work out your scheme? That is it, is it not?

Mr. CLARK. From the St. Mary storage water?

Mr. POWELL. Yes; from the St. Mary storage water.

Mr. DRAKE. I think our calculations show that we would have to have some 500,000 acre-feet of water altogether from the St. Mary River.

Mr. POWELL. To work out your scheme?

Mr. DRAKE. Yes. How we can get it is a problem.

Mr. CLARK. You have to first ascertain what your needs are and then try and have somebody work it out for you.

Sir WILLIAM HEARST. Mr. Drake, as I understand Mr. Meek, and I think also yourself, you are simply at the present time working out your scheme. The scheme on the map is not a finality, as I understand it?

Mr. DRAKE. By no means. I attempted to say when I first referred to that map that it is our working map. At any time within the last five years we have had a map similar to that showing to the best of our knowledge at that time the storage facilities, the canal capacities that would be required, and the areas of land that might be irrigated. All these data are changed from time to time as our surveys are completed or as we get more information, and all of these maps are indefinite, because of certain factors which we can not control, one of them being the amount of water or the proportion of the flow of the St. Mary and Milk Rivers that will finally be allotted to Canada under the waterways treaty; another of the uncertain factors being the extent to which the United States may be willing to construct reservoirs on the upper St. Mary River; and still another being doubt as to whether and under what conditions we may be able to use storage on the Waterton River. All of these are uncertainties.

Sir WILLIAM HEARST. I think we all understand that there is a very much larger area of land that could be irrigated for profit if we can get water from any source, and you are working within that to see how much it is?

Mr. DRAKE. Yes, sir; that is true. That map, if any of the members of the commission care to examine it in detail, contains quite an amount of information that you may find interesting.

Mr. GARDNER. Within the limits of what parks did you speak of?

Mr. DRAKE. The Glacier National Park on the United States side and the Waterton National Park on the Canadian side.

Mr. MAGRATH. Does anyone else wish to be heard now? On behalf of the commission I want to thank Mr. Marnoch and the other gentlemen who appeared here and addressed us. It is hardly necessary for me to point out that we are conscious of your difficulties. We are conscious of your keen desire for an immediate settlement. As I said in opening, we have been giving the matter a great deal of thought, and I think I am justified in saying on behalf of the commission that we intend to either settle it very shortly or let the Governments undertake to say what they intended that article of the treaty to mean. There is nothing further to be said, gentlemen, than that the sincere hope of the members of the commission is that we will reach a settlement. We do not want to let go. We appreciate that an international tribunal that can not settle international difficulties will not be of much use to these two countries, and that has been the impelling force that has kept this problem largely before us.

We thank you, gentlemen, for your attendance.

(Thereupon, at 12.30 o'clock p. m., the commission adjourned.)

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