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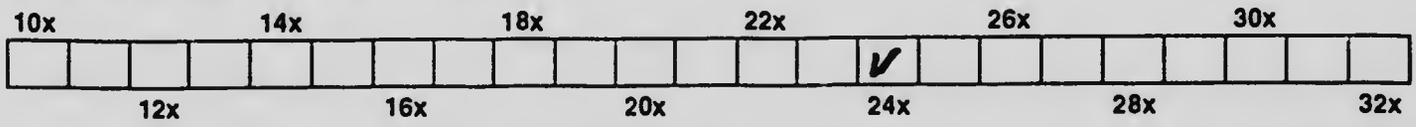

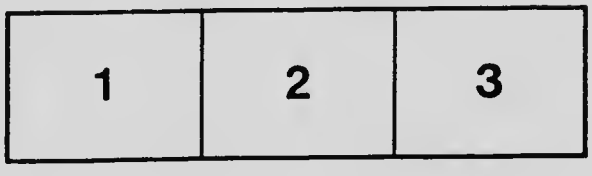

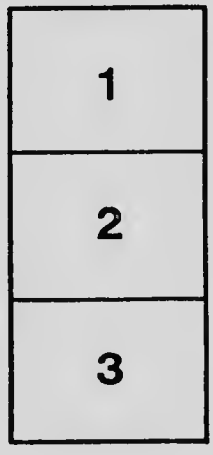

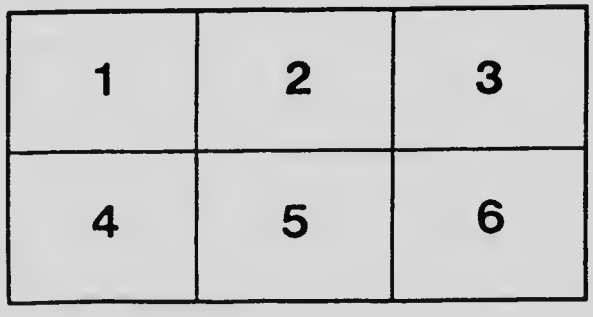

The Proposed Northwest Saskatchewan Irrigation Project

and Some Reminiscences of Irrigation in Western Canada

Given by

WILLIAM PEARCE

Also Discussion by D. B. DOWLING of the Geological Survey, Ottawa

at the

Thirteenth Annual Convention
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Proposed Northwest Saskatchewan Irrigation Project

The subject is so big it is something like the air. I do not know of any irrigation scheme on the continent of America that can affect so much land. The only limitation which it has is the amount of water. In connection with that, I might say that the two portions of Alberta and Saskatchewan which would be beneffitted by means of irrigation contain very much more land than there is water for. That brings it down to the Government administering the water and acquiring the fullest possible information as to the volume of water available and the land available; and to what area that water will render the greatest use.

What I have before the Convention to-day is the necessity of urging upon the Government at the next session, which comes next month, the advisability of making a liberal appropriation for that investigation The biggest problem is getting the water out and getting in the vicinity of the lands to which we wish to have it applied; and to make that water go as far as possible and to make the scheme as cheap as possible. storage is absolutely necessary. By getting a fairly liberal vote for survey purposes you can ascertain where the territory in which that storage lies and where the canals to supply that will have to be located—heading up on the Saskatchewan River probably a few miles above Rocky Mountain House, which is a bush country in which you can carry on investigations fairly well in the winter time. It would be a difficult matter on the plains to do much work in winter, but as one who has perhaps done more winter work in the Western Provinces in the way of survey than any other single man in it, I venture to say that a good deal of the territory through where the investigations have to be made can be carried on more cheaply in the winter than in the summer. so that we want the coming session of Parliament and the Minister of the Interior to realize the necessity of a vote to carry on that investigation. There was an appropriation made for it, but that will be exhausted very shortly without getting anywhere near as far as it is necessary to go. I am certain that the irrigation authorities in the West under the control of the Department of the Interior would be only too willing to take hold of that investigation during the coming winter and shove it as far along as they can and do it before the winter sets in.

The territory to be served by the scheme is bounded by the two Saskatchewans, that is, the North and South, by the Battle River and the Red Deer. There is an elevation of 2,500 feet. It includes 12,700,000 acres in Saskatchewan and in Alberta about 7,000,000, making a total of 19,000,000 acres;

at least seventy per cent. of which can be served with water so that water can be taken out for stock and storage purposes.

My investigations have led me to believe that we can support more population in this country under dairying conditions than we can under any other, and if we can furnish feed to a large tract of country suitable for dairying—and seventy-five per cent. of that country will be if the scheme is carried out—you can calculate how many cows it will carry, the amount of butter, cheese and milk to be produced. From those streams and draws I would drain out all the alkali ponds, scour them out, fill them with fresh water and convert the country into a high-class stock proposition and also a foreign proposition. Any of you who desire to go into the details of the scheme—and it would be too long for me to read it to you to-day as it is largely composed of statistics and is very dry matter to put before you—can apply to the Secretary of the Department of the Interior for this paper of mine. He will send it to you with literature and map which has been published.

I want to say first that I drew attention to this scheme in 1898, but I have been hammering at it ever since. It was not until the last session of Parliament that the powers that be decided to give a grant towards the starting of the investigation. The result so far is more favorable than I had even anticipated, and I have no doubt myself that complete investigation will show a surprisingly cheap irrigation proposition, based upon the unit of an acre or such unit as you see fit to adopt.

I will not take your time up any longer with this proposition, because anyone interested can understand it very much better by applying for the literature than he can from any address I might make.

Mr. Dowling, who will follow me, will probably bring out some points that will be of great interest to you. Any of you who do not care to write to the Secretary of the Department of the Interior can apply to me. I have a limited supply in Calgary, but will be pleased to send out what is available upon request.

There is also another proposition which is an old one and partially surveyed. In 1895 surveys were made to show that it was possible to take water out of the Red Deer River, and bring it to the plateau west of Olds, at an elevation of 3,300 feet of contour and allowing 100 feet to go. This proposition covers 1,200,000 acres, and I think that forty per cent. of it; that is as much water as you can probably get—lends itself cheaply to irrigation. I do not know of any part of the West that is so well fitted to growing hay as that plateau. I do not know if any one of you have been in the neighborhood of Trochu in a wet year. There is no part of the province that can approach the production of native hay as that. It is a strong clay soil and you all know how that will produce if you get enough water, but not too much, on it. Owing to

the drainage of the country the application of water would be very cheap, and, so far as investigation has gone, it is not an expensive matter, taking into consideration the acreage involved, to bring the water out on the land.

I have prepared a short paper on that scheme and if you like I will read that, but I think I have told you pretty nearly all the paper contains, but if you want that I will send you it also. A paper to be of any value to you must necessarily be tedious and lengthy and too much so to be of any interest to this Convention.

I thought I would give you an idea of the history of irrigation so far as the two prairie provinces are concerned. I do so because I do not know of any man to-day who knows so much about it as I do. That may seem egotistical, but I make it from the standpoint that I believe the public should know the history of irrigation and know what obstacles have been met and overcome and be more hopeful of the future of irrigation.

My first attention was drawn to irrigation by a visit to the States of Colorado and Utah in 1881. My first acquaintance with a portion of Alberta requiring irrigation was in 1883, and I then came to the conclusion that irrigation was necessary and advisable. I was laughed at for a good many years for entertaining such an idea.

The first time I ever went over the route of the Canadian Pacific Railway from Calgary to Edmonton was in 1883, and the gentleman who accompanied me had also lived in Colorado, and I asked him what he thought of the country, and he said it would be a good country if the Bow River was out of it and not running where it is.

I was the first government official who drew attention to the necessity of irrigation in an official report and if you will consult page 20, Part 1, Report of 1885, you will find it. I would have alluded to it much sooner than that, only that it was thought good policy on the part of the people of Canada not to admit that we had a country requiring irrigation. That was bolstered up by the then directors of the Canadian Pacific, but it did not take very long before the Canadian Pacific saw for themselves that irrigation was required, and the most enthusiastic director of that Company for irrigation was the late Sir William Van Horne. He was not at all timid about entering into this question. He came down in the nineties with a proposition to his company to go into irrigation, but the directors turned it down. That was a state secret for a long time after it happened. When he left the management of the company it was quite an uphill undertaking to educate his successor up to the point Sir William had attained. However, we succeeded in doing it eventually.

I think the first irrigation ditch ever put out in the two provinces of Alberta and Saskatchewan was taken out in the flats of the Belly River just below the mouth of Beaver Creek, which flows down the Piegan Reserve. It

was taken out in 1875. Two men came in with a band of stock and settled there and they evidently came from an irrigated district, for the first thing they did was to dig a ditch out of the Creek and irrigate the flat for hay. Unfortunately for their enterprise, the land became seceded territory to the Indian Reserve and they had to leave. The next man was John Glenn, on Fish Creek. He settled in 1874 and in 1875 and 1876 he took a ditch out of Fish Creek and irrigated land for vegetables and grain, and that ditch can be seen to this day. It was not a very large one, but it was very successful. The third ditch was taken out of the Highwood River by two men named Smith. One was called Smithy and the other Buck Smith. That was probably on the site of the Little Bow River from the Highwood River. It was taken out purely as a pasturage and hay proposition. Irrigation then practically stood still except little spasmodic efforts at it until the early nineties, when what was known as the Galt Railway got a charter for an irrigation scheme, in 1892, I think, but they did not start active operations on that scheme until the fall of 1897, when surveys were commenced. In the meantime three more charters were taken out, one by the Macleod Irrigation Company, which only made a couple of surveys. Then there was the Calgary Hydraulic Company and the Calgary Irrigation Company. They both went to work and spent money in getting water out. Immediately after they started, we had a series of wet years and the high flood we had in that country damaged both schemes badly and the Calgary Hydraulic Company was abandoned.

The Calgary Irrigation Company, of which I was the largest stockholder, renewed its scheme and got it working again, and in 1902 another high water knocked us out and it looked as though we were not going to need any irrigation. If we had had a cast iron contract before we started, and when the country was dry, we would have made it a success. I put in $15,000 personally into the scheme and my family $27,000, and after being at it for ten years we got 51c on the dollar, which was obtained by the increase in the price of the lands themselves. In spite of that disaster, I can see where it would have been a success had I to do it over again At that time we had no Irrigation Act and had to go to Ottawa to get a charter if we wanted to carry on the work here. That was expensive in time and money. We had great difficulty in getting our representatives to see that irrigation was necessary. We started an agitation to have an Irrigation Act passed. Some people even asked me what irrigation was. I told them to look out of the Parliament Buildings' windows and see the lawns being sprinkled with water. To further the acquirement of that legislation we constituted ourselves into what was called an Irrigation League, put our hands in our pockets to put up money to carry on propaganda; and I recollect myself one time going down to Macleod and holding a meeting there, and starting up enthusiasm to see if pressure could be brought on Parliament to enact legislation, so that we could go to work and do something.

I was sent to Ottawa and set to work with the late Mr. Fraser, of the Department of Justice, to draft an Irrigation Act, and ninety per cent. of the present Irrigation Act is the work of Mr. Fraser and myself. Some clauses are taken from the American Act, by Col. J. S. Dennis, who was sent to the United States to consult them about this irrigation question. At his instance, several amendments were made, and if you compare the 1894 and the 1987 Acts, you will see that ninety-three per cent. of it is similar in both Acts. When I went down there we anticipated that the great trouble would come from the Opposition. We had several men then who knew the leader of the Opposition, Mr. Laurier. I took several letters to him, and he told me that he would see that no vexatious opposition would be offered when we got to the House. We got through there all right, and it was a question of preventing opposition from our own side. For some reason the Legislature drew out late that session and decided not to introduce the Act. When the Minister made the announcement to me, I do not know that I ever felt more blue over any announcement than I did over that. Perhaps we did not lose such a lot, however, because we had another year to fight, and, in the meantime, another delegation went to Ottawa, when Sir John Thompson was Premier. It consisted of Mr. Magrath, of Lethbridge, and Mr. Pillings, from the settlement on the St. Mary's—and I want to say this, that I think Mr. Pillings did more good with the Premier for the promotion of the Act than all the rest of the members of the delegation. He could talk from personal experience on irrigation, and that was what took the ear of Sir John Thompson. Sir John then and there promised that he would see that the Bill went through that session. Fortune favored us. We had before us the experience of the introduction of an Irrigation Act in New South Wales when they debated for twenty-six successive days over one clause. In the Irrigation Act you have eliminate the old riparian law. The lawyer would hold up his hands in ly sorrow at the thought of doing away with riparian rights.

The Bill came up for its second reading on the evening of the hottest day I ever experienced I think it was fortunate for us, because the members had not energy enough to discuss it or there would have been an acrimonious debate, and the Act would have been held up for another year. That Bill went through its second reading in two hours in the House of Commons. I have often thought how Providence favored us by having such a hot day at that time.

Having got the Bill through it was an easy matter for men to start irrigation works if they had money enough to undertake them; and a great deal has been done under it since.

There is perhaps one thing more that I should mention. The irrigation scheme of the Canadian Pacific, the largest we have in Canada, started out in investigating the supply of water along the track for the purpose of water for engines for steam purposes. I was going down over the line in company with the late Sir William White and William Cross, master mechanic, and they

were having great difficulty at Crowfoot, where there was a water station pumping from the Bow River. Between this station and Medicine Hat they had great difficulty. They had not put in pumping stations at Suffield or Bassano. I asked Mr. Cross when we stopped there: "How high is the Bow River above the line?" I think it was 117 feet. He said: "If the Bow River falls above here there should be no difficulty in getting water here and getting it right along your line," I told them. Sir William White was greatly taken with the idea. If you will send up a man with a rod and a level I will go out with him and settle it, I intimated. Later I discovered that by putting a dam where the Bassano dam is now, we could get water for all the eastern country. I reported this and got Mr. Lumsden to run a level to show what cutting was necessary to get the water out and get an intake near where the Bassano dam is now located.

You talk about people being discouraged and leaving the country. Prior to getting an Irrigation Act, between Calgary or Macleod, or say to High River, a large number of settlers came in 1883, the year the C.P.R. got as far as Calgary, and an odd one or two in 1882. They did pretty well there. 1884 was a set year. 1885 was not so bad, and 1886 was fair, and 1887 was a very wet year. 1888 was fair, and 1889 it began to get rather dry and kept getting drier and drier until 1894 or 1896. I think I am within the mark when I say that fifty per cent. of the settlers in that tract between Calgary and High River abandoned their farms and many took the barb wire off their fences and sold it. Some of them went north and some went to British Columbia, which had then begun to boom from a money standpoint. A good many of them came back, however, some buying back their old holdings, others buying elsewhere. I mention this to show it does not do to get too badly discouraged because things look blue. If we only put our shoulders together and push together I do not think we need be discouraged by the drought.

I have a letter from one of the largest operators in farm products in this country to-day. He says, that it is a hard thing to say, but he believes that if we had one more dry year it would be the salvation of the country. It would force every man to go into irrigation and if we could get them once into it we would never have any trouble about the supply of fodder. I just mention that to show that sometimes these calamities work out beneficially.

I think I have given you as egotistical an address as you might wish for. Thanking you for your attention.

CHAIRMAN: I will now ask Mr. D. B. Dowling, of Ottawa, to supplement the remarks made by Mr. Pearce on the proposed project.

MR. DOWLING: I had not expected to discuss Mr. Pearce's scheme. I merely thought that if I brought along some maps for Mr. Pearce that most of my contribution would have been over. However, I will add a few words that you would probably not read or hear in the ordinary discussions of the irrigation projects.

In all large schemes you may have noticed that the insurance of the scheme, that is, the insurance of co-operation by the Government, is emphasized by those interested in schemes. Small projects scattered here and there are not looked upon with great favor by the Dominion Government. We have seen that in, say, the St. Lawrence ship canals and forestry schemes, and so on. The Government recognized that there was a big question here and have referred to a special board all schemes for examination and put them together for decision what should be done for the whole question from Montreal to Fort William. So, in projects like irrigation in the west, the more complete the scheme the more apt the engineers in the department are to take an interest in it. You may also know that the Minister there is often dependent upon the enthusiasm of the men who are to do the work, so that I say in the scheme submitted by Mr. Pearce the very completeness of it and the size of it appeals to most people, because it serves not the interests of a few individuals, but it also takes into account the large province of Saskatchewan—its immensity is what appeals at once.

When you commence to consider a very large scheme of this kind, then you have to think of the topography of the country first of all. As Mr. Pearce says, they are making surveys to see if they can get the water. The Government will have to make many more surveys to get the shape of the land on which this water is to be brought, so that the large arteries will be placed in the right direction to serve the country on both sides. The topography of the plains is, as you know, very complicated. It was at one time, we may say, a sloping plain towards the north-east, with the drainage from the mountains running across this for many years—for many centuries. This drainage has cut furrows. The mere action of a stream running down a grade is apt to bend the stream. There are many factors entering into that. The history of the streams is that they widen their valleys and we know that very few of our deep valleys now were always there.

One thing that has made a great impress upon this country, which you may not notice unless you are told about it, is that some of the old valleys were bottled up and wiped out by the ice sheet that came over the central part of this province and reached almost to the mountains. Many of these valleys were filled up, while many of the existing valleys are the same valleys which were filled with ice and in which the river has resumed its course; but we have right in sight of this meeting room the banks of the Saskatchewan River on which there are no rocks, but is all boulder clay. The whole valley was blocked up and it turned to the north. I merely mention that in passing to show that our topography has been a changed one.

If we consider the surface of the country as we have it now we will find that there are regions of lumpy country with boulders strewn on it. That there are ridges running across from north-west to south-east and that between those ridges—I mean between the major ridges—we have fairly level ground and good farm land. What is the cause? The cause assigned to that

scheme of topography is that after the ice sheet advanced as far as it could, and it commenced to melt by the change in temperature, the front of the ice with its melting waters was fairly stationary for some time, and there we had miniature lakes. In fact, some were large lakes; and where the ice was stationary for some time there was gradually deposited all the dirt that melted out of the ice. Those are called moraines. Many of you may not have travelled over the right part of the country to have noticed these; but if you travel from Drumheiler, I think it is north, you come into a very lumpy country. You may not have noticed it, but they are hills about as big as this room, and the railway has to dash around them to get through. It is a change from the plains. Another effect of that scheme of dumping the dirt on the surface is that instead of our rivers from the mountains flowing directly north-east down that slope, they have nearly every one of them taken a turn to the south-east. The large valley of the North Saskatchewan; the large valley of the Red Deer, portions of the Battle River, and so on. You will find the streams running in that direction. They are all stopped by the lumps of boulder clay in the hills.

In thinking of any large scheme of irrigation we must think of these hills as barriers to the direct lines of irrigation canals, but if you can get your water into the hills, you have all the storage basins that you may want. You have storage basins on every side. There are hardly any farmers in those basins. Those zones, as we may say, will give us a lot of storage basins. Now, the principal barrier or the great barrier across the country is along the coteau. Then it jumps the Saskatchewan and is along the hills between the two Saskatchewans: it follows the height of land between the rivers draining to the North Saskatchewan and those running to the Red Deer. I happened to find out the depth of the boulder clay near the station called Fusilier on the boundary between Alberta and Saskatchewan. At three hundred feet they were still cutting through granite boulders.

The dry part of the prairie, as you all know well, very nearly fits the yellow band until you get near the North Saskatchewan River. This is the area in that part that is practically dry going west into South Manitoba, when you get to the south-western corner you are then going to the Estevan area from where in 1881 most of the settlers in Southern Manitoba came. They moved at once east and settled in South Manitoba. Now it has re-settled again—since about 1902—around Estevan. So we must commence with our discussion of the scheme of irrigation to be completed at that corner and take in everything as it goes. In that scheme we have it divided into several sections.

The Saskatchewan River has cut a barrier through here, dividing it into three parts, the part between the rivers, the part south of the river, and the part, we will say, east. The east is better supplied by timber and better supplied by water. The south was reported on by the Irrigation Branch of the Department of the Interior some years ago, to pump water at Moose Jaw or

Swift Current and carry it on to the Regina plain. It seems impossible to bring water from the Saskatchewan into the part discussed this morning, south of the Cypress Hills. In the discussion on storage basins it struck me there was another way of settling that. If the Cypress Hills were thoroughly forested, I think the retention of the water in the hills would be almost settled and there would be very little flood water then. I think it is up to the Forestry Branch to re-forest them thoroughly. North of the South Saskatchewan the distance to bring the water is very great. That is the point that Mr. Pearce has touched on and to get into Saskatchewan there is one spot you must get the water to and that is the division line between Sounding Creek and the Red Deer River, that is a point you cannot get away from. By bringing the water from the North Saskatchewan or the Clearwater River, just south of it, and from south on to this point down there, you are able to distribute north as far as the Saskatchewan. You cannot distribute from there south. From that east it is all downhill.

There is another thing that Mr. Pearce did not mention. The deep coulees are evidences of old drainage about which we have written many times. In the country to the south-west of us we have Etzikom coulee and Chin coulee which have no reason for their existence except the water that falls on their surfaces at the present time. At one time the Old Man River went all over the country and ended up at Medicine Hat, and so when the ice left the channel of the Saskatchewan again it cut a new channel, which, from Medicine Hat to Lethbridge, is a brand new one—not over 12,000 years old. We know that at Lethbridge we go down the bank and we go through boulder clay and finally arrive near the bottom of the Old Man River bed with round boulders here and there which was the old river channel. We go a little further down and get down to the dark shales and gradually strike a coal seam.

MR. PEARCE: When the question of irrigation first came up on a large scale, I believed and still believe that if there is anything in which Government control is particularly appropriate and will work out well, it is in the matter of irrigation. I am not a believer in the Government running everything; but in the matter of irrigation I think it is an ideal condition, and it was urged upon the Government at that time, as far as it was possible to urge it, but they would not consider it. We had then to induce outside capital or corporations to take it up.

There is one matter I did not emphasize. The people in Southern Alberta think that they have the monopoly of dry lands; but they are mistaken. On the 30th July, 1915, I travelled from Edmonton to Saskatchewan, and after passing Wainwright and until I reached Saskatoon, I never passed through a country that was drier and more windy than was that country. The same thing occurred shortly after getting past Rosetown to near Munson; so these districts require water just as much as any other part of the country. As this scheme is an interprovincial one, we shall have to educate the people of both

provinces to the necessity of agitation if they are going to carry it out. Unfortunately we have no representatives here from that portion of Saskatchewan. There has been a certain amount of opposition created there, but we found the same opposition in many parts of Alberta when we first started our irrigation propaganda. There is a large number of people who have lands they want to dispose of, and they have the idea that if the lands acquire a reputation that irrigation is necessary or beneficial to them, their value is very low and the chances of disposing of them probably lessened.