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Introduction by Professor Cook:

Our speaker tonight could be described as our token American. But still, even though he may be token, I think it might also be fair to say, that token is the most valued one. Perhaps I might mention that we had been particularly unsuccessful in obtaining Americans who would be willing to come and state their view, who were either willing or able to state their views so we're particularly grateful to our token American to come and to speak to us on the subject of the Columbia River Treaty with a southern perspective.

As a matter of fact, Professor Marts' talk is entitled, "Retrospection on the Great River Treaty from South of the Border". So a little bit of terminology has some significance of yet, of which I am not yet aware, but am all ears. Professor Marts is a Professor of Geography in Urban Planning. I don't know what relationship that has to do with the Columbia River Treaty either, but it does show me that he is a foreign Professor of Environmental Geography. And that does have something to do with it. He is presently dean of a summer school, and I know that has nothing to do with the Columbia River Treaty. And in the period from 1963 to 69, he was the, what was called down there use a quaint American terminology, Vice Provos… which in Latin stands for vice president academic. I think I know what that means, but again I don't think has anything to do with the Columbia River Treaty. However, he was born in Seattle. A native son of the Pacific Northwest, and I believe that might have something to do with the interest in the Columbia River. His early research was on, related to water resource planning in the Columbia River Basin. In fact, I think it's fair to say that Professor Marts has worked with, something of pioneering work in the area of benefit cost analysis, at least for geographers. I don't know what

economists would have to say to that, about that.

His research was on indirect [….] of irrigation. And as a matter of fact, his work was sponsored by the US Bureau of Reclamation. Professor Marts has written extensively on the development of the Columbia River and on the Columbia River Treaty. And so we've asked Professor Marts to come here this evening and to give us his views on the Columbia River after the lapse of some 10 years now. Have you written anything since? So Professor Marion Marts will be speaking to us on the subject of Retrospection on the Great River Treaty from South of the Border.

CRT Lecture 10: Marion Marts

Thank you Dr. Cook. I'm not quite sure, is this machine working at about at the right level. Fine. The connection of the Vice Provos position of course is, starting in that position in 1963, I disappeared completely into administration and therefore had to ignore the Columbia River completely. And therefore, while I'm very familiar at one time with the Treaty and Annex A, and Annex B and all that sort of thing, I never really got into the Protocol because I was into budgets by then. So that my retrospective view is rusty, has all the advantage of 20:20 hindsight seen through rusty spectacles.

Incidentally, I suppose should get a glossary laid out before you before going too far. If I say project, you know that means project. And if I say Pacific Northwest, I'm really talking about the north-western states of the United States, and if I say American, forgive me, I know Canadians are part of the continent and all that, but American is just an easy way to say denizens of the United States, so for you folks I'll probably say Canadians and for we folks I'll probably say Americans. I'm glad you're able to find a token American, and I think this is the first time that I have ever been an American of last resort.

Now down to the serious stuff. The background from the US side of the border really was the, to the Treaty, was the Columbia mainstream development program. Which was an out-growth of the depression years, based on planning really was undertaken in 1930-31, led to the recommendation to construct Grand Coulee and Bonneville Dam in the first 308 report on the Columbia River which was finally published about 1933, and at the same time, that old report identified the series of dams downstream from Grand Coulee and upstream from Bonneville which is the lower most of them.

Then that plan was all redone during World War 2, and by the end of the war, was about in ready to go shape. The notion being of course that with the return to civilian life of some 12 million service men in the United States, that there would be massive unemployment if the government didn't throw in large scale public works program almost immediately. And so the notion of the sheaf of projects ready designed, sitting on the shelf ready to be taken off and put into construction in order to counter the anticipated recession was also part of the background of the Columbia mainstream development program.

What it amounted to was a set of run-of-river dams, and I'm sure you've had all that explained to you, taking advantage downstream from Grand Coulee, and taking advantage of the storage and water releases from that storage space from Grand Coulee. But the run of river dams of course the essence is, that none of them has any capacity in the reservoirs behind the dam to carry storage over from the wet

season to the low flow season, which on the Columbia, as I'm sure you know, comes off in the middle of the winter. So, the storage plan was to include Grand Coulee, already in existence, and build a set of additional upstream, large upstream reservoirs, further upstream in the Columbia basin, and at least one in the Snake River basin, the Hells Canyon, a total of 6 reservoirs with a total capacity in the order of 20 million acre feet.

And from 1945 on, when that plan first came out in draft form, the recommendations for the upstream storage, the history of Columbia River development in the United States is summed up by the successive failure or withdrawal from consideration of one after another of the upstream storage proposals. Hells Canyon was turned over to a much smaller development proposed by the Idaho power company under the general philosophy of the Eisenhower administration that the private money was somehow cleaner and purer than public money. And never mind that it sacrificed 3 million acre feet of storage. Libby, of course, had been submitted to the International Joint Commission by reference of 1944. And the American bargaining negotiating position on Libby was just unconscionable. All we wanted to do was to buy out the piece of real-estate in the valley upstream and give you cash payment in advance and go ahead and build the reservoir. The notion of sharing output, advanced by the Canadians, was simply unacceptable to the United States' negotiators. Our negotiating team was led by a former used car salesman. Glacier View was turned over to the wildlife, and the Glacier National Park, and so scratch Glacier View for another 35 hundred feet of storage. The Koosky site on the Clearwater River would have inundated some Indian cemetery land, 2 or 3 small communities and also it would have effected the plans for a trans-mountain highway, that the Idaho highway department had long had on the drawing boards, and so scratch Koosky, 3 million acre feet. The Boundary site, which has since been built as a low dam by Seattle City Light, could have been built as a high dam in the backwater clear up onto the surface of Lake Pend Oreille, partially destroying of course the scenic qualities of the lake. It was objected to partly for that reason, but primarily because of the fear that it would drown out some of the mining properties in the Medalene district that is lead and zinc and silver ore mines in the Medalene district in Pend Oreille county north-eastern Washington. So the High Boundary Dam was not built with a loss of something like 4 million acre feet of storage. So on and so on.

You've got a total of, depending on how you score them, anywhere from 10 to 15 large storage reservoirs with a total storage capacity of something in the order of 35 to 40 million acre feet that were simply made unavailable by this seriatim set of decisions not to construct. So that by 1954-55, in addition to Grand Coulee which had been built in the 1930's, we managed to put only 2 more on the line. One, Hungry Horse reservoir, on the south fork on the Flathead in western Montana, for about 3 million acre feet, and a dam at Albeni Falls to control the surface up to natural high water level on Lake Pend Oreille, that added 1 million acre feet. So between the three, Grand Coulee, Albeni Falls, and Hungry Horse, we had about 9 million out of the target of 20 million.

At the same time, the run of river dams downstream were proceeding right on schedule, for a couple of reasons. One is that, as a result of the shotgun Treaty imposed on the Bureau of Reclamation and the Corps of Engineers that was announced in 1949, the geographic line was drawn around the boundary, and the Corps of Engineers was given the authority to build all of the downstream dams… that

is downstream from Grand Coulee, and also some of the upstream dams including Libby.

The Corps of Engineers has a great deal of political power as I'm sure you know. The lobby supporting the Corps is commonly referred to in the United States as the lobby that can't be licked, and the legislation authorizing Corps of Engineers proposal is, carries the standard nickname of the pork barrel, the annual pork barrel law.

The Eisenhower administration, as I already said I guess, was hostile to public development, that is federal development especially in the field of power, especially where a private power utility was offering any reasonable alternative or even unreasonable alternative as in the case of Hells Canyon, but the Eisenhower administration simply did not have the political power to stop the Corps of Engineers. Translated then into actual operation, this meant that the downstream run of river dams were proceeding on schedule, the upstream storage was stymied with the result that we were rapidly developing a situation, a very unbalanced situation in the Columbia River power program with a whole set of downstream power plants in place that would only become economic… would sit there and lose money until adequate upstream storage was provided.

About 1952, this situation began to be recognized by the planners in the region, by the utility companies, Bonneville Power Administration and so forth, and there was more and more talk about a mysterious, but mighty upstream storage site high up in the Upper Columbia River Basin, at a place called Mica. And so, it became a fairly standard question in the United States you know, is there some way the Canadians can save us? We're obviously not going to be able to do it ourselves. For a while, there was actually comforting assumption rooted around that, just wait, the Canadians would inevitably, and unavoidably develop the Columbia River themselves. To develop the Columbia, that meant they would put storage in at this place call Mica, and that means the water would run down the stream and we would be able to use it. So if we were just patient long enough, we would get the benefit of Canadian storage without having to put anything up.

Well, that worked fine, there was a brief flurry of panic when some wise guy on the Canadian side of the line suggested taking water out of the Columbia, and putting it through a tunnel and dumping it into the Fraser. We didn't take that too seriously because we knew the Fraser was a sacred river dedicated to fish, and it would be a long tunnel, 14 miles or so, and only American engineering, and ingenuity and capital would be able to overcome that kind of a physical barrier, etc.

So the Canadian strategy to panic us by the Columbia to Fraser diversion really didn't work. It just didn't get anybody aroused. Of course the lawyers had a field day arguing as to whether the high contracting parties, the initial letters were capitalized in article 2 of the Boundary Waters Treaty of 1909, but not in article 3 and therefore that meant that in under certain conditions, upstream sovereignty was accepted by the Treaty, and so the upstream state could do anything it wished and so forth. It was an amusing argument about what you expect out of lawyers, utterly devoid of reality. Is he here tonight? Oh I'm sorry. I wouldn't have said that had I known he was not here.

We also observed the fact that the Canadians had talked loudly and bravely about going it alone on the St. Lawrence Seaway. Finally we took that seriously, and knuckled under a little bit, and joined the Canadians in developing the St. Lawrence Seaway, and it's been a loser ever since. But still we refused to consider any serious and reasonably fair negotiation on the Columbia River.

And then somebody got the bright idea, I think it was somebody named of Wenner-Gren, who was a match king from Sweden or something like that, for you to develop the Peace River. And then we all rushed to our maps and found where the Peace River was. Obviously it was so close to the Arctic that we didn't have to worry about the Peace River. And then came along direct current transmission and suddenly that changed the whole picture.

Now the transmission technology had changed sufficiently that suddenly the Peace River became a seriously bargaining weapon in the hands of the British Columbia government, and Canadians in general, and for the first time then, it became apparent that our strategy of simply waiting for the Canadians to get impatient and develop the Columbia might not work for another 30 or 40 years, and in the mean time, we would lose all the money on those downstream, under-nourished run of river power dams.

So we signalled I guess, from our State Department to your Department of External Affairs, that we were ready to sit down and to talk like reasonable people, about not only Libby, but about the development of the Columbia. Oh yes, you had us confused about your no export policy too. And we didn't know whether that only applied to water or if it applied to power. But that inhibited us a little bit. And of course there's always the standard confusion that goes in on the United States, and only in the United States, as to where the real seat of power is in Canada. Whether it lies in Ottawa, or in the provincial capital as in the case of British Columbia, in Victoria. Was the capital of Canada Victoria or Ottawa when you start talking about the Columbia River? And very few Americans have ever been able to sort that out. And I'm sure you'll forgive us for that.

But we really didn't know much about the Upper Columbia in Canada. We did not know what cards Canada held, and we didn't even know whether Canada were willing to join in and play the game. So we engaged into the negotiations in a very weak bargaining position. We had no intelligence on the adversary. We didn't know whether the adversary was willing to negotiate, we didn't know anything about Mica except somebody had said it was an awfully, potentially very large site. We understood that the Peace River guaranteed all the power the Lower Mainland could have thrust down its throat for the next 30 years by nationalization, or with any other monopolistic marketing device. And we had this massive, but badly sunk investment in our run of river dams downstream on the Columbia. So we were not prepared for the negotiations.

I suspect although I have no information, that the Canadians were really not prepared either in terms of having done the homework, and having developed negotiating positions, gotten the engineering site studies, and the core drilling done and so forth. If so, I was unaware of it at the time.

But coming with the statement of agreement on principles in 1959, then things began to move very, very fast, as I'm sure you know. So, it's not surprising then, given the speed, the lack of preparation in advance, and then the speed with which the negotiations were conducted that the Treaty had some weaknesses. And I think some pretty serious weaknesses. At one time, shortly after the Treaty was signed, speaking before a group in Seattle, I reviewed the weaknesses, and then came out flatly and said , "When my advice is asked, which it will not be, I would say advocate the Treaty right now, and start over and design a good one." That was not done, but in effect, an alternative was carried out, and that was the development of the Protocol which converted what I think is a bad Treaty into a fairly good one. And incidentally most of the items in the Protocol, from my point of view were in favour of Canada.

My basic objection to the Treaty, the provisions of the Treaty was the same kind of thinking that stimulated the preparation of the Protocol. And that was that the Treaty did not provide adequate protection for Canada. I suspect, but I do not know, that the Protocol was largely dictated in Victoria, and so far as the Canadians dictated the Treaty, that that was more dictated in Ottawa. And I think in any case, whether it was Victoria or Ottawa, the Protocol was a much more realistic kind of approach to the issue.

My basic objections to the Treaty at that time, and still, although they've been weakened by the force of the Protocol were the lack of provision for incremental or staged development. It was a lump sum package ceremoniously signed for the whole thing. Incremental development, one storage reservoir at a time, and then examine it, get it started, examine the results, consider the alternatives then for the next step, do the proper evaluations, benefit and cost evaluation, and conduct negotiations for the next step and so forth. That is my notion of how the Columbia River program should have been built. And I find the Treaty no exception. So I think the one lump total package thing was unfortunate. I don't know how you can write a Treaty in pieces, but, maybe that should be considered for the next Treaty which might be on the Tia, or the Yukon, or some of the other rivers of the north-western.

Another problem of course was that the Columbia Treaty power coming on top of the Peace River development really swamped the power market of British Columbia. And while it isn't exactly my fault, I've always felt badly that the citizens of the Lower Mainland got stuck with, what I'm sure is the higher cost power, and the people in the Untied States got the Columbia power that might otherwise have gone to Canada. On the other hand, if you had not used the Peace River development as your bargaining weapon, you might not have got such a good deal out of the Columbia. We might have waited you out, and got that water for free.

So in retrospect, it's too bad that the two countries didn't simply join forces on Columbia development in a proper and fair way, without the additional confusion of the Peace River program, and the affect it had on the British Columbia power market.

Another aspect of the BC program that was probably unfortunate, and here as so much of it, sheer speculation, I suspect it diverted Canadian attention from proper planning on the Columbia. The Peace was the thing, Peace was in 1956 as well as 1966. As so, the planning and attention given the Columbia was probably less than it might otherwise have been. Another, and this is related to my first complaint,

the lack of incremental planning, that there was inadequate flexibility provided for reconsideration and renegotiation within the Treaty itself. Again, somewhat remedied by the Protocol.

But the Treaty was really negotiated while the planning was in progress… which is a bad way to write a treaty. Mankind's experiences, you write the treaty after the war is over. No, I guess that's not entirely true is it, we write a lot of conditional treaties during the course of a war in order to be sure that somebody doesn't enter on their other side and that kind of thing. But Mica's size for example was fixed, Treaty size was fixed to 7 million acre feet, really as a result of the Treaty negotiations, rather than as a result of planning considerations based on the project site itself. In other words, the Treaty was overly specific in some places, and too general in others.

But my basic, my most fundamental objection to the Treaty, and to the whole history of Columbia River development between the two nations is that it stopped short of complete electrical integration. We simply, to coin a figure of speech that I coined 10 years ago or so, we're in a position of a housewife trying to redecorate her home with a lot of various styles of furniture, so she tries to coordinate them all by hanging one set of drapes that somehow relates to all the pieces of diverse furniture she has. That's sort of what we did on the Columbia. We hung the drapes in the form of the Treaty, without bringing the furniture into some kind of coordinated and compatible plan. Think of what a great power system we might have had, and how long we could have postponed the day of the nuclear power, and all of the danger that brings had we really set up a power system all the way from Alaska to the Mexican border in Southern California. Sure, monstrously hard to administer and operate, all kinds of administrative and operational problems, but a challenge for man that's really worthy of human ingenuity. And the Treaty was not quite that.

Another major worry that I had, still have, is the emasculation of the mighty Mica site. 7 million acre feet in the Treaty, 12 million acre feet in the ground. Lip service provided in the Treaty to onsite power generation at Mica, but not the electrical system that would provide for the real trade and development of credit if Mica is withdrawn in order to maximize output in the total system, but loses at Mica on account of that withdrawal than there should be downstream credit built up to replace the electricity that Mica has sacrificed for the good of the whole. That kind of thing is not in there, sure. There's some adjustment. There's some adjustment in how much you have to deliver in the way of power and that kind of thing. But it's only partial. It's, to coin a word, tokenism.

But the major disability of Mica of course is that General McNaughton was not heated, and the Kootenay River diversion was not built. So they gave the United States the dubious privilege of constructing Libby and thus without reversing any of the flow from the Kootenay into the upper Columbia, we left Mica as a reservoir too large for the inflow to it to be the optimal site it could have been.

I suppose there are all kinds of ecological and environmental problems that would have resulted from the reversal of the Kootenay, but I point out that the Kootenay did at one time go that way anyway, and it's only in recent geologic history that, or was it the Columbia went though the Kootenay? Maybe

I've lost my stream history. I guess the Columbia flowed southward all the way from the Big Bend. Anyways, nature has rearranged things and I don't see where we can't on occasion. Certainly Mica would have been a greater power plant.

And Libby was marginal as I'm sure you know because of the high cost. And then perhaps further investigation would have found it unnecessary to build Duncan, and we could have gotten by nicely with a two reservoir system instead of a three reservoir system by using a greatly capacity at Mica Creek. But somebody in the opening days of the negotiation got hung up on the notion of having three reservoirs and so it got embedded in the Treaty and was carried on in the Protocol and there you are… probably one more than is needed.

And then finally, the Treaty to me represents an excess of sovereignty. Comes back to the article 2 or is it article 8 of the Boundary Waters Treaty and so forth. There's not enough effort nor attention in the Treaty to designing Treaty conditions simply as the base for coherent international negotiation, and then leaving all the super structure of cooperation to reasonable men working within some kind of reasonable administrative structure, and arriving at good design, planning and operating decisions as the problems arise. There was no macro think in the Treaty. It was a workman like job, carried on by good workman, but there's nothing in it to stir the imagination of the human soul… frozen wisdom if you will.

Not clear to me, whether the Treaty can adjust properly in the future as the US Pacific Northwest hydro power system flips from an all hydro system, to the use of the hydro plants strictly for daily peaking, with the base load carried by thermal plants. When that will arise, I do not know. My crystal ball doesn't tell me. All of our power planners say that will happen in the 1980's. I suspect that's a little premature. None the less, some time within the next 20 or 30 or 40 years, the hydro power plants in the Columbia River will not be of the storage in the spring, winter release, firming up low winter flows, balancing secondary, natural flow secondary power in order to produce dependable year-round firm power. They will be peaking operations, therefore the amount of storage needed will probably be less and, I think there's no one who can predict whether the value per kilowatt hour of peaking power and the lesser amount of storage water required will offset each other or not.

And I think this is the essence of the fundamental discussion that's been carried out for so long on the question of whether Canada got the better of the United States, or the United States got the better of Canada. I think no one has the foresight to predict the way the system is going to be operating by the year 1990, 2000. Pick any year you want, in order to make this kind of an appraisal.

Well, the weaknesses of the Treaty were in part the result of the weaknesses of the process and I've already mentioned that I felt that there was too much hast in developing the Treaty. What in the world was the hurry? After all, these negotiators got their per diem, and their travel allowance, there was no need for them to try and get the job done. Any good academic knows that if you can spend five days at a meeting on per diem you don't finish up in two days and go home. There was too much security. This was not negotiating 19th century style, secret diplomacy sort of Treaty. This was large scale natural resource planning and it should have been, as they say, carried on in a goldfish bowl, with the public and

the experts, from all quarters able to looking and watch and make their contribution.

Finally, there was too much Treaty. Why did we need a Treaty in the first place? Did we need a Treaty to put together the national hockey league? That's a complex operation. Did we need a Treaty to put together the Canadian Alaskan pipeline that was just announced? I'm not sure if there will be a Treaty. A contract, an administrative structure, a system if you will. What in the world was the Treaty for? A formality, signed ceremoniously by a Prime Minister and a President, both who probably never read it. Harder to abrogate, harder to renegotiate… all because the sacred honour and so forth of those nations is pledged to uphold the Treaty. At least until such time as is terminated, or abrogated, or redone. The Treaty itself is actually only of very modest utility. It's the Engineering Board's reports, this agreement on principles, and the consult that really, to my thinking, provide the structure and the good things that did come out. However, the Treaty is an easy word to cover the whole thing, but we really needed more planning less Treaty… more planning and less diplomacy. Next time, let's keep the State Department, and External Affair types out, and let the experts get together. They're usually men of goodwill. But there were some good points. And before I finish, just let me cite quickly some of the good things that I have seen in the Treaty.

Whimsically, cynically to start off, it gave Eisenhower a chance in his last week in office, to do something good for the Columbia River program, that his administration has spent 8 years sabotaging. But more importantly, it's the best international river agreement ever yet developed, and signed by two countries. Nowhere else is there one that comes up to its equal. It had another great advantage. It laid the nefarious Harmon Doctrine to rest I hope finally and firmly. The Harmon Doctrine as you know was advanced by an Attorney General. I guess he was back at the turn of the century, when Canada objected to somebody in Maine diverting part of the Allagash River which is the headwater in the St. Johns, and Harmon said that the upstream state was sovereign, and therefore, our Maine citizens could do anything they wanted with the Allagash River, and the Canadians couldn't stop us. And of course this came home to roost beautifully when Charles Bourne speaking in Seattle pointed out. That under the Harmon-Doctrine, the Columbia Fraser diversion was perfectly acceptable in international law. Well, the Columbia Treaty, I trust, has finally eliminated the Harmon Doctrine, at least from American thinking, and that we have substituted the Doctrine of Equitable Apportionment as a better way for neighbours to behave.

It is striking to me, another point, that we have between Canada and the United States a Treaty and yet between the states of the Pacific Northwest, there is no Treaty. No Columbia River compact on the US side of the border. Oregon, Washington, Idaho, and Montana have never been able to get together and write and sign an agreement. So here was something we're able to do internationally, but unable to do intra-nationally.

Although there was no electrical integration, and I'm sorry we missed on that chance, the Treaty did give Canada access to the Pacific Northwest power grid, the Bonneville system, and the high capacity inter-tie line to California. Canada is selling electricity in California, and that is a step in the direction of this Alaska to Mexico dream that I've always had.

The Treaty managed to avert the Fraser River diversion, had somebody taken that seriously, thus perhaps saving not only Columbia River power, keeping the Columbia from being a lesser stream, but also keeping, saving the fish of the Fraser.

It probably also postponed nuclear power by at least a decade, maybe longer, on the US side of the border. I'm sure we would have had a significant number of those things by now, had there not been the Columbia Treaty, and the Canadian storage available. The Treaty storage certainly weakens the case for the remaining large storage sites in the US side of the border, specifically the Nez Perce site which would block the Salmon River, and the High Mountain Sheep site, both of which would take out a good bit of what remains of the scenic, untouched, Hells Canyon gorge of the Snake River, and other sites. And also, the Treaty weakens because it supports the third power house at Grand Coulee, which will be an extremely large, peaking power plant when it's completed. This certainly weakens the case for the elevation of Ross Dam on the Skagit River. There will be so much peaking power at Grand Coulee, that the trivial 275 thousand kilowatts of peaking power that the Ross Dam enlargement would make available to Seattle, is a very modest kind of consideration. So you may be able to use the Treaty to strengthen your hand in opposition to Ross Dam, the Ross Dam enlargement.

Finally it contributed to the change of Canadian policy on energy export. And this was an important step forward toward international cooperation, and international energy policy which at the very least, can be used to minimize transportation cost on both sides of the border. So I'll be happy to expose my prejudices further. Questions? No more tokenism.

Audience: In your article, you did mention looking to Canada for alternatives. To what extent did that carry any weight?

Professor Marts: No I don't think so. Far as I know, it was completely ignored.

Audience: But you did mention that they did finally approach them?

Professor Marts: Yes, I mentioned it. I can't remember, I may even have mentioned Mica. I certainly mentioned Canadian storage as one of the possible alternatives.

Audience: On your upstream storage problem?

Professor Marts: I doubt if that had any influence on American power planning.

Audience: [inaudible]

Professor Marts: I often wondered. I agree with you completely. I suspect that many people in Seattle are hardly aware that there is a Treaty, or hardly aware that there is Canadian storage that's been provided as a result of the Treaty. And they're certainly unaware of the difference between an upstream storage reservoir, and the downstream run of river plants and the relationship between them. I don't think it's part of the general lack of knowledge of things Canadian on my side of the border, a situation that I regret, but

I think it's true. I think it's just a general feeling that there are more important things, and electricity is something you get from Seattle City Light, or Bonneville Power Administration or something like that. Never excited the imagination. There's never been any controversy about it. I even mentioned the Treaty, that I was talking about the Treaty up here to the Director of our Environmental Institute and I was rocked back when he said, oh yeah certainly took them long enough to negotiate that. And I think the negotiation took something like 2 years at the most, year and a half. That's the situation I don't know why.

Audience [Tim Newton?]: Do you feel the United States' position was weakened by the infightings between the Corps, and other American negotiators? Or did you feel they managed to patch up things?

Professor Marts: I suspect that they were patched up pretty well. The only evidence I have is the fact that the Treaty as negotiated in 1961, was far more favourable to the United States than I think it should have been, or that I think we had any right to expect. If differences arose, or our weaknesses identified, they probably underlay the fact that the Protocol, move things much more favourably in the direction of Canada so that the actual Treaty itself, I suspect there was a pretty united party line by the American negotiators and the Corps vs. the rest of the world meaning the president and everybody else. They only practice on the Bureau of Reclamation, that's just to keep in shape. May have had affected the Protocol, but I'm sure it didn't effect the Treaty.

Audience: Can you talk some more about some of the possibilities about what might happen in the future?

Professor Marts: You mean, how it'll be used?

Audience: Yes, certainly no ones talked about it.

Professor Marts: Well the background of the Treaty, and the background of the whole upstream storage objective and planning was to catch flood flows in May and June, and hold them through the summer and release them the following winter when we need the power, and when the river's the lowest. Seasonal smoothing of the river flow. And by the time we get this horrifying prediction of 1 million kilowatt nuclear power plant every year being added to the regional system. By the time we've got 20 or 30 of those, that will carry all of this winter power load. You'll turn them on, and you'll leave them on by the month. And even fluctuating their output will increase cost. So the more uniform the rate at which they produce power, the more economic those uneconomical things will be. Then the rest of the fluctuations in the load, the 7 am cooking of breakfast, and the 5 pm dinner and shower and so forth will be carried by the hydro power plants because they can be turned on very easily. They're magnificent for that kind of close adjustment without loss of energy or anything else. And so the goal then will be to keep all of the reservoirs completely full, in order to maximize the head. You'll try not to draw down, on any daily peak period, any more than the river will refill during the rest of the day. Keep a level, uniform surface on the reservoirs. And I really, as I'm afraid I said before, just can't predict how that is going to affect the value of the Canadian storage in the future. But my suspicion is that it will be less valuable 30 years from now, than it is now.

Audience: I'm sorry, but can you explain a little bit more?

Professor Marts: Well, basically the water shortage comes from the fact that so much of it has to be release in the winter months to keep power generation up to load, up to the demand. So that in the future, with all the thermal plants, they won't be releasing in the winter, therefore all that water available during the flood period will be kept and saved all winter long, to provide a full head in all of the reservoirs. And this incidentally will be the way, I'm sure Mica will be operated ultimately, and will be all to your advantage not to release storage from Mica, more than just enough to meet the daily peak loads when you've all those oil, and coal, and nuclear plants providing the base load. It'll be a complete reversal of all the hydro planning in this region which has been carried on up till the present time.

Audience: How does the Kennedy administration feel on the Treaty?

Professor Marts: I'm not sure that the Kennedy administration paid much attention to it. Certainly they were sympathetic enough that there apparently was no objection to signing … agreeing to the Protocol. In which, as I said most of the changes that where made in the Treaty, or annexes went in favour of Canada. Generally speaking, the Kennedy administration was quite the antithesis of the Eisenhower administration with regard to public investment, public activity in a variety of fields. But, power planning was simply not a high priority issue in the Kennedy years. Social welfare programs, and of course the rising war in Vietnam and so forth attracted most of the attention. I think probably it was benign neglect of the Columbia power program and what was going on in Canada. Leaving that to the people in the Department of the Interior. I don't know… anybody else have a different view of the Kennedy years? I have some experts here. By then I was Vice Provos.

Audience: Generally in those years, the Kennedy administration, the large public projects would be entertained in Washington. The shift from private to public.

Professor Marts: Well there was some reversal of the Eisenhower administration's attempt to push it all off on the locals. It ended not the local private utilities, but the local public utilities doing most of it. But, then the Kennedy administration sponsored a more liberal set of evaluated criteria, what finally came out as you probably know, as Senate document 97. It was not a Senate document, it was an executive branch document. It provided much more liberal ground rules for the evaluation of benefits and costs and therefore made big projects, typically meaning big federal projects and programs much more feasible in the water field. So the Kennedy administration was certainly more sympathetic than the Eisenhower administration had been.

Audience: All I know about the Doctrine 97, it begins to give values, signed values, to recreational and environmental aspects.

Professor Marts: Yes.

Audience: Yet those didn't get into the Treaty?

Professor Marts: No, but this doesn't surprise me because, while there's lip service, in Senate 97 and subsequent documents, there was very little of it actually done on environmental issues. Even today still. But certainly by, as of 1959, '60, '61, '62.

Audience: The pressure groups aren't there?

Professor Marts: The pressure groups weren't there. The engineers had not been sensitised by the pressure groups, or by the writings. We hadn't even invented Rachel Carson's Silent Spring until 1962. That was pesticides… that wasn't the effective reservoir impoundments upon nice valleys, deer boroughs and so forth.

Audience: Isn't the document 97 now superseded by the…?

Professor Marts: Yes it has been. And the water resource test force report which came out in the review draft form 1971 has been superseded by the Office of Managements and Budget version which is more restrictive and which was published in September of 73. So that's the current controlling document.

Audience: Both seem to be doing a much more elaborate job in evaluating environmental impact.

Professor Marts: Yes. Well, it calls for, it sets up two dominant goals. National economic well-being, and environmental well-being. Other goals are subordinate. But it called for high interest rate, high discount rate and so forth. So more restrictive really than Senate 97 was.

Audience: Have any case studies been done applying those documents?

Professor Marts: I'm sure there have been, but I'm not familiar with them. Oh I'm sure the agencies themselves, yes. I've saw brief reference to a Corps of Engineers report, or something, or senate committee report, public works committee probably, that so many Corps projects would be infeasible under these guidelines. As a matter of face, the guidelines are right now under serious attack. The Congress has passed, and presented to the Senate the flood control act of whatever the next year is, I guess it's 1975, which goes back to the discount rate formula that applied in Senate 97, gives the President 1 year to present a report as to why the 4 goals of the water resources council should not be considered anew. And those 4 goals include the 2 that were accepted by the OMB version, and also the regional wellbeing and social wellbeing of people. So this is a direct challenge now to the President. And I suppose in part, well, it's clearly a reaction to the OMB version of the water resource council principle and standards, but I suspect also the fact that they feel free to make this direct challenge, is one of the pieces of fallout from Watergate.

Audience: One of the criticisms on this side of the border has been the, the sale of the downstream benefits for cash. And they say, the light of the energy crisis, they consider it the truest advantage to the Untied States, that BC insisted in selling those downstream benefits.

Professor Marts: I suppose it is because it'd be more costly now to pay but at the time, it was a source of

embarrassment because we didn't quite know how we were going to find the money to put it up. And in very short time, put together a consortium that was willing to obligate itself to take the power, and arrange money in advance. So it was a very awkward thing for the United States to accommodate. And it came as a bit of a surprise.

Audience: What about flood control benefits that we now feel we're giving much more than we're getting? Is this an issue?

Professor Marts: Can you say that again?

Audience: Well, the flood control benefits. It's felt in Canada now, that we did not get anything like our proper share of advantages that the USA got. Last year you had some astronomical sum that would have devastated your side of the border if it hadn't been for us.

Professor Marts: I think the American position pretty much has been that we overpaid for the flood control benefits. That the American storage available was sufficient to have controlled any flood up to the 1894 level, no more than 800 000 cubic feet per second which would be approximately two-thirds of the 1894 level, and we could accommodate, we could accept an 800,000 cfs flood without serious damage downstream. These figures are a little old, and undoubted there's been a lot of development since and so forth. **And the current target of 600,000 cfs probably reflects that greater development but we could have adjusted to and stayed with the 800,000 and we about had that within the United States**. So I think you'd get a good argument from any American river basin economist on the amount of flood control. Incidentally of course there was a technical issue too. Although the Canadian power storage was given next added position, which was more favourable, the flood control storage was treated as average within the system, rather than incrementally analysed. This had the effect of giving Canada an advantage also on the amount of payment for flood control that the United States made. We overpaid for flood control I'm sure. I'm not sure … I don't think we overpaid for power, and maybe there was some trade there.

Audience: [inaudible]

Professor Marts: In these days, we're used to the Canadians objecting to much of what we have been doing, the public reaction would just be that its more of that. The technical reaction would probably be, and here I am on very shaky ground, that the people who are really familiar with the issues, would not object seriously to renegotiation. But, probably with a view to reducing the amount of payment to Canada… the Canadian entitlement on the bar. Clearly the cost of Treaty power in the United States has eliminated that rosy era of low cost hydro power that we thought was going to be so important for economic development of the Pacific Northwest. That era is gone and therefore, and it's gone largely because we failed to get our own upstream storage. We had to pay Canada, and the payment to Canada was more than it would have cost us to do it ourselves. And so the interest in hydro power is gone.

Mr. Higgins: Mr. Marts, I happen to agree with very many of your observations, although I disagree with a few. I wondered if I might make one or two comments.

Professor Marts: Sure.

Mr. Higgins: I noticed as you went along, first thing I would say is this, I think many of, and nearly all of, Canada's technical advisors, the sensible men whom you referred who might have been given a chance with our opposite members across the line, to work out along the way a much more flexible agreement had they been given a chance to do this. I agree completely with your point with respect to the specificity of the Treaty, indeed even to the existence of the Treaty. Particularly I agree with respect to … I think they have to keep all the provisions of the Treaty and all the Treaty sites. Indeed, even the position to build the Duncan Dam at Duncan Lake had not been taken as a hard and fast decision. If you look at the Treaty, the Duncan Dam's not in there as such. It could have been moved to another river. One of the assignments given was to look at Mica, and this is very interesting, because it's so often forgotten that the staff advisors in Canada were not big spectre men. They were not going to build the projects themselves, they weren't going to operate them. They weren't out to build engineering monuments. BC had a strong hunch that it might make sense to build a much smaller project at Mica, and another one upstream, and these two together might make economic sense… much more sense than a great big 20 million acre project.

Now Conseco finally convinced them that it was economically sound to build a big one, but we could really only build a 7 million acre project for storage purposes only under the terms of the Treaty. It really isn't correct to suggest that the Treaty constrains here. I happen to disagree with your thesis vis-à-vis about how we found out about maximizing its output. If the Treaty be fuel pumped from systemic perspective only, and if Canadian environmental concerns be ignored, and if incremental costs be ignored, but as it was, we indulged the American desire to build, or the agency's desire to build Libby, and I think you could make a pretty good case for the fact that we didn't suffer as the consequence even though Mica doesn't produce as much power, as it might otherwise have been the case. I think perhaps, perhaps one other thing. You happened to mention the fact that if the Treaty hadn't been signed principally, here incidentally I think I pointed out, it was Mr. Bennett this is his fundamental observation on the Treaty 'signed too soon' he says

Professor Marts: First time I've ever agreed with Mr. Bennett.

Mr. Higgins: You referred to the fact that Duncan should have been taken out. And I think you're right. My own interpretation is the fact that it's in there is this. The prospect of taking it out was put on the table in August 1960. In a complicated exchange, the condition however, on the Canadian point of view, the United States agreed to pick up part of the cost of the Libby flowage areas… reservoir in Canada, if we let them, but here was another piece. That was that the United States be given a 10 year option with respect to Libby. This is the point I started my comments on 10 minutes ago, you can't take the political out of politics. If there's one thing government of British Columbia wanted to end by 1961 if it could, it was the uncertainty which East Kootenays had lived with for 20 years. And to give the United States 10 years, another full decade in which to decide or not to decide to build Libby, I'm convinced was the fundamental reason which by the way prompted the government of British Columbia to say, well we're just going to have to reject the option, but otherwise you're right Hydro.

Professor Marts: Well, I wouldn't want to respond. You've obviously studied this far more thoroughly than I. All of my knowledge of what was going on in Canada, is largely based on inference. My only fall back on a basic principal which is that if you're going to compromise a site by a river valley, by any dam, it might just as well make the dam big, rather than small, and get the most benefit out of it as possible. And I suspect that somehow, had Mica been larger, we could have worked out ways to use it. And I guess it's larger isn't it?

Mr. Higgins: Yeah. It wouldn't have been any larger. It's simply at certain times of certain years, it would have more water in its reservoir. That's all. To do that we would have had to build 3 dams in Canada, perhaps 4 through the Rocky Mountain trench.

Professor Marts: But am I incorrect in my understanding that Mica has now built, is able to store more than 12 million acre feet? I mean more than 7 million acre feet?

Mr. Higgins: It stores 20 million acre feet: 12 of it is live storage, the other 8 million is dead storage.

Professor Marts: And the reason for picking the 7 million, is that is just assured refill, annual refill?

Mr. Higgins: Basically, although there's a little more than that I think.

Professor Marts: Well, if the Canadians are convinced the Treaty did not interfere with building Mica to its full economic limit, then I'm pleased. And I hope you're right, and I'm wrong.

Audience: [inaudible]

Professor Marts: It's still completely in abeyance. It's still considered a marginal project, and now a days, of course it's also subject to the environmental attack. Based largely on the nitrogen super saturation problem. That's the only part of the Columbia River where natural equilibration can take place between the oxygen level content and the nitrogen content in the water because that's the only free flowing part. So I don't know what. My prediction is, that Ben Franklin will probably never let it go. I have a confidence limit of 40%.

Audience: Can you tell us something of the Knolls site.

Professor Marts: No, I can't. I haven't heard anything more about the Knolls site for some time. Nor the Buffalo, the various Buffalo Rapids Dam.

Audience: Your comment earlier, the chief negotiator on the American side was a used car salesman.

Professor Marts: That was not on the Treaty. That was on the IJC negotiations over Libby, before the Treaty negotiations.

Audience: So what did the guy in the Protocol receive a new person?

Professor Marts: I'm not sure.

Audience: We've been led to believe that Canadian negotiators have been led through the woods. What are you feelings on that?

Professor Marts: I though they were pretty good. I just thought they were being kind. We were in trouble, they knew it, and they were trying to help us out.

Audience: You thought they were being conned?

Professor Marts: No, kind.

Audience: Oh kind. Did you know, Mr. Williston the other night, after he had finished speaking, said that we were supplied with information by the Americans to destroy the argument of the Corps of Engineers. Do you know anything about that?

Professor Marts: No I don't, it was mentioned to me earlier today. That's the first I've heard of it. And he said we?

Audience: Yes.

Professor Marts: Alright, this may explain the relative American weakness when it came to doing the Protocol. My theory then would be that the Ottawa folks who basically negotiated the Treaty were less aware of the American weakness than the British Columbia people were after the Treaty, and in the development of the Protocol. Is that a reasonable theory? Yes, I think it was surprising how many weaknesses there were in the first version of the Treaty. Weaknesses from the Canadian point of view. I never knew why. You had good people, and I didn't develop any theory that you were poorly represented. And I'm not sure that we had exceptionally able negotiators on our side. I just thought there were 3 or 4 engineers that sat down and tried to work things out. Little technical things that were surprising that the Canadian engineers would agree to. Like the 20 year critical period, which was too short, which was lengthened to 30 in the Protocol. And 40 would have probably been better. But it was amazing that a simple and obvious thing like that slipped through. Even a geographer would be able to spot the weaknesses of picking a 20 year critical period and building it into a Treaty.

Audience: What was the speculation on the use of the time period of 60 years into the Treaty. Why 60?

Professor Marts: That may have came out of American planning practice which is to consider 50 years as the economic life of a project. And a 10-year development period to get the projects built in the first place. May have led to the 60 years. Some kind of planning or engineering convention. Certainly nothing in the logic of the situation, or in international administration would have kept the 60 instead of some other period. It's a good round number.

Audience: You are giving us the hindsight. Let's look forward. What do you see with the advantages in the way of future planning?

Professor Marts: Planning separate from the Columbia?

Audience: Well, what has already been done?

Professor Marts: I think it would be very interesting when we get into the, after the end of the 30 year period of sale and the consideration as to whether Canada will extend the sale of power to the Untied States, or call back the Canadian entitlement. And that will depend on a lot of things that happens here in British Columbia. It may also depend on the purchasing power of the people in California who are buying your Canadian entitlement power. And that if I can spin along here a little further. And that will depend upon the cost of nuclear energy and every time a new nuclear plant is built, it appears that the cost has gone up dramatically. Over and above just the normal cost of inflation, so that 30 years from now, the Canadian entitlement power may look awfully good in California, and may as a result of the effect of nuclear power pricing, be so saleable at such a high price, that you won't be able to afford to call it back, and that may lead them to pressure for more hydro power projects in British Columbia, or more fuel fire plants to substitute. Assuming that by then you need more than what you're now getting at a present plant, including the Peace. How's that for speculation. Would you like to seduce me further?

Audience: Well, do you have any other ideas?

Professor Marts: Obviously when I'm talking about further hydro plants in British Columbia, you're aware then that Moran site comes back up to the top of the agenda. This is terrible for me to see a relationship between the inefficiencies of nuclear power, and the threat of constructing the Moran Dam on the Fraser. So maybe the best thing for us is to pray that the nuclear power engineers can come up with good machines instead of inadequate machines.

Audience [Tim Newton?]: One of the criticisms that we've heard a lot about is in selling the downstream benefits, we sold jobs downstream. Is this factual? Has there been a large increase in, for instance, aluminium? Do you feel that these plants are in fact beneficial thing to your particular state, in the United States?

Professor Marts: Of course the aluminium industry in the Pacific Northwest is not welcomed. Mainly because it means additional power development and conflicts with our, the general public's attitude to hold the line. As far as selling jobs, the Americans all took it for granted that you would indeed take the Canadian entitlement power in British Columbia, and so it came as a great surprise when the Bennett government announced that it was going to be sold in the United States. That was clearly not a decision that we'd thrust on you at all. We were all ready to build a transmission line up to someplace called Oliver, none of us knew where Oliver was, but there it was, and charge you $1.5 per kilowatt year for standby capacity, and all of that, you saved $2 million on that standby capacity that you didn't have to pay for etcetera, etcetera.

Yes, you did provide more employment, construction employment primarily at the sites that are being enlarged, the power plants that are being enlarged now on the US side of the border. You probably, had you withheld the storage somehow, wouldn't have gotten those jobs, the sites simply wouldn't have been

increased. That means the 3rd power house at Grand Coulee, and the enlargement of 3 or 4 others. Incidentally, you look at the table of Annex B of the Treaty, and it gives the ultimate size of Grand Coulee as something like 3,600,000 kilowatts or there about. And of course that figure is obsolete now. It's more nearly 7 million kilowatts as the current ultimate plan. You bought into a magnificent power plant, just Grand Coulee alone. I've often said that Grand Coulee was the best investment the United States have made since the Louisiana Purchase. And to think that you are able to get a share of the output of Grand Coulee, just by inundating 3 or 4 beautiful valleys.

Audience [Tim Newton?]: One other side effect apparently that has materialized as a result of the Treaty in the States is the coordination of a lot of free enterprise, and public generator facilities in the States. Would it be saying too much to say that this in fact would be worth as much as the Treaty to get these various utilities to cooperate in a unified fashion?

Professor Marts: No, I don't think the incremental benefit from the coordination agreement is anywhere the size of the incremental benefits from the Treaty. Sure, they're substantial and important, and they may even be rational, but they're not in the same scale as the Treaty. I would hazard to guess by a factor of 1 to 10 maybe. There was a good deal of coordination, prior to the coordination agreement de facto. 2 power house operators getting on the phone and talking things over when they had a problem that kind of thing. But the coordination agreement was more to satisfy the people in the front office that the accounting was done properly and so forth. It was a management kind of thing. Not so much an operational motive, not so much motivated by operational requirements. That again is a jaundiced and cynical view. You can discount it if you wish. I think I have exhausted, exhausted your audience, and your audience has more than exhausted my wisdom.

Mr. Cook: One more. One more token question.

Audience: What are your objections on nuclear power?

Professor Marts: Hazard of course, especially the hazard of moving the waste around and the threat of it being hijacked, and used for terrorist purposes. One shipment diverted, captured by terrorists, and we have to surrender Canada to something or some other hostage that may be held. And insurance. The insurance of the liability is limited. And even with the limitation on the liability, the insurance is 80% the cost of it is 80% covered out of public funds, rather than by the plants themselves. That does not sound very reassuring to me. The fact that they have to be out in areas of low population density, which means then, the heat has to be wasted because there's no nearby market for it, doesn't sound very reassuring to me. If they're safe, why can't they be where the heat can be used. If they're not safe, why do people keep saying their safe? The plumbing always goes bad on them.

The use factor has been well below 50% on practically all the nuclear power plants in the United States. The same day, last winter, that Richard Nixon was talking to the editors in Florida, citing how comfortable it was to have his San Clemente Whitehouse right next to the San Offray nuclear power plant. That very time, that plant was closed down because of a safety machine failure. And the fact that

they are very wasteful of fuel, and all the high grade uranium fuel will be used up very quickly, and the low grade will be very expensive, or we may not even be able to find adequate fuel so we may end up with a shortage of uranium fuel, even before we end up with a shortage of petroleum. Which would be ironic. And the fact that the agency involved, plays a very ambivalent, schizophrenic role. Having to sponsor the research and development, and at the same time, play the advocacy roll. It's just the wrong way to design an executive agency. This is the Atomic Agency Commission. They can't do both, and do an honest job at both.

Audience [Tim Newton?]: So is this problem just specific to the US situation? For instance, Canada where the Candu reactor uses natural uranium so you haven't got the fuel problem, and where the licensing is different.

Professor Marts: How do you get by with non-enriched uranium? Does it come out of the ground so rich?

Audience: No, we use the natural uranium with a heavy water moderator. This allows you to use natural uranium as a fuel. As opposed to enriched uranium as the US reactors.

Professor Marts: This is not a breeder reactor?

Audience: No, this is not a breeder, although it has many of the characteristics in fuel saving of a breeder reactor. And in performance at Pickering have been better than any other thermal station.

Professor Marts: The British experience is better. And I don't know, I suspect there maybe because there's more public intervention in Canada, and in Britain than in the United States.

[Closing Remarks]