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THE COLUMBIA RIVER TREATY AND PROTOCOL AGREEMENT

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INTRODUCTION

Across the world today there are about seventy-five major international river basins. Some of them possess considerable hydroelectric potentials, and many of them could be harnessed to provide irrigation, navigation, flood control, and other services. In many instances their development might provide the key to economic growth.¹ So far, however, very few international river basins have been developed, and even where development has taken place it generally has been limited in scale and in scope. In many cases the utilization of the available resources has probably been far less than it would have been had no boundary existed. The tendency is for the countries sharing international river basins to develop alternatives first, even though they may cost far more than the benefits that could be obtained from a co-operative international venture.²

There are three broad types of international river development: unilateral, exclusive, and unified. These reflect differing degrees of international co-operation.

A. Unilateral Development

In this type of development one nation may take the initiative and develop its own part of the river. Sometimes this development will affect the other country, but usually the effects are small, and

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1. The International River Basin, Proceedings of a United Nations Seminar on the Development and Administration of the International River Basin, University of British Columbia, Vancouver, British Columbia 1 (Chapman ed. 1963).

2. Scott, *River Basins—National Pawns or International Wealth*, Paper presented to the Vancouver Institute, January 6, 1962, p. 1.

international agreements for compensation are fairly easily obtained. The works involved are generally located in the country which uses them. International co-operation may be suspended, but the effects are never so serious as to cause a national emergency. Instances of unilateral international river development include improvements on the Rhine, the Danube and the Nile Rivers. Most of the problems dealt with by the Canadian-United States International Joint Commission³ are in this unilateral category and relate to such matters as regulation of stream flows to prevent flooding in one country from development in the other, or to prevent pollution in one country from waste disposal in the other, although the International Joint Commission has other important functions also.

B. Exclusive Development

Competition for the use of the waters of an international stream may be so great, or the problems of co-ordination of use so complex, that the only possible course of action is to divide the waters between the countries sharing the river. The division of the Indus River between India and Pakistan is perhaps the best example of exclusive development. Another instance is the St. Lawrence River, where the river is literally divided down the middle, with United States powerhouses extending halfway across, and Canadian powerhouses located on the other half.

C. Unified Development

In the case of unified development, the countries involved decide to develop the basin to its optimum extent, ignoring the existence of the international boundary. This approach is based on the concept of integrated, basin-wide development. Its basic tenet is that by recognizing the hydrologic unity of the basin in planning and development much greater net benefits may be derived than with independent development of the separate parts of the basin.⁴ The

3. The International Joint Commission was established pursuant to the 1909 Boundary Waters Treaty between the United States and Canada. The Commission consists of three members from the United States and three from Canada. The basic function of the Commission is to study disputes arising from the use of international waters and to make recommendations to the two governments. To carry out these responsibilities it has established various Boards to control water use. It also sets up boards from time to time to investigate problems which are brought to its attention. For a discussion of its work, see Bloomfield & Fitzgerald, *Boundary Water Problems of Canada and the United States* (1958).

4. The river basin often provides a convenient unit for planning the development of water resources, especially in those instances where the larger part of the popula-

excess of benefits over what could have been achieved with independent development can then be shared between the participants.

The logical outcome of this approach is a division of labor between the various parts of the basin, as for example, storage in the headwaters and generation downstream. For maximum advantage to be derived, operations of the various facilities are centrally coordinated and integrated.

There are several examples of unilateral international river development, and a few examples of exclusive development. So far, however, there has been no instance of unified development. The Columbia River offered great possibilities of being the first example of unified development of an international river. Certainly, many of the basic requirements for such an approach were there. Here were two countries with similar political ideologies, a long history of international co-operation, and considerable experience in river development. Furthermore, there were growing demands for electric power on both sides of the border. Unfortunately, however, the arrangements under the Columbia River Treaty fall short of the ideal of unified river basin development.

I

ORIGINS OF THE COLUMBIA RIVER TREATY

The Columbia River Treaty is the end-product of a search for upstream storage to regulate stream flows for power generation and for flood damage reduction. The larger part of the head on the United States' portion of the main stem of the Columbia River has been developed; only the Ben Franklin project remains to be constructed. Installed capacity on the main stem of the American reach will total 9.8 million kilowatts when all projects now under construction are completed.⁵ Another 3 million kilowatts of capacity are distributed on the Clark Fork-Pend Oreille and Snake Rivers. (Figure 1)⁶

tion is concentrated in the basin, and where the services derived from the development of the water resources are used within the basin. In other instances, however, other regional units, either smaller or larger than the river basin, will be more appropriate for the development of water resources. For a discussion of this point, see Fox & Craine, *Organizational Arrangements for Water Development*, 2 Natural Resources J. 1 (1962).

5. Krutilla, *The Columbia River Treaty: an International Evaluation* 6 (Resources for the Future, Inc., 1963).

6. *Ibid.*

FIGURE 1
 MAJOR PROJECTS PROPOSED AND CONSTRUCTED
 ON THE COLUMBIA RIVER AND MAJOR
 TRIBUTARIES



Optimum utilization of this capacity, and the development of further capacity, hinges on the provision of upstream storage to even out the seasonal and cyclical fluctuations of river flows. The

United States Corps of Engineers has estimated that 27 million acre-feet of storage are required for the "C" phase of power development.⁷ So far, however, only 13 million acre-feet of storage for power purposes have been developed.⁸

In addition, there continues to be a threat of inundation from major floods in the Columbia River Basin, especially in the lower reaches of the river. The United States Corps of Engineers estimates that some 18 million acre-feet of storage are required to reduce the 1894 flood to 800,000 cubic feet per second at the Dalles.⁹ Only 2/3 of the required amount has been provided so far. Of the 13 million acre-feet of storage developed in the basin to date, only 10.5 million acre-feet are usable for flood control purposes.¹⁰

A number of major storage sites are still available in the United States part of the basin, but development of some of the most attractive ones is stalled by various conflicts of interest. Glacier View, for example, is stalled because of opposition of parkland and wildlife interests. Nez Perce was shelved because of conflicts between the fishery interests and power interests.¹¹ Attention has turned therefore to possibilities in Canada.

A. The International Joint Commission Reference, 1944

In 1944 the United States and Canadian governments asked the International Joint Commission to investigate the possibilities of developing the Columbia River basin on a unified basis, ignoring the international boundary.¹² The International Joint Commission set up the International Columbia River Engineering Board, which presented a report after 15 years of study. It outlined three alternative schemes of development which would make possible "The maximum practicable utilization of the water resources of the

7. 1 U.S. Corps of Engineers, *Columbia River Treaty and Tributaries*, H.R. Doc. 531, 81st Cong., 2d Sess. 115 (1950).

8. Krutilla, *op. cit. supra* note 5, at 7.

9. U.S. Corps of Engineers, *Water Resource Development of the Columbia River* 33 (1958). The Corps of Engineers has also considered the reduction of the 1894 flood to 600,000 cubic feet per second at the Dalles. This would require about 30 million acre-feet of storage. *Id.* at 34.

10. Krutilla, *op. cit. supra* note 5, at 8.

11. For discussions of problems of developing upstream storage in the Columbia River Basin in the United States, see Marts, *Upstream Storage Problems in Columbia River Power Development*, 44 *Annals of the Ass'n of American Geographers* 43 (1954); Marts, *The Middle Snake River Controversy*, *Water Power*, January, 1961, pp. 23-27.

12. The Canadian reference note is reproduced in Canadian Dep't of External Affairs, *The Columbia River Treaty, Protocol, and Related Documents* 17 (1964).

Columbia River Basin."¹³ Any of these schemes would produce over 16 million kilowatts of prime power, and would require over 50 million acre-feet of storage.

The report revealed that there are opportunities for developing upwards of 23 million acre-feet of storage in the Canadian part of the basin. Possibilities for head development in Canada, however, are quite limited. Storage development in Canada, therefore, hinges largely on whether the United States is willing to provide the necessary incentive.

B. The Principle of Downstream Benefit Sharing

Various incentives were proposed. The first was compensation for the lands which would be flooded by the reservoirs in Canada. This approach was probably based on the principle in the 1909 Boundary Waters Treaty which states that a country can use in its territory the waters which flow across the boundary, providing that claimants in the other country who are injured are entitled to the same compensation that an injured party in the country using the water would have.¹⁴ The Canadians, led by General McNaughton, Chairman of the Canadian Section of the International Joint Commission, realized that compensation for land flooded by the reservoirs understated the value of the storage. Its real value was in the extra power that could be generated downstream and in the reduction of flood damages that it made possible. And so the principle of downstream benefits was born. This was a new concept in the development of international rivers in North America. The notion of compensation for damages was replaced by one of sharing of benefits of development.

Canada claimed a share of the benefits. At first the Americans were unmoved by this claim. It was thought that Canada would have to develop the Columbia River eventually, and that all the United States had to do was wait, and then collect storage benefits free of charge. Two events, however, changed American thinking

13. International Columbia River Engineering Board; *Water Resources of the Columbia River Basin* 9 (1959).

14. Article II of Treaty with Great Britain Relating to Boundary Waters Between the United States and Canada, January 11, 1909, 36 Stat. 2448 (Boundary Waters Treaty of 1909) states in part:

it is agreed that any interference with or diversion from their natural channel of such waters on either side of the boundary, resulting in any injury on the other side of the boundary, shall give rise to the same rights and entitle the injured parties to the same legal remedies as if such injury took place in the country where such diversion or interference occurs

in this connection. First, Canada threatened to divert the Columbia River into the Fraser River; second, British Columbia announced plans for developing the Peace River in northern British Columbia. It is difficult to assess the impact of the diversion threat. Certainly it did not result in any immediate action on the part of the Americans to persuade Canada that non-diversion was more profitable. Many Americans did not take it seriously, for they were aware that diversion would probably harm the Fraser River fishery. They thought, therefore, that the Canadian government would be unwilling to sanction such a scheme.¹⁵

The announcement of plans to develop the Peace River, however, certainly was taken seriously by the Americans. In fact, it is probable that this announcement was the most important single event in the course of the negotiations relating to the Columbia River. It was now clear that Canada might not develop the Columbia River, and that she would have to be given a positive incentive in order to encourage her to do so. Doubtless it was this announcement that led to official recognition of Canada's right to downstream benefits in January, 1959.¹⁶

C. Determination and Allocation of Downstream Benefits

The problem then became one of finding a mutually acceptable method for determining the magnitude of the downstream benefits and finding a formula for allocating these benefits between the United States and Canada. Unfortunately, the International Columbia River Engineering Board Report provided no guidance on these matters.¹⁷ The report assumed, for example, that all the projects would be built simultaneously. This simplified the studies but failed to recognize a most important factor in hydroelectric power planning: the first storage added to a system is the most valuable. The first one million acre-feet of storage results in a much greater increase in prime power than does the second million acre-feet of storage. The aim, therefore, is to build the most economic

15. For a discussion of the Columbia-Fraser diversion proposals see Senator Neuberger's testimony in *Hearings on Upper Columbia River Development Before the Senate Committee on Foreign Relations*, 84th Cong., 2d Sess. 13 (1956).

16. See Phillips, *U.S. Concedes Power Point*, Vancouver Province, January 30, 1959, p. 3.

17. In its terms of reference to the International Columbia River Engineering Board, the International Joint Commission instructed the Board not to apportion costs and benefits for projects which might be developed co-operatively between Canada and the United States.

projects first. In this way net benefits (or profits) are maximized.¹⁸ Unfortunately, the International Columbia River Engineering Board Report does not indicate which are the most economic projects. It indicates only that the schemes as a whole are economically feasible in the sense that total benefits exceed total costs. Only with an incremental analysis would it be possible to determine the most economic components of these schemes.

The International Joint Commission was then requested to recommend a set of principles for determining and allocating downstream benefits. It made its recommendations in December, 1959,¹⁹ and these principles formed the basis for the negotiations for the Columbia River Treaty which was signed in January, 1961.

The principles recommended by the International Joint Commission have been criticized on grounds of both economic principle and equity. They are in fact a compromise between economics and practicality. They recommended, for example, that each country should build its own facilities, and then share the resulting power and floor control benefits equally. This principle has been severely criticized in Canada, particularly by economists.²⁰ They claim that it fails to recognize that one partner is investing far more in the program than the other and yet is getting the same share of the benefits. Canada would be paying about \$400 million and the United States about \$130 million.²¹ A much more equitable formula would be one which ensured that benefits were shared in proportion to the costs.

The major difficulty, however, is the determination of the costs of each partner. Canada's costs are readily identifiable because they are new costs. In the case of the United States, however, there is

18. See Krutilla, *Sequence and Timing in River Basin Development* (Resources for the Future, Inc., 1960).

19. International Joint Commission, *Principles for Determining and Apportioning Benefits from Co-operative Use of Storage Waters and Electrical Inter-connection within the Columbia River System* (1959).

20. See, e.g., Higgins, *Columbia River Treaty: A Critical Review*, 16 *International J.* 390 (1961).

21. To enjoy the benefits provided by 15.5 million acre-feet of storage in Canada, Canada would have to build three projects costing a total of \$394.4 million. The United States would have to build additional downstream generating facilities to take full advantage of the storage releases. These facilities, together with the necessary transmission lines, would cost about \$130 million. The Libby project, which is not involved in benefit sharing, would cost the United States \$322.9 million. See United States Negotiators, *Report to the Governments of the United States and Canada* (1960). It should be noted that estimates of costs of development have increased considerably since then. The most recent estimate available suggests costs in Canada would total \$450 million.

considerable debate as to which are the relevant costs. The United States negotiators argued that their country had already invested over \$2.7 billion in installations on the Columbia River, and that the existence of these installations made possible the realization of the downstream benefits. Canadian economists have argued, however, that previously incurred costs (historic costs) are irrelevant: only new, incremental costs should be counted. They recognized, nevertheless, that some of the present installations had been built to take advantage of future availability of storage, but had not been used so far.²² Costs of such non-used facilities might be referred to as "attributed costs" and might properly be regarded as part of the incremental costs of adding new capacity. No agreement was reached, however, on how much of the costs of present installations could properly be charged as "attributed costs." Therefore, the principle of each country bearing the costs of development in its own country with a 50-50 sharing of benefits was accepted.

II

THE COLUMBIA RIVER TREATY

The Columbia River Treaty was signed in January, 1961, by Prime Minister Diefenbaker and President Eisenhower. It calls for the provision of 15.5 million acre-feet of storage in Canada at three projects to be constructed within nine years of ratification of the Treaty.²³ The storage at these three projects will be operated to increase generation at plants downstream in the United States' part of the basin and to reduce flood hazards there. The United States agreed to operate the existing 24 downstream installations, and all future installations, in such a way as to take maximum advantage of the storage regulation provided by Canada.²⁴ The power benefits of the Treaty projects are to be shared on a 50-50 basis.²⁵ At the time of the signing of the Treaty it was estimated that these benefits would amount to a total of 2.6 million kilowatts of capacity and 13 billion kilowatt hours of energy.²⁶

22. Provision has been made at the Chief Joseph project, for example, for the installation of additional units, once storage is made available.

23. Treaty with Canada relating to Co-operative Development of the Water Resources of the Columbia River Basin, hereinafter cited as "Columbia River Treaty," reproduced in Canadian Dep't of External Affairs, *op. cit. supra* note 12, at 58.

24. Columbia River Treaty, *op. cit. supra* note 23, art. III, para 1.

25. Columbia River Treaty, *op. cit. supra* note 23, art. V, para. 1.

26. These benefits were calculated on the basis of a twenty-year period of stream-flow records. More recently studies have been undertaken using a thirty-year period.

Under the terms of the Treaty, about 8.5 million acre-feet of the 15.5 million acre-feet of storage provided by Canada will be used for flood control purposes. For this Canada will receive payments when each facility begins operation totaling \$64 million.²⁷ In addition, Canada agrees to provide other storage on an "on call" basis in the event of special emergencies. The United States will pay Canada \$1,875,000 for each of the first four calls, plus compensation for any power losses.²⁸ The flood control provisions of the Treaty will continue after the sixty-year period of the Treaty is terminated.²⁹ After that time the United States will pay operating costs involved for any call that is made, plus compensation for any power losses.³⁰

Under the Treaty agreement the United States has the option to commence construction of the Libby project within five years after the Treaty goes into effect.³¹ Canada will pay the costs of clearing the part of the reservoir that is located in Canada. These costs will amount to about \$13 million.³² The Libby project will make possible the generation of an additional 550,000 kilowatts of prime power in the United States. This will not be shared with Canada. Canada will be able to increase prime power capacity of the West Kootenay power plants by 200,000 kilowatts.³³ This increase will be retained by Canada.

Canada is permitted to divert the Kootenay River into the Columbia River after twenty years.³⁴ After that time up to 1.5 million

These reveal that power benefits larger by fourteen to eighteen per cent would be available. Protocol, para 8; Background Paper, reproduced in Canadian Dep't of External Affairs, *op. cit. supra* note 12, at 132.

27. Columbia River Treaty, *op. cit. supra* note 23, art. VI, para. 1.

28. Columbia River Treaty, *op. cit. supra* note 23, art. VI, para. 3.

29. Columbia River Treaty, *op. cit. supra* note 23, art. IV, para. 3; art. VI, paras. 4, 5; art. XIX, para. 4.

30. Columbia River Treaty, *op. cit. supra* note 23, art. VI, para. 4.

31. Columbia River Treaty, *op. cit. supra* note 23, art. XII, para. 1.

32. Vancouver Province, Special Issue on the Columbia River Treaty, January 24, 1963, p. 2.

33. The British Columbia Hydro and Power Authority has been designated as the Canadian entity to undertake development of the Columbia River in Canada. It will be responsible for clearing the part of the Libby reservoir that is located in Canada. Releases from Libby reservoir will be of direct benefit to the West Kootenay Power and Light Company which has plants on the Kootenay River. Arrangements have yet to be worked out between the British Columbia Hydro and the West Kootenay Power and Light Company for compensation for clearing of the Libby reservoir. See the agreements between Canada and British Columbia dated July 8, 1963, and January 13, 1964, reproduced in Canadian Dep't of External Affairs, *op. cit. supra* note 12, at 100, 107.

34. Columbia River Treaty, *op. cit. supra* note 23, art. XIII, para. 2.

acre-feet per year may be diverted. Diversion of the Columbia River into the Fraser River, however, is not permitted during the life of the Treaty.³⁵

III

BRITISH COLUMBIA—OTTAWA RELATIONS

The Treaty was ratified almost immediately by the United States Senate but has still to be ratified by the Canadian government. The main reason for the delay has been the lack of entente between the British Columbia government and the federal government at Ottawa. Under the terms of the British North America Act of 1867, the provinces are granted ownership of resources within their boundaries.³⁶ The federal government, however, is given jurisdiction over certain uses of those resources. In the case of water resources the federal government has jurisdiction over navigable streams, inter-provincial waters, and international waters.³⁷ In addition, treaty-making powers are an inherent federal function. Such an arrangement makes it essential that there be an entente between the federal and provincial government in matters relating to the development of international streams. The provincial government can propose developments on such streams but cannot implement them without federal sanction. On the other hand, the federal authority can make treaties with the United States relating to river development but cannot easily implement them without provincial co-operation.

A. The Kaiser Deal

The necessary entente between British Columbia and Ottawa, however, was not easily established, and for a time it seemed that the federal government at Ottawa was having more difficulty in bargaining with British Columbia than it was in bargaining with

35. Columbia River Treaty, *op. cit. supra* note 23, art XIII, para. 1, states:

Except as provided in this Article neither Canada nor the United States of America shall, without the consent of the other evidenced by an exchange of notes, divert for any use, other than consumptive use, any water from its natural channel in a way that alters the flow of any water as it crosses the Canada-United States of America boundary within the Columbia River basin.

Other paragraphs of the Article provide for diversions of the Kootenay River, under specified conditions.

36. British North America Act, 1867, 30 Vict., c. 3, §§ 92(10), (13), (16).

37. British North America Act, 1867, 30 Vict., c. 3, §§ 91(10), (12), (29), 132.

the United States. Disagreement between Ottawa and British Columbia dates back to 1955 when the federal government blocked a proposed agreement between the British Columbia government and the Kaiser Aluminum Company for the development of storage on Arrow Lakes. Kaiser Aluminum had offered to build a \$30 million dam to regulate flows from Arrow Lakes. This project would have resulted in the addition of 331,000 kilowatts of prime power to the United States system. Kaiser had proposed that one half of this would be made available to the Bonneville Power Administration, and the other half would be used for its own purposes and to compensate British Columbia. The Canadian federal government, however, responded by passing the International River Improvements Act which requires federal approval of works constructed on international rivers. It reasoned that studies of the Columbia River in Canada were not yet complete, and until they were complete it would be impossible to judge the long run merits of the proposed Kaiser deal.

B. Sale of Downstream Benefits

The main point of disagreement, however, between the federal government and the British Columbia government was over the disposal of downstream benefits. Mr. Bennett, the Premier of British Columbia, has consistently maintained since 1961 that his Province's share of the downstream benefits of Columbia River development should be sold to the United States. The federal government, on the other hand, remained adamant that they should be returned to Canada as they were held to be the cheapest source of power available to British Columbia. The federal government, therefore, continued to maintain its ban on the export of electric power.

Mr. Bennett, however, was in a very strategic position. He realized that development of the water resources of British Columbia could not easily take place without his consent. Canada, on the other hand, had signed a Treaty with the United States and was running the risk of international embarrassment if she did not ratify it. It was suggested that the way out of the dilemma was for the federal government to build the projects itself as a work for the "general Advantage of Canada," a step that was possible under the provisions of the British North America Act.³⁸ It seems unlikely that

38. Under the terms of the British North America Act, the federal authority may undertake

the federal government would have invoked this provision, particularly as it might have appeared as a usurpation of provincial autonomy.³⁹ In any event, Mr. Bennett acted swiftly, and pulled the rug from beneath the federal government's feet. He expropriated the British Columbia Electric Company and the Peace River Power Company.⁴⁰ He thus provided a power market for the Peace River project, and at the same time precluded the use of downstream benefit power in British Columbia.

C. Expropriation of the British Columbia Electric Company

The British Columbia Electric Company was an investor-owned utility, serving the Lower Mainland of British Columbia, the largest power market in the province. This company, however, had shown only limited interest in power from the Peace River, and had indicated that it had cheaper alternative sources, such as thermal power

Such Works as, although wholly situate within the Province, are before or after their execution declared by the Parliament of Canada to be for the general Advantage of Canada or for the Advantage of Two or more of the Provinces.

British North America Act, 1867, 30 Vict., c. 3, § 92(10) (c).

39. The extent to which the federal government might go without provincial cooperation is a matter which is open to debate. Clearly, it would depend on the circumstances of the individual case. Nevertheless, there is a great respect for provincial autonomy. See *e.g.*, the ruling of the Privy Council in *Attorney-General Canada v. Attorney-General Ontario*, [1937] 1 D.L.R. 673, 682-84:

In other words the Dominion cannot merely by making promises to foreign countries, clothe itself with legislative authority inconsistent with the constitution which gave it birth.

* * * *

It must not be thought that the result of this decision is that Canada is incompetent to legislate in performance of treaty obligations. In totality of legislative powers, Dominion and provincial together, she is fully equipped. But the legislative powers remain distributed and if in the exercise of her new functions derived from her new international status Canada incurs obligations, they must, so far as legislation be concerned, when they deal with provincial classes of subjects, be dealt with by the totality of powers, in other words, by co-operation between the Dominion and the Provinces.

40. *Vancouver Sun*, August 1, 1961, p. 1. The expropriation resulted in a long and complicated legal battle between the former owners and the British Columbia government regarding the validity of the legislation under which the expropriation was undertaken, and the adequacy of the compensation offered for the power companies' assets. The legislation was declared *ultra vires* by Chief Justice Sherwood Lett of the British Columbia Supreme Court on July 30, 1963. Subsequently, the British Columbia government came to terms with the British Columbia Power Corporation, the parent company of the British Columbia Electric Co., and offered to increase compensation from \$171 million to \$192 million. The Power Corporation accepted the offer. The government also paid \$8 million for the assets of the Peace River Power Co. For an outline of the legal battle see *Vancouver Sun*, July 30, 1963, pp. 1-3, and August 1, 1963, pp. 1-3.

based on coal from the Hat Creek deposits. With an embargo on the export of power, and with no immediate market in the Lower Mainland, it is probable that the Peace River project would have been shelved, for the time being at least. The provincial government, however, was anxious that the Peace River project should go ahead, particularly as it was regarded as a key element in a program for the development of the northern part of the province.

The provincial government expropriated both the British Columbia Electric Company and the Peace River Power Company. The latter company had been formed to carry out the development of the Peace River. The expropriation brought both companies under the control of a newly-formed agency, the British Columbia Power Corporation (which subsequently was merged with the British Columbia Power Commission to form the present British Columbia Hydro and Power Authority). The Peace River project was thus guaranteed the Lower Mainland market. Power from the Columbia River, therefore, would be surplus for at least twenty years.

D. The Canada-British Columbia Agreement

The federal government had no alternative but to reverse its policy of non-export of electric power from Canada. Once this reversal had been formally announced, the British Columbia government and the federal government resumed negotiations. An agreement between the two governments concerning the development of the Columbia River was signed in July, 1963.⁴¹ With a united front thus assured, the federal government resumed talks with the United States.

Meanwhile, there had been a number of criticisms of the Treaty in Canada,⁴² particularly during the federal and provincial election campaigns. The New Democratic Party (popularly known as the NDP) claimed that the Treaty was a sell-out to the United States and that it should be scrapped. The Liberal Party, which was elected to office at Ottawa shortly afterwards, suggested that some of its provisions should be modified. The federal government thus had the benefit of these criticisms when it resumed negotiations with the United States in the latter part of 1963. These negotiations resulted in a Protocol Agreement between Canada and the United States which was signed in Washington, D.C., in January of this

41. Reproduced in Canadian Dep't of External Affairs, *op. cit. supra* note 12, at 100.

42. See, e.g., Higgins, *op. cit. supra* note 20; General A. G. L. McNaughton, *The Proposed Columbia River Treaty*, 18 *International J.* 148 (1962-1963).

year.⁴³ This Agreement has been attached to the Treaty as a Protocol Note.

IV

THE PROTOCOL AGREEMENT

The Protocol Agreement removes some of the objections that were raised in Canada about the terms of the original Treaty. First, it makes it clear that Canada wishes to dispose of her share of the downstream benefits to the United States, and it establishes the terms of this sale.⁴⁴ Under the Agreement the United States will pay Canada a lump sum of \$274.8 million (Canadian) for Canada's share of the downstream benefits during the first thirty years of the sixty-year Treaty, plus \$69.6 million (Canadian) for flood control benefits.⁴⁵ Invested at five per cent these sums would accumulate to over \$500 million by 1973. This will make it possible for Canada to build the three Treaty projects, and to have enough left over to pay half the cost of the generators for the Mica project. It will make possible the delivery of about twenty billion kilowatt hours of energy annually in the Vancouver area at a total cost of less than three mills per kilowatt hour—about half the present cost of generation in that area.⁴⁶

The Agreement also eliminates the objection that the original Treaty removed control of the Canadian portion of the River from Canadian hands. Generators will be installed eventually at Mica, and probably at Downie, and also at Revelstoke Canyon. Canada wanted to ensure that maximum use would be made of the head available at these sites. The Protocol permits Canada to decide which reservoirs shall provide the releases required for downstream power benefits in the United States.⁴⁷ Under the Treaty,

43. The Columbia River Treaty, the Canada-British Columbia Agreement, the Protocol Agreement, an Abstract of the International Columbia River Engineering Board Report, and the Report of the International Joint Commission on Principles for Determining and Apportioning Benefits from Co-operative Use of Storage of Waters and Electrical Interconnection within the Columbia River System, are set out in Canadian Dep't of External Affairs, *op. cit. supra* note 12, at 100.

44. Protocol, para. 3, *id.* at 112; Attachment Relating to Terms of Sale, *id.* at 117.

45. *Id.* at 118. Expressed in United States dollars, payments for power benefits would amount to \$254.4 million, and those for flood control, \$64.4 million. If Canada elects to sell her share of the downstream benefits after the thirty year period, payments by the United States would average between \$5 and \$10 million annually after 1994. *Id.* at 155.

46. *Id.* at 178-79.

47. Protocol, para. 7(2), *id.* at 113.

the United States may call upon Canada for flood control in addition to the 8.5 million acre-feet provided at Mica, Arrow Lakes, and Duncan for flood control purposes.⁴⁸ It may do so, however, only in emergency situations, when the flow at the Dalles exceeds 600,000 cubic feet per second. The Protocol makes it clear that the United States may make such calls only if all available storage in the United States portion of the basin has been used.⁴⁹ This will ensure that Canadian power production is not unreasonably impaired by emergency calls.

The original Treaty provides for the construction of the Libby project. It was unclear, however, how beneficial its regulation would be for Canadian plants on the Kootenay River. The Protocol Agreement calls for the co-ordination of the operation of the Libby project with the operations of the Canadian plants to the extent that it is not to the disadvantage of the United States.⁵⁰

Another important modification is that Canada may divert water from the basin at any time for irrigation or domestic and industrial purposes.⁵¹ This provision overcomes objections raised by the government of Saskatchewan that the Prairie provinces are becoming dangerously short of water, and that flows of the Columbia River should be diverted to the Saskatchewan River for irrigation and domestic supply purposes rather than utilized in the United States for power purposes. However, it seems unlikely, at least within the foreseeable future, that Canada will take advantage of this provision. There are much cheaper ways of augmenting water supplies in the Prairie provinces than diverting flows from the Columbia River system into the Saskatchewan River system.⁵²

The Protocol Agreement also removes the requirement that Canada pay the United States for providing standby service for the Canadian share of the downstream benefits during the sale period.⁵³

48. Protocol, para. 1(1), *id.* at 111.

49. *Ibid.*

50. Protocol, para. 5, *id.* at 113.

51. Protocol, para. 6, *id.* at 113. The United States is accorded the same right.

52. In a preliminary study of the possibilities of diverting water from the Columbia River basin into the Saskatchewan-Nelson River basin, the Crippen Wright Engineering Company, Ltd., estimated that water diverted from the Columbia River basin would cost \$10.50 per acre-foot delivered to the South Saskatchewan reservoir. Water diverted from the Athabaska River, however, would cost only \$3.50 per acre-foot delivered to the same point, and water diverted from the Peace River would cost \$4.60 per acre-foot. See Canadian Dep't of External Affairs, *The Columbia River Treaty and Protocol: a Presentation* (1964).

53. Protocol, para. 4, in Canadian Dep't of External Affairs, *The Columbia River Treaty, Protocol, and Related Documents* 112 (1964).

Since these benefits will be retained in the United States, such standby service will not be required. This elimination will save Canada up to \$2 million per annum.

Finally, the Protocol Agreement states that the Treaty shall not be regarded as a precedent.⁵⁴ This leaves Canada and the United States free to negotiate appropriate terms for the development of other rivers which they share, such as the Yukon and the St. John.

V

OPPOSITION TO THE TREATY

The Treaty was debated in the Canadian House of Commons and was discussed in detail in the Standing Committee on External Affairs. The Treaty was supported by the Government party (the Liberals)⁵⁵ and the Social Credit Party. It received some comments but no serious criticism from the Conservative Party, under whose administration the Treaty was originally drawn up. It was severely criticized, however, by the New Democratic Party (NDP).

A. The McNaughton Plan

The New Democratic Party proposed that the Treaty be scrapped and that an alternative scheme be adopted which would permit the development of a greater amount of storage and head in the Canadian portion of the basin. The scheme which they proposed has come to be known as the "McNaughton Plan." It is based on a scheme recommended by General McNaughton, the former Chairman of the Canadian Section of the International Joint Commission. Its basic difference from the Treaty plan is that it diverts the Kootenay River into the Columbia River rather than allowing the Kootenay to flow in its natural course as in the Treaty Plan. To accomplish this the McNaughton Plan would substitute the Dorr-Bull River project for the Libby project, and a low dam at Arrow Lakes for the proposed high dam there (Figure 2).

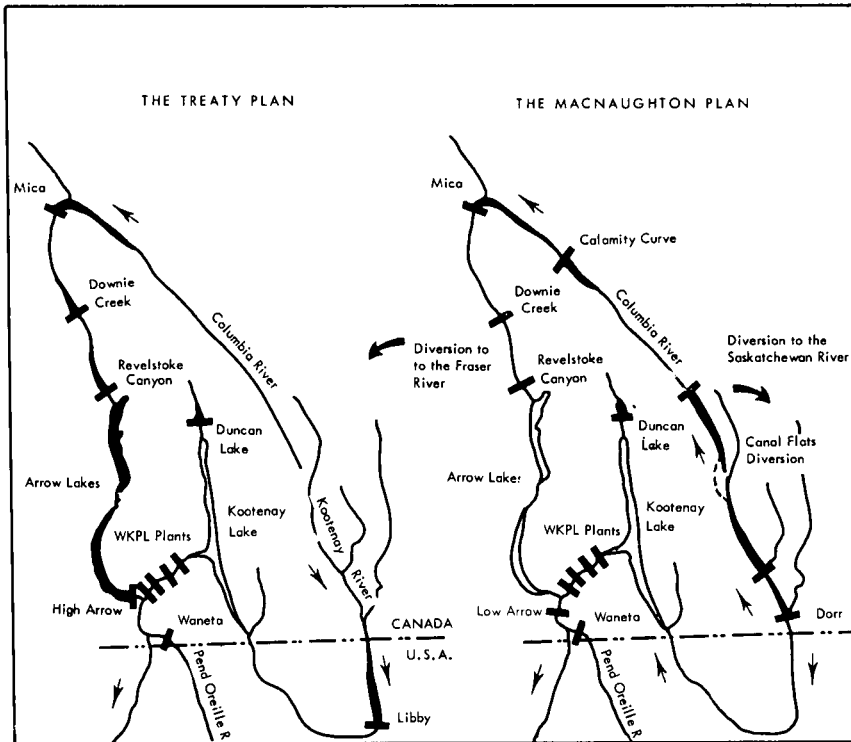
Several advantages have been claimed for the McNaughton Plan over the Treaty scheme. The McNaughton Plan would increase power production from the Canadian portion of the basin by at least ten per cent over that estimated in the Treaty scheme.⁵⁶ It

54. Protocol, para. 12, *id.* at 114.

55. The federal government's position on the Columbia River Treaty is set forth in Canadian Dep't of External Affairs, *The Columbia River Treaty and Protocol: a Presentation* (1964).

56. *Id.* at 67.

FIGURE 2
ALTERNATIVE PLANS FOR COLUMBIA
RIVER DEVELOPMENT



would improve the economic feasibility of the Mica project by providing storage to compensate for releases at Mica. It would however, eliminate the Libby project and therefore preclude the development of two sites immediately downstream from the Libby project, Katka and Kootenay Falls. Furthermore, substitution of the McNaughton Plan for the Treaty scheme would no doubt have required Canada to compensate for loss of at-site power production from the Libby project.

General McNaughton claimed that the diversion scheme would provide regulation of the Upper Kootenay and Columbia at lesser cost than the Treaty Scheme.⁵⁷ The Dorr-Bull River projects would

57. See General A. G. L. McNaughton, *op. cit. supra* note 42, at 161.

provide less at-site power than the Libby project, but would result in comparable downstream benefits. The major advantage as seen by the General is that much of these downstream benefits would be generated in Canada rather than in the United States.

There has been a good deal of disagreement as to the costs of the McNaughton scheme, and the data presented so far do not permit any firm conclusions as to relative economic feasibility.⁵⁸ In any event, development of the McNaughton Plan was precluded by the decision of the British Columbia government to ban any inundation by hydroelectric power schemes in the East Kootenay Valley. This is presently an agricultural region. It appears to have considerable potential, however, as a recreational area. The diversion scheme would inundate several thousand acres of critical grazing area for big game, as well as large areas of waterfowl habitat. It would require relocation of transportation media and the removal and rehabilitation of over 1500 people.⁵⁹ Equally important was the fact that the United States negotiators were not especially anxious to give up the Libby project. It had already reached an advanced stage of engineering design and there appeared to be political support for its development.

B. The High Arrow Project

The inclusion of the High Arrow Dam also gave rise to opposition to the Treaty. Opponents of the Treaty pointed out that the High Arrow project would result in only minor power production in Canada, and would inundate a number of small communities and several thousand acres of agricultural land. They suggested that the McNaughton scheme would not only provide the same function as the High Arrow project, but would also make possible greater power production in the Canadian part of the basin, as well as avoiding inundation in the Arrow Lakes area.

One of the Principles recommended by the International Joint Commission for the Determination and Allocation of Downstream Benefits was that the most profitable projects should be built first. The High Arrow project was found to be the most profitable of all the projects considered by the International Columbia River Engineering Board and by several firms of consulting engineers.⁶⁰ More-

58. Krutilla, *The Columbia River Treaty: An International Evaluation* 13 (Resources for the Future, Inc., 1963).

59. Canadian Dep't of External Affairs, *The Columbia River Treaty and Protocol: a Presentation* 50 (1964).

60. *Id.* at 69.

over, the inundation caused by the High Arrow project would be far less than that caused by the McNaughton scheme. The High Arrow project would inundate 5,000 acres of agricultural land. Only a part of this, however, is presently cultivated because farming has become progressively less profitable in the area, and it seems that there is little likelihood of any change in this situation in the foreseeable future.⁶¹ Those residents whose homes and lands will be inundated by the High Arrow project will be compensated for the losses involved.

C. Flood Control Payments

There was also criticism of the amount of flood control payments which Canada is to receive. General McNaughton suggests that the \$70 million (Canadian) lump sum called for in the Treaty is far below the amount Canada should rightfully receive.⁶² He noted that the flood control benefits on which the lump sum payment is based represent the value of protection against losses from floods up to the magnitude of an 1894 flood. He pointed out, however, that the Treaty projects will provide control of much larger floods than the 1894 flood and claimed that this should have been recognized in the calculations. He claimed further that under the terms of the Treaty the United States will be paying the equivalent of \$16 per acre-foot of storage for flood control purposes, whereas the United States would have to pay \$24 per acre-foot for comparable storage in the United States part of the basin. For these reasons, General McNaughton claimed that the lump sum payment to Canada should be substantially increased.

Many of the General's arguments on this point, however, can be refuted. First, the fact that Canadian storage capacity can provide additional flood control is recognized in the Treaty, and arrangements are set out for emergency calls on this capacity. Canada will be compensated for such additional calls. Second, whether the United States would have to pay \$24 or \$50 per acre-foot for comparable storage really begs the question. Storage may be available at \$24 per acre-foot, but this is no guarantee that it would be developed.

In any event, it is probable that the benefits of Canadian storage were over-valued rather than under-valued. The method used for calculating the benefits considered all storage used in reducing

61. *Id.* at 71.

62. See Vancouver Province, Special Issue on the Columbia River Treaty, *op. cit. supra* note 32, at 4.

potential floods to the level of 800,000 cubic feet per second at the Dalles to be of equal value.⁶³ Such an averaging of storage benefits fails to recognize the basic principle that the value of each additional unit of storage diminishes as more storage is added.⁶⁴ Had an incremental approach been used, the value attributable to benefits of Canadian storage probably would have been much less than under the equal shares method used by the negotiators.

CONCLUSION

The unified approach to the development of international river basins has much to recommend it. In particular, it generally makes possible much greater net returns from the development of the basin than could have been obtained through independent actions of the various nations sharing it. Although the unified approach has been successfully applied in several parts of the world in the development of internal river basins,⁶⁵ it has been applied to only a minor extent in the case of international rivers.⁶⁶ There are a few instances where it has been applied at the planning stage, such as in the Lower Mekong,⁶⁷ but there is not one example of an international river developed on a completely unified basis. In many cases the reasons for this are fairly obvious. Conflicting political ideologies, lack of experience in river basin development, and intense competition for the use of water are among the most common factors preventing unified development. None of these, however, applied in the case of the Columbia River.

The Columbia River offered an ideal opportunity for the development of an international river on a unified basis. Indeed, the initial studies were undertaken from a basin-wide standpoint. The Treaty which has emerged from the investigations and negotiations, however, falls short of a completely unified approach.

With a unified approach projects would have been selected on the basis of their maximizing net benefits from the use of the River.

63. Canadian Dep't of External Affairs *The Columbia River Treaty: a Presentation* 88 (1964).

64. See Krutilla, *Sequence and Timing in River Basin Development* (Resources for the Future, Inc., 1960).

65. G. White, *A Perspective of River Basin Development*, 22 *Law & Contemp. Prob.* 157 (1957).

66. United Nations, *Integrated River Basin Development* 32-43 (1958).

67. For discussions of progress and problems in planning the development of the Lower Mekong River, see Schaff & Fifield, *the Lower Mekong: Challenge to Cooperation in Southeast Asia* (1963); G. White, *The Mekong River Plan*, *Scientific American*, April 1963, pp. 49-59.

Evidence suggests, however, that selection was not made on this basis, and various non-economic factors played a cardinal role in determining which projects were to be included in the Treaty.⁶⁸ It is likely, therefore, that less than optimum use of the River will result from the Treaty scheme.

Nevertheless, the Treaty clearly benefits both countries, since it facilitates the development of a resource (the Upper Columbia River) which otherwise would have remained undeveloped. Canadian storage is apparently cheaper than American storage, and therefore the Treaty arrangements are of advantage to the United States. On the other hand, without United States participation it is unlikely that Canada would have developed the Upper Columbia, since there are cheaper alternatives than independent Canadian development of the Columbia River. The Treaty provided Canada with the opportunity to buy into a going concern in the United States. In addition, the lump sum payments called for under the Protocol Agreement will furnish British Columbia with investment capital for economic development in the immediate future. At a later stage she will be able to enjoy the benefits of power generation on the Columbia River in Canada as well as downstream benefits from generation in the United States part of the basin.

How much larger the benefits might have been with a completely unified approach to development, however, and whether the relative shares from co-operative development are equitable, will remain matters of continued speculation. Satisfactory answers can only be provided by a complete economic evaluation of the benefits and costs of various possible schemes for developing the Columbia River. Unfortunately, neither the tools nor the data are available to undertake such an evaluation. Considerable progress has been made in the past ten years in developing a framework for the economic analysis of river basin schemes.⁶⁹ There remains substantial disagreement, however, both as to concepts underlying the analysis, and as to techniques for measuring benefits and costs.⁷⁰ Much more

68. Krutilla, *The Columbia River Treaty: an International Evaluation* 13 (Resources for the Future, Inc., 1963).

69. See, e.g., Krutilla & Eckstein, *Multiple Purpose River Development* (1958); Eckstein, *Water-resource Development* (1958); McKean, *Efficiency in Government through Systems Analysis* (1958); Maas, Dorfman, *et al.*, *Design of Water Resource Systems* (1962). See also Hirschleifer, de Haven, & Milliman, *Water Supply: Economics, Technology, and Policy* (1960).

70. For a concise discussion of problems of concepts and techniques of measurement, see Kneese & Nobe, *The Role of Economic Evaluation in Planning for Water Resource Development*, 2 *Natural Resources J.* 445 (1962).

research is required before completely satisfactory principles and procedures for economic analyses of river development projects can be agreed upon. Until such principles and procedures are available, however, it is impossible to determine whether the proposals for international development of the Columbia River are consistent with net benefit maximization, nor can we judge whether one arrangement is more "equitable" than another.

TABLE I
COLUMBIA RIVER
GENERAL AND PHYSICAL CHARACTERISTICS

General Data	Canada	U.S.A.
Source of the Columbia River	Columbia Lake	
Mouth of the Columbia River		Astoria, Ore.
Length in Miles	480	740
Drainage Area in Square Miles	39,500	219,500
Total Fall of River in Feet	1,360	1,290
Average Annual Runoff in Millions of Acre-Feet	73	107

TABLE II
TREATY PROJECTS

Project	Arrow Lakes	Duncan Lake	Mica Creek
Location	5 miles upstream from Castlegar	Outlet of Duncan Lake	90 miles upstream from Revelstoke
Drainage Area	14,000 sq. miles	925 sq. miles	8,220 sq. miles
Average Flow	39,800 cfs	3,600 cfs	20,700 cfs
Max. Recorded Flow	220,000 cfs	21,400 cfs	112,000 cfs
Min. Recorded Flow	4,800 cfs	268 cfs	2,140 cfs
Dam Height	190 ft.	120 ft.	645 ft.
Live Storage	7.1 million acre-feet	6.4 million acre-feet	Stage 1. Storage only: 7 million acre-feet Stage 2. With at-site gen. 12 million acre-feet