

THE HYDROLOGICAL CYCLE AND
THE LAW OF NATIONS

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I. THE BACKGROUND

Water has been variously described as “a keystone of the resource structure”,¹ “the most abundant and the most important substance with which man deals”² and, more poetically, as “one of the rare wonders of the universe”.³ About three quarters of the earth’s surface is covered by water. Water evaporates over the oceans and is precipitated as rain. When it falls over the land it soaks into the earth’s crust and creates underground water. Rivers contain moving water emanating from rain, lakes, ground water, or melting snow. The total amount of rain falling on the earth is enormous, yet most river waters flow to the sea almost unused by man and much water evaporates from the continents without having served any useful purpose.⁴ For centuries very little has been done by man in order to provide for a better and more equitable use of the world’s water resources. The largest consumer of water is agriculture, but much more is needed for this purpose. Water is demanded also for other purposes such as domestic and recreational uses, various industrial uses including the generation of water power, and for navigation and floating. Moreover, water contains valuable resources that have to be preserved and exploited.

In recent days more attention has been given to water as “the most important substance with which man deals”. The purpose of the present paper is to consider the impact on organized international cooperation under the law of nations of new developments in the scientific field. New scientific achievements will make

¹ Erich W. Zimmermann, *World Resources and Industries. A Functional Appraisal of the Availability of Agricultural and Industrial Materials*, 2nd ed. New York 1951, p. 572.

² Roger Revelle, “Water”, *Scientific American*, September 1963, vol. 209, no. 3, p. 93.

³ Hawthorne Daniel & Francis Minot, *The Inexhaustible Sea*, New York 1961, p. 43.

⁴ According to Revelle, *op. cit.*, pp. 94 f., the hydrological cycle for the United States, a highly developed country, shows that 29 per cent of the rainfall arrives in the oceans via stream flow, and 71 per cent falls on various types of non-irrigated land, returning directly to the atmosphere by transpiration and evaporation. Water withdrawn for irrigation, industry and municipal use constitutes only 7.3 per cent of the total.

possible a better use of water resources, and methods may be found by which new resources can be provided or created. Such achievements are not the concern of technology alone. They open up possibilities and give rise to problems for the economic and social sciences as well. Worldwide cooperation for the effective use of the world's water resources for all kinds of purposes (in the first instance, to meet the need of food, clothing and other consumption goods for a rapidly expanding population, particularly in the economically underdeveloped countries) presupposes the existence of adequate rules of international law. Indeed it may be necessary, at some stage, to reconstruct the existing body of international law in the light of the importance of water as a basic commodity for mankind as a whole. The rules relating, for instance, to the high seas or international waterways have been developed during different periods of history, and their basis is often conceptualistic rather than functional. It seems possible that a common, functional denominator could be found for "water law" as a whole, with the main emphasis put on the various purposes for which water is being used rather than on the areas where water is found.

The search for ways of making a better use of existing supplies of water, of counteracting the destructive forces that water, if left to itself, can exert—such as erosion, pollution, the silting up of rivers and the spread of diseases—and of increasing the total volume of fresh water has already started and results have been achieved.⁵ On the basis of the experience gained, action has been taken in many countries in order to establish more efficient flood control and to provide for power plants, irrigation, navigation, and so on. Examples of vast enterprises in developed countries are the Colorado River Projects and the Tennessee Valley Authority in the United States, the recent Ob-Yenesi Project in the Soviet Union, and the basin projects in the Snowy Mountains of Australia. River projects tend, however, to become more and more international in scope, since it is now generally understood that the proper way to regulate and control water is by managing entire river systems and that a river system cannot be separated from its

⁵ On the trends in modern research, see Revelle, *op. cit.*, pp. 97 ff. See also Nathanael Wollman, *The Value of Water in Alternative Uses*, University of New Mexico Press, 1962, and the excellent article by R. L. Nace, "Water—Essential Factor of Economic Development", *Impact of Science on Society*, vol. 14 (1964), no. 1, pp. 39 ff. See also *The Population Crisis and the Use of World Resources*, ed. by Stuart Mudd, World Academy of Art and Science, The Hague 1964, *passim*.

watershed environment.⁶ Flood control also depends, moreover, on factors determining events within the hydrological cycle as a whole. In other words, new techniques are widening the geographical area of control where river systems are concerned, and the problems of the law relating to international rivers are becoming more numerous and even more complicated. This does not only mean that general rules of international law have to be developed and that bodies of law have to be built up by treaties between states concerned. Legal questions often have to be considered already when a project is being planned, and at this stage international organizations and their law may be involved. The most striking example of an international enterprise for river development is the Mekong River Plan of 1957 in South East Asia, which involves a constructional project to be completed in 25 years at a cost of about two thousand million dollars.⁷ The 2600-mile-long Mekong is one of the world's great rivers: even without its reaches beyond the Chinese frontier it drains an area of 307,000 square miles. Most of its water flows from source to sea without being used by man. The United Nations Economic Commission for Asia and the Far East (ECAFE)⁸ is responsible for the

⁶ See Zimmermann, *op. cit.*, pp. 572 f.

⁷ See *Development of Water Resources in the Lower Mekong Basin*, Flood Control Series no. 12 (ECAFE). Also Gilbert F. White, "The Mekong River Plan", *Scientific American*, April 1963, vol. 208, no. 4, pp. 49 ff., and C. Hart Schaaf & Russel H. Fifield, *The Lower Mekong: Challenge to Cooperation in Southeast Asia*, New York 1963.—Several other internationally sponsored river projects are under way, for instance the Niger, Senegal and Volta rivers projects in West Africa, projects in Latin America under the sponsorship of ECLA, and the works financed by the Indus Basin Development Fund, created simultaneously with the signing of the Indus Water Treaty between India and Pakistan September 19, 1960. The construction of the High Aswan Dam, the *Sadd-el-Ali*, in Egypt was made possible by several arrangements between the United Arab Republic and foreign countries and bodies, including a series of agreements in 1958 and 1959 with the Soviet Union on technical and economic aid. Questions relating to the allocation of the water of the Nile were settled by the Treaty of November 8, 1958, between Sudan and the United Arab Republic. The impact of an extensive water project of this kind is explained in an interesting manner by Taher Abu Wafa in "The Social and Economic Consequences of the High Aswan Dam", *Impact of Science on Society*, vol. 13 (1963), no. 4, pp. 253 ff. If there had been several riparian states on the Nile north of the High Aswan Dam the solution of the many social and economic problems caused by the manipulation of the water of the river would obviously have been more complicated and the situation would have been similar to that existing in the case of the Mekong River.

⁸ It should be noted that several specialized agencies of the United Nations, such as WMO, FAO, WHO, ILO and UNESCO, as well as the International Atomic Energy Agency, have taken part in the work on the Mekong River Plan. Grants have been given by the Special Fund. An agreement was signed between the four riparian states and Denmark, Finland, Norway, Sweden and ECAFE on May 14, 1964, on Scandinavian assistance to the project.

present Mekong River Plan, which is the direct concern of four countries belonging to the river's watershed, namely Cambodia, Laos, Thailand and Vietnam.⁹ Gilbert F. White has pointed out that the plan is unique in three respects:

It is the first such effort in the UN family. It is the first to marshal knowledge from the social as well as the natural sciences on such a large scale in setting the aims, priorities and methods of river-basin management before the moving of earth or the pouring of concrete. It exacts international co-operation in a region where political relations are unstable and where an untoward turn of events—or the mistakes of administrators—could destroy the enterprise overnight.¹

The social sciences have, according to White, been enlisted in the plan for the collection and analysis of social and economic data, for the training of agricultural advisers to work in the villages and provincial centres, and for the education of the people in general. "In settling human and cultural demands . . . the program for water management in the Mekong River Basin becomes the organizing force behind more subtle aspects of social change."² He also mentions the need for highly educated individuals in the agencies of the governments "who are qualified to prepare, review and revise the schemes for water management in relation to the scheme for the basin as a whole and the economic policies of their countries".³ Obviously, decisions of this kind are not solely a national concern but also an international one and must be based on rules of international law and on organized international co-operation. The legal sciences should become involved in the planning, together with the natural sciences and the social sciences in the narrower sense of that term. Nevertheless, in contemporary practice the legal problems connected with projects are too often neglected at the planning stage.⁴

⁹ As a result of the non-recognition, by the majority of States Members of the United Nations, of the Government which controls the mainland of China, the extension of the planning to Chinese territory has not been possible. In its upper reaches, however, the Mekong (or Lan-Tsan-Kiang) is a wild river, a fact which made earlier efforts to develop it into a water route from the ocean to south-east China unsuccessful. (See Schaaf & Fifield, *op. cit.*, pp. 80 f.)

¹ See White, *op. cit.*, p. 49.

² White, *op. cit.*, p. 58.

³ *Ibid.*

⁴ Cf. footnotes 5 p. 76 and 8, p. 90 below.

It is not only river projects that tend to become a serious concern of international law. The interest of scientists in water as a basic commodity is directed to all stages of the hydrological cycle. Plans exist for the utilization of tides, waves, ocean currents and ocean-temperature differences for the generation of electric power.⁵ The carrying out of such plans, as well as of attempts at desalination of water from the oceans,⁶ is likely to concern many nations and to influence the international law of the sea. More extensive use of the ocean bottom and of the animal and mineral resources of the high seas may also give rise to new legal problems. Successful efforts to tap reserves of underground water that are as yet unexplored or unexploited may lead to competing legal claims relating to the use of such new resources.⁷ There is also a danger that an overdraft of water in one country may worsen water problems in a whole region by increasing the geographical variability of usable water.⁸ Competing claims may also occur if, as has been suggested, great "international" artificial lakes are created in Africa with the help of the United Nations Special Fund. The melting of glaciers and icecaps is another method of gaining usable water and this, too, must inevitably give rise to international legal problems.⁹

It is only since the Second World War that worldwide inter-governmental action has been taken with a view to promoting the study of the various uses of water. The United Nations has convened several conferences, both general and regional, with the aim of surveying the various world resources and their utilization. The first of these was the United Nations Conference on the Conserva-

⁵ See Zimmermann, *op. cit.*, pp. 592 f.

⁶ See Ronald S. Fenton, "Where We Stand with Water Desalination", *The UNESCO Courier*, July-August 1964, pp. 29 ff.

⁷ See Vladimir N. Kunin, "Underground Water—A Wasted Treasure", *The UNESCO Courier*, July-August 1964, pp. 15 ff.

⁸ Compare Luna B. Leopold, "Water in the World", *The UNESCO Courier*, July-August 1964, pp. 11 ff.—From time to time it has been reported that an enormous lake of fresh water is supposed to underlie large areas in the Sahara. (Compare Nace, *op. cit.*, pp. 48 f.) According to the *New York Times*, January 20, 1964, the geological services in Spanish Sahara struck the water layer at a depth of 1,400 feet in October, 1963. The 12,000 inhabitants of the town of Villa Cisneros thereby became independent of water supplies by tanker from the far-away Canary Islands.

⁹ According to Leopold, *op. cit.*, the amount of water in the icecaps is large compared with that in rivers. "If the Antarctic ice-caps were melted, the amount of water freed would, if supplied at a uniform rate, feed the Mississippi River for 50,000 years. It could provide the flow of all the rivers in the world for about 800 years." Cp. A. Bauer & C. Lorius, "The Polar Ice-Caps", *Impact of Science on Society*, vol. 14 (1964), no. 4, pp. 226 and 237.

tion and Utilization of Resources, held at Lake Success in 1951.¹ In 1963 the United Nations Conference on the Application of Science and Techniques for the Benefit of the Less Developed Areas was held in Geneva,² and in the same year the United Nations Conference on New Sources of Energy was held in Rome. In August–September 1964 the Third International Conference on the Peaceful Uses of Atomic Energy was held in Geneva; it dealt, *inter alia*, with water problems. As early as 1955 the International Technical Conference of the Conservation of the Living Resources of the Sea took place in Rome. It marked the entry of the United Nations into “a new and important field where a widening area of international agreement may yield considerable benefits for the future food supply of the world and also in reducing international disputes in a large and important sector of the world economy”.³ The work of this Conference was followed up by the International Law Commission, whose reports on the legal regimes of the high seas and of territorial waters formed the basis of the conventions adopted at the United Nations Conference on the Law of the Sea, Geneva 1958.⁴

Several specialized agencies of the United Nations, such as the Food and Agriculture Organization (FAO), the International Labour Organisation (ILO) and the World Meteorological Organization (WMO), have been engaged in studies and technical assistance relating to the use of water. The promotion of scientific

¹ Vol. 4 of the *Proceedings* of the Conference (U.N. Publications, Sales no. 1950 II.B.5) deals with water resources.

² In 1963 the United Nations started publication of the report of the Conference under the title *Science and Technology for Development*. Part II of vol. 2 of the publication is entitled “The Waters”. See also *Natural Resources. Energy, Water and River Basin Development*, United States papers prepared for the Geneva Conference, Washington D.C. 1962.—As a result of the Conference the Economic and Social Council, in 1963, established the Advisory Committee on the Application of Science and Technology to Development. In the committee’s first report, dated March 12, 1964, (U.N. doc. E/3866) the suggestion is made on page 2 of Annex III that the highest priority should be accorded the calling of “an international conference of experts covering all aspects of the water problems common to developing countries”.

³ *United Nations Review*, vol. 2, no. 2, August 1955, p. 80.—It should be mentioned that in 1927 the Assembly of the League of Nations, dealing with the development of international law, asked for an inquiry into the question whether it was possible to establish by way of international agreement rules regarding the exploitation of the products of the sea. *League of Nations Official Journal*, Special Supplement no. 53, October 1927, p. 9.

⁴ The Final Act of the Conference (U.N. doc. A/CONF. 18/L. 58) includes as annexes the text of four Conventions, namely the Convention on the Territorial Sea and the Contiguous Zone; the Convention on the High Seas; the Convention on Fishing and Conservation of the Living Resources of the High Seas; and the Convention on the Continental Shelf.

work aiming at a better use of water resources has become one of the most important concerns of the United Nations Educational, Scientific and Cultural Organization (UNESCO).⁵ Having almost concluded its "major project" on arid lands, UNESCO under a resolution of its General Conference in 1962 is to prepare for an "International Hydrological Decade" to begin in 1965.⁶ An inter-governmental conference met in Paris in April 1964 in order to draw up a programme for the Decade,⁷ and in the autumn of 1964 the General Conference of UNESCO decided to establish a "Co-ordination Council of the International Hydrological Decade", consisting of representatives of twenty-one Member States of UNESCO. Already in 1960 the General Conference had adopted a resolution providing for the setting up of the Intergovernmental Oceanographic Commission, the first meeting of which was held in October 1961.⁸ In 1964 international cooperation was initiated for the purpose of augmenting conventional sources of water supply by desalination of sea water and brackish water. Scientific activities⁹ and bilateral arrangements¹ were preludes to discussions

⁵ See the comprehensive presentation of UNESCO's work for the promotion of international scientific cooperation in *UNESCO Chronicle*, March 1964, vol. 10, no. 3, pp. 81 ff., the UNESCO information manual *The Activities of UNESCO in Science and Technology*, Paris 1964, and Daniel Behrman, *Web of Progress. UNESCO at Work in Science and Technology*, Paris 1964.

⁶ *UNESCO Chronicle*, January 1963, vol. 9, no. 1, pp. 32 ff. See also UNESCO/NS/181 (July 1963). On the intergovernmental meeting of experts for the Decade, April 1964, see *Arid Zone*, June 1964, pp. 3 f.

⁷ See *UNESCO Chronicle*, June 1964, vol. 10, no. 6, pp. 207 ff., and also Michel Batisse, "The International Hydrological Decade. A World-Wide Programme of Scientific Research", *The UNESCO Courier*, July-August 1964, pp. 5 ff. The basic document is UNESCO 13 C/PRG/9 (August 1964).

⁸ *UNESCO Chronicle*, January 1962, vol. 8, no. 1, pp. 8 ff. The second session was held in September 1962 and the third in June 1964. The fourth session is scheduled to be held in November or December 1965; thereafter sessions will be held on a biennial basis. See "Report on the Activities of the Intergovernmental Oceanographic Commission", UNESCO 13 C/ PRG/ 7 (August 1964).

⁹ In April 1964, a symposium was held in Milan, organized by the *Federazione delle Associazioni Schientifiche e Techniche*, for an international survey of problems relating to the production of fresh water from the sea.

¹ In July 1964, specialists from the Soviet Union and the United States of America met in Washington in order to discuss a joint study of desalting sea water. The aim was announced to be the finding of an inexpensive method of turning salt water into fresh water for the benefit of the arid regions of the world. The meeting was followed up by a formal agreement signed in Moscow November 18, 1964. An agreement has been announced between the United States and Israel providing for joint efforts on water desalination, possibly by nuclear power. Compare *An Assessment of Large Nuclear Powered Sea Water Distillation Plants*, U.S. Office of Science and Technology, Washington 1964.

at the summer session in Geneva of the Economic and Social Council on the basis of a report prepared by the Secretariat of the United Nations on "Water Desalination in Developing Countries".² Later in the year the Third International Conference on the Peaceful Uses of Atomic Energy received a report from the International Atomic Energy Agency (IAEA) comparing the potential advantages of conventional and nuclear energy for the purpose of water desalination.³ While the reports do not envisage the economic use of desalted water for irrigation in the near future, such water may be used for drinking purposes and for industrial requirements. The role of water desalination is now to be determined within a broader international water resources programme, based on surveys to be prepared during the International Hydrological Decade.

UNESCO is the United Nations organ responsible for promoting international cooperation in the field of science.⁴ When new methods have been developed and when international action along new lines becomes possible, other United Nations agencies of an operational character, such as FAO or WMO, will take the necessary steps. It must be assumed that problems in the political and legal fields relating to such new activities will be the concern of the main organs of the United Nations. Technical and economic developments are watched over centrally by the Water Resources Development Centre, which was established at United Nations headquarters in New York in 1959 and, in 1964, made part of the Secretariat.⁵ No similar body exists to deal with legal developments relating to the use and expansion of the world's water resources. The sector of the law relating to the sea was dealt with by the United Nations Conference in Geneva 1958. The law of international rivers has received increased consideration within the

² United Nations Publications, Sales no. 64.II.B.5. The report surveyed 43 non-industrialized countries and territories. Its publication prompted a number of countries, including Argentina, the Netherlands Antilles, Saudi-Arabia, Tunisia and the United Arab Republic, to request United Nations assistance on projects in the field of desalination.

³ *Desalination of Water Using Conventional and Nuclear Energy*, Technical Reports Series no. 24, Vienna 1964.

⁴ It should be noted that UNESCO, in a series called "Natural Resources Research", has published *A review of the Natural Resources of the African Continent* (Paris 1963) which includes critical reviews of, *inter alia*, hydrology and climate and meteorology, as well as a *Bibliography of African Hydrology* (Paris 1963), prepared by J. Rodier.

⁵ See, concerning its second biennial report to the Economic and Social Council, *Yearbook of the United Nations* 1962, p. 255.

United Nations.⁶ Some attention to problems in the field of international law which could have a bearing on the use of water was given by the United Nations Commission on Permanent Sovereignty over Natural Resources.⁷ But much remains to be done.

II. NATIONAL STATES AND THE REGULATION OF THE USES OF WATER

Within states the uses of water are subject to detailed legal regulation. In a country like Sweden, for instance, with its long coastline, well-developed shipping and fishing, numerous navigable lakes, sounds and rivers, its extensive forest industry and its large and steadily growing system of hydroelectric plants, there is legislation relating to all kinds of uses: navigation, fishing, the generation of water power, irrigation, etc. Legislation also covers

⁶ The Economic Commission for Europe, in 1952, issued a report on the legal aspects of hydro-electric developments of rivers and lakes of common interest, U.N. doc. E/ECE/136. The General Assembly, in 1959, declared that it was desirable to initiate preliminary studies on the legal problems relating to the utilization and use of international rivers with a view to determining whether the subject was appropriate for codification, and requested the Secretary General to prepare a collection of legislation and treaty provisions regarding such rivers. (Res. 1401 (XIV).) The collection was published as document A/5409 under the title "Legal Problems Relating to the Utilization and Use of International Rivers". Professor Albert Lepawsky, in an interesting article in 39 *International Affairs* (1963) on p. 550, has stated his opinion that "the function of international river basin development may in the near future actually become one of the principal concerns of the United Nations family of organizations".

⁷ The Commission was established by the General Assembly in 1958. Its report was considered at the 16th session of the General Assembly; see *Yearbook of the United Nations* 1961, pp. 530 ff. The report was based on a Secretariat study, entitled "Status of Permanent Sovereignty over Natural Wealth and Resources" (U.N. doc. A/AC. 97/5/Rev 1, and Ad 1, and Corr. 1 and 2). See also a supplement in document E/3840 including sections on both national measures and international agreements affecting foreign exploitation of natural resources. At its 17th session, in 1962, the General Assembly adopted a declaration on "Permanent Sovereignty over Natural Resources". See further Stephen M. Schwebel, "The Story of the U.N. Declaration on Permanent Sovereignty over Natural Resources", *American Bar Association Journal*, May 1963; James N. Hyde, "Permanent Sovereignty over Natural Wealth and Resources", 50 *A.J.I.L.* (1956), pp. 854 ff.; and Karol N. Gess, "Permanent Sovereignty over Natural Resources: An Analytical Review of the United Nations Declaration and its Genesis", 13 *The International and Comparative Law Quarterly* (1964), pp. 398 ff.

the protection of water resources, for instance against pollution, and the solution of a wide variety of social problems connected with the different uses of water, such as the welfare of seamen and the need for recreational waters. National legislation in this field has a long history and is generally based on the idea that water, as a vital commodity, should be efficiently used to benefit the population as a whole and to assist the country's economic and social development. This is the "functional" approach to the legislative problems involved. Therefore, national water law provides a source of knowledge and experience which should play a role as source material for the development of an international water law.⁸

In shipping and fishing countries, national regulation includes legislation relating to international trade, events at sea, and working conditions on ships. In principle a state cannot apply enforcement measures against ships flying the flag of another state and sailing on the high seas, in foreign waters, or in territorial waters while exercising the right of innocent passage.⁹ Nevertheless, national laws may include provisions aimed at regulating the conduct of foreign ships sailing not only in the national waters of the legislating country but also on the high seas, as well as rules for the conduct of the courts within the legislating country, should matters relating to such foreign matters be brought before them.¹ The prohibition of enforcement measures on the high seas, how-

⁸ See concerning national water law F. J. Berber, *Rivers in International Law*, London 1959, pp. 185 ff. An early comparative work by a Swedish writer is Adolf Åström, *Über das Wasserrecht in Nord- und Mittel-Europa*, Leipzig & Lund 1905. The Legislation Research Branch of the FAO, in collaboration with its Land and Water Development Division, published in 1964 a collection on national legislation entitled *Groundwater Legislation in Europe* (FAO Legislative Series, Rome 1964).—H. A. Smith, in "The Waters of the Jordan. A Problem of International Water Control" (14 *International Affairs* (1949) pp. 415 ff.) based his considerations, at least partly, on the principles developed in national water law. Roman law was referred to by B. Winiarski, "Les principes généraux du droit fluvial international", *Recueil des Cours*, 1933, *passim*. On the highly developed water law in ancient China see Dante A. Caponera, "Water Law Principles in the Chinese Legal System", *The Indian Journal of International Law*, vol. 1 (1960–1961), pp. 239 ff.

⁹ See below, p. 66.

¹ The words "exclusive jurisdiction" in Article 6 of the 1958 Geneva Convention on the High Seas should not, it is submitted, be construed as prohibiting legislation by other states than the flag state concerning events and persons aboard ships on the high seas or enforcement measures taken by agencies operating within the borders of the legislator state. (Compare Article 3, para. 3, and Article 4 of the Convention on Offenses and Certain Other Acts Committed on Board Aircraft, signed in Tokyo September 14, 1963. The text is reproduced in 58 *A.J.I.L.*, 1964, pp. 566 ff.) In legal writing, however,

ever, helps to avoid conflicts between the maritime laws of different countries, and the fact that the legal regulation of a large number of matters relating to trade and shipping has developed through history along similar lines in the different nations and has been the subject of an increasing number of international agreements on uniform standards and uniform law reduces the need for a coordination of the national legislation of different countries where shipping is concerned.

Sometimes a country's regulation of uses of water other than navigation necessitates consideration of the national interests of other states. Then, coordination by national legislative measures or by treaties becomes necessary. Many fishing conventions provide for coordination of national legislation, particularly those conventions which concern not only fishing in the high seas but also fishing within the territorial waters of the contracting states. Thus the waters covered by the Convention for the Protection, Preservation, and Extension of the Sockeye Salmon Fishery in the Fraser River System, signed by Canada and the United States on May 26, 1930,² comprise both the high seas and the territorial sea; both parties share equally in the fishery. Another example is the Agreement regarding Fishing and Sealing between Finland and the Soviet Union, signed on February 21, 1959,³ which permits Finnish fishermen to engage in fishing and sealing in the territorial seas of the Soviet Union.

Agreements relating to the use of water in international rivers aim at finding compromises between conflicting national interests and conflicting alternative uses. The existing conventions will not be reviewed here. However, it should be pointed out that

and during the debates leading to the adoption of the Convention, states have been said to be prohibited under the rules of general international law from exercising "jurisdiction" (in the broader sense) with respect to events which occur abroad, at least when vital interests of the state are not affected. In that case, it is maintained by some writers, the "protective principle" allows "jurisdiction". We shall not discuss this question here. It should be emphasized, however, that the free use of the high seas is not hampered by national legislation or national judicial activities. They may, in fact, help to complement the system of sanctions against the disorderly, destructive and wasteful use of the high seas as an international highway. Compare UN Secretariat, *Memorandum on the Regime of the High Seas* (U.N. doc. A/CN.4/32), 1950, pp. 3 f. Article 11 of the Geneva Convention contains a limitation of jurisdiction, but only for incidents of navigation concerning a ship on the high seas that involve the penal or disciplinary responsibility of the master or of any other person in the service of the ship.

² *League of Nations Treaty Series*, vol. 184, p. 305.

³ *United Nations Treaty Series*, vol. 338, p. 3.

bilateral or regional agreements may be of limited scope, since they may concern, for instance, only floating, or be restricted to one river system only. It is also possible that a bilateral agreement aims at achieving a general coordination of the national water legislation of the contracting states. Thus the Convention of 1929 between Norway and Sweden on Certain Questions relating to the Law on Watercourses⁴ is, in spite of its title, concerned with all the uses of water, although undertakings which include the transfer of water from one drainage area to another may be the subject of special negotiations.⁵ An undertaking in one country which is likely to involve any considerable inconvenience in the other country requires the approval of that country, but application for the authorization of an undertaking must be addressed to the competent agency in the country in which the undertaking is to

⁴ *League of Nations Treaty Series*, vol. 120, p. 262. The 1929 Convention succeeded a previous Convention of 1905. See *Recueil des Traités de la Norvège*, Christiania 1907, p. 632, and *British and Foreign State Papers*, vol. 98, p. 128. The early Scandinavian convention of 1905 is the first, or one of the first, comprehensive river conventions. It should be compared to the Treaty of Washington of January 11, 1909, between Great Britain and the United States relating to boundary waters between the United States and Canada. (*British and Foreign State Papers*, vol. 102, p. 137.) A comprehensive river regulation by treaty was achieved between the United States of America and Mexico by the Convention for the Equitable Distribution of the Water of the Rio Grande of May 21, 1906, as supplemented by the Treaty between Mexico and the United States of America relating to the Utilization of the Waters of the Colorado and Tijuana Rivers and of the Rio Grande, of February 3, 1944. (*United Nations Treaty Series*, vol. 3, p. 314.) A Mexican writer has described the treaties as "una reglamentación más o menos adecuada para que ambos países aprovechen las aguas de los ríos Bravo, Colorado y Tijuana y sus afluentes principales". (César Sepúlveda, *Curso de Derecho internacional público*, Mexico 1960, p. 134.) A dispute has, however, arisen between the two countries concerning the salination of the water of the Colorado river, which flows into Mexican California, by reason of the use of the river for draining water arriving from irrigation systems in the United States. A provisional agreement has been reached between the countries with a view to solving the problem. It is one example of the effect on treaty obligations of new scientific discoveries and techniques. The facts of the *Lac Lanoux* case provide another example. See A. Gervais, "L'Affaire du Lac Lannoux", *Annuaire français de droit international* 1960, p. 372 ff.

⁵ The scope of the Convention is defined in Article 1 as follows: "1. The present Convention relates to installations or works or other operations on water-courses in one country which are of such a nature as to cause an appreciable change in water-courses in the other country in respect of their depth, position, direction, level or volume of water, or to hinder the movement of fish to the detriment of fishing in the latter country.—2. The Convention also refers to communications and floating on water-courses which form the frontier of both countries, or otherwise lie within the territory of both countries, or which flow into such water-courses.—3. The term "water-course", within the meaning of this Convention shall include lakes and other bodies of water...".

be carried out. A joint commission may be appointed to give its opinion with respect to a projected undertaking, but the decision rests with the national agency alone, which, with some exceptions,⁶ applies its own law. In the case of other international rivers standing commissions have been created and special rules and machinery have been established for the settlement of disputes between the riparian states. The regime, in such cases, becomes truly international and not merely a coordination by treaty of national legislation and administration.

Territorial Waters

It is a characteristic of modern states that they all possess a territory, include a people and are run by a government under a system of law. When the international society is described, the territory of each of the individual states must be defined. Some frontiers on land are still the subject of dispute between states, but nevertheless it is on the whole possible to draw up a map of the world where the existing states appear as geographical entities divided from one another by international frontiers which have been established by custom or treaties, e.g. peace treaties. But a state's frontier with the high sea cannot be shown in the same way. Here, each state has only a claim, sometimes based on municipal enactments, and the claims vary with respect to the width of the waters claimed; it adds to the confusion that some states put forward different claims for different purposes, such as fishing, customs control, etc. Before the 1958 Geneva Conference, it might have been possible to say that to a large extent different claims were tacitly accepted and that the guiding rule of international law was that the custom developed in different regions of the sea should be respected.⁷ But the failure of the Conference of 1958, and the following one of 1960, to reach any agreement on a rule of international law governing the width of territorial waters had an effect opposite to that of consent. The

⁶ According to Article 6, the law of the country in which damage or nuisance occurs shall apply with regard to compensation.

⁷ P. E. Corbett, *Law and Society in the Relations of States*, New York 1951, states on p. 123: "If there is any rule on the subject, it can only be stated in the form of a consensus recognizing the sovereignty of States for a distance of at least three miles seaward from their shores."

rules of international law, previously obtaining, ceased to exist.⁸

Under international law a state has the right to regulate, control and dispose of persons and things within its territory, including the territorial sea. The control relates also to fisheries; a state may control fisheries within its territorial waters and reserve such fisheries for its own nationals. Expanding claims for territorial waters mean that states want to regulate, for various purposes, a larger area of water than was earlier under their control. Once upon a time the need for military protection against an enemy may have motivated claims to a marginal belt of sea between the land and the high seas. The theory of "effective control" is said to lie behind "the Cannon Shot Rule",⁹ but the rule may have had an even more realistic explanation in the desire to forbid foreign ships to approach those parts of the sea from which their guns could reach the land.¹ It seems reasonable to assume, however, that in these days of nuclear weapons, missiles and other new long-range devices for destruction the limit of territorial waters is irrelevant from the military point of view.² Reasons relating to customs control and control of persons and things may still be valid, but do not necessarily call for an extension of territorial waters beyond, for instance, the three-mile limit,

⁸ It should be noted that in the period immediately following the 1958 Conference claims for extended territorial waters were made by China, East Germany, Indonesia, Iran, Iraq, Libya, Mexico, Panama, Saudi Arabia, Thailand, the United Arab Republic and Vietnam. The impact of the Conference on the position of countries opposed to the extension of the width of the territorial sea is shown by the fact that the United Kingdom, in the spring of 1963, denounced all conventions which bound the country to the three-mile limit; this was done in order to facilitate the development of a new fishing policy. Cf. below, pp. 81 f.

⁹ Cornelius van Bynkerhock, who is regarded as the father of the rule, spoke in the terms of effective control: "... potestatem terrae finiri ubi finitur armorum vis". *Dissertatio de dominio maris*, Leiden 1702, chap. ii *if*.

¹ According to William Edward Hall (*International Law*, Oxford 1880, p. 125), effective command from the coast was needed in order to satisfy the condition of "valid appropriation" of the marginal sea. But the reason why states appropriated the sea was to reserve for their own subjects the enjoyment of the fisheries and also because "no sufficient security would exist for the lives and property of the subjects of the state upon land" if the marginal sea was not appropriated. The subjects would be exposed to intended or accidental effects of acts of violence without recognized means of redress.

² At the 1958 Geneva Conference, however, the United States argued *against* an extension of the territorial seas for military reasons. See Arthur H. Dean in 57 *A.J.I.L.* (1958), pp. 607 ff.: "An extension of the territorial sea threatens the security of the United States by reducing the efficiency of its naval and air power, and by subjecting it to increased risk of surprise attack." In time of war "an extension of the territorial sea of neutral nations would dramatically increase the striking power of enemy submarines".

particularly in view of the existence of the right to hot pursuit confirmed by Article 23 of the Convention on the High Seas,³ and the right of control within a contiguous zone under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone. The monopoly with respect to the use of the sea bed and its subsoil does not provide a valid reason for claims for the extension of territorial waters when international law permits a coastal state to exercise sovereign rights over the continental shelf for the purpose of exploiting its natural resources (Article 2 of the Convention on the Continental Shelf). The monopoly rights with respect to fishing within territorial waters may, however, continue to produce serious claims for their extension. (Cf. below pp. 81 f.) On the other hand, the importance of national fishing monopolies may be reduced by developments in the field of oceanography, greater possibilities for all nations profitably to extend their fishing activities farther out in the oceans, and continuing efforts to provide for international cooperation in the control of sea resources.

Opposition against expanding claims is based on several grounds. In the case of fishing, monopolies created by new claims, if accepted, may prevent fishermen from operating in areas which formerly belonged to the high seas and in which they have been fishing for a long time under favourable conditions. Moreover, extensions may impose new restrictions on the use of the sea for commerce and navigation. Security at sea may also be affected.⁴ It seems reasonable to believe that solutions could be achieved by compromises. It is significant that in 1961 Iceland and the United Kingdom were able to reach agreement on the Icelandic claim for a twelve-mile "fishery zone" providing also for fishing by vessels registered in the United Kingdom within parts of that zone.⁵ However, it seems difficult in view of recent developments to evolve a general rule of law in terms of a distance limit of the territorial sea that would be applicable everywhere. Nations may

³ Cf. C. John Colombos, *The International Law of the Sea*, 5th rev. ed. London 1962, pp. 151 ff.

⁴ See Colombos, *op. cit.*, pp. 100 f.

⁵ See Shigeru Oda, *International Control of Sea Resources*, Leyden 1963, pp. 24 f. and 138, and Colombos, *op. cit.*, pp. 140 ff. The case of Iceland is argued by Gunnlaugur Thordarson in *Les eaux territoriales d'Islande en ce qui concerne la pêche*, Reykjavik 1958. Note also the agreement between Denmark and the United Kingdom of April 27, 1959 (*United Nations Treaty Series*, vol. 336, p. 416), and between Norway and the United Kingdom of November 17, 1960 (*United Kingdom Treaty Series*, no. 25, 1961).

perhaps have to adopt the method used for drawing frontiers on land, that is to try to reach agreement in one region of the seas after another on geographical frontiers in the water, taking into account the special economic and topographical conditions of the region. If so, the general rule of international law would consist in recognition by consent of reasonable regional treaty arrangements on maritime frontiers.

The regime within territorial waters is a national regime.⁶ However, under a rule of general international law confirmed by Article 14 of the 1958 Geneva Convention on the Territorial Sea and the Contiguous Zone, ships of all states enjoy a right of innocent passage through the territorial sea. This rule protects the use of the seas for commerce and navigation. With respect to internal waters, viz. ports and harbours, lakes, straits and rivers, efforts have been made to develop general rules of international law, particularly in order to establish a right of access for foreign vessels to internal waters and ports.⁷ It is assumed that ships in distress have free access to national ports. However, it seems safe to conclude that the right of innocent passage in territorial waters is the only real limitation under general international law on a state's power to control its waters, whether territorial or internal.⁸

The right of control within a contiguous zone with a maximum extent of twelve miles from the base line from which the breadth of the territorial sea is measured under the Geneva Convention is an exception from the general rules relating to the high seas. The exercise of this right, which only concerns the prevention and punishment of infringements of a state's customs, fiscal, immigration or sanitary regulations, may necessitate special national legis-

⁶ On the controversial question of "the legal nature" of territorial waters see Colombos, *op. cit.*, pp. 79 ff.

⁷ See Colombos, *op. cit.*, pp. 158 ff.

⁸ Limitations may, of course, be the result of conventions. A Convention on the International Regime of Maritime Ports was signed in Geneva 1923, providing, *inter alia*, that all sea-going vessels of the contracting states shall enjoy freedom of access to the maritime ports of those states. See *League of Nations Treaty Series*, vol. 58, 285. The 1958 Geneva Convention on the Territorial Sea and the Contiguous Zone creates by Article 5, para. 2, a new right of innocent passage: "Where the establishment of a straight baseline in accordance with article 4 has the effect of enclosing as internal waters areas which previously had been considered as part of the territorial seas, a right of innocent passage, as provided in articles 14 to 23, shall exist in those waters". Indonesia and the Philippines claim sovereignty over all waters around, between and connecting the different islands of the respective archipelagos. Both states have expressly recognized the right of innocent passage through these waters which are claimed as internal waters. Cf. C. F. Bouchez, *The Regime of Bays in International Law*, Leyden 1964, pp. 5 f. and 98 ff.

lation or treaty arrangements, for instance where the coasts of two states are opposite or adjacent to each other or where cooperation is desirable in order to make control effective. The general rule on a contiguous zone should, however, make possible the abolition of claims for wide special zones for the enforcement of customs and revenue laws or for security reasons, claims which have caused controversies in the past and have been regarded as harmful to the freedom of the high seas.⁹

III. THE PRESENT STATUS OF INTERNATIONAL LAW AND THE USES OF WATER

A. NAVIGATION

The Oceans

The high seas, that is the interlinking chain of oceans which lie seaward of territorial waters,¹ can be used for many purposes. Navigation for the transporting of goods and persons remains, however, the most important use. The rules of international law governing the high seas should be assessed, in the first instance, on the basis of the extent to which they conduce to the protection of freedom of navigation. They have, in fact, been developed for that purpose, that is to further the interests of states engaged in shipping or trading with countries in other continents. However, the rules relating to the high seas also take into account other interests than those of securing liberty and equality of navigation. The 1958 Geneva Convention on the High Seas declared in Article 2 that freedom of the high seas includes freedom of fishing, freedom to lay submarine cables and pipelines, and freedom to fly over the high seas. It is generally accepted that the freedom of the high seas further protects industry and science in and on the seas. Subject to the regime of the continental shelf (below, pp. 71 f.), all states are entitled to utilize the subsoil of the high seas for exploitation of its resources.

⁹ Cf. below, pp. 68 f.

¹ Paul Reuter (*Droit international public*, Paris 1963, p. 171) defines the sea as follows: "D'un point de vue juridique, la mer se définit comme l'ensemble des espaces d'eau salée en communication libre et naturelle. Cette formule exclut les mers intérieures et les eaux douces et souligne la place des communications dans le droit maritime."

Convention on the High Seas, but to some extent they are forbidden by the 1963 Test Ban Treaty.⁵ Under general international law, activities carried out on the high seas create a liability on the state controlling them, for instance if they cause damage to foreign ships or in neighbouring marginal seas or on land. The state under whose control such activities are carried out should also have to provide protective measures for avoiding detrimental effects of the activities, an obligation that finds support in the second paragraph of Article 2 of the Convention, which reads as follows:

These freedoms, and others which are recognized by the general principles of international law, shall be exercised by all States with reasonable regard to the interests of other States in their exercise of the freedom of the high seas.

The "rule of reasonableness" thus referred to does not imply, however, that a state which carries out military experiments on the high seas is entitled to close parts of the seas and forcibly to prevent foreign ships from entering closed areas. It could not be left to powerful nations to assume, for whatever purpose, exclusive jurisdiction over parts of the high seas by unilateral declarations. The test whether a claim for exclusive jurisdiction under given conditions is "reasonable" or not must be an international one.⁶ States are free to limit or exclude the exercise of their rights based on the rules governing the freedom of the seas. It can be done by consent or acquiescence. Consent can be given explicitly by treaties such as those entered into by the United States with several countries for the control of liquor traffic. It can also be given by any of the other mechanisms of consent or acquiescence recognized by international law.⁷

⁵ Article I of the Test Ban Treaty, which was signed in Moscow on August 5, 1963, and entered into force on October 10 that year, prohibits nuclear weapon tests and other nuclear explosions, *inter alia* under water, including territorial waters and the high seas, and also "in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the state under whose jurisdiction or control such explosion is conducted".

⁶ In Myres McDougal & William T. Burke, *The Public Order of the Oceans. A Contemporary International Law of the Sea*, New Haven & London 1962, pp. 770 and other places, a different interpretation is given, as it seems, of "the reasonableness criterion".

⁷ Danish seizure of the "Lucky Star", a broadcasting ship operating on the high seas in the Baltic, could be defended by the almost universal acceptance of the Radio Regulations, adopted on December 21, 1959, by the Administrative Radio Conference. Article 7 of the Regulations contains a prohibition of the

Does fishing or the utilization of the ocean subsoil for the purpose of exploitation of resources or for that of communication interfere with freedom of navigation? It is taken for granted that the laying of cables or pipelines does not cause such interference. The exploration of submarine areas or the exploitation of their natural resources is open to any ship under the regime of the high seas, but there is no evidence at present that the installations needed for such activities would constitute obstacles to navigation.⁸ The situation is different with respect to the continental shelf. The 1958 Geneva Convention on the Continental Shelf gives coastal states an exclusive right to explore the natural resources of the continental shelf (Article 2), to construct and maintain installations on the superjacent waters and to establish safety zones around such installations (Article 5); ships of all nationalities must respect these safety zones. Assuming that the rules relating to the continental shelf may apply to the Grand Banks of Newfoundland, the whole North Sea, much of the Bay of Biscay and waters around the Phillipines, Indonesia, New Guinea and Australia, it is conceivable that a possible progressive exploitation of the continental shelf might impede free navigation on already well-established lanes. The Convention is carefully worded and states explicitly that the rights of the coastal state over the continental shelf do not affect the legal status of the superjacent waters as high seas (Article 3) and that the exploration and exploitation of the shelf "must not result in any unjustifiable interference with navigation" and other customary uses of the high seas. But it seems difficult to reconcile, on the one hand, the rights of the coastal states to protect the zones and their interest in preventing others, by force if necessary, from trying to share in

establishment and use of broadcasting stations on board ships, aircraft or any other floating or airborne objects outside national territories. On this incident and Danish and Swedish legislation prohibiting broadcasting on the high seas, see Max Sørensen, "Pirate Broadcasting from the High Seas", in *Legal Essays. A Tribute to Frede Castberg on the Occasion of his 70th Birthday 4 July 1963*, Oslo 1963, pp. 319 ff.—A European agreement for the repression of pirate broadcasting was signed by seven states, Members of the Council of Europe, on January 22, 1965.

⁸ Extensive installations might, however, limit the freedom of ships to seek new and more favourable lanes for navigation, as indicated by better oceanographic knowledge. Note that the United States Military Sea Transport Service reduced the average times of transocean voyages by about ten per cent by routing its ships along the most favourable seaways for waves and winds. Revelle, "Unesco and the World Ocean", *Unesco in a Decisive Decade*, Washington D.C. 1963, pp. 11 f. See also Revelle, "Oceans, Science and Men", *Impact of Science on Society*, vol. 14 (1964), no. 3, pp. 170 f.

the exploration and exploitation of the natural resources of the continental shelf, and, on the other hand, the general obligation of states not to interfere with foreign ships navigating on the high seas.⁹ There are risks of conflicts and of insecurity with respect to the conditions of shipping within the area of the oceans above the shelf, that is to say about eight per cent of the total area of the oceans. It may be added that fishing may also be disturbed, since the major fisheries—such as those of the North Sea and the Baltic, of the waters around Norway and Iceland, Newfoundland and New England, and of Alaska, Siberia, Japan, Korea and China—are all either directly over or near certain portions of the continental shelf.¹

Conflicts between navigation and fishing seem on the whole negligible. It should be mentioned, however, that under Articles 6 and 7 of the 1958 Geneva Convention on Fishing and Conservation of the Living Resources of the High Seas a coastal state may adopt unilateral measures of conservation which “shall be valid as to other States” during a certain period of time. It has been pointed out by Professor Max Sørensen that “the convention contains no clear provision forbidding the coastal state to take enforcement action against foreign fishermen who violate the mea-

⁹ Cf. Georg Schwarzenberger, “The Fundamental Principles of International Law”, *Recueil des Cours* 1955, I, Leyden 1956, p. 364. The possibility of future international conflicts is demonstrated by recent legislation. We may refer to the British Continental Shelf Act of April 15, 1964, establishing “designated areas” on the continental shelf outside territorial waters; ships are not allowed to enter such areas without the consent of the Minister of Power and if this prohibition is violated the owner or master of the ship is liable to punishment. See 58 *A.J.I.L.* (1964), pp. 1085 ff.—The United States Congress approved on May 20, 1964, an Act which forbids, *inter alia*, “any vessel” to engage “in the taking of any Continental Shelf fishery resource which appertains to the United States”; vessels employed in any manner in connection with a violation of the Act shall be seized and subject to forfeiture, and the responsible persons fined. See 58 *A.J.I.L.* (1964), pp. 1090 ff. — A series of new legal problems raised by the exploitation of the continental shelf were discussed at the first international congress on “Petroleum and the Sea”, Monaco, May 1965.

¹ David & Minor, *op. cit.*, pp. 31 and 66 f.—Denmark, Germany, the Netherlands, Norway and United Kingdom, together with 20 international oil operators, are planning extensive drilling operations outside the territorial seas bordering the North Sea, where one of the world's largest hydrocarbon reserves is thought to lie. The necessary legal machinery is to be set up between the states concerned. The North Sea is, at the same time, an area extensively used by many other nations for both navigation and fishing. See the *New York Times*, Feb. 9, 1964.—In Sweden, the Riksdag in 1964 gave its consent to Swedish ratification of the Convention on the Continental Shelf and at the beginning of 1965 the Government announced its intention to start exploring the “Swedish” continental shelf in both the Baltic and the North Sea.

asures".² This statement implies that the protection by the Convention of the fishing interests of coastal states in areas of the high seas adjacent to the territorial sea might lead to encroachments on the principle of the freedom of the high seas which might possibly hamper the interests of free navigation. However, the majority interpretation of the Convention seems to be that a coastal state may not enforce its measures directly over nationals of other states. It is the obligation of the other states to apply to their own nationals the measures unilaterally adopted by the coastal state.³

Several matters of concern to all states which relate to navigation and overseas commerce have been regulated by municipal legislation and international agreements in interplay. Among such matters are the regulation of sea traffic and the salvage of life and property at sea, as well as efforts to arrive at common rules to be applied by municipal courts in cases concerning collisions, limitations of shipowners' liability, etc. It can be said that the 1958 Convention on the High Seas gives a basis for a "public order of the high seas" by obliging signatory states, *inter alia*, to fix the conditions for the grant of their nationality to ships (Article 5) and to take measures necessary to ensure safety at sea (Article 10) and for rendering assistance to vessels in distress (Article 12). In future, states will be bound to participate, in accordance with the provisions of the Convention, in the formulation and implementation of rules which together create a "public order of the high seas", emphasize its character of *res communis omnium* and provide for the free and orderly use by all states of the oceans as an international highway.

Through the establishment of the Intergovernmental Maritime Consultative Organization (IMCO) as one of the specialized agencies of the United Nations, efforts have been made to provide machinery for cooperation between governments in the field of regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade.⁴ IMCO's functions are restricted to matters related to shipping. At the same time, some of these matters are the concern of other international agencies. ILO, for instance, cooperates with IMCO with respect

² Max Sørensen, "The Law of the Sea", *International Conciliation*, no. 520 (1958), p. 223.

³ Cf. Oda, *op. cit.*, pp. 116 f.

⁴ IMCO was established by a convention adopted at the United Nations Maritime Conference in Geneva 1948. The convention entered into force in March 1958, when Japan ratified it as the twenty-first state. The first Assembly was held in London in January 1959.

to the improvement of working conditions aboard ships.⁵ The World Health Organization (WHO) carries the responsibility for international regulation of shipping in the interests of public health. IAEA investigates the effects of radioactivity on the sea; it has established a panel of legal experts to consider water-disposal problems.⁶ WMO has an interest in the interaction between the sea and the air, and its services are of great importance for shipping.

Other Waterways

Waterways, other than the oceans, of importance to shipping engaged in international trade are straits, canals, rivers and lakes. As to straits, Article 16 (4) of the Geneva Convention on the Territorial Sea and the Contiguous Zone provides that "there shall be no suspension of the innocent passage of foreign ships through straits which are used for international navigation between one part of the high seas and another part of the high seas or the territorial sea of a foreign State".⁷ This principle goes further than the draft of the International Law Commission by protecting freedom of access through straits from the high seas even to "the territorial sea of a foreign State". While this addition appears as a *lex in casu* aiming at settling the controversial issue of the rights of entry into the Gulf of Aqaba,⁸ it should be regarded as an important step towards securing freedom of navigation in the interests of international trade.

Artificial canals are parts of the internal waters of the riparian states.⁹ The great interoceanic canals, however, have by treaty been opened to the ships of all nations.¹ This corresponds to the

⁵ Third Report of the ILO to the United Nations, 1949, pp. 188 ff.

⁶ Another panel of scientists is studying the question of the sea disposal of radioactive waste. See McDougal & Burke, *op. cit.*, pp. 867 f. IAEA also co-operates with the Monaco Hydrographic Bureau and the Oceanographic Institute of Monaco. See Colombos, *op. cit.*, p. 312.

⁷ Concerning in particular the Dardanelles and the Danish straits, see Erik Brüel, *International Straits*, London 1947.

⁸ Cf., for instance, Dean, *op. cit.*, pp. 621 ff. See also Charles B. Selak, "A Consideration of the Legal Status of the Gulf of Aqaba", 52 *A.J.I.L.* (1958), pp. 660 ff., and Gross, "The Geneva Conference on the Law of the Sea and the Right of Innocent Passage through the Gulf of Aquaba", 53 *A.J.I.L.* (1959), pp. 564.

⁹ J. L. Brierly, *The Law of Nations*, 6th ed., edited by Sir Humphrey Waldock, Oxford 1963, pp. 333 f.

¹ On the right of free passage through interoceanic canals, see R. R. Baxter, *The Law of International Waterways*, Cambridge, Mass., 1964, particularly pp. 168 ff.

demands of freedom of navigation on and between the oceans. But so long as the principle of a right for all vessels to pass through interoceanic canals does not form part of general international law, international trade interests are, as experience shows, under the constant threat of the possibility that throughways such as the Suez Canal or the Panama Canal may be closed as a result of political events which affect or are claimed to affect treaty obligations.

As to rivers, much work has been devoted to developing the law relating to "international rivers", generally defined as rivers which flow either through, or between, two or more states. The problems studied have related to the allocation of water for different users and to the reconciliation of conflicting interests of the riparian states. However, on some "international rivers" navigation is of no importance or only of subordinate importance, and it is not all rivers that play a significant role as parts of the routes of international trade. On the other hand, there exist rivers or lakes or canals which are important in this respect although they are not "international" under the definition given but from the point of view of international *lex lata* are internal waters.

Historically, international regulation of the use of international rivers has been concerned mainly with navigation.² Various developments led to the adoption, in 1921, of the Barcelona Convention and Statute on the Regime of Navigable Waterways of International Concern. This provided for the free use of waterways usually navigable from the sea, which separate or traverse different states or which connect with the sea a naturally navigable waterway separating or traversing different states.³ The Barcelona Convention was ratified by only twenty states, however, and most of these were states on which the Convention had no practical effect. Its rules cannot be regarded as the expression of prevailing state practice.⁴ Nevertheless, free navigation is protected, to a varying extent, by treaties relating to individual rivers of concern to more than one state. It remains to develop, in the interests of international navigation and trade, rules of international law which protect free access for all commercial vessels to all international

² F. J. Berber, *Rivers in International Law*, London 1959, pp. 5 f.; Colombos, *op. cit.*, pp. 215 ff.; and Corbett, *op. cit.*, pp. 148 ff. See also Y. Y. Baskin, "International Juridical Questions regarding the Utilization of Rivers", *Soviet Yearbook of International Law* 1961, p. 262.

³ *League of Nations Treaty Series*, vol. 7, p. 51.

⁴ Cf. Berber, *op. cit.*, pp. 122 f.

rivers of importance to world trade.⁵ The St. Lawrence Seaway, for instance, is a joint concern of Canada and the United States and is therefore an international waterway according to current definitions. Its use seems indispensable to international commerce inasmuch as it provides a continuous navigable route for larger ships from Montreal as far west as Port Arthur and Fort Williams in Canada, and Duluth and Chicago in the United States;⁶ the desideratum would appear to be that the St. Lawrence Seaway and similar waterways, even those which are internal, should be open under general international law for innocent passage of vessels from all nations in time of peace.⁷

B. OTHER USES OF WATER

The available water resources of the world are to an increasing extent being used for the generation of electricity, for various industrial purposes, for irrigation and for domestic and recreational purposes. The use of water for such ends becomes an international concern mainly with respect to international rivers and to lakes which constitute border waters. On the whole, the water of the oceans is still being used only for navigation and fishing, and the rules of international law which relate to the regime of the oceans do not directly apply to enterprises for other uses. However, isolated areas belonging, as it were, to the world of the oceans present specific water problems. For instance, no atoll in the South Pacific ever has enough fresh water for cooking and drinking.

The legal problems relating to the use of the water of international rivers remain to a large extent unsolved, although it may

⁵ According to White (*op. cit.*, pp. 55 f.) the main stream of the Mekong river will be opened as a transportation route. Conversion of the Mekong into a year-round deepwater channel to the Laotian Capital of Vientiane—1,000 miles from the sea—would open up the landlocked areas of the basin to bulk shipments by water. But the freedom of access to Laos from the high seas is obviously an international concern and not merely a matter to be settled by the riparian states. A convention establishing free navigation on the Mekong river was signed on December 29, 1954, by Vietnam, Laos and Cambodia. (See Schaaf & Fifield, *op. cit.*, p. 82.) But the problem how to achieve a legal regime of the Mekong river which satisfies all international interests seems to have been referred to the final stage of execution of the river plan. See Nguyen Quoc Dinh, "L'internationalisation du Mekong", *Annuaire français de droit international*, 1962, pp. 91 ff. and, particularly, p. 112.

⁶ See R. R. Baxter, *Documents on the St. Lawrence Seaway*, London 1960.

⁷ Cf. Colombos, *op. cit.*, pp. 214 ff. On the Yangtse-Kiang, a national river in China of the highest importance as a commercial waterway, see Colombos, *op. cit.*, pp. 234 f.

be said that some broad principles have emerged as customary law.⁸ Much research work of a more or less constructive nature has been carried out in recent years, particularly within the International Law Association, and it might be possible to construct the framework of a law of international rivers by codification or a general treaty. Nevertheless, it seems reasonable to assume that the conclusion of specific and specialized water treaties will always be necessary, since the concrete problems vary from basin to basin.⁹

The efforts to solve problems relating to international rivers pave the road for further developments; for, where international rivers are concerned, many kinds of uses compete with one another. It becomes necessary not only to apportion the water between several and competing users but also, by joint action, to combat pollution and salination and to provide for a more economical use and re-use of the water, in view of the ever-increasing shortage of this commodity in all parts of the world.

New Water Resources

The shortage of available water makes it imperative to look for new resources of water and for ways of bringing about a more extensive and efficient use of resources already explored. Here, developments in the scientific field may not have reached a stage where the assistance of the international lawyer is urgent. But such lawyers should realize the fact that this stage may soon be reached, just as the scientists engaged in, for instance, the UNESCO arid zones, hydrology and oceanography programmes should be aware of the economic, social, cultural and legal implications of new scientific discoveries and techniques.¹

⁸ See Brierly, *op. cit.*, pp. 128 ff.—Compare the case of the *Donauversicherung* (1927) of Würtemberg and Prussia versus Baden. *Entscheidungen des Reichsgerichts in Zivilsachen*, vol. 116, Appendix, p. 18. See also William W. Van Alstyne, "The Justiciability of International River Disputes: A Study in the Case Method", *The Duke Law Journal* 1964, pp. 307 ff.

⁹ Cf. Berber, *op. cit.*, pp. 270 ff., and H. A. Smith, *The Economic Uses of International Rivers*, London 1931, p. 143.

¹ The Arid Zone Programme of UNESCO, started in 1951, has been extended to fields outside hydrology, irrigation and fertilization methods, botany, etc., but the legal implications of international coordination and integration of efforts to improve living conditions in desert or semi-desert areas throughout the world do not seem to have been studied or even noticed. Legal implications were not considered at the Lagos conference of 1964 on the organization of research and training in Africa in relation to the study, conservation and utilization of natural resources. They were not dealt with in the issue of *International Social Science Journal* (vol. 16, no. 3, 1964) which concerned "social aspects of African resource development".

If the tides, waves and currents of the oceans or the heat differences between deep and surface waters should come to be more generally used for the generation of electric power, the existing rules of general international law relating to the high seas may prove inadequate. The question may also arise whether the utilization of the high seas for such a purpose, permissible to everybody under the present law, should reasonably benefit only the user. The question of the impact on the climate may also become topical.² The use of large areas of the oceans for the desalination of sea water so that it can be used for agricultural, industrial, or domestic purposes will also raise problems with respect to the freedom of the high seas and the allocation of fresh water thus obtained. The Hydrological Decade will be concerned with the global distribution of water, the use of both known and as yet undiscovered or unexplored underground supplies and, possibly, weather control.³ Any international action based on new discoveries must involve many states with probably diverging interests and give rise to legal problems just as pertinent and difficult as the long-existing ones relating, for instance, to the freedom of the high seas and the rights in international rivers.

C. THE RICHES OF THE SEA

Fishing

In discussing the various uses of water, a distinction is sometimes made between forms of exploitation which are said not to consume the water, such as navigation, floating and generation of power, and other forms of exploitation which are said to consume it, such as irrigation or the use of water for domestic purposes. The value of this distinction is questionable, as the water returns through the hydrological cycle although the timetables of return differ. A distinction between uses which are "clean" and uses that pollute

² Compare McDougal & Burke, *op. cit.*, pp. 790 ff. On p. 793 it is said: "Interference with the natural conditions determining climate would appear to be one activity which will be regarded as requiring the explicit agreement among states adversely affected."

³ See *Report of Preparatory Meeting on the Long-Term Programme of Research in Scientific Hydrology*, Paris, May 20-29, 1963; UNESCO/NS/181.—The legal aspects of rainmaking have been studied by Jack C. Oppenheimer in vol. 2 of *Final Report of the Advisory Committee of Weather Control*, U.S. Printing Office, Washington D.C., pp. 209 ff. Cf. also H. Wexler, "Modifying Weather on a Large Scale", *Science*, vol. 120, no. 331 (1958), pp. 1054 ff.

or otherwise change the quality of water may, however, be useful for various purposes.

Fishing can be said not to involve the use of water at all, apart from the navigation of fishermen's boats. It is the extraction of marine animal life as a source of human nourishment. The mineral resources of the sea may also be exploited for various purposes; this operation may change the chemical composition of the water but it does not, even temporarily, "consume" water. In this paper, for the reasons given, the exploitation of the resources of the seas is not dealt with as one of the uses of water; nevertheless conflicts may occur between activities aiming at exploiting marine resources and the use, in the proper sense, of the water of the sea for navigation or other purposes.

Fishing in rivers is not without importance, and agreements relating to international rivers sometimes provide for the conservation of fishing resources in such rivers. At the 1958 Geneva Conference attention was drawn to migratory resources (e.g. salmon, shad, alewife, eel) which come and go between fresh and salt water and thus migrate between the fishing areas of individual states, including their rivers, and areas of the high seas. A resolution was adopted on conservation measures with respect to such resources. But the chief international legal problems relating to fishing concern the high seas only. However, fishing outside the territorial sea seems to have developed slowly; fishing on the high seas became of major importance only when railroads and steamships expanded the world market, when refrigeration and canning made worldwide distribution possible and when the floating factory emerged.⁴ Legal as well as political developments have followed the economic trends. The principle of freedom of fishing on the high seas must for long have benefited mainly those fishing nations that were economically and industrially most developed.

The 1958 Geneva Convention on Fishing and the Conservation of the Living Resources of the High Seas has changed the picture. The monopoly of states within their territorial waters and unlimited competition on the high seas are no longer the guiding principles. At any rate, they have been considerably encroached upon by rules favouring the fishing interests of coastal states in areas of the high seas adjacent to the territorial sea and providing for cooperation amongst all states for the adoption of measures for the conservation of marine living resources. The new policy is

⁴ See Daniel & Minot, *op. cit.*, pp. 14 f. and 173 ff.

well explained in the *considerata* of the preamble of the Convention. These read:

The States Parties to this Convention,

Considering that the development of modern techniques for the exploitation of the living resources of the sea, increasing man's ability to meet the need of the world's expanding population for food, has exposed some of these resources to the danger of being over-exploited,

Considering also that the nature of the problems involved in the conservation of the living resources of the high seas is such that there is a clear necessity that they be solved, whenever possible, on the basis of international co-operation through the concerted action of all the States concerned,

Have agreed as follows:

The new community aspect applied to the regime of the high seas where fishing is concerned is underlined by the provisions in Article 9 of the Convention for the establishment of an *ad hoc* arbitral commission, called the "special commission", for the settlement of disputes relating to measures for the conservation of the living resources of the sea.

In Article 1 of the Convention it is laid down that all states have the right for their nationals to engage in fishing on the high seas, subject (a) to their treaty obligations, (b) to the interests and rights of coastal states under the Convention, and (c) to the provisions in the Convention concerning conservation measures. The Convention aims at transforming the high seas into an international fishing community, but this development might be hampered by the terms of some of the existing fishery conventions still binding upon the parties. The most striking example is the International Convention for the Regulation of Whaling, signed in 1946.⁵ The distribution under this Convention of the total catch among Japan, Norway, the Soviet Union and the United Kingdom means that "free competition has practically ceased with respect to the Antarctic whaling".⁶ Controversies persist with respect to the principles for the allocation of the marine resources of the high seas and particularly to "the concept of abstention" advanced by the United States of America and embodied, *inter alia*, in the International Convention for the High Seas Fisheries in the North Pacific, signed in 1952 by Canada, Japan and the

⁵ *United Nations Treaty Series*, vol. 161, p. 72.

⁶ Oda, *op. cit.*, p. 82.

United States.⁷ In spite of the work of the 1958 Geneva Conference, it must be recognized that the problem of international fisheries—and especially of the allocation of limited resources among states—“will require more comprehensive study by international lawyers as well as by national statesmen than it has received”.⁸

The need for renewed considerations on the international level of the international law relating to fisheries becomes evident when we consider developments since the Geneva Conferences of 1958 and 1960. The Geneva principles are based on the rule of general international law, embodied also in the Convention on the High Seas, that there must be freedom of fishing for all nations on the high seas. In addition, the Geneva Convention on Fishing and the Conservation of the Living Resources of the High Seas provides for active cooperation between all countries for conservation measures and gives coastal states special rights to take unilateral measures, though only for the conservation of living resources. Since Geneva, however, many states have claimed a right to establish special “fishing zones” in the high seas.⁹ Among those countries are Denmark (for Greenland and the Faroe Islands), Iceland, Norway and United Kingdom as well as Canada and South Africa. On March 9, 1964, sixteen European states met at the European Fisheries Conference in London. A Fisheries Convention was adopted¹ which recognized the right of contracting parties to establish a fishery regime by which coastal states have the exclusive right to fish and exclusive jurisdiction in matters of fisheries within the belt of six miles measured from the baseline of its territorial sea. The Convention also reserves, in principle, exclusive fishing rights for coastal states within the belt between six and twelve miles measured from the baseline of the territorial sea. The claims for exclusive fishing rights in the high seas within a newly invented “contiguous zone” for fishing of twelve miles

⁷ *United Nations Treaty Series*, vol. 205, p. 65. On the concept of abstention see Oda, *op. cit.*, pp. 65 ff. Cf. Henry Reiff, *The United States and the Treaty Law of the Sea*, Minneapolis 1959, pp. 278 ff.

⁸ Oda, *op. cit.*, p. 142. Compare the critical study on the work of the International Law Commission preparatory to the Geneva Conference by H. Ph. Visser t' Hooft, *Les Nations Unies et la conservation des ressources de la mer*, The Hague 1958.

⁹ Several countries reported as early as the 1958 Geneva Conference that they claimed special fishing zones in the high seas. Among those countries were Argentina, Brazil, Cambodia, Ceylon, the Dominican Republic, Lebanon, Morocco, Italy, Korea, Thailand, Tunisia, and Yugoslavia.

¹ 58 *A.J.I.L.* (1964), pp. 1068 ff.

may be based on the assumption that state practice since the Geneva Conferences indicates that international law in the future will recognize claims for a twelve-mile limit of the territorial sea. But even if this assumption were correct, traditional international law does not allow states to claim exclusive fishing rights in waters which are not claimed as territorial sea but are in principle recognized by the claimant states themselves as part of the high seas. The present practice means that states try to acquire special territorial rights and privileges but, at the same time, refuse to accept within the maritime belt, where they exercise their "rights", the obligations of territorial jurisdiction, that is to ensure that areas under their control are not used for purposes injurious to the interests of other states in a manner contrary to international law and to prevent such areas from causing economic injury to neighbouring territory in a manner not permitted by international law.²

We have already mentioned that, in the future, conflicts may occur between fishing and other activities on the high seas. Extensive exploitation of the continental shelf may disturb fishing and the same may be true of enterprises for the desalination of ocean water or the generation of electric power. New methods of weather control might influence fishing; the distribution and abundance of individual species of the fishes of the high seas change with changes in the oceanic environment. At the same time, increased knowledge about the reversal of the winds blowing over the oceans and its effect upon the currents and organisms in the water will make it possible for scientists to predict fish catches from weather maps and so to help fishermen in the planning of their activities.

The need for some form of international organization to regulate fishing outside national waters has been strongly felt. An outline of organization and functions for an "International Fisheries Office" was worked out by L. L. Leonard in a study published in 1944.³ Many international conventions have been entered into for the establishment of commissions for the scientific study and the conservation of various marine resources (tuna, shrimp, halibut, salmon, fur seals, etc.).⁴ In the United Nations orbit the FAO is the agency responsible for international coopera-

² See *Survey of International Law*. United Nations Publications, Sales no.: 1948. V. 1. (1), pp. 34 f. Cf. concerning this problem Bouchez, *op. cit.*, pp. 288 f.

³ L. L. Leonard, *International Regulation of Fisheries*, New York 1944.

⁴ See Oda, *op. cit.*, *passim*.

tion in dealing with the problems of fisheries. The FAO functions as a clearing house for scientific information on fisheries.⁵ It disseminates information on fishing, processing and marketing techniques, and publishes summaries of fisheries legislation, etc. In pursuance of a decision taken at the third session of the Conference of FAO, in 1947, two regional councils have so far been established for the scientific exploration of the sea.

New Resources

The worldwide study of the oceans conducted by the Intergovernmental Oceanographic Commission under the auspices of UNESCO and in cooperation with FAO aims at the rational exploitation of marine resources. At the same time oceanographic exploration helps to gather marine meteorological data that will help to supplement the information so far assembled purely by meteorological networks. Thus, there is a close connection between the current programmes for extensive study by concerted international action in the fields of oceanography, meteorology and hydrology. An international expedition consisting of a great number of ships from several countries began in 1960 to carry out studies in the Indian Ocean, which affects the lives of one-fourth of the world's population and influences the climate, the food supply and the mineral resources which they enjoy. Another expedition, composed of ships from many countries, is helping to determine the potential fishery resources in the tropical Atlantic. The results of this investigation will be discussed at a symposium to be held in West Africa in December 1965. Preparatory work for a study of the Kuroshio Current in the North-west Pacific, a phenomenon similar to the Gulf Stream, will begin in 1965. Proposals for further investigations are being considered.⁶

Obviously, much more could be done to discover new fishery resources and to improve their exploitation, not only for the production of human and animal food but also of oils, leather, vitamins, fertilizers, sponges and other goods.⁷ But it is not only

⁵ Cf. Constitution of FAO, Articles I, IV and XVI.

⁶ See Revelle in *Unesco in a Decisive Decade*, Washington D.C., 1963, p. 17. See also information contained in *International Marine Science*, a quarterly prepared jointly by UNESCO and FAO.

⁷ Cf. Daniel & Minot, *op. cit.*, pp. 106 ff. According to Revelle, *op. cit.*, p. 11, the living harvest from the sea has doubled since the Second World War, from 20 million to more than 40 million tons a year, and it must, he states, double again within the next two decades. "Otherwise, by 1980, most of the people in the world's poor countries, particularly the children, may suffer from a crippling deficiency of animal protein in their meager diets."

fishery resources that need to be considered. Various types of vegetable matter to be found in the sea are useful in foodstuffs and in the textile, paper and other industries. It is also possible to extract salt, potassium, magnesium, bromine, iodine and other chemicals from the sea, but these resources are as yet little explored and developed. "Minerals and chemicals exist on such a scale that, even were they measured and set down, the figures would be almost incomprehensible."⁸

The results of the intensive studies now started remain to be assessed, and it may well prove that the opinions of the scientists will vary with respect both to the scale of existing resources and to the possibilities of rational and extensive exploitation. But in any case it must be assumed that new legal problems relating to the allocation between nations of new resources will arise in the future. In addition, plans for the "farming" of the sea may affect the legal regime of bays and inlets, and international legal rules may be needed for the protection of "fish pastures" and other areas containing specially enriched waters.⁹ Claims for restrictions on freedom of navigation, particularly in some types of offshore areas, are conceivable.¹

IV. CONCLUSIONS

To the scientist it must seem evident that, of all the world's natural resources, water is especially suitable as a subject for international cooperation, since the occurrence and distribution of water is a consequence of the circulation of water throughout the world. This paper is based on the assumption that, similarly, the regulation of the use of water for various purposes and of interference with water at any stage of its circulation is essentially an international concern, and that in discussing the relevant rules of international law, whether existing or needed for the future, emphasis should be laid on the purposes for which the world's water resources are being used rather than on the areas where water happens to be found (oceans, lakes, clouds, etc.). In con-

⁸ Daniel & Minot, *op. cit.*, p. 75. Cf. Revelle in *Impact of Science on Society*, vol. 14 (1964), no. 3, pp. 156 ff.

⁹ Daniel & Minot, *op. cit.*, pp. 187 ff.

¹ Cf. Baxter, *The Law of International Waterways*, pp. 2 f. He mentions that Canada has been concerned about fishing rights in the Hecate Straits between Queen Charlotte Islands and the mainland of British Columbia.

temporary international society the rules which derive from state practice and treaties must be watched over by agencies which should strive to promote a worldwide observance of the *lex lata*. Machinery for legislative development is also required. Our conclusions concern the present status of international law and organization with respect to these various needs. They are urgent; despite the growth of international economic and technological organization and cooperation, there has not been a comparable development of international law.²

The Rules

The 1958 United Nations Conference on the Law of the Sea was an important achievement, both because it codified the customary international law of the high seas and because it paved the way for an international fishing community. While the question of the outer limit of the territorial sea was not solved, the rules of the Geneva Conventions give a satisfactory protection both of the freedom of navigation on the high seas and of the reasonable interests of coastal states, including their interests in developing fisheries. It can be assumed that the rules established by the Conventions, except, perhaps, for some provisions of the Convention on the Continental Shelf, will remain for a considerable period of time the basic rules relating to the high seas and adjacent waters and their use for various purposes. Where fisheries are concerned, however, the claims by many countries for exclusive fishing rights in special zones of the high seas give rise to legal problems which have to be solved in order to avoid a chaotic state of

² Cf. A. P. Lester, "River Pollution in International Law", 57 *A.J.I.L.* (1963), p. 853. See also Wolfgang Friedmann, *The Changing Structure of International Law*, London 1964, p. 365. It should be recalled, however, that new possibilities and activities for the use of nuclear energy have led to the creation of several international agencies and the nucleus for a new law for both peace and war. The pioneer writer was M. Bourquin in "Pouvoir scientifique et droit international", *Recueil des Cours*, 1947, I, pp. 335 ff. As early as 1954 Professor Charles Rousseau drew attention to a series of problems of international law which had come into being as the result of scientific discoveries and new techniques. See "Scientific Progress and the Evolution of International Law", *Impact of Science on Society*, vol. 5, no. 2, June 1954, pp. 71 ff. The United Nations has paid attention to the need for the development of an international law relating to the use of outer space, *inter alia* through the adoption by the General Assembly in 1961 of the Declaration of Legal Principles Governing the Activities of States in the Use of Outer Space. It has been said, however, that the speed at which technical advances are being made today is such that the lawyer should not lag far behind. See Cyril E. S. Horsford, "Legal Problems of Space Exploration", *Impulse*, no. 25, 1964, pp. 8 ff.

affairs. Moreover, new methods aiming at a more energetic exploitation of the animal, vegetable and chemical resources of the sea may, together with emerging new uses of water, create a need for more extensive regulation than that achieved by the Geneva Conventions.

It can also be assumed that the traditional legal questions relating to international rivers and other international waterways can be solved. They are difficult from both the technical and the political viewpoint, but there is a common understanding with respect to the basic rules which should apply; at the same time, it is generally understood that special agreements must be made for individual waterways and that, by such agreements, river commissions or other agencies should be established to facilitate the orderly use of waterways in accordance with the law. It is not impossible that the machinery of the United Nations may, on the basis of existing preliminary studies, achieve with respect to international rivers and other waterways results similar to those of the 1958 Geneva Conference. However, little has been done to promote the idea of a right to free navigation along the entire navigable course of international rivers and lakes, not only for the vessels of riparian states but also for those of other nations and of a right to innocent passage in time of peace for all vessels through waterways which, though not "international" under the prevailing legal definition, are of major importance to international trade.

If scientific and technological progress makes possible new uses of the water in the oceans, rivers and lakes, and in glaciers and icecaps, new rules of law may have to be devised. At the present time, however, the nature of the new legal problems and the mode of solving them cannot be stated in detail. An exception should be made for the possible discovery of large assemblies of underground water, subjacent to the land territories of several states. The solution of conflicting interests with respect to the utilization of such water would, it seems, have to be sought through analogies both with the international law relating to rivers and with national water legislation.³ The same seems to be true with respect to artificial international lakes.

International law includes rules for the settlement of disputes concerning the interpretation or application of provisions in trea-

³ An American study of this problem is C. L. McGuiness, *Water Law with Special Reference to Ground-Water*, Washington D.C. 1951 (U.S. Geological Survey, Circular 117).

ties and of customary rules of law. This system is not complete, and the fact that, between some states or for some kinds of legal disputes, judicial settlement is possible only if the states concerned make an *ad hoc* agreement to that effect creates a major problem of international law. This problem must, however, be left aside in the present context.⁴ Disputes concerning legal issues relating to the use of water are not *per se* either better or less well suited to judicial settlement than are other legal disputes, and the resistance to compulsory international jurisdiction is rooted in complex political considerations. It is significant that the 1958 Geneva Conference could not achieve anything more than an Optional Protocol of Signature concerning the Compulsory Settlement of Disputes; Article 1 of this instrument provides: "Disputes arising out of the interpretation or application of any Convention on the Law of the Sea shall lie within the compulsory jurisdiction of the International Court of Justice."

The Agencies

Many agencies exist which perform useful functions with respect to the use of water within specific regions of the sea or within individual waterways. Some such agencies are concerned with the use of water for several purposes, others are restricted to, for instance, navigation or fishing. In this paper we are primarily concerned with international agencies able to promote worldwide cooperation. Several such agencies exist, but their functions are limited. IMCO, for instance, deals only with shipping engaged in international trade, FAO is mainly devoted to fishing, and other agencies are concerned only with specific aspects of the use of water. IAEA, WHO and WMO have been mentioned above. The International Telecommunications Union (ITU) may also be included in the list of agencies which deal with matters relating to the use of water.

All these agencies are undoubtedly necessary and provide for cooperation between nations. They are also available for the negotiation of controversial issues and for studies aiming at further international developments within their specific fields of activity. It may be suggested, however, that a gradual strengthening of the organizations and widening of their competence is desir-

⁴ Cf. "Report on the Gradual Extension of the Compulsory Jurisdiction of the International Court of Justice" to the 1964 Tokyo Conference of the International Law Association. (Rapporteur: Louis B. Sohn.)

able.⁵ There are unsettled matters with respect to navigation in which IMCO, for instance, should have a reasonable interest; the solution of economic and legal questions relating to shipping seems to be a concern as important in the long run as the tasks of IMCO under its present Constitution. With regard to fishing, the International Law Commission, in 1953, proposed that an international authority with judicial and legislative powers be created, but the proposal was not accepted by the General Assembly. What experts find desirable or even necessary is sometimes not politically feasible. This problem relates to the dilemma of international law in our days, to which Dr. Georg Schwarzenberger referred when, dealing with the freedom of the seas under the "quasi-order" of the United Nations, he said that "the issue is that of a clear alternative between either retracting our steps from this quasi-order or of going very much beyond it".⁶

Machinery for Legislative Development

Economists nowadays regard water as "a keystone of the resource structure". They are also becoming aware of the fact that "problems of water are closely intertwined with those of land-management and with political and social milieus".⁷ This approach is recognized and supported by the United Nations, as is evidenced, *inter alia*, by the creation in 1959 of the "Water Resources Development Centre" at its headquarters in New York. At the same time, several intergovernmental agencies within the United Nations system encourage organized international cooperation among scientists in order to gain optimum benefit from the available

⁵ The need for "extensive intergovernmental apparatus" to coordinate the many new activities on the oceans is underlined by Revelle. "We can visualize, within the next ten years, an international network of measuring buoys and bottom-mounted devices throughout the world ocean, with an internationally agreed system to operate them and to disseminate the data they obtain. Ships, aeroplanes, research submarines and other vehicles will be used to study the ocean in new and undoubtedly expensive ways." Revelle, *op. cit.*, pp. 155 f.

⁶ Schwarzenberger, *op. cit.*, p. 37. A striking example of the limitation of the powers of present international organization was given at a meeting at Sandefjord in Norway in June 1964. The International Whaling Commission issued a scientific note of advice on the next season's catch recommending a total catch of 4,000 "whale units", but the four Antarctic whaling countries rejected this advice in spite of the fact that a larger catch figure might lead to the finback species of whale being hunted out of existence. The FAO does not seem to have powers to cope with a situation of this type.

⁷ Nace, *op. cit.*, p. 54.

supply of water and to prevent or reduce damage by water. But there is no international machinery, other than the United Nations itself, which has competence to watch over the need for legislative development with respect to the expanding use of the world's water resources or, more specifically, the settling of disputes which may arise when uses of water for different purposes conflict. In several instances above, we have pointed out that conflicts may arise between uses of water each of which is authorized under the present law of nations. The use of water for new purposes, novel techniques, or the discovery of new water supplies may multiply the risk of conflicts.

In addition, it is always possible that there may arise between states so-called political disputes concerning the use of water, that is to say disputes which cannot be solved by judicial settlement because the claim of a state is not that its legal rights have been violated but that the existing law is contrary to some meta-legal standard such as natural justice or the vital interests of the claimant state. Such disputes can be settled only by negotiation, preferably with the assistance of an international agency and aiming at an agreement between the states concerned. But at the same time this type of conflict generally suggests the need for an amendment of the law.

Conflicts should, if possible, be avoided. The function of a system of law is not only, or even primarily, to provide for the settlement of disputes but to clarify legal issues in different types of situations so that litigation does not need to occur. Within states the legislators are accustomed to foresee the need for new rules of law to apply to new phenomena, such as the automobile or telegraphy in earlier days or nuclear energy plants in our own days. The rules are there at the very moment when the wheels begin to spin or the power plants become operative. A similar approach should be applied to international legal development in the rapidly changing contemporary world. With respect to the types of problems discussed in this paper, avoidance of future conflicts should be possible, since the water projects to be brought about as a result of current studies and research will, to a large extent, be international undertakings carried out and financed with the help of intergovernmental organizations. If legal issues were studied before the projects were started and possible conflicts between various users and different national interests and claims were taken into account and weighed, legal regulations could be inte-

grated in the planning of projects.⁸ The acceptance of certain rules of law could be made a prerequisite for international assistance to countries concerned. But such rules cannot be made out of thin air. They must be based on a carefully considered and coherent legal policy which must be developed through the co-operation of all countries. And the rules so developed must be of general applicability, and not confer rights and duties only on nations which receive international aid for the furthering of water projects.

The "codification" and "progressive development" of international law is, within the United Nations system, the task of the International Law Commission. That body's method of work, however, is not such as to enable it continually to follow developments in every field of international public life and to establish legislative policies for all of them. The Commission's agenda is already so heavy that, at the present rate of progress, nothing more can be completed for the forthcoming ten or twenty years. The logical conclusion would seem to be that another kind of institution within the United Nations system should be created in order to deal with political and legal matters which relate to the use of the world's waters and to their misuse, but fall outside the competence and the expertise of the existing specialized agencies. International scientific cooperation as such helps to improve the relations between states. Speaking of the benefits of international oceanographic cooperation, apart from the scientific advantages, Roger Revelle has said the following: "There are the increases in international understanding which result from both the planning and the operational part of cooperative efforts, and the provision

⁸ Occasionally this seems to have been done. The International Bank for Reconstruction and Development submitted in 1954 to the governments of India and Pakistan a "Plan for the Development and Use of the Indus Basin Waters". (See Abraham M. Hirsch, "Utilization of International Rivers in the Middle East", 50 *A.J.I.L.* (1955). In general, however, technical and financial support from agencies within the United Nations system for river projects seems to have been given without much attention to the legal implications, which have been left to the riparian states. With respect to the Niger River project the United Nations began its help by appointing a committee of technical consultants for the project. The convention for the use of the Niger was drafted by the interested African states and "made available" to the United Nations. (See T. O. Elias, "The Berlin Treaty and the Niger Commission", 57 *A.J.I.L.* (1963) pp. 873 ff.) A similar procedure seems to have been adopted with respect to the Senegal River. There, an International Committee established by the four riparian states (Guinea, Mali, Mauretania, and Senegal) carries the general responsibility for the development of the river, and the Special Fund limits itself to providing money for various technical projects. See U.N. doc. SF/R. 10/Add. 67 and 68 (1964).

of assistance to the scientific and economic progress of the less-developed countries. By fostering scientific cooperation among oceanographers of different countries, we are learning ways of finding agreement among citizens and statesmen. By working with each other, we are gaining mutual understanding of the social and economic constraints that affect the thought and action of scientists in different countries.”⁹ All this is true, but the benefits won by scientific cooperation can be preserved only if by legal planning and legal machinery provision is made for an equitable distribution among the nations of the economic benefits which result from the application of new discoveries. The ultimate goal to aim at in developing the world’s water resources must be what Professor Berber, in the foreword to the German edition of his work on international rivers, describes as “eine glückliche Wasserrechtsgemeinschaft”.¹

⁹ Revelle, *op. cit.*, p. 154.

¹ F. J. Berber, *Die Rechtsquellen des internationalen Wassernutzungsrecht*, Munich 1955, p. 4.