CHAPTER 1

General Considerations

The shore or littoral is the zone where two great physical provinces meet and where changes in the form of the land take place rapidly. It is the end of the visible continent and the beginning of the submerged margin of its seaward extension. Coastlines are continually changing. Certain portions have had a long history of accretion, while others have had a history of erosion. Still other localities, often lying between two regions of these opposing histories, may show alternate erosion and accretion. In such areas, accretion may have been going on for many years, and suddenly the situation is reversed, and, for reasons unknown, erosion sets in. (*See* fig. 90.)[1] In other localities, sand bars or barrier beaches, separating shallow lagoons or bays from the open ocean, are broken through during storms to form inlets of a temporary or permanent nature.

Some rather dramatic changes in shoreline have taken place along our coasts since the first accurate surveys were made by the Coast and Geodetic Survey. The following are a few examples: In a period of 100 years, the eastern portion of the delta of the Mississippi River has built up as much as 10 miles (*see* Volume One, fig. 26); Rockaway Point on the south shore of Long Island had moved westward 4 miles until arrested by a jetty built in 1933; and Fishing Point on the Virginia coast has moved southward and westward over 4 miles in 66 years, converting an open bight into a natural harbor or refuge. A hurricane in 1938 lashed the south shore of Long Island causing a major breakthrough in the barrier beach fronting Shinnecock Bay and resulting in a navigable inlet 18 feet deep and 300 feet wide. The severe northeaster that battered the Atlantic seaboard during March 1962 caused radical changes in the shoreline at various places, notably at Cape Henlopen, Del., where it had moved several hundred feet

1. Figure 90 shows the maximum consistent recession of the shoreline to have taken place about 2 nautical miles south of Leadbetter Point in approximate latitude 46°36′.5. Here the shoreline has receded about 800 feet between 1871 and 1926, and about 400 feet between 1926 and 1950. Southward of this locality, the rate of recession decreases until approximate latitude 46°33′ where the trend is reversed and a small accretion is indicated. Northward of latitude 46°36′.5, the rate of recession also decreases until it reaches practically zero 1.5 miles away. From here the recession again becomes significant as the northern end of Leadbetter Point is reached, where a maximum recession of about 1,200 feet is indicated.

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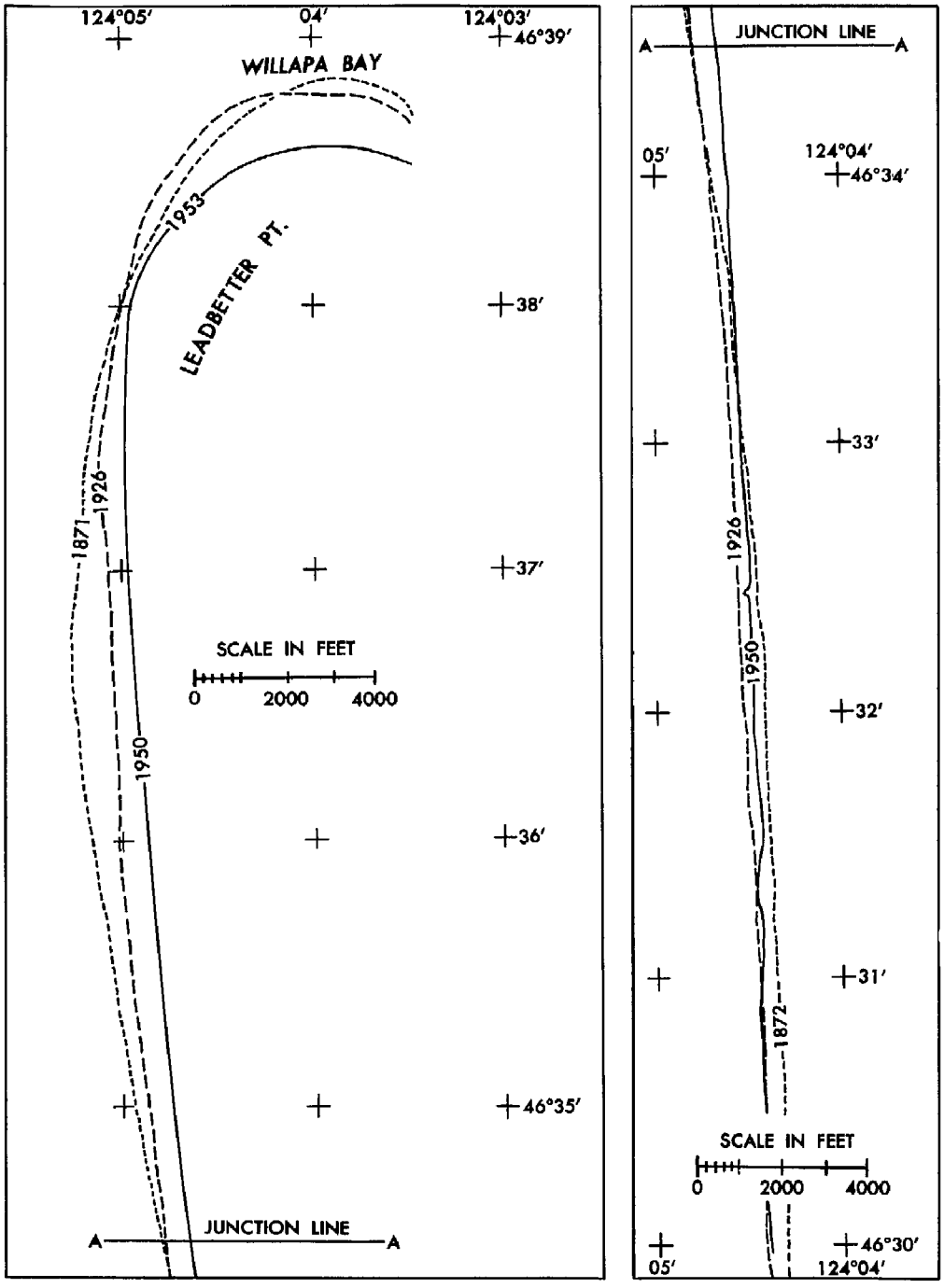

FIGURE 90.—Changes in shoreline in vicinity of Leadbetter Point, Wash., showing both erosion and accretion within a short distance.

to the northwest; and at Fishing Point, Va., where the shoreline was moved 0.4 mile to the west.

While these visible effects on the shoreline are taking place, others not visible to the eye are going on beneath the surface of the water, due to natural processes or to the impact of storms.[2] Bars and channels shift, new shoals form, and old ones disappear.

It is because of these changes that the Bureau has made periodic surveys along many sections of the coasts. These date back to 1834 when the first topographic and hydrographic surveys were made of Great South Bay, Long Island (*see* Part 2, 43, 52). Although subject to certain accuracy limitations, as has been discussed in previous chapters, the early surveys were based on a geodetic control system which prevented the accumulation of major discrepancies in the work. The surveys therefore represent the first authentic record of our coastline. Their periodicity gives them an application far beyond their primary use in the making of nautical charts. Some of these applications are discussed in this chapter.

11. COASTAL ENGINEERING

The engineer engaged in harbor improvement, channel development and maintenance, or shore protection must be fortified with a history of beach evolution in order to determine the type of structures most feasible for the area. Waves and currents produced by winds are the principal forces responsible for changes in coastline. By correlating changes based on successive accurate surveys with the attacking forces, the engineer may draw conclusions as to the nature of the component factors and predict the probable changes expectable in the future. From quantitative studies of changes in an area, it is sometimes possible to determine where the eroded material was deposited, whether as accretion to existing coastlines or as contribution to the formation of shoals and bars. Negatively, the study would show where the material could not have been deposited.[3]

Along many beaches exposed to wave attack, inlet migration is a well-known phenomenon (*see* fig. 91). If the alongshore current in one direction pre-

2. Following the March 1962 storm, a survey of Sinepuxent Channel, between Assateague Island and the mainland near Ocean City, Md., disclosed changes in depths of as much as 15 feet (*see* chart 1220).

3. In a study of changes along the New Jersey coast, surveys between 1839 and 1920 indicated (with some fluctuations) a rather steady recession of the beach as a whole. While it was not possible to determine absolutely where the sand was transported, it was possible to state that it was not utilized for building out the termini of the New Jersey beach system, namely, Sandy Hook and Cape May. The surveys showed that Sandy Hook occupied substantially the same position in 1920 as it did in 1835, and that Cape May had remained nearly fixed since the earliest survey in 1842. ON THE EROSION AND PROTECTION OF THE NEW JERSEY BEACHES 20 (and accompanying maps), BOARD OF COMMERCE AND NAVIGATION (1922).

dominates over that in the other, the inlet will migrate in the direction of the dominant current. Debris brought by the currents will be deposited on one side of the inlet with a tendency to narrow it, while the transverse currents through the inlet will cause an erosion of the other side. An excess of deposition on one side accompanied by erosion on the other side results in a lateral migration of the inlet in the direction of the dominant current.[4] Comparative surveys furnish information on the direction of this current and enable the engineer to determine the best method of protection.[5]

A study of underwater slopes adjacent to the shoreline from successive hydrographic surveys would indicate whether there has been a steepening or flattening of the slopes and thus throw light on the probable changes to be expected in the future. A steepening of the slope would subject the shoreline to attack by higher waves and cause increasingly rapid erosion of the beach, while a flattening of the underwater area is to some degree a protection to the beach since it causes higher waves to break and expend their energy a greater distance offshore, with a consequent lessening of destructive wave action.

Periodic surveys, therefore, give the coastal engineer a background of information indispensable in determining the character of the changes his structures must control.

12. SHORE PROCESSES AND DEVELOPMENT

Closely related to the problem of beach protection is the study of shore processes and development. To the student of shore forms, successive surveys enable him to trace the recent evolution of our coastline with certainty and to draw conclusions regarding its past history. Nature's processes in forming the coastline are complex and depend upon the configuration of a locality and the activity of the elements. By correlating changes in shoreline with the action

4. JOHNSON, SHORE PROCESSES AND SHORELINE DEVELOPMENT 374 (1919). Between 1839 and 1936, Barnegat Inlet, N.J., migrated a distance of about 1300 yards in a south-southwesterly direction and narrowed from a width of about 1300 yards to 400 yards.

5. This is exemplified by the Beach Erosion Board study at Blind Pass, Fla. It was believed by local interests that currents through the inlet were primarily responsible for denuding an adjacent beach. A study of existing surveys indicated, however, that erosion was being caused principally by the migration of the inlet (a mile in 63 years) rather than by the currents through the inlet. A fixation of the inlet would therefore have produced unsatisfactory results on the beach intended to be protected, because a jetty on either side would have starved the beach by preventing the alongshore drift from reaching the beach. A closing of the inlet was therefore recommended—a conclusion which might not have been reached but for the qualitative data provided by the existing surveys. *Beach Erosion Study at Blind Pass, Fla.*, H. Doc. 187, 75th Cong., 1st sess., 2, 5, 10 (1937).

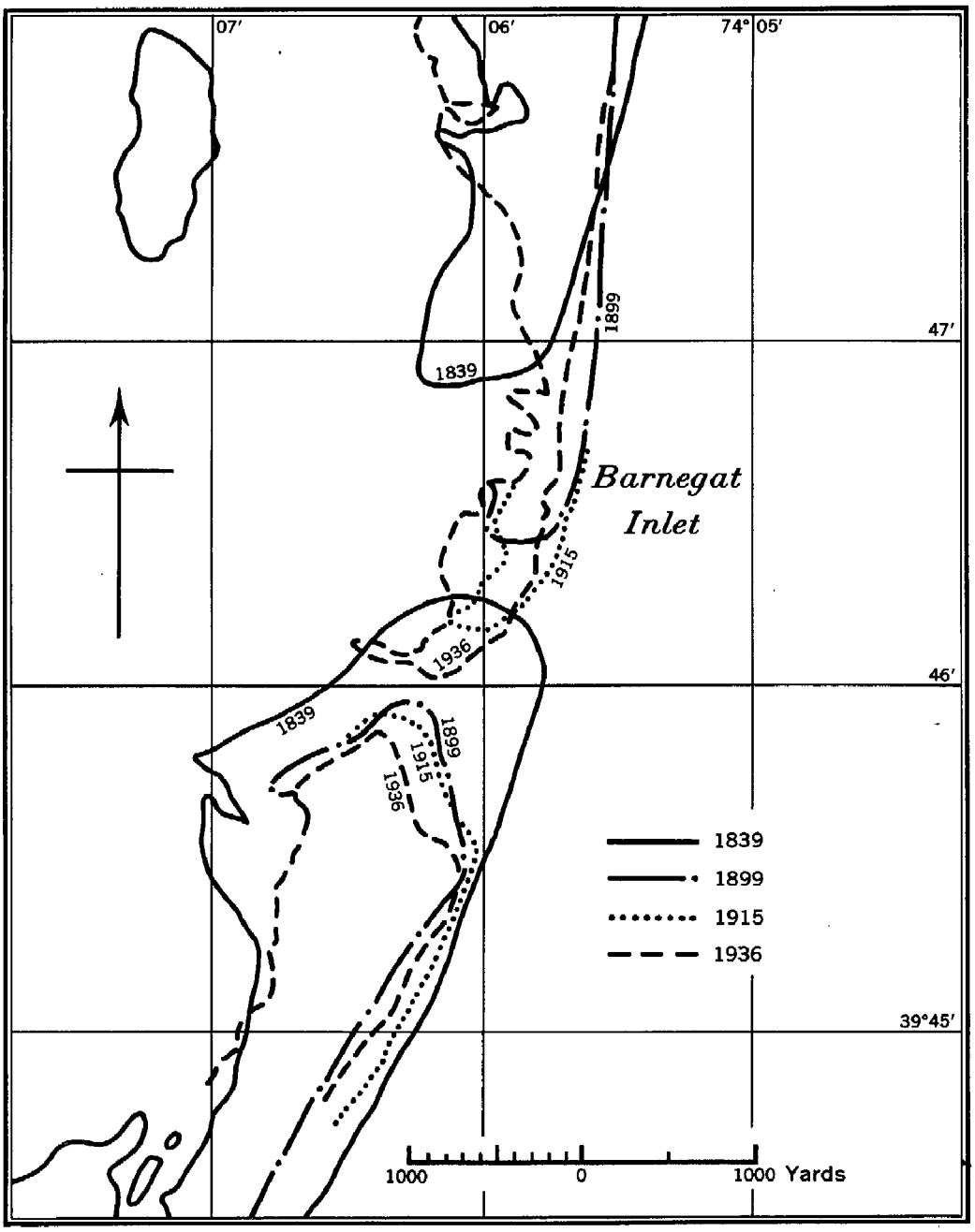

FIGURE 91.—Migration of Barnegat Inlet, N.J., between 1839 and 1936.

and interaction of winds, waves, tides, and currents, laws may be discovered which control the operation of these forces, thereby facilitating the interpretation of shore forms in other regions. Whether a shoreline is one of submergence or emergence (a downwarping or upwarping of the earth's crust or a raising or lowering of sea level), or what stage in its development it has attained (youth, maturity, or old age), can be studied from successive topographic surveys, as can the essential features of land forms such as bars and spits, inlets and lagoons, capes and deltas.

The hydrographic surveys of the Bureau permit the study of submerged land forms beyond the barrier of the shoreline—submarine valleys and canyons, plateaus, the continental shelf and slope, etc. Together with the topographic surveys they serve to emphasize the similarity that exists between the character of the visible land area and the adjacent land beneath the sea. This similarity is strikingly illustrated in many localities. The ridges and valleys of the Maine coast are only partially exposed above sea level, and the visible valley of the Hudson River may be followed as a submarine canyon to the edge of the continental shelf (*see* Volume One, fig. 34). In Alaska, the path of glacial movement is well defined and its general direction as observed on land continues under water and can be traced on the hydrographic surveys. No study of coastal features can be complete which does not consider their seaward continuations as revealed by hydrographic surveys.[6]

A discussion of the major terminology associated with the coastal region is contained in Part 2, 682.

13. WATERFRONT PROPERTY DISPUTES

Waterfront properties pose unique problems not common to other lands. The waters often perform in strange fashion, sometimes causing an increment to the land and sometimes a loss. It is a generally well-recognized principle of riparian law that whatever is added to riparian lands as a result of gradual and imperceptible growth through the operation of natural causes belongs to the riparian owner. And, conversely, whatever is taken away from riparian lands

6. The detailed surveys of the Bureau in the northern and eastern quadrants of the Gulf of Mexico contributed to a knowledge of the formation of specific submarine features and to the geology generally of the gulf. Ewing, Ericson, and Heezen, *Sediments and Topography of the Gulf of Mexico,* HABITAT OF OIL (A Symposium) 995 (1958).

under similar circumstances is lost to the upland owner.[7] But if the change is sudden or rapid, as when a river forming the boundary between two states breaks across a bend and forms a cutoff, or where the shoreline has been changed by artificial filling, no alteration is effected in the original boundary. The test of what is a gradual and imperceptible addition within the meaning of the rule is that "Though the witnesses may see, from time to time, that progress has been made, they could not perceive it while the progress was going on."[8] Whether a particular change has been gradual or sudden is a question of fact which must be determined by evidence. The story told by a series of periodic surveys, impartially executed and authenticated, is of great value in determining the rate at which the change took place.[9]

(*a*) *Early Descriptions of Boundaries.*—During the early years of the Nation's history, when land values in general were low, the methods used by land surveyors were crude. Many points then considered of negligible importance have become the subject of litigation because of the great increase in land values. A common practice of that early period was to define the seaward limit of property as the high- or low-water line, or by some generalized description. If the upland (land above high water) was bordered by an area of salt marsh, which was later reclaimed, and the property conveyed had passed by successive conveyances to others, questions may arise as to the boundary of the tract originally conveyed. If one litigant can show by an authentic survey that the area in question was covered with water at low water or high water, which the other litigant maintains was upland, he will have made out a convincing case (*see* Part 2, 4433).

(*b*) *Demarcation of Tidal Boundaries.*—Another facet of the application of Coast Survey data is in the demarcation of waterfront boundaries based on tidal definition. Such boundaries usually involve the mean high-water line or the mean low-water line (*see* Volume One, fig. 20).

7. This is termed the doctrine of accretion and erosion, and is one of the rights—known as riparian rights—that inhere in land by virtue of its bordering the sea. Accretion is the act while alluvion is the deposit itself. It has been stated that the doctrine of accretion was adopted in order to preserve the fundamental riparian right on which all others depend, namely, the right of access to the water. *Lamprey* v. *State and Metcalf,* 53 N.W. 1139 (1893) (Minn.). The reasonableness of the rule is based on the fact that the riparian owner stands to lose land through the operation of eroding forces. Rights to accretion, as with other riparian rights (the right of egress and ingress, the right to build wharves, the right to reclaim the shore), are governed by the laws of the state where the land lies and not by any federal law, unless a federal question is involved. But in either case the riparian rights are subject to the primary right of the United States in navigable waters for the purposes of commerce. For additional discussion of the doctrine of accretion, *see* 4423.

8. *County of St. Clair* v. *Lovingston,* 23 Wall. 46, 68 (90 U.S., 1874).

9. In one investigation which the Bureau made, it was essential to determine whether accretion to a coastline was induced by a jetty constructed several miles down the coast from the locus in question. A study of comparative shorelines extending over a period of nearly 100 years provided unmistakable evidence that accretion had already taken place prior to the building of the jetty.

According to the common law of England (*see* 251), which is the basis for the law in nearly all of the states, the boundary between upland and the shore (land between high- and low-water marks) is ordinary or mean high-water mark.[10] But according to the civil law (*see* 252), which is in effect in a few states, the boundary of the shore (as defined by the Supreme Court of Texas in 1958) extends to mean higher-high-water mark.[11] In either case, the long-period accumulated tidal data of the Bureau, which furnishes the elevations of the various tidal datums with respect to established bench marks on shore (*see* Part 1, 2314), must be used in order to precisely demarcate the boundary on the ground.

14. MARITIME BOUNDARIES

In the field of maritime boundaries, whether national or international, Coast and Geodetic Survey data find a special application. A nation's sovereignty extends not only over its land area and over its inland waters (ports, rivers, harbors) but also over a belt of water adjacent to its coast, known as the territorial or marginal sea (*see* Volume One, Part 1, 312, 32). There is universal agreement on this. What has not yet been agreed on is what the width of this belt should be. The United States has thus far consistently adhered to a narrow territorial sea (a 3-mile belt) as best preserving the free seas doctrine—one of the keystones of American foreign policy since 1793.[12] There is unanimous agree-

10. *Borax Consolidated, Ltd.* v. *Los Angeles,* 296 U.S. 10, 22 (1935). This is a landmark case in the law of tidal boundaries, and is reproduced in its entirety as Appendix D. The Court stated that "by the common law, the shore is confined to the flux and reflux of the sea at ordinary tides"; that is, "the land between ordinary high and low-water mark, the land over which the daily tides ebb and flow. When, therefore, the sea, or a bay, is named as a boundary, the line of ordinary high-water mark is always intended where the common law prevails." *Ibid.* This case established for the Federal courts not only the rule to be applied in interpreting the term "ordinary high-water mark" when construing a federal grant, but it also established the first precise standard for the demarcation of such boundary on the ground. The Court said that "in order to ascertain the mean high tide line with requisite certainty in fixing the boundary of valuable tidelands . . . an average of 18.6 years [of tidal observations] should be determined as near as possible." *Id.* at 26–27. For a discussion of the principles of this case in relation to the establishment of tidal boundaries, *see* Volume One, Part 1, 6413.

11. *Luttes* v. *State,* 324 S. W. 2d 167 (1958), clarified the civil law (Spanish law) concept of seashore and held such interpreted references of *Las Siete Partidas* (the body of Spanish law written in the 13th century) as "covered with the water of the latter [the sea] at high tide, during the whole year, whether in winter or in summer," "their highest annual swells," "that part of the land covered by the highest swells in perennial agitation, during the winter as well as during the strong but customary summer storms," to be, in the light of modern conditions and the need for exact application, the line of mean higher high tide as determined from a 19-year period. *Id.* at 178, 182, 192. Pertinent portions of this case dealing with the establishment of tidal boundaries and the acceptance of tide-gage determination are reproduced in Appendix D.

12. This has been reaffirmed on numerous occasions, and the United States has uniformly protested encroachments on this doctrine through extensions of the territorial sea, whether arrived at unilaterally or multilaterally. At the 1958 and 1960 Conferences on the Law of the Sea (*see* Volume One, Part 3, 21, 23), the United States proposed a 6-mile territorial sea with an additional 6-mile fisheries zone in the interest of reaching a compromise, but the Conference failed to reach agreement on any breadth of the territorial sea. This left the preexisting position of the United States intact (*see* Volume One, Part 3, 231, 233).

ment among nations that each should have a territorial sea of at least 3 miles. But wider maritime belts have been claimed by some countries—for example, Norway and Sweden claim 4 miles, Spain 6 miles, Mexico 9 miles, and the Soviet Union 12 miles. For a recent compilation (Feb. 8, 1960) by the United Nations of the various claims of nations to a breadth of the territorial sea and to contiguous zones, *see* Volume One, Appendix J. Subsequent to this compilation, the following countries have made unilateral claims to extended territorial seas or to exclusive fishing zones:

ALBANIA—March 1, 1960, restricted innocent passage in a 10-mile territorial sea, and claimed fishing jurisdiction to 12 miles.

CAMEROON—June 23, 1962, claimed a 6-mile territorial sea.

CHINA (Communist)—claims a 12-mile territorial sea.

DENMARK—June 1, 1963, extended the fisheries limits for Greenland to 12 miles. A similar limit for the Faroes Islands will take effect March 12, 1964. Certain countries are exempted from the Greenland limits until May 31, 1973.

MALAGASY REPUBLIC—February 27, 1963, claimed a 12-mile territorial sea.

MOROCCO—extended fisheries jurisdiction to 12 miles, except for the Strait of Gibraltar, for which such jurisdiction was extended to 6 miles.

NORWAY—extended fisheries jurisdiction to 6 miles on April 1, 1961, and to 12 miles on September 1, 1961.

SENEGAL—June 21, 1961, claimed a 6-mile territorial sea plus a 6-mile contiguous zone.

SUDAN—August 2, 1960, extended the territorial sea to 12 miles.

TUNISIA—July 26, 1962, extended the territorial sea to 6 miles with an additional 6 miles of fisheries jurisdiction for a portion of its coast from the Algerian border to Ras Kaboudia, and extended the territorial sea from there to the Libyan border to the 50-meter isobath line.

URUGUAY—February 21, 1963, claimed a 6-mile territorial sea plus a 6-mile contiguous zone for fishing and other purposes.

Besides the above countries, a number have indicated that they intend to assert extended claims. Legislation has been introduced in Colombia to extend the territorial sea from 6 to 12 miles; in Ghana to establish a 12-mile territorial sea, with an undefined protective area seaward of this, and up to 100 miles of fishing conservation zone; in South Africa, Costa Rica, and Turkey to extend the territorial sea to 6 miles, with a 6-mile contiguous fishing zone; and in the Ivory Coast to extend the territorial sea to 12 miles.

In addition, Canada, on June 4, 1963, extended its exclusive fishing rights to 12 miles in the following proclamation: "With these considerations in mind, the Canadian Government has decided to establish a 12-mile exclusive fisheries zone along the whole of Canada's coastline as of mid-May 1964 and to implement the straight baseline system at the same time as the basis from which Canada's territorial sea and exclusive fisheries zone shall be measured." [13]

13. The above information is based on a report furnished by the Department of State to Senator Gruening, of Alaska, on June 17, 1963. 109 Cong. Rec. 11279–11280 (June 28, 1963). With reference

141. The Headland-to-Headland Line

Besides the international boundaries discussed above, there are other maritime boundaries associated with national waters. These concern boundaries at bays and rivers.

The problem of defining the specific limits of a body of water tributary to a larger body is not always a simple one. The solution lies in finding the exact place where the tributary waterway merges into the principal waterway. In the absence of established criteria, a basic consideration is the physical configuration of the waterway.[14] Based on this consideration, the "headland-to-headland" principle has been deduced. This principle considers the boundary between a tributary waterway and a larger body of water to be a line joining the headlands of the tributary. The headland rule has been applied in various contexts, on international, national, and local levels, to bays and rivers.

1411. *Boundary at Bays*

(*a*) *Internationally.*—As applied to bays, the headland rule probably had its origin in international law in connection with delimitation of the territorial sea

to the Canadian proclamation, it should be noted that in its reply to the Secretary-General of the United Nations, prior to the Second Geneva Conference on the Law of the Sea, Canada claimed a 3-mile territorial sea and a 12-mile fisheries zone (*see* Volume One, Appendix J). This was evidently a mere claim without implementation. The present proclamation formally establishes this 12-mile fisheries zone with a definite date of implementation. The proclamation does not refer to the territorial sea and presumably this would remain at 3 miles with an additional 9 miles of exclusive fisheries rights. Under this interpretation, the area beyond the 3-mile belt would be part of the high seas insofar as free navigation is concerned. On Mar. 3, 1964, 13 European countries reached an agreement whereby each would have an exclusive right to fish within a 6-mile zone and to impose its regulations in a further zone between 6 and 12 miles which would remain open only to fishermen who had traditionally fished in that zone. Signatories to the agreement were Austria, Belgium, Denmark, France, West Germany, Ireland, Italy, Luxembourg, Holland, Portugal, Spain, Sweden, and the United Kingdom. The *Washington Post,* Mar. 4, 1964, p. D3.

14. Names of bodies of water shown on the nautical charts of the Bureau mark in a general way the limits of the features they represent (*see* Part 2, 6565). But they are intended primarily for navigational use. In their placement on the chart, the best available information is generally consulted, taking into account such factors as long usage and such sources as the Light Lists, the *Coast Pilots,* and decisions of the Board on Geographic Names (*see* Part 2, 6563). The more pronounced the physical features or headlands are, the more closely will the opinions of experts agree as to the boundary of the tributary waterway. For example, there would be little disagreement that the boundary between Providence River and Narragansett Bay (*see* fig. 92) is the line joining Nayatt Pt. and Conimicut Pt. On the other hand, opinions might differ as to the exact boundary between Taunton River and Mt. Hope Bay or between Warren River and Narragansett Bay. Another example of the latter category is Buzzards Bay (*see* chart 1210). While the western limit of the bay is not specifically defined in the *Coast Pilot,* Westport River is described as emptying "into the large bight between Gooseberry Neck and Sakonnet Point," the inference being that the bight is not a part of Buzzards Bay. But in the Light List, the various lights and buoys in the approach to Westport Harbor are listed under Buzzards Bay, apparently considering this bight within the geographic limits of the bay.

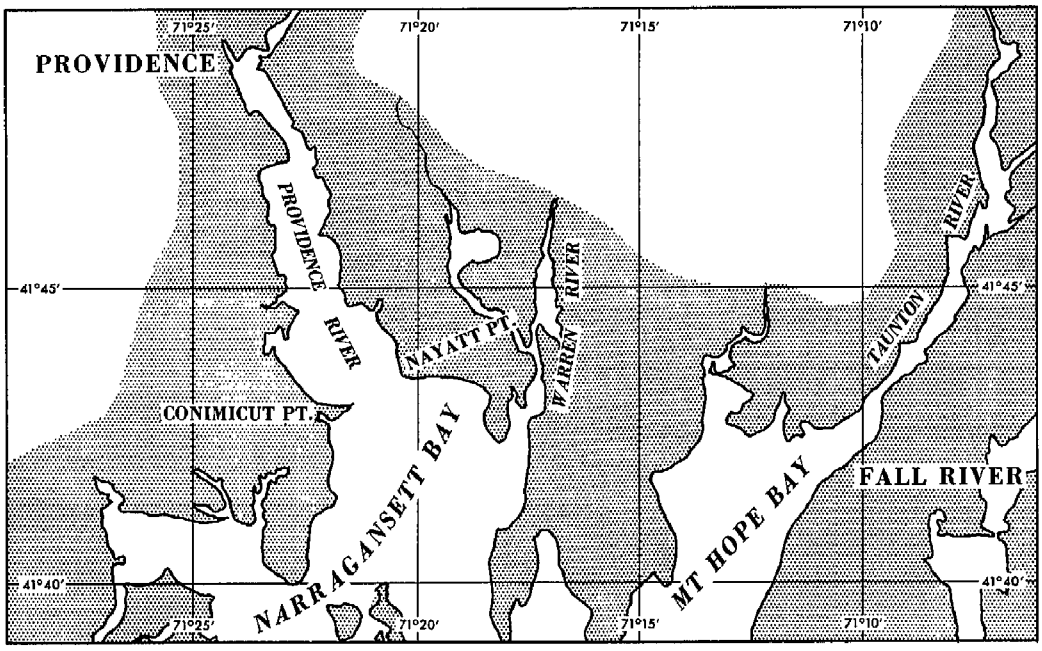

FIGURE 92.—Shoreline in vicinity of Narragansett Bay, R.I., from chart 353. Determining the boundary between a tributary waterway and a principal waterway is not always a simple matter where the physical features are not well pronounced (*see* text).

over which a maritime nation exercises sovereignty.[15] Thus, in *United States* v. *Carrillo et al.*, 13 F. Supp. 121 (1935), it was said: "From a very early date nations have generally acquiesced in the proposition that a nation's territory over which its sovereignty extends ends 3 miles from and into the bordering ocean. . . . Such three miles was not a line following the exact contour of the coast, which would seem impracticable, but was three miles from the line joining headlands or points between which lie indentations or bays." [16]

The question of boundaries at bays was given exhaustive consideration by the Permanent Court of Arbitration at The Hague in 1910, in connection with

15. The principle might be considered a restricted version of the old "King's Chambers" doctrine, proclaimed by James I in 1604, by which England claimed jurisdiction over an area formed by squaring off the British Isles. The chambers were formed by straight lines from one extreme landmark to another around the coast and not necessarily between the headlands of different bays. This doctrine has of course long been abandoned (*see* Volume One, Part 1, 332).

16. Other statements which support the delimitation of the territorial sea as the origin of the headland rule are the following: On Feb. 14, 1884, the Assistant Secretary of State, John Davis, stated: "The general law and rule is understood by this Government to be that beyond the marine league or three-mile limit, all persons may freely catch whale or fish. In computing this limit, however, 'bays' are not taken as a part of the high seas; the three miles must be outside of a line drawn from headland to headland." MOORE, I DIGEST OF INTERNATIONAL LAW 718 (1906). And Jessup, in his work on territorial waters, makes this observation: "A third principle of perhaps less well-defined application is the so-called headland theory. Following this rule the line of territorial waters would be drawn from headland to headland, making all bays territorial, regardless of extent." JESSUP, THE LAW OF TERRITORIAL WATERS AND MARITIME JURISDICTION 358 (1927).

the North Atlantic Coast Fisheries Arbitration between the United States and Great Britain. The arbitration marked the culmination of a century-long dispute over the meaning of the Convention of October 20, 1818, in which the United States renounced the rights of its nationals to fish within 3 marine miles of any of the bays of the British dominions in America. The question to be resolved was from what line the 3 miles was to be measured. The tribunal made the following award: "In case of bays, the three marine miles are to be measured from a straight line drawn across the body of water at the place where it ceases to have the configuration and characteristics of a bay." This in essence is an application of the headland principle. For a fuller discussion of this arbitration, *see* Volume One, Part 1, 411.

The most recent pronouncement internationally with respect to boundaries at bays is the provision adopted in 1958 by the United Nations Conference on the Law of the Sea. Article 7 (par. 4) of the Convention on the Territorial Sea and the Contiguous Zone provides that "If the distance between the low-water marks of the natural entrance points of a bay does not exceed twenty-four miles, a closing line may be drawn between these two low-water marks, and the waters enclosed thereby shall be considered as internal waters." (*See* Volume One, Appendix I.) The 3-mile marginal belt would be measured from this line. This constitutes for all practical purposes a headland-to-headland line.[17]

International law today recognizes still another principle in connection with bay boundaries, to wit, the semicircular rule. This rule postulates that a semicircular bay having its diameter along the line joining the headlands is the theoretical bay which lies on the borderline between a closed and an open bay, that is, between inland waters and the open sea. In other words, before a bay can be considered as part of the inland waters of a nation, so that the 3-mile marginal belt can be drawn from a line joining the headlands of the bay, it must satisfy the criteria set out in international law for such assimilation; otherwise the boundary of inland waters would follow the sinuosities of the shore. Article 7 (par. 2) of the Convention on the Territorial Sea provides: "For the purposes of these articles, a bay is a well-marked indentation whose penetration is in such proportion to the width of its mouth as to contain landlocked waters and constitute more than a mere curvature of the coast. An indentation shall not, however, be regarded as a bay unless its area is as large as, or larger than, that of the semicircle whose diameter is a line drawn across

17. Prior to the 1958 Conference, the closing line for a bay was generally considered to be 10 miles, at least this was the position taken by the United States and by some other nations in their international relations (*see* Volume One, Part 1, 43 and Part 3, 2218(*b*)).

the mouth of that indentation." [18] And Article 3 states: "Except where otherwise provided in these articles, the normal baseline for measuring the breadth of the territorial sea is the low-water line along the coast as marked on large-scale charts officially recognized by the coastal State." (*See* Volume One, Appendix I.)

(*b*) *Nationally.*—On the national level, consideration was given the matter of bays and headlands by a Special Master of the Supreme Court in 1952 in the case of *United States* v. *California,* 332 U.S. 19 (1947). In defining the federal-state boundary along the California coast, which the Supreme Court had said was the ordinary low-water mark and the seaward limits of inland waters, the Master made the following recommendation with respect to bays: "For indentations having pronounced headlands not more than ten nautical miles apart [*see* note 17 *supra*], and having a depth as hereinafter defined, a straight line is to be drawn across the entrance . . . . the requisite depth is to be determined by the following criterion:" (here follows the semicircular rule) (*see* text at note 18 *supra,* and Volume One, Appendix C).

(*c*) *Locally.*—On a local level, some of the state courts have adopted the headland principle in determining proprietary rights in coastal indentations, and for jurisdictional purposes.

In New York, in the case of *Grace* v. *Town of North Hempstead,* 152 N.Y. Supp. 122 (1915) (*affirmed* in 115 N.E. 1040), which involved title to land under the waters of Manhasset Bay in Long Island Sound (*see* chart 1213), it was held that "the Sound or East River means the Long Island Sound and the course 'round the points of the necks till it comes to Hempstead Harbour,' plainly means a boundary run around the outer points or headlands of Great Neck and Cow Neck, by which this bay is plainly comprised." And in the case of *Bliss* v. *Benedict et al.,* 195 N.Y. Supp. 690 (1922) (*affirmed* in 138 N.E. 461), which involved the seaward boundary of Westchester Creek (*see* chart 1213), the court said that "the land in controversy lies . . . under the waters of Westchester creek . . . the mouth of which must be held to lie between the two headlands Clason Point and Old Ferry Point, where it empties into the Sound."

In Massachusetts, a statute was adopted in 1859 (Mass. Gen. Stats., C. 1, sec. 1) which provides as follows: "The territorial limits of this commonwealth extend one marine league from its sea-shore at low-water mark. When an inlet or arm of the sea does not exceed two marine leagues in width between its head-

18. For a discussion of the genesis and development of the semicircular rule and its application to a coastline, *see* Volume One, Part 1, 42, 421.

lands, a straight line from one headland to the other is equivalent to the shore line."

An application of the semicircular rule to such situations would give geometric rationality to the problem of determining the boundary at such waterways.

1412. *Boundary at Rivers*

In the case of rivers, cognizance has been taken internationally of the headland-to-headland principle at the 1930 Hague Conference for the Codification of International Law in the proviso contained in the final report of the Second Sub-Committee of the Conference that "When a river flows directly into the sea, the waters of the river constitute inland waters up to a line following the general direction of the coast drawn across the mouth of the river, whatever its width." [19] To the same effect is the recommendation of the International Law Commission in its final report to the United Nations,[20] as is Article 13 of the 1958 Convention on the Territorial Sea and the Contiguous Zone (*see* Volume One, Appendix I), which provides that "If a river flows directly into the sea, the baseline shall be a straight line across the mouth of the river between points on the low-tide line of its banks." [21]

In *United States* v. *California, supra* (*see* 1411(*b*)), a Special Master made the following recommendation regarding the boundary at rivers along the California coast: "Where rivers empty into the sea, the seaward limit of inland waters is a line following the general direction of the coast drawn across the mouth of the river whatever its width." [22]

1413. *Termini at Headlands*

In drawing a headland-to-headland line at the boundaries of bays or rivers, certain physiographic and geometric principles are followed in ascertaining the exact points on the headlands between which the line is to be drawn. These are

19. 3 Acts of the Conference for the Codification of International Law (League of Nations Publications V: Legal) 220 (1930).

20. Report of the International Law Commission, 8th Sess. 18 (1956) and recorded in Official Records, U.N. General Assembly, 11th Sess., Supp. No. 9 (1956) (U.N. Doc. A/3159).

21. In international law, the line that divides the inland waters of a nation from its territorial sea is known as the "baseline." It is also the line from which the outer limits of the territorial sea, the inner and outer limits of the contiguous zone, and the inner limits of the continental shelf and high seas are measured (*see* 143, 1431). The normal baseline follows the low-water mark, except where indentations are encountered that fall within the category of "true" bays, in which case the baseline becomes a straight line between the headlands (*see* text following note 17 *supra*, and Volume One, Part 1, 33, 331).

22. Report of Special Master 4, United States v. California, Sup. Ct. No. 6, Original, Oct. Term, 1952 (*see* Volume One, Appendix C).

discussed in Volume One, Part 1, 48, in relation to the *California* case, *supra,* and the method of determining the termini illustrated. The Special Master's recommendation to the Supreme Court in this case was as follows: "Where pronounced headlands exist at tributary waterways, the appropriate landmark is the point of intersection of the plane of ordinary low water with the outermost extension of the natural headland. Where there is no pronounced headland, the landmark is the point of intersection of the ordinary low-water mark with a line bisecting the angle between the general trend line of the ordinary low-water mark along the open coast and the general trend line of the ordinary low-water mark along the shore of the tributary waterway." [23]

142. River Boundaries

A river has been defined legally as "a natural stream of water, of greater volume than a creek or rivulet, flowing in a more or less permanent bed or channel, between defined banks or walls, with a current which may either be continuous in one direction or affected by the ebb and flow of the tide." [24]

In addition to the river boundaries dealt with above under the headland principle, there is the situation where the river forms the dividing line between two political jurisdictions, to wit, two nations, two states, etc. These are sometimes referred to as *boundary rivers* in international law to distinguish them from *national rivers,* which are under the sway of one nation, and *international rivers,* which separate or pass through several nations between their sources and their mouths at the open sea.[25]

There are many instances of river boundaries in the United States, some of which have been adjudicated by the Supreme Court.[26]

In delimiting river boundaries, three principal rules have been followed: (1) the geographic middle of the river, or the *medium filum acquae;* (2) the middle of the channel, or the rule of the *thalweg;* and (3) the shore or bank. These will be dealt with following the discussion of definitions associated with river boundaries.

23. *Ibid.* This recommendation followed the Bureau's suggestion to the Department of Justice.

24. Black, Law Dictionary (4th ed.) 1491 (1951), citing *Alabama* v. *Georgia,* 23 How. 505, 513 (64 U.S., 1860) and *Motl* v. *Boyd,* 286 S.W. 458 (1926) (Tex.). A river or stream consists of a bed, banks, and stream of water. *Id.* at 467. Technically, a river has been defined as a stream relatively prominent in any extensive region (Adams, Hydrographic Manual 55, Special Publication No. 143, U.S. Coast and Geodetic Survey (1942)); and as a large stream of running water (Edmonston, Nautical Chart Manual 79, U.S. Coast and Geodetic Survey (1956)).

25. Oppenheim, I International Law (5th ed.) 361 (1937).

26. Reference to these can be found in the Digest of Supreme Court Reports under the classification "Boundaries."

1421. *Associated Definitions*

Terms associated with river surveys and boundaries, that have been defined legally and technically, include "bank," "bed," "right bank," "left bank," "ordinary high-water mark," and "ordinary low-water mark."

(*a*) *Bank.*—The bank of a river has been defined by the Supreme Court as "the water-washed and relatively permanent elevation or acclivity at the outer line of the river bed which separates the bed from the adjacent upland, whether valley or hill, and serves to confine the waters within the bed and to preserve the course of the river." [27]

(*b*) *Bed.*—The bed of a river has also been defined by the Supreme Court as "that portion of its soil which is alternately covered and left bare, as there may be an increase or diminution in the supply of water, and which is adequate to contain it at its average and mean stage during the entire year, without reference to the extraordinary freshets of the winter or spring, or the extreme droughts of the summer or autumn." [28]

(*c*) *Right and Left Bank.*—The right bank of a river is the bank on the right-hand side and the left bank is the one on the left-hand side as one proceeds downstream.[29]

(*d*) *Ordinary High-Water Mark.*—Along a navigable river, above the ebb and flow of the tide, the term "ordinary high-water mark" has been held by the Iowa court to refer to "the line to which high water ordinarily reaches," and not the line reached by the water in unusual floods (*State* v. *Sorenson,* 271 N.W. 234, 236 (1937)). Neither does it mean "the line ordinarily reached by the great annual rises of the river, which cover in places lands that are valuable for agricultural purposes. . . . Nor yet does it mean meadowland adjacent to the river, which, when the water leaves it, is adapted to and can be used for grazing or pasturing purposes" (*Welch* v. *Browning,* 87 N.W. 430 (1901)).

27. *Oklahoma* v. *Texas,* 260 U.S. 606, 631 (1923). In interpreting the intention of the Treaty of 1819 between the United States and Spain, the Court held that the boundary between Oklahoma and Texas along the Red River "is on and along the bank at the average or mean level attained by the waters in the periods when they reach and wash the bank without overflowing it." *Id.* at 632. The banks of a river have been variously defined in the state courts. Thus, in California it has been defined as "the boundaries which confine the water to its channel throughout the entire width when the stream is carrying its maximum quantity of water." *Mammoth Gold Dredging Co.* v. *Forbes,* 104 P. 2d 131, 137 (1940). In Louisiana, it has been held to be "the land between the ordinary high-water mark and the ordinary low-water mark." *Seibert* v. *Conservation Commission of Louisiana,* 159 So. 375, 377 (1935). But where there are levees established according to law, the levees form the banks of the river. *Ward* v. *Board of Levee Commissioners,* 92 So. 769, 772 (1922) (La.). In Oregon, the term "bank" has been held ordinarily to be "synonymous with that high-water mark, below which the title was originally in the state, and not in the general government." *Richards* v. *Page Investment Co.,* 228 Pac. 937, 942 (1924). But where the stream is in a ravine, and such was the intention of the parties, the Massachusetts court has held the term to mean the entire slope running along the side of such ravine and not along the high-water mark. *Langevin* v. *Fletcher,* 174 N.E. 194, 195 (1931). Technically, the term "bank" has been defined as the continuous margin along a river where all vegetation ceases (MITCHELL, DEFINITIONS OF TERMS USED IN GEODETIC AND OTHER SURVEYS 9, SPECIAL PUBLICATION NO. 242, U.S. COAST AND GEODETIC SURVEY (1948)); and as the rising ground bordering a lake, river, or sea (*Technical Report No. 4,* U.S. Beach Erosion Board (1954)).

28. *Oklahoma* v. *Texas, supra* note 27, at 631. The term has also been defined by the state courts as the "soil which is submerged so long or so frequently, in ordinary seasons, that vegetation will not grow upon it" (*City of Cedar Rapids* v. *Marshall,* 203 N.W. 932, 933 (1925) (Iowa)); and as "that portion of its [the stream] soil covered by the waters under normal conditions and seasons" (*King* v. *Schaff,* 204 S.W. 1039, 1042 (1918) (Texas)). Technically, the bed of a stream or river has been defined as the area within the high-water lines—the area which is kept practically bare of vegetation by the wash of the waters from year to year. MITCHELL (1948), *op. cit. supra* note 27, at 12.

29. MANUAL OF INSTRUCTIONS FOR THE SURVEY OF THE PUBLIC LANDS OF THE UNITED STATES 234, U.S. BUREAU OF LAND MANAGEMENT (1947).

(*e*) *Ordinary Low-Water Mark.*—The usual or ordinary stage of a river when the volume of water is not increased by rains or freshets occasioned by melted snow, or diminished below such usual stage or volume by long continued drought to extreme low-water mark (*Goodall* v. *T. L. Herbert & Sons,* 8 Tenn. App. 265 (1928)).

1422. *Geographic Middle of a River—Medium Filum Acquae*

The use of the geographic middle of a river, or the *medium filum acquae* or *filum acquae,* as it is sometimes called, is a rule laid down by Grotius, the Dutch jurist who lived during the late 16th and early 17th centuries, and who is considered the father of the free or open seas doctrine (*see* Volume One, Part 3, 223).[30]

In construing a boundary convention between Georgia and South Carolina, the Supreme Court held the boundary line to be the thread of the Savannah and other rivers—the middle of the stream—when the water is at ordinary stage, regardless of the channel of navigation.[31]

The rule of *medium filum acquae* had for its principal objection, at least insofar as navigable rivers were concerned, the fact that it disregarded the main channel, thereby resulting in inequities to the nation which happened to be the more remote therefrom. The result was that at the beginning of the 19th century a new rule, known as the *thalweg,* was substituted for medium filum acquae.[32]

The rule of the geographic middle of a river being the boundary is still applicable to non-navigable rivers.

30. *Filum acquae* has been defined as a thread; a line of water; the middle line of a stream of water supposed to divide it into two equal parts, and constituting in many cases the boundary between the riparian proprietors on each side. BLACK (1951), *op. cit. supra* note 24, at 757, citing *Ingraham* v. *Wilkinson,* 21 Mass. 268 (1827), 16 Am. Dec. 342. This is identical with a median line, every point of which is equidistant from the nearest points of the baselines on the opposite shores (*see* Volume One, Part 3, 2212).

31. *Georgia* v. *South Carolina,* 257 U.S. 516, 521, 522 (1922). The Court stated the general rule to be that "where a river, navigable or non-navigable, is the boundary between two States, and the navigable channel is not involved, in the absence of convention or controlling circumstances to the contrary, each takes to the middle of the stream," citing *Handly's Lessee* v. *Anthony,* 5 Wheat. 374, 379 (18 U.S., 1820). Since the convention between the two states secured free navigation on the boundary rivers to each state, the Court ruled out the *thalweg doctrine* (*see* 1423), insofar as the precise location of the boundary was concerned. It also held that where islands exist, the boundary line is midway between the island bank and the South Carolina shore when the water is at ordinary stage. *Georgia* v. *South Carolina, supra,* at 523.

32. In *Iowa* v. *Illinois,* 147 U.S. 1, 8–9 (1893), the Supreme Court cites CREASY, FIRST PLATFORM ON INTERNATIONAL LAW (1876) for the statement that the *medium filum acquae* "will be regarded *prima facie* as the boundary line, except as to those parts of the river as to which it can be proved that the vessels which navigate those parts keep their course habitually along some channel different from the *medium filum.*"

1423. *Rule of the Thalweg*

The rule of the *thalweg* holds that where a navigable river separates two nations, the middle of the main channel is the boundary between them. The thalweg, as the derivation of the word indicates, is the downway, or the course followed by vessels of largest tonnage in descending the river.[33] The thalweg bears no necessary relationship to the median line of a river; they may cross each other at many points.

The various treaties of the United States, involving river boundaries, lack uniformity of expression. Thus, the Treaty of 1783 with Great Britain referred to the "middle" of boundary rivers; the Treaty of 1908, concerning the Canadian international boundary along the St. Croix River, provided that the line should "follow the center of the main channel or thalweg as naturally existing" (this is the first boundary convention of the United States in which the term thalweg is used); the Treaty of 1795 with Spain declared that the boundary along the St. Mary's River should follow the "middle thereof," while another article of the treaty declared the "western boundary of the United States" to be the "middle of the channel or bed of the river Mississippi"; and in the Treaty of Guadalupe Hidalgo with Mexico in 1848, the boundary was to proceed up the "middle" of the Rio Grande, "following the deepest channel where it has more than one." [34]

The doctrine of the thalweg was fully considered and applied by the Supreme Court in the settlement of the boundary between New Jersey and Delaware in the lower Delaware River and in the bay. In deciding the case, the Court applied what it believed to be the principles of international law. "International law," it said, "to-day divides the river boundaries between states by the middle of the main channel, when there is one, and not by the geographical centre, half way between the banks . . . . It applies the same doctrine, now known as the doctrine of the *Thalweg,* to estuaries and bays in which the dominant sailing channel can be followed to the sea . . . . The *Thalweg,* or downway, is the track taken by boats in their course down the stream, which is that of the strongest current . . . . The underlying rationale of the doctrine of

33. On the derivation of the word "thalweg," Westlake, in his treatise on international law, states: "When a river forms the boundary between two states it is usual to say that the true line of demarcation is the *thalweg,* a German word meaning literally the 'downway', that is the course taken by boats going downstream, which again is that of the strongest current, the slack current being left for the convenience of ascending boats . . . . *Thal* in the sense of valley enters into *thalweg* only indirectly. The immediate origin of the word lies in the use of *berg* and *thal* to express the upward and downward directions on a stream." Westlake, I International Law (2d ed.) 144 and n. 1 (1910).

34. Hyde, 1 International Law Chiefly as Interpreted and Applied by the United States 244–245 (1922).

the *Thalweg* is one of equality and justice . . . . If the dividing line were to be placed in the centre of the stream rather than in the centre of the channel, the whole track of navigation might be thrown within the territory of one state to the exclusion of the other . . . . If the boundary be taken to be the *Thalweg,* it will follow the course furrowed by the vessels of the world." [35] Where there is more than one channel in a river and if the boundary reference is merely to the center of the channel, then the boundary would be held to be the center of the main channel.[36]

1424. *The Shore or Bank*

The third form of river boundary is where the entire river is part of the domain of one state so as to make the farther shore the boundary line between the two states. This is an exceptional case that is usually created by charter, immemorial possession, or treaties of the United States regarding international boundaries. Thus, the boundary between Maryland and Virginia is along the Potomac River on the Virginia shore, having been created by the charter of 1632 from Charles I to Lord Baltimore (*see* 4211); [37] the boundary between Delaware and New Jersey, within the 12-mile circle centered on Newcastle, is along the low-water mark on the New Jersey shore of the Delaware River, the title in Delaware being traceable to a grant made in 1682 by the Duke of York to William Penn; [38] and the Red River boundary of Texas follows the south bank of that river, being traceable to the Spanish-American Treaty of 1819, which provided that the Red River and all the islands therein should belong to the United States (8 Stat. 252 (1819)).[39]

35. *New Jersey* v. *Delaware,* 291 U.S. 361, 379, 380, 385 (1934). The decision with respect to the boundary in the lower river was in favor of the claim of New Jersey (*see* 1424). Other cases which have held the mid-channel of a river to be the boundary line are: *Iowa* v. *Illinois,* 147 U.S. 1 (1893), involving the Mississippi River (the Court here held that by international law as shown in the usage of European States, the term "middle of the stream" and "mid-channel" are synonymous, but this hardly seems correct and geographically it would be better to consider the first as the geographic middle of the river (*see* 1422)); *Nebraska* v. *Iowa,* 143 U.S. 359 (1892), involving the Missouri River; *Arkansas* v. *Tennessee,* 246 U.S. 158 (1918), also involving the Mississippi River; and *Louisiana* v. *Mississippi,* 202 U.S. 1, 50 (1906), where the Court applied the doctrine to estuaries and bays in which the dominant sailing channel can be followed to the sea.

36. *Washington* v. *Oregon,* 211 U.S. 127 (1908). The Court held here that the boundary between the two states was the middle of the north channel of the Columbia River because it was so provided in the statute admitting Oregon as a state. And it further said: "The courts have no power to change the boundary thus prescribed and establish it at the middle of some other channel. That remains the boundary, although some other channel may in the course of time become so far superior as to be practically the only channel for vessels going in and out of the river." *Id.* at 135.

37. By the original charter, the boundary line of Maryland was set at the high-water mark along the Virginia shore, but in the Award of 1877, Virginia's immemorial usage of her shore to low-water mark was recognized and the boundary set along that line (*see* 4211).

38. *New Jersey* v. *Delaware, supra* note 35, at 364, 374.

39. *Oklahoma* v. *Texas, supra* note 27, at 624. The Supreme Court held this to mean the south bank of the river even though the treaty did not mention the bank as it did in the case of two other boundary rivers specified in the same treaty.

This type of river boundary also arises where one state is the original proprietor of the territory through which the river flows and grants territory on one side of the river only, retaining the river within its own domain. The state created out of the ceded territory extends to the river only. This is exemplified by the state boundaries along the Ohio River. The cession by Virginia to the United States of the territory "situate, lying and being to the north-west of the river Ohio," has been held to have conveyed territory on the far side of the river only, Virginia retaining dominion over the entire Ohio River to the ordinary low-water mark on the opposite shore, that is, on the north and northwestern sides of the Ohio River. The states that were carved out of the territory retained by Virginia (West Virginia and Kentucky) succeeded to Virginia's rights in the Ohio River, and their boundaries extend to the ordinary low-water mark on the north and northwest shores, and this is the boundary line of these states with the States of Ohio, Indiana, and Illinois which were formed out of the Northwest Territory.[40]

A. RIPARIAN BOUNDARIES ALONG INTERSTATE RIVERS

Where a state boundary is on the opposite shore of an interstate river, it does not necessarily follow that a riparian owner's title also extends to the far shore. Thus, although the boundary between Indiana and Kentucky is the low-water mark on the north shore of the Ohio River (*see* note 40 *supra*), the

40. *Handly's Lessee* v. *Anthony, supra* note 31, at 379; *Indiana* v. *Kentucky,* 136 U.S. 479 (1890); *Point Pleasant Bridge Co.* v. *Point Pleasant,* 9 S.E. 231 (1889) (W. Va.); and *Church* v. *Chambers,* 33 Ky. 274 (1835), where it was held that the whole of the Ohio River bordering Kentucky, from shore to shore, is within the boundaries of Kentucky. Other cases involving state boundaries, where one shore or the other of the river is the boundary, are: *Alabama* v. *Georgia, supra* note 24, at 514, in which it was held that the western bank of the Chattahoochee River is the boundary between Georgia and Alabama and is based upon the words in the contract of cession between the United States and Georgia (*but see Florida Gravel Co.* v. *Capitol City Sand Co.,* 154 S.E. 255 (1930) (Ga.), where the court said the middle of the Chattahoochee River was the boundary between Georgia and Florida under the terms of the Treaty of Sept. 3, 1783, with Great Britain); *Maryland* v. *West Virginia,* 217 U.S. 577 (1910), in which the low-water mark along the south bank or West Virginia side of the Potomac River was adjudged the boundary between the two states (since West Virginia was but a successor of Virginia in title, this decision is in accord with the Award of 1877 in the Maryland-Virginia boundary dispute (*see* note 37 *supra*) and thus gives Maryland a uniform southern boundary along Virginia and West Virginia); and in *Vermont* v. *New Hampshire,* 289 U.S. 593 (1933), the boundary line between the two states was held to follow the low-water mark on the Vermont side of the Connecticut River. The boundary between Louisiana and Texas originally followed the west bank of the Sabine River, this having been the eastern boundary of the Republic of Texas. DOUGLAS, BOUNDARIES, AREAS, GEOGRAPHIC CENTERS, AND ALTITUDES OF THE UNITED STATES AND THE SEVERAL STATES (2d ed.) 169, BULLETIN No. 817, U.S. GEOLOGICAL SURVEY (1932). In 1848, Congress consented to extending the eastern boundary of Texas "to include within her limits one half of Sabine Pass, one half of Sabine Lake, also one half of Sabine River, from its mouth as far north as the thirty-second degree of north latitude" (9 Stat. 245).

title of riparian owners on the Kentucky side was held to stop at the thread of the river.[41]

143. High Seas Boundaries

In international law, the term "high seas" is defined as "all parts of the sea that are not included in the territorial sea or in the internal waters of a State." [42] The high seas thus begin at the outer limits of the territorial or marginal sea and extend seaward for an indefinite distance. The territorial sea begins at the low-water line and the seaward limits of inland waters and extends, in this country, for a distance of 3 nautical miles.[43] But since the territorial sea concept was carved out of the open sea, or free seas, doctrine (*see* Volume One, Part 1, 32, 321), it follows that, in a boundary context, the line dividing the inland waters from the territorial sea is, in effect, the line dividing them from the high seas. This line, then, is the landward or inner boundary of the high seas. The principles developed for the delimitation of such lines are dealt with in Volume One, Part 3, 2211 A, C.

High seas boundaries fall into two categories: (1) outer or exterior boundaries, and (2) lateral boundaries.

1431. *Exterior Boundaries*

Strictly speaking, the high seas have no exterior boundaries since they extend seaward an indefinite distance and are incapable of appropriation by

41. *Bedford-Nugent Co.* v. *Herndon,* 244 S.W. 908 (1922) (Ky.). But in *Jones* v. *The Water Lot Co. of Columbus,* 18 Ga. 539 (1855), the Georgia court held that a grant of land bounded by the Chattahoochee River extended to the opposite shore, thus following the boundary line between Georgia and Alabama (*see* note 40 *supra*).

42. Article 1 of the 1958 Geneva Convention on the High Seas (*see* Volume One, Appendix I).

43. Over the territorial sea, a coastal nation exercises exclusive sovereignty—the same as it does over its land territory and its inland waters—except for the right of innocent passage of foreign vessels. This sovereignty includes the prevention of fishing by foreign vessels and applies to the bed and subsoil of the territorial sea (*see* Volume One, Part 3, 221). While the right to enforce this sovereignty is a well-recognized principle of international law, the United States has heretofore never enacted legislation spelling out specific sanctions for such violations. On Oct. 1, 1963 (109 Cong. Rec. 17554–17561), the Senate approved, and sent to the House, S. 1988, a bill prohibiting (with certain exceptions) any foreign vessel from taking fish within the territorial waters of the United States (including the territories and possessions and the Commonwealth of Puerto Rico) or from taking any fishery resources of the continental shelf which appertain to the United States. Sec. 2 provides for penalties involving a fine of $10,000 or imprisonment for not more than a year, or both, for any person violating the provisions of the act, and authorizes the seizure and forfeiture of the vessel and all fish taken in violation of the act. S. Rept. 500, 88th Cong., 1st sess. (1963) (to accompany S. 1988). As amended by the House (in which the Senate concurred) and sent to the White House on May 6, 1964, the act embodies the 1958 Geneva convention definition of the Continental Shelf and the sedentary fisheries definition (see Volume One, Appendix I). The act also defines such terms used in the bill as "fisheries" and "fish." In the House report on S. 1988, it is stated that "the powers of the States in dealing with trespassers of their territorial waters would not be preempted by the passage of this bill." H. Rept. 1356, 88th Cong., 2d sess. 5 (1964). The act was approved by the President on May 20, 1964, and became Public Law 88–308 (78 Stat. 194).

any nation. In actuality, when considered in the context discussed above, the high seas encompass the territorial sea, the contiguous zone, and the continental shelf (*see* Volume One, fig. 51), in each of which international law recognizes certain rights as exclusive in the coastal State and therefore give rise to seaward boundary problems (*see* Volume One, Part 3, 221, 2215, 2222). Nationally, there are also the seaward boundaries of the states under the Submerged Lands Act, which in turn are the dividing lines between federal and state ownership of the submerged lands and associated natural resources, and these also give rise to boundary problems.

A. DELIMITATION OF THE TERRITORIAL SEA

The exterior boundary of the territorial sea is delimited cartographically by an "envelope line." This is defined as a line every point of which is at a distance from the nearest point of the baseline (the line that divides the inland waters from the territorial sea) equal to the breadth of the territorial sea (*see* Volume One, Part 3, 2211 B). The principles on which the envelope line is based and the reasons for its adoption by the 1958 Geneva Conference on the Law of the Sea are dealt with in Volume One, Part 2, 1621(*c*) and will not be repeated here. What is considered in this section is the application of the line to various geographic situations where islands and low-tide elevations exist and the effect each has on the delimitation of the territorial sea (*see* fig. 93). The broken line in the figure that parallels the coastline is the boundary of the territorial sea unaffected by islands or low-tide elevations. This is referred to in subsequent paragraphs as the "main territorial sea."

The basic principle of delimitation of the territorial sea in the vicinity of islands and low-tide elevations is that an island, no matter where situated, carries its own territorial belt, while a low-tide elevation generates such belt only if it lies within the territorial sea. Represented in the figure are the following situations:

At *A* is an island within the main territorial sea, and at *B* is an island outside the territorial sea. In either case, the island will generate its own territorial sea.

At *C* is a low-tide elevation outside the main territorial sea. This situation calls for no modification of the territorial sea. The same result obtains if the low-tide elevation is outside the territorial sea of an island.[44]

44. Article 11 of the Convention on the Territorial Sea and the Contiguous Zone defines a low-tide elevation as "a naturally formed area of land which is surrounded by and above water at low-tide but submerged at high tide" (*see* Volume One, Appendix I). Such elevations are the same as "drying rocks" and "drying shoals," the terminology used by the International Law Commission. In Coast Survey terminology, they are called "rocks awash" and "shoals awash." Rocks awash are defined as "those exposed at any stage of the tide between mean high water and the sounding datum, or that are exactly awash at these planes." JEFFERS, HYDROGRAPHIC MANUAL 209, PUBLICATION 20-2, U.S. COAST AND GEODETIC SURVEY (1960, 3d ed.).

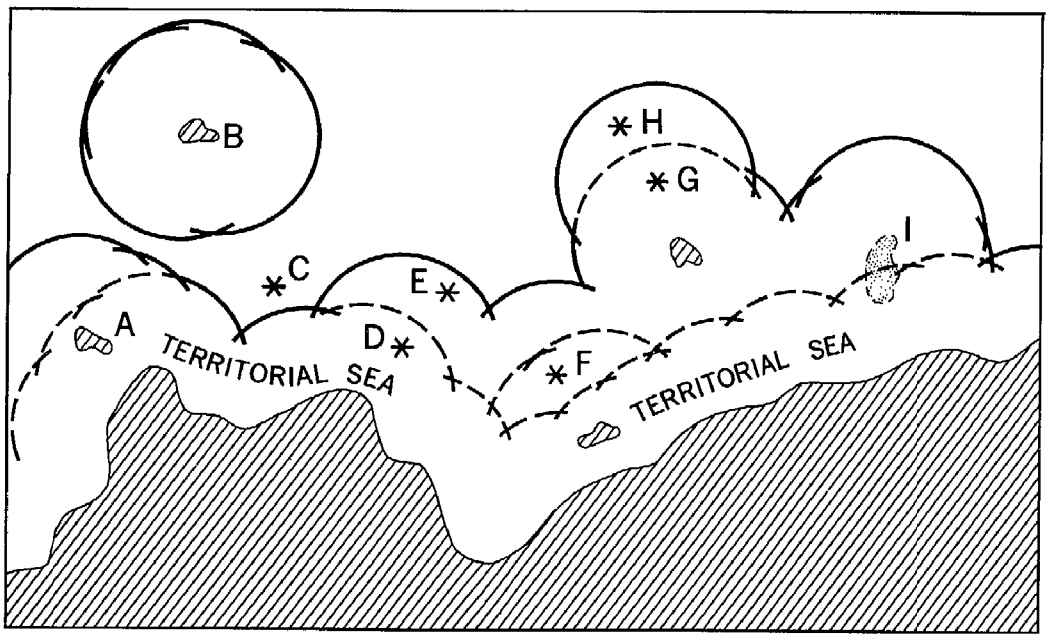

FIGURE 93.—Application of the "envelope line" to a composite coastal area to illustrate the delimitation of the territorial sea under various geographic situations.

At *D* is a low-tide elevation within the main territorial sea. In this situation, the low-tide elevation will generate a territorial sea of its own to produce the bulge shown in the figure. This also applies to low-tide elevations situated within the territorial sea of an island.

At *E* is a low-tide elevation outside the main territorial sea but within the territorial sea generated by a low-tide elevation. Such elevation generates no new territorial sea and the situation remains as though the outer elevation did not exist.[45]

At *F* is a low-tide elevation within the territorial sea generated by an island situated within the main territorial sea. Such elevation generates a new territorial sea, in the same manner as the case of an island situated outside the main territorial sea (*see G*).[46]

At *G* is a low-tide elevation situated within the territorial sea generated by an island that lies outside the main territorial sea. Such elevation generates a new territorial sea. If this elevation were outside the territorial sea of the island, for example at *H*, no change would be effected and the situation would remain as though the elevation did not exist.

At *I* is the situation of a low-tide elevation partly within and partly without the main

45. This follows from par. 2 of Art. 11 of the Convention on the Territorial Sea and the Contiguous Zone (*see* Volume One, Appendix I), which states that where a low-tide elevation is "at a distance exceeding the breadth of the territorial sea *from the mainland or an island,* it has no territorial sea of its own." (Emphasis added.)

46. This follows from the fact that no distinction is made in the convention (*see* note 45 *supra*) between an island lying within and an island lying without the territorial sea. Therefore, the rules applicable to the mainland would be applicable to all islands.

territorial sea. In such case, Article 11 of the Convention on the Territorial Sea (*see* note 45 *supra*) provides that "the low-water line on that elevation may be used as the baseline for measuring the breadth of the territorial sea." The effect of this is to generate a new territorial sea using the portion of the low-tide elevation outside the main territorial sea for generating the new territorial sea.[47]

B. DELIMITATION OF THE CONTIGUOUS ZONE

The contiguous zone in international law is an area of the high seas, outside and adjacent to the territorial sea of a country. The zone may not extend beyond 12 miles from the *baseline* from which the breadth of the territorial sea is measured (*see* Volume One, Part 3, 2215).

In the 1958 Convention on the Territorial Sea and the Contiguous Zone (*see* Volume One, Appendix I), no specific provision is made for the method of delimiting the exterior limits of the contiguous zone. But inasmuch as the measurement is made from the baseline, there is no reason why the same method that the convention provides for drawing the outer limits of the territorial sea should not be used for the contiguous zone, that is, by the use of an envelope line. All the reasons advanced for the use of this method in the first case is equally applicable to the second case (*see* A, above).

C. DELIMITATION OF THE CONTINENTAL SHELF

The 1958 Geneva Convention on the Continental Shelf defines the continental shelf as the seabed and subsoil of the submarine areas adjacent to the coast to a depth of 200 meters (approximately 100 fathoms) (*see* Volume One, Part 3, 2221). Therefore, the delimitation of the exterior boundaries of the shelf requires no geometric construction, but is determined by the charted location of the 100-fathom, or 200-meter, depth contour on world nautical charts. For the coasts of the United States, the shelf has been surveyed and charted by the Coast and Geodetic Survey and is continuously delineated on its series of General charts (approximate scale of 1:400,000 for the Atlantic and Gulf coasts and 1:200,000 for the Pacific coast).

D. SEAWARD BOUNDARIES UNDER SUBMERGED LANDS ACT

Another category of exterior boundaries is the "seaward boundaries" of the states under the Submerged Lands Act of 1953 (67 Stat. 29). This act established titles in the states to lands beneath navigable waters within state boundaries. For Atlantic and Pacific coast states the titles extend seaward 3 geographic miles

47. For a comment on this treatment, *see* Volume One, Part 3, 2211 D(*c*) note 48.

from the "coast line" of each state.[48] For the Gulf coast states, the act sets a possible maximum of 3 marine leagues (9 geographic miles) from the "coast line" of each state, provided a state can meet certain tests as to the preexistence of a boundary in excess of 3 miles (*see* Volume One, Part 2, 1541). In considering these boundary provisions, the Supreme Court found that only Texas and Florida met these tests and decreed a 3-league boundary for Texas and for the west coast of Florida, but limited the States of Louisiana, Mississippi, and Alabama to boundaries of 3 geographic miles from their coasts, for purposes of the Submerged Lands Act.[49] In either case, the seaward boundaries would be measured from the respective "coast lines" (wherever they may be) in the same manner and by the same method as is used for delimitation of the territorial sea (*see* A, above).[50]

Before the seaward boundaries of the states can be delimited, the important question of the location of the "coast line" under the Submerged Lands Act will have to be settled—by agreement or by adjudication. Thus far, no judicial proceeding has been instituted for the adjudication of this aspect of the boundary problems, insofar as the Gulf states are concerned. However, in March 1963, the United States filed a motion for leave to file a supplemental complaint, or an original complaint, against the State of California, for the purpose of determining what constitutes the "coast line" of California, under the Submerged Lands Act. In the proceeding, the Government seeks to utilize, to the extent

48. Sec. 2(c) of the act defines "coast line" as "the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters" (*see* Volume One, Appendix G).

49. *United States* v. *Louisiana et al.*, 363 U.S. 1, 64, 79, 81, 82 (1960); *United States* v. *Florida*, 363 U.S. 121, 129 (1960). The Court held the purposes of the act to be purely domestic and saw no irreconcilable conflict between the national 3-mile boundary and the fixing of the seaward boundaries of some states in excess of 3 miles. It noted that a nation may extend its national authority into the adjacent sea to varying distances from its seacoasts and for various purposes—for example, for customs control, for enforcing sanitary regulations, and for defense, such practices being recognized in international law. "A nation," the Court said, "which purports to exercise any rights to a given distance in the sea may be said to have a maritime boundary at that distance." *Id.* at 34. For a discussion of departures by the United States from the 3-mile limit, *see* Volume One, Part 1, 3211. In the 88th Cong., 1st sess., S. 1109 was introduced on Mar. 15, 1963, to amend the Submerged Lands Act so as to establish the seaward boundaries of Alabama, Mississippi, and Louisiana as extending 3 marine leagues into the Gulf of Mexico and providing for the ownership and use of the submerged lands within such boundaries, to be effective as of May 22, 1953. Thus far (Mar. 1964), the bill has not been acted on. A number of similar bills were also introduced in the House during this session but without any further action.

50. The question as to what constitutes the "coast lines" of the states, under the Submerged Lands Act, was not reached by the Court in *United States* v. *Louisiana et al.*, *supra* note 49, nor was it put in issue. The sole question there was how far into the Gulf do the seaward boundaries of the states extend. After determining this, the Court specifically noted: "We do not intend, however, in passing on these motions, to settle the location of the coastline of Louisiana or that of any other State." *Id.* at 67 n. 108.

applicable, the findings of the Special Master in *United States* v. *California,* 332 U.S. 19 (1947), on the ground that the present dispute involves the same legal and factual issues that were considered by the Special Master.[51] In that case, the matter to be adjudicated was the federal-state boundary, which the Supreme Court held to be the ordinary low-water mark and the seaward limits of inland waters. The basic question involved was where to draw the line that defines the seaward limits of the inland waters along the California coast. The Special Master found the channels and other water areas between the mainland and the offshore islands along the southern California coast not to be inland waters, and that no one of the seven coastal segments recommended for immediate adjudication was a bay constituting inland waters (*see* Volume One, Part 1, 71).[52] Under the Submerged Lands Act, the federal-state boundary has been moved 3 geographic miles seaward from the "coast line" as defined in the act. This definition is strikingly similar to the phraseology used by the Supreme Court in *United States* v. *California, supra,* to describe the line from which federal paramount rights are to be measured. The legislative history of the act seems to indicate that the term "coast line" was understood to be the same as the baseline from which the territorial sea is measured. Therefore, as of the date of the act (May 22, 1953), the inland waters along the California coast comprised what was then the position of the United States in its international relations. (*See* Volume One, Part 2, 1611, 1612.) [53]

1432. *Lateral Boundaries*

Besides the exterior boundaries described above, other high seas boundaries are involved in delimiting the boundaries through the territoral sea and the

51. Motion for Leave to File Supplemental Complaint or Original Complaint, 7–8, United States v. California, Sup. Ct. No. 5, Original, Oct. Term, 1962. On Dec. 2, 1963, the motion of the United States was granted by the Supreme Court and the motion of California to dismiss the Government's complaint was denied. California was allowed 60 days to answer the complaint, and both parties were allowed 60 days to file additional exceptions to the Special Master's Report, together with briefs in support of the exceptions. *United States* v. *California,* 375 U.S. 927 (1963).

52. The seven segments constituted the following: Crescent City Bay, Monterey Bay, San Luis Obispo Bay, Point Conception to Point Hueneme, Santa Monica Bay, San Pedro Bay, and Area east of San Pedro Bay. These were considered as representative of physiographic conditions along the entire California coast (*see* Volume One, Part 1, 2111).

53. There is now pending (Apr. 1964) in the United States District Court for the District of Alaska an action by the United States against the State of Alaska for the purpose of confirming title of the United States to certain submerged lands in Yakutat Bay (Civil Action No. A–51–63). The bay is approximately 17 geographic miles wide at its entrance points, that is, Point Manby to Ocean Cape (*see* chart 8455).

continental shelf between contiguous States or between States opposite each other. These are termed lateral boundaries. In delimiting such boundaries, the objective is to apportion the sea area in such manner as will be equitable to both States. The Geneva Conference on the Law of the Sea adopted the principle of equidistance as the guiding rule in the delimitation of boundaries through the territorial sea and the continental shelf. The basis for the rule and the method of constructing a boundary line between adjacent coastal nations and nations with coasts opposite each other are discussed in detail and illustrated in Volume One, Part 3, 2212, 2224.[54]

1433. *Status of Conventions on the Law of the Sea*

As of March 9, 1964, the various conventions adopted at Geneva in 1958 had been ratified or acceded to by the following countries:[55]

Convention on the Territorial Sea and the Contiguous Zone.—Australia, Bulgaria, Byelorussia, Cambodia, Czechoslovakia, Haiti, Hungary, Israel, Madagascar, Malaysia, Nigeria, Portugal, Rumania, Senegal, Sierra Leone, Ukraine, South Africa, U.S.S.R., United Kingdom, United States, and Venezuela. (*21 nations.*)

This brings in issue the question whether the seaward limit of inland waters in the bay is at this line (the state's contention), or whether it is at a line within the bay where the width is 10 geographic miles (the Government's contention). The United States position is predicated on the fact that prior to the admission of Alaska as a state on Jan. 3, 1959, the United States was the owner of all the submerged lands of the Territory of Alaska from the line of mean high tide seaward to the edge of the continental shelf; that Alaska, upon its admission into the Union, received, by virtue of its sovereignty, title to the tidelands along its coast to the line of mean low water and title to the lands underneath the waters of bays out to the point where the bays do not exceed 10 geographic miles in width, the position taken by the United States in its international relations prior to Mar. 24, 1961 (*see* note 55 *infra* and Volume One, Part 3, 2218(*b*)); and that under the Submerged Lands Act, which became effective on May 22, 1953, Alaska received title to the submerged lands underlying a 3-mile belt of territorial waters immediately seaward of the tidelands and the submerged lands acquired by virtue of its sovereignty. Since the United States, on Mar. 24, 1961, ratified the Convention on the Territorial Sea and the Contiguous Zone, which was adopted at the First Law of the Sea Conference at Geneva in 1958, and since that convention provides for a 24-mile closing line for bays (*see* Volume One, Part 3, 2211 C(*c*)), the question is raised as to the effect of this ratification on the scope of the Submerged Lands Act, insofar as inland waters are concerned. As of Mar. 9, 1964, 21 nations had ratified the convention out of a necessary 22 required to bring it into force (*see* 1433). On Aug. 19, 1964, the district court entered judgment for the United States.

54. The principle being geometric in nature is applicable to the delimitation of the lateral boundaries between the states under the Submerged Lands Act (*see* Volume One, Part 2, 1622).

55. Information furnished by the United Nations Secretariat at New York, Mar. 9, 1964. The conventions enter into force on the thirtieth day following the deposit of the twenty-second instrument of ratification or accession with the Secretary-General of the United Nations. Thus far, the Convention on the High Seas is the only one of the four conventions that is presently operative, having entered into force on Sept. 30, 1962. The Optional Protocol of Signature became operative on the same date for those countries having ratified the Protocol or having signed it without reservation as to ratification and as to matters arising under an operative convention (*see* Volume One, Appendix I). The four conventions were ratified by the President of the United States on Mar. 24, 1961. 44 DEPT. STATE BULLETIN 609 (1961). The ratification of the United States was deposited with the Secretary-General of the United Nations on Apr. 12, 1961, and the Convention on the High Seas was proclaimed by the President of the United States on Nov. 9, 1962. *Treaties and Other International Acts Series 5200*, DEPARTMENT OF STATE (1963). For pertinent events leading up to ratification, *see* Volume One, Part 3, 2271.

Convention on the Continental Shelf.—Australia, Bulgaria, Byelorussia, Cambodia, Colombia, Czechoslovakia, Denmark, Guatemala, Haiti, Israel, Madagascar, Malaysia, Poland, Portugal, Rumania, Senegal, Ukraine, South Africa, U.S.S.R., United Kingdom (*Washington Post*, May 14, 1964), United States, and Venezuela. (*22 nations.*)

Convention on the High Seas.—Afghanistan, Australia, Bulgaria, Byelorussia, Cambodia, Central African Republic, Czechoslovakia, Guatemala, Haiti, Hungary, Indonesia, Israel, Madagascar, Malaysia, Nepal, Nigeria, Poland, Portugal, Rumania, Senegal, Sierra Leone, Ukraine, South Africa, U.S.S.R., United Kingdom, United States, and Venezuela. (*27 nations.*)

Convention on Fishing and Conservation of the Living Resources of the High Seas.—Australia, Cambodia, Colombia, Haiti, Madagascar, Malaysia, Nigeria, Portugal, Senegal, Sierra Leone, South Africa, United Kingdom, United States, and Venezuela. (*14 nations.*)

Optional Protocol of Signature Concerning the Compulsory Settlement of Disputes.—Austria, Haiti, Madagascar, Malaysia, Nepal, Portugal, Sierra Leone, and United Kingdom. (*8 nations.*)

1434. *Lines of Allocation*

Since the high seas are *res communis* (the property of all) and incapable of appropriation by any nation, no boundary problems arise except in the portions covered by the contiguous zone and by the continental shelf (*see* 1431). Lines of allocation are, however, sometimes delimited through the high seas for the purpose of allocating lands without conveying sovereignty over the waters. Such lines are not true boundaries because they do not affect the waters of the high seas, at least insofar as the rights of countries not signatory to such arrangement are concerned, but represent a dividing line for the inclusion or exclusion of certain land and island areas under a particular agreement. The charted line in the Bering Sea and Bering Strait between Russia and the United States is a case in point (*see* charts 9302 and 9400).

(*a*) *United States—Russian Convention Line.*—By the Convention of March 30, 1867, between Russia and the United States (proclaimed June 20, 1867 (15 Stat. 539)), Russia ceded Alaska to the United States. The ceded area, insofar as the western limit is concerned, is described as follows:

> The western limit within which the territories and dominion conveyed, are contained, passes through a point in Behring's straits on the parallel of sixty-five degrees thirty minutes north latitude, at its intersection by the meridian which passes midway between the islands of Krusenstern, or Ignalook [Little Diomede], and the island of Ratmanoff, or Noonarbook [Big Diomede], and proceeds due north, without limitation, into the same Frozen ocean. The same western limit, beginning at the same initial point, proceeds thence in a course nearly southwest through Behring's straits and Behring's sea, so as to pass midway between the northwest point of the island of St. Lawrence and the southeast point of Cape Choukotski, to the meridian of one hundred and seventy-two west longitude; thence, from the intersection of that meridian, in a southwesterly direction, so as to pass midway between the island of Attou and the Copper island of the Kormandorski couplet or group in the North Pacific ocean, to the meridian of one hundred and ninety-three degrees west longitude, so as to include in the territory conveyed the whole of the Aleutian islands east of that meridian.

After the acquisition of Alaska by the United States, Congress passed several statutes regulating seal fisheries in the Bering Sea, but none of these contained any definition of the area within which the regulations were enforceable. Nevertheless, the statutes were construed by the Executive Branch of the Government as applying to the Bering Sea beyond the 3-mile limit, on the basis that this jurisdiction was asserted by Russia for more than 90 years and jurisdiction over the waters east of the cession boundary was transferred to the United States by the Convention of 1867.

The Supreme Court of the United States upheld these interpretations in the case of *In Re Cooper,* 143 U.S. 472 (1892),[56] on the ground that the Court was bound by the actions of the Executive Branch in its interpretation of the Convention of 1867 and of the laws of Congress enacted on the basis of what the United States acquired by the treaty.

Following the decision of *In Re Cooper,* Great Britain protested these seizures and after a series of diplomatic exchanges between the two governments, the matter was submitted to arbitration, commonly known as the Bering Sea Fur Seal Arbitration. In the oral argument for the United States, the position taken in *In Re Cooper* was disavowed and the tribunal advised that the United States did not assert a territorial claim to the waters of the Bering Sea beyond the 3-mile limit.[57]

The line shown on charts 9302 and 9400 through Bering Strait and Bering Sea is therefore no more than a line of allocation of territory and carries with it no extraterritorial rights in the high seas.[58]

1435. *Limits of Oceans and Seas*

The water areas of the world are divided into the major oceanic basins and the lesser subdivisions, comprising seas, gulfs, and bays.[59] Except for the

56. The case involved the arrest of a British schooner, engaged in seal fishing in the waters of the Bering Sea 59 miles from land, for violating the laws of the United States which prohibited the killing of fur seals in the waters of the Alaska Territory.

57. *12 Fur Seal Arbitration 107–110, Proceedings of the Tribunal at Paris, 1893.* The issue submitted to the tribunal by agreement of the parties was "what right of protection or property" the United States had "in the fur seals frequenting the islands of the United States in Behring Sea when such seals are found outside the ordinary three-mile limit?" A majority of the tribunal answered that it had no right of protection or property.

58. On July 7, 1911, the United States, Great Britain, Russia, and Japan entered into a treaty prohibiting the killing, taking, and hunting of seals within the Pacific Ocean north of 30° north latitude, including the seas of Bering, Kamchatka, Okhotsk, and Japan. The seals may only be captured on land by the littoral States concerned. U.S. Treaty Series No. 2 (1912). For later developments regarding their multilateral treaty during and following World War II, *see* COLOMBOS, INTERNATIONAL LAW OF THE SEA 357–358 (1959).

59. The water area (including all oceans and adjacent seas) has been calculated to be 70.8 percent of the surface, leaving 29.2 percent as the land area. However, the amount of land in the Northern

oceans, there are no exact criteria for defining the secondary features. The result is that a geographic configuration in one locality may be termed a "gulf" and in another locality a similar configuration may be termed a "sea"—witness, for example, the Gulf of Siam and the Adriatic Sea. In many cases, the nomenclature represents long, historic usage which has not been deemed advisable to disturb. Sverdrup notes the indiscriminate use of the term "sea" and cites as examples its use in connection with inland salt lakes, such as the Caspian Sea; with relatively isolated bodies of the ocean, such as the Mediterranean Sea; with less isolated areas, such as the Caribbean Sea; and even for some areas with no land boundaries, such as the Sargasso Sea in the western North Atlantic.[60]

A. DELIMITATION BY INTERNATIONAL HYDROGRAPHIC BUREAU

In 1953, the International Hydrographic Bureau (IHB) published the third edition of a publication entitled "Limits of Oceans and Seas." [61] The publication consists of text material in which the proposed limits of oceans and seas and certain gulfs, bays, and straits are described and shown on three accompanying diagrams. The publication states that the limits have no political significance and are not to be regarded as representing the result of full geographic study, but have been drawn up solely for the convenience of National Hydrographic Offices when compiling their *Sailing Directions, Notices to Mariners,* etc., so as to ensure that all such publications headed with the name of an ocean or sea will deal with the same area. The bathymetric results of various oceanographic expeditions were however taken into consideration as far as possible.

The limits given for the oceans exclude the seas lying within each of them.

Hemisphere is more than twice that in the Southern Hemisphere, and the water covers only 60.7 percent of the former and 80.9 percent of the latter. SVERDRUP, JOHNSON, AND FLEMING, THE OCEANS 13 and Tables 3 and 4 (1942).

60. *Id.* at 12. In its usual geographic sense, an *ocean* is any one of the greater tracts of water that cover the globe, such as the Atlantic Ocean. The term "seven seas" has been applied figuratively to all the waters or oceans of the world, but generally it is applied to the seven oceans—Arctic, Antarctic (*see* note 62 *infra*), North Atlantic, South Atlantic, North Pacific, South Pacific, and Indian. *Sea* is defined as a large or considerable body of oceanic water partly or almost entirely enclosed by land, as, for example, the Bering Sea and the Mediterranean Sea. *Gulf* is defined as the tract of water within an indentation or curve of the coastline, in size between a bay and a sea—the Gulf of California, for example. A *bay* (in the general sense) is defined as an indentation of the coast, a subordinate adjunct to a larger body of water—Chesapeake Bay, for example. In the context of international law, a bay is defined much more specifically (*see* Appendix A).

61. LIMITS OF OCEANS AND SEAS, SPECIAL PUBLICATION NO. 23, INTERNATIONAL HYDROGRAPHIC BUREAU (1953). This edition of the publication was drawn up and approved by the 1952 International Conference which took into account proposals made at various hydrographic conferences up to and including the 1952 conference, and by certain scientific institutions, including the report of a sub-committee of the Association of Physical Oceanography on "The Criteria and Nomenclature of the Major Divisions of the Ocean Bottom," issued in 1940.

The boundary line between the North Atlantic and South Atlantic Oceans and the North Pacific and South Pacific Oceans is the equator. The southern boundary line between the South Atlantic and South Pacific Oceans is the meridian of Cape Horn (60°04′ W.).[62]

B. THE WESTERN HEMISPHERE

Figure 94 is a portion (on a reduced scale) of one of the diagrams accompanying the IHB publication to show the limits of the oceans and the seas of the Western Hemisphere. The numbering of the areas follows the numbering in the publication. The diagram is on the Mercator projection and meridians and parallels or rhumb lines were used as far as possible for the limits. The descriptions follow those in the publication but in a modified form. The bodies of water are numbered from (1) to (66) inclusive, but only selected bodies are given below:

(12) *Chuckchi Sea.*—Bounded on the west by the eastern limit of the East Siberian Sea (11); on the north by a line from Point Barrow (71°20′ N., 156°20′ W.), Alaska, to the northernmost point of Wrangel Island (179°30′ W.); and on the south by the Arctic Circle between Siberia and Alaska.

(13) *Beaufort Sea.*—Bounded on the north by a line from Point Barrow, Alaska, to Lands End (76°16′ N., 124°08′ W.), Prince Patrick Island; and on the east from Lands End through the southwest coast of Prince Patrick Island to Griffiths Point, thence a line to Cape Prince Alfred, the northwestern extremity of Banks Island, through its west coast to Cape Kellet, the southwestern point, and thence by a line to Cape Bathurst (70°36′ N., 127°32′ W.) on the mainland.

(14) *The Northwest Passages.—See* figure 94.

(14 A) *Baffin Bay.*—Bounded on the north by a line from Cape Sheridan (82°35′ N., 60°45′ W.), Grant Land, to Cape Bryant, Greenland; on the east by the west coast of Greenland; on the south by the parallel of 70° N. between Greenland and Baffin Land; and on the west by the eastern limits of the Northwest Passages (14).

(15) *Davis Strait.*—Bounded on the north by the southern limit of Baffin Bay (14 A); on the east by the southwest coast of Greenland; on the south by the parallel of 60° N. between Greenland and Labrador; and on the west by the eastern limit of the Northwest Passages (14) south of 70° N. and of Hudson Strait (16 A).

(15 A) *Labrador Sea.*—Bounded on the north by the south limit of Davis Strait (15); on the east by a line from Cape St. Francis (47°45′ N., 52°27′ W.), Newfoundland, to Cape Farewell, Greenland; and on the west by the east coast of Labrador and Newfoundland and the northeast limit of the Gulf of St. Lawrence (24).

(16) *Hudson Bay.*—Bounded on the north by a line from Nuvuk Point (62°21′ N., 78°06′ W.) to Leyson Point, the southeastern extremity of Southampton Island, through the

62. The Antarctic or Southern Ocean has been omitted from the publication because the majority of opinions received by the IHB since the issue of the second edition in 1937 were to the effect that there exists no real justification for applying the term "ocean" to this body of water, the northern limits of which are difficult to lay down owing to their seasonal change. The limits of the Atlantic, Pacific, and Indian Oceans have therefore been extended south to the Antarctic Continent. Hydrographic Offices who issue separate publications dealing with this area are left to decide the northern limits for themselves (Great Britain uses latitude 55°S.). *Id.* at 4.

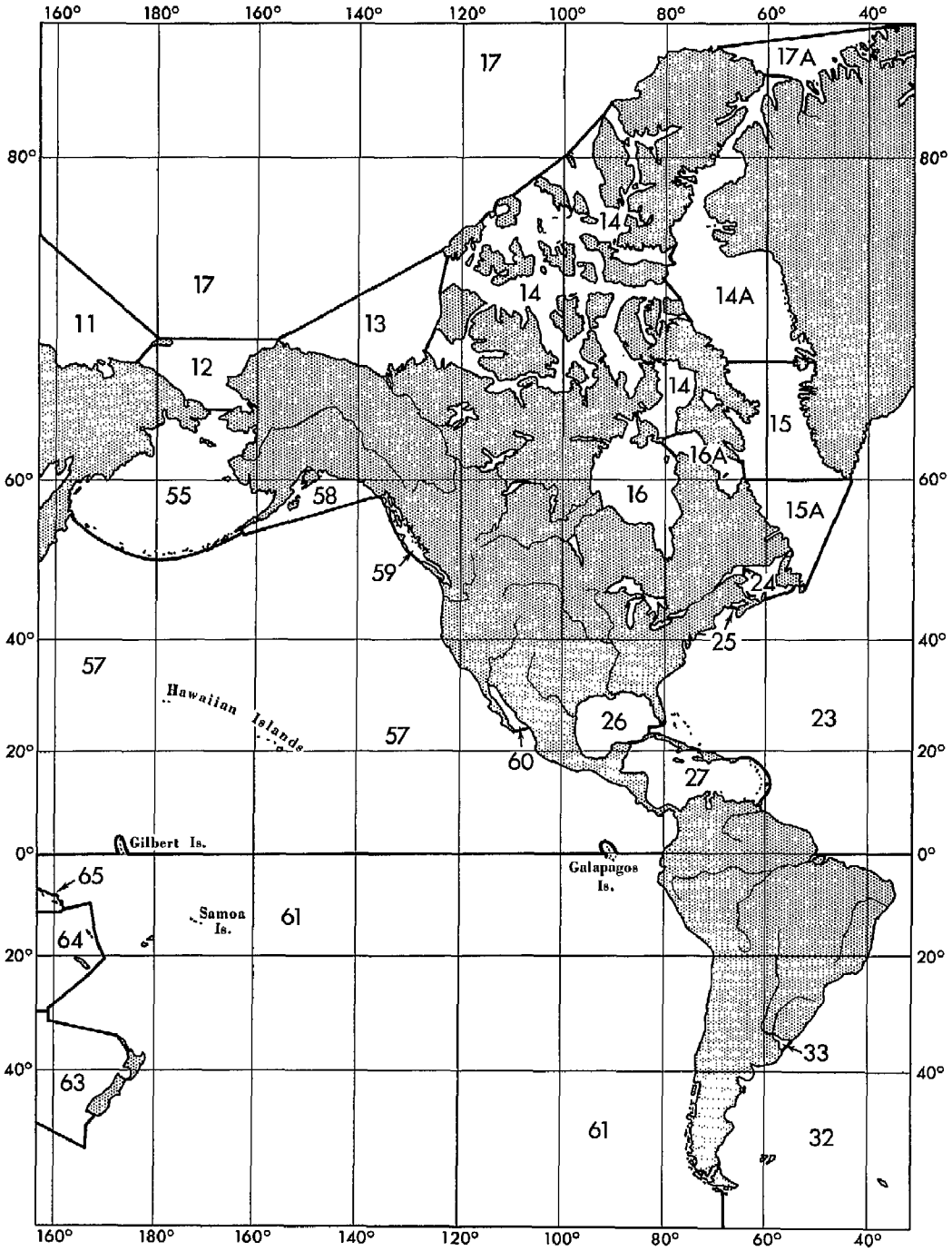

FIGURE 94.—Limits of oceans and seas of the Western Hemisphere. (*After Special Publication No. 23, International Hydrographic Bureau.*)

southern and western shores of Southampton Island to its northern extremity, thence by a line to Beach Point (66°03′ N., 86°06′ W.) on the mainland.

(16 A) *Hudson Strait.*—Bounded on the west by a line from Nuvuk Point to Leyson Point, thence by the eastern shore of Southampton Island to Seahorse Point, its eastern extremity, thence by a line to Lloyd Point (64°25′ N., 78°07′ W.) on Baffin Island; on the north by the south coast of Baffin Island between Lloyd Point and East Bluff; on the east by a line from East Bluff, the southeast extremity of Baffin Island (61°53′ N., 65°57′ W.), to Point Meridian, the western extremity of Lower Savage Islands, along the coast to its southwestern extremity and thence by a line across to the western extremity of Resolution Island, through its southwestern shore to Hatton Headland, its southern point, thence by a line to Cape Chidley (60°24′ N., 64°26′ W.), Labrador; and on the south by the mainland between Cape Chidley and Nuvuk Point.

(17) *Arctic Ocean.*—*See* figure 94.

(17A) *Lincoln Sea.*—Bounded on the north by a line from Cape Columbia to Cape Morris Jesup, Greenland; and on the south by a line from Cape Columbia through the northeastern shore of Ellesmere Island to Cape Sheridan to Cape Bryant, Greenland and through Greenland to Cape Morris Jesup.

(23) *North Atlantic Ocean.*—Bounded on the west by the eastern limits of the Caribbean Sea (27), the southeastern limits of the Gulf of Mexico (26) from the north coast of Cuba to Key West, the southwestern limit of the Bay of Fundy (25), the southeastern limit of the Gulf of St. Lawrence (24), and the eastern limit of the Labrador Sea (15 A),[63] the southeastern coast of Greenland from Cape Farewell to Cape Nansen; on the north by the southwestern limit of the Greenland Sea and the Norwegian Sea from Greenland to the Shetland Islands; on the east from the northwestern limit of the North Sea, the northern and western limits of the Scottish Seas, the southern limit of the Irish Sea, the western limits of the Bristol and English Channels, of the Bay of Biscay, and of the Mediterranean Sea; and on the south by the equator, from the coast of Brazil to the southwestern limit of the Gulf of Guinea.

(24) *Gulf of St. Lawrence.*—Bounded on the northeast by a line running from Cape Bauld (north point of Kirpon Island, 51°40′ N., 55°25′ W.) to the eastern extremity of Belle Isle and on to the Northeast Ledge (52°02′ N., 55°15′ W.), thence by a line joining this ledge with the eastern extremity of Cape St. Charles (52°13′ N.) in Labrador; on the southeast by a line from Cape Canso (45°20′ N., 61° W.) to Red Point (45°35′ N., 60°45′ W.) in Cape Breton Island, through this island to Cape Breton and on to Pointe Blanche (46°45′ N., 56°11′ W.) in the island of St. Pierre, and thence to the southwest point of Morgan Island (46°51′ N., 55°49′ W.); and on the west by the meridian of 64°30′ W., but the whole of Anticosti Island is included in the Gulf.

(25) *Bay of Fundy.*—Bounded on the southwest by a line running northwesterly from Cape St. Mary (44°05′ N.), Nova Scotia, through Machias Seal Island (67°06′ W.) and on to Little River Head (44°39′ N.) in the State of Maine.

(26) *Gulf of Mexico.*—Bounded on the southeast by a line joining Cape Catoche Light (21°37′ N., 87°04′ W.) with the light on Cape San Antonio in Cuba, through this island to the meridian of 83° W. and to the northward along this meridian to the latitude of the south point of the Dry Tortugas (24°35′ N.), along this parallel eastward to Rebecca Shoal (82°35′ W.), thence through the shoals and Florida Keys to the mainland at the eastern end of Florida Bay, all the narrow waters between the Dry Tortugas and the mainland being considered to be within the Gulf.

63. The IHB text includes the Labrador Sea within the limits of the North Atlantic Ocean, but this is contrary to the explanation given at the beginning of the publication that the limits given for the oceans "exclude the seas lying within each of them." The text has therefore been modified accordingly.

(27) *Caribbean Sea.*—Bounded in the Yucatan Channel by the same limit as that described for the Gulf of Mexico (26); on the north, in the Windward Channel, by a line joining Caleta Point (74°15′ W.) and Pearl Point (19°40′ N.) in Haiti, and in the Mona Passage by a line joining Cape Engano and the extremity of Agujereada (18°31′ N., 67°08′ W.) in Puerto Rico; and on the east by a line from Point San Diego, Puerto Rico, northward along the meridian thereof (65°39′ W.) to the 100-fathom depth curve, thence eastward and southward in such a manner that all islands, shoals, and narrow waters of the Lesser Antilles are included in the Caribbean Sea as far as Galera Point (northeast extremity of the island of Trinidad), thence through Trinidad to the southeast extremity of Galeota Point, and thence to Baja Point (9°32′ N., 61° W.) in Venezuela.

(32) *South Atlantic Ocean.*—Bounded on the southwest by the meridian of Cape Horn (68°04′ W.) from Tierra del Fuego to the Antarctic Continent, and by a line from Cape Virgins (52°21′ S., 68°21′ W.) to Cape Espiritu Santo, Tierra del Fuego, the eastern entrance to Magellan Strait; on the west by the limit of the Rio de La Plata (33); on the north by the southern limit of the North Atlantic Ocean (23); on the northeast by the limit of the Gulf of Guinea; on the southeast by a line from Cape Agulhas along the meridian of 20° E. to the Antarctic Continent; and on the south by the Antarctic Continent.

(33) *Rio de La Plata.*—Bounded to the eastward by a line joining Punta del Este (34°58′.5 S., 54°57′.5 W.), Uruguay, and Cabo San Antonio (36°18′ S., 56°46′ W.), Argentina.

(55) *Bering Sea.*—Bounded on the north by the southern limit of the Chuckchi Sea (12); and on the south by a line running from Kabuch Point (54°48′ N., 163°21′ W.) in the Alaskan Peninsula, through the Aleutian Islands to the southern extremities of the Komandorski Islands and on to Cape Kamchatka in such a way that all the narrow waters between Alaska and Kamchatka are included in the Bering Sea.

(57) *North Pacific Ocean.*—Bounded on the southwest by the northeastern limit of the East Indian Archipelago from the equator to Morotai Island; [64] on the west and northwest by the eastern limits of the Philippine Sea and the Japan Sea and the southeastern limit of the Sea of Okhotsk; on the north by the southern limits of the Bering Sea (55) and the Gulf of Alaska (58); on the east by the western limit of the coastal waters of Southeast Alaska and British Columbia (59), and the southern limit of the Gulf of California (60); and on the south by the equator, but excluding those islands of the Gilbert and Galapagos groups which lie to the northward thereof.

(58) *Gulf of Alaska.*—Bounded on the north by the coast of Alaska; and on the south by a line drawn from Cape Spencer, the northern limit of (59) to Kabuch Point, the southeast limit of (55), in such a way that all the adjacent islands are included in the Gulf of Alaska.

(59) *The Coastal Waters of Southeast Alaska and British Columbia.*—Bounded on the southwest by a line running from the northwestern extremity of Cape Flattery to Tatoosh Island (48°23′ N.), and thence to the southern extremity of Bonilla Point (124°42′ W.) in Vancouver Island; and on the west by a line running westerly from Black Rock Point (50°44′.5 N.) in Vancouver Island through the Scott Islands in such a way that all the narrow waters between these islands are included in the coastal waters, thence to Cape St. James (the southern extremity of the Queen Charlotte Islands), through this group in the same way, then from Cape Knox (54°10′ N., 133°06′ W.) northward to the western extremity of Langara Island and on to Point Cornwallis (132°52′ W.) in the Prince of Wales group, thence along the western shores of this group, of Baranof, Kruzof, Chichagof, and Yakobi Islands, so that all the narrow waters between them are included in the coastal

64. The IHB text gives this as "Luzon Island," but this is obviously an error since it does not conform to the boundary line shown on the diagram accompanying the IHB publication (*see* text following note 61 *supra*).

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waters, and, finally, from Cape Bingham (58°04′ N.) in Yakobi Island to Cape Spencer (58°12′ N., 136°39′ W.).

(60) *Gulf of California.*—Bounded on the south by a line joining Piastla Point (23°38′ N.) in Mexico, and the southern extremity of Lower California.

(61) *South Pacific Ocean.*—Bounded on the west by a line from Southeast Cape, the southern point of Tasmania, down the meridian of 146°55′ E. to the Antarctic Continent; on the northeast and northwest by the southern, eastern, and northeastern limits of the Tasman Sea (63), the southeastern, eastern, and northern limits of the Coral Sea (64), the northeastern limits of the Solomon Sea (65) and the Bismarck Sea, along the northern coast of New Guinea to its western extremity, and along the northeastern limit of the East Indian Archipelago from New Guinea to the equator;[65] on the north by the equator, but including those islands of the Gilbert and Galapagos groups which lie to the northward thereof; on the east by the meridian of Cape Horn (68°04′ W.) from Tierra del Fuego to the Antarctic Continent, and a line from Cape Virgins (52°21′ S., 68°21′ W.) to Cape Espiritu Santo, Tierra del Fuego, the eastern entrance to Magellan Strait; and on the south by the Antarctic Continent.

1436. *Administrative Boundary Lines*

High seas boundaries are sometimes established for administrative purposes rather than as a division of sovereignty. In this category would fall the authority that a regulatory or enforcing agency has in establishing boundary lines for purposes of carrying out its functions under a statute of authorization. Such delineations would be limited to the purposes intended. Examples of such boundary lines are the lines established by the United States Coast Guard in the Gulf of Mexico for separating the areas where the International Rules of the Road apply from those where the Inland Rules apply. These lines were established under the Act of February 19, 1895 (28 Stat. 672), and extend in places 10 to 25 miles from shore (*see* fig. 83 and charts 1116 and 1117). Rules of the road boundary lines have been held to have no application other than determining what rules of navigation are to be followed. *United States* v. *Newark Meadows Improvement Co.*, 173 Fed. 426, 428 (1909). For a discussion of the rules—their history, application to nautical charts, and their judicial and administrative interpretation—*see* Part 2, 67 *et seq.*

Another form of administrative boundary line is that used by the Bureau of the Census for measuring the area of the United States for the Sixteenth Census in 1940. Special definitions were adopted for state waters, inland waters, and land area in order to determine the outer limits of the United States (*see* 381).

Thus, from the very nature of the Bureau's accumulated technical data, it has been called upon over the years to render various types of assistance and

65. This is a modification of the IHB text in the interest of clarification and to achieve greater conformity to the boundary line shown on the diagram accompanying the IHB publication (*see* text following note 61 *supra*).

advice in helping to resolve many legal and technical problems arising out of waterfront property disputes. As a preliminary to the consideration more specifically of some of the areas in which Coast Survey records were applied or services utilized, brief discussions will be given of the judicial structure in the United States and the basis for land ownership. The following two chapters deal with these matters.