CHAPTER 4

Some Legal Aspects of the Bureau's Work

A plane crashes on the west shore of the Potomac River. Does jurisdiction over the accident fall to the District of Columbia or to Virginia? An award of arbitrators defines the boundary between two jurisdictions as "following the meanderings of the said river." How is this to be interpreted with respect to indentations of the shore? The recreation room of a seaside home is damaged during a storm. Did the flooding result from the stage of the tide or from the storm? A Supreme Court decision describes the area of federal jurisdiction as seaward of the "ordinary" low-water mark. How is such boundary to be interpreted for the coasts of the United States? The seaward limit of riparian property is defined by the high-water line. How is such line to be established on the ground?

These are but a few examples of the types of information the Bureau is called upon to furnish, and constitute the legal aspects of its work. They are not exactly new developments in the work of the Bureau, but greater attention has been focused on them in recent years resulting from an increased awareness of the usefulness of precise surveys and of the carefully accumulated observational data in the settlement of boundary and other problems associated with lands bordering the seacoast.

The legal aspects of the Bureau's work may thus be said to flow from the nature of its work, from the precise survey methods used, and from its area of operation. They take the form of cases in which Bureau records are used or personnel appear as expert witnesses, cases in which the Bureau's advice is sought or its services solicited, and legal-technical inquiries covering almost every field of its operations. In dealing with these legal aspects, any phase of the law that has an impact on the field surveys (geodetic, topographic, hydrographic, or tidal) or nautical charts of the Bureau is considered an appropriate subject of discussion in this publication.

41. COAST SURVEY RECORDS AS EVIDENCE

The grants of waterfront property contain frequent references to the boundaries as the high-water line or the low-water line. Such lands are often in litigation and it becomes necessary to establish where the present boundary line is, or where it was at some time in the past. Our hydrographic and topographic surveys, as well as our tidal data, constitute an authentic record of conditions along our coasts extending back for more than a hundred years. The Bureau is called upon many times each year for tabulations of tidal data, for copies of original surveys, or for copies of aerial photographs. There are many instances of the use of Bureau records as evidence in legal controversies, a few of which will be described following the discussion of documentary evidence and judicial notice.

411. Documentary Evidence

Documentary evidence is evidence supplied by written instruments. In the law of evidence, documents are either public or private. A public document, it has been held, is one that records facts which may have been inquired into or taken notice of for the benefit of the public by an agent authorized for the purpose (*Woltin* v. *Metropolitan Life Ins. Co.*, 4 N.Y.S. 2d 296, 300 (1938)). Relevant public records are always admissible in evidence, although not accompanied by the usual tests of truth—the swearing and cross-examination of the persons who prepared them. They are entitled to this confidence because made as part of an official duty by agents appointed for that purpose, and because the facts stated in them are entries of a public nature and it would often be difficult to prove them by means of sworn witnesses. The document produced must be from the proper custody, and its identity, authenticity, and genuineness established. The rule admitting official documents has been applied to official letters, official maps, reports and records generally of official surveyors, and naval charts.

In view of the impropriety of allowing public records to be removed from their usual place of deposit, it is an established rule that whenever they are needed as evidence the contents may be proved by a properly authenticated copy (*New Mexico* v. *Texas*, 275 U.S. 279 (1927)).

The admission of government documents in evidence in the Federal courts, is governed by Title 28, chapter 115, section 1733(b) of the United States Code (1958 ed.), which provides that "Properly authenticated copies or transcripts

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of any books, records, papers, or documents of any department or agency of the United States shall be admitted in evidence equally with the originals thereof." 62 Stat. 946 (1948). It appears from this that only *copies* need be authenticated and not the *originals*. For example, a photostatic copy of a survey sheet or of a tidal record would require authentication, but a published chart or a printed publication would not, since all are *originals* and no particular one can be considered the master copy. It should be remembered, however, that this provision of the U.S. Code applies to procedures in the Federal courts. It may be different in some of the state courts. This interpretation as to our publications and charts is borne out by the method of authentication provided for in Rule 44(a) of the Rules of Civil Procedure for the District Courts of the United States (U.S. Code, page 5165). The rule states: "An official record or an entry therein, when admissible for any purpose, may be evidenced *by an official publication* thereof or by a copy attested by an officer having the legal custody of the record, or by his deputy, and accompanied with a certificate that such officer has the custody." (Emphasis added.) The rule further provides that the certificate may be made by a judge of a court of record, authenticated by the seal of the court, "or may be made by any public officer having a seal of office and having official duties in the district or political subdivision in which the record is kept, authenticated by the seal of his office."

In connection with authentication, it should be noted that both the 1940 and 1946 editions of the Code (Title 28, sec. 661(b)) provided that authentication be under the seal of the department. This was omitted in the 1952 and 1958 editions (sec. 1733(b)). However, this does not obviate the need for a seal because the language of Rule 44, quoted above, is actually broader than was provided in former editions of the Code. The former provisions that courts should take judicial notice of executive department seals was purposely omitted in the 1952 edition as being unnecessary, since state and Federal courts do take judicial notice of such seals without statutory mandate.

412. Judicial Notice of Coast Survey Records

It is a tribute to the foresight and wisdom of the pioneering founders of the Coast Survey that the precision standards which they established early in the 19th century have stood well the test of time. This accuracy is reflected in the credence which judicial tribunals attach to the surveys of the Bureau, by way of taking judicial notice of their accuracy.[1] This was significantly brought out in

1. Judicial notice is the act by which a court, in conducting a trial, or framing its decision, will, of its own motion, take cognizance of certain facts without proof which are regarded as established by common knowledge, *e.g.*, the laws of the state, international law, historical events, main geographical features, etc.

the case of *United States* v. *Romaine,* 255 Fed. 253 (1919), where the United States Court of Appeals for the Ninth Circuit said:

> We are unable to agree with the trial court as to the effect which should be given to the hydrographic maps of the United States Coast and Geodetic Survey as evidence in this case. We think the maps should be given full credence, and should be taken as absolutely establishing the truth of all that they purport to show . . . . Capt. George R. Campbell, United States engineer and hydrographic surveyor, testified to the accuracy of official hydrographic maps, stating that all the features connecting the shores with the water are accurately outlined and surveyed and tied to permanent landmarks, that these surveys are made with extreme accuracy, and that all are worked on an astronomical basis and are chained and taped a number of times, and that the government is always careful to do as accurate work as is possible on a coast line and in its marine coast survey work. Such testimony was hardly necessary, we think, for the court might properly take judicial notice of the accuracy of the official plats of the United States Coast and Geodetic Survey.[2]

The importance of this pronouncement by so high a court is emphasized by the nature of the doctrine of judicial notice and its evidentiary value. It was stated by the Supreme Court of California that "The judicial notice which courts take of matters of fact embraces those facts which are within the common knowledge of all, or are of such general notoriety as to need no evidence in their support, and also those matters which do not depend upon the weight of conflicting evidence, but are in their nature fixed and uniform, and may be determined by mere inspection, as of a public document, or by demonstration, as in the calculations of an exact science. . . . As this knowledge of the court does not depend upon the weight of evidence, and is not to be determined upon a consideration of the credibility of witnesses, it is evident that, when the court has stated to the jury a fact of which it takes judicial knowledge, the correctness of such statement is not to be controverted or set aside on an appeal by affidavits which are merely contradictory of the correctness of such statement." [3]

North Hempstead v. *Gregory,* 65 N.Y. Supp. 867 (1900). The limits of judicial notice cannot be prescribed with exactness, but notoriety is, generally speaking, the ultimate test of facts sought to be brought within the realm of such notice. *Gottstein* v. *Lister,* 153 Pac. 595, 602 (1915) (Wash.).

2. The controversy involved the question of the true location of the mouth of the Nooksack River, Wash., in 1855. (It had later changed its position.) The hydrographic surveys of 1855 and 1888 were introduced in evidence to show where the mouth of the river was. The lower court disregarded these surveys and relied upon the testimony of certain witnesses. The Circuit Court of Appeals reversed this and found for the United States. To the same effect is *Boone* v. *Kingsbury,* 273 Pac. 797, 813 (1928), where the Supreme Court of California, in passing on the question of the power of the state to alienate tide and submerged lands that are unfit for navigation and fishing, said: "The court is invited to and will take judicial notice of the coast lines within the state and will also resort to publications issued by the department of commerce describing and delineating the United States coast and geodetic surveys."

3. *People* v. *Mayes,* 45 Pac. 860 (1896) (Calif.). In this case, the trial court instructed the jury, as a matter of judicial knowledge, that the moon on a certain night rose at 10:57 p.m. No evidence on that point had been offered. The appellant contended that the instruction to the jury was erroneous, and in support of his contention presented an affidavit by one Swift that the moon rose at 10:35 p.m. The court said that while the affidavit stated that the statement is "made from accurate, correct, and reliable astronomical observations, calculations, and data," it does not state that the calculations were made by Swift, or the person by whom they were made, "so that the affidavit is of no higher grade than hearsay, and is insufficient to overcome the presumption of the correctness of the court's statement to the jury."

But it is important to emphasize that before a record is introduced in evidence, the primary purpose of the record should first be established. For example, an index map of charts in an area, as is contained in a chart catalog or in a *Coast Pilot,* is prepared for the purpose of showing primarily the layout of charts and should be used for that purpose only. The inclusion of geographic names is only secondary to the main purpose and should have no probative value for establishing the historical use of a particular name. The same applies to sketches in annual reports of the Bureau that show the work progress. That is the primary purpose of the sketch and any additional information shown must be evaluated with that in mind. On the other hand, a geographic name on a nautical chart is an integral part of the chart because it aids the navigator in identifying his whereabouts and would be given full credence.[4]

413. The Westward Growth of Rockaway Point

An interesting example of the value of the surveys and resurveys of the Bureau involved the westward growth of Rockaway Point, Long Island. Specifically, the question concerned the ownership of the point, which had built up considerably to the westward since the date of the original grant in 1685. By various conveyances through this grant the Rockaway Pacific Corporation claimed title to the land now forming the point.

The controversy centered about the manner in which the point grew—whether as a result of true accretion, or whether by annexation of islands or bars. Figure 100 is a section of the Coast Survey chart of 1844 and shows the middle ground shoal, including an area bare at high water known as Duck Bar Island, to the westward of Rockaway Point. (In the figure, the point is to the right of the feature marked "Negro Bar.") The State of New York had maintained that the growth of the point since 1887, the date it released its interest in the land area, was the result of the annexation of islands or bars; that the island had remained fixed in position, and that the water area in

4. In *Colby* v. *Todd Packing Co.,* 80 F. Supp. 761 (1948), the Federal District Court of Alaska took judicial notice of the time of flood tide as given in the *Tide Tables;* in *Borax Consolidated, Ltd.,* v. *Los Angeles,* 296 U.S. 10 (1935), the Supreme Court of the United States took notice of the definition of mean high water as given in Marmer, Tidal Datum Planes 76, Special Publication No. 135, U.S. Coast and Geodetic Survey (1927); in *Atkocus* v. *Terker,* 30 N.Y.S. 2d 628 (1941), the court took judicial notice of the geographical features and navigability of Jamaica Bay, N.Y.; and in *People of the State of New York* v. *Kraemer, Foley, Scannella,* and *Emig,* 164 N.Y.S. 2d 423 (1957), the court, in passing on the question of the public right of navigation in a man-made harbor which opened on navigable waters, took judicial notice of the statement in the Atlantic Coast Pilot (Section B) 344, U.S. Coast and Geodetic Survey (1950), that the harbor in question "is used considerably by local boats as an anchorage and as a harbor of refuge." But it has been held that variations in the location of the magnetic meridian on different dates is a matter of proof and not subject to judicial notice (*see* 3741 E).

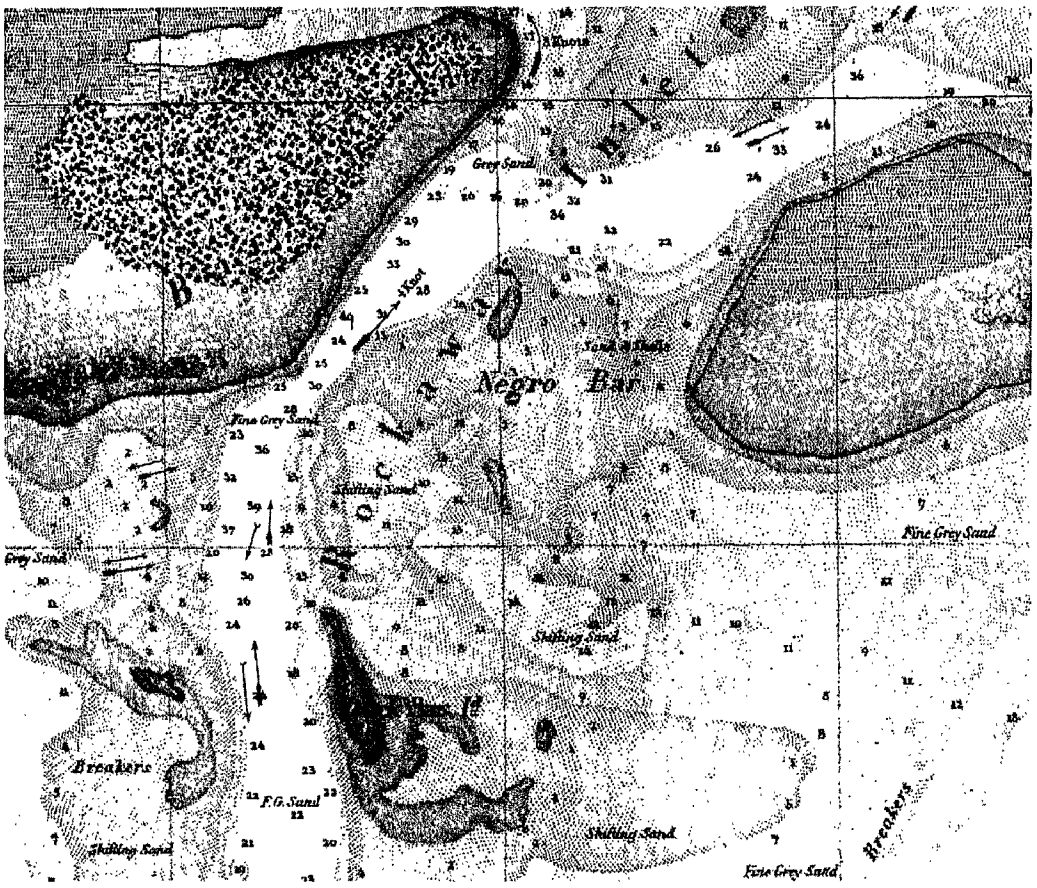

FIGURE 100.—Section of Coast Survey chart of 1844 used in the controversy over the westward growth of Rockaway Point, Long Island.

between filled up and connected the point with the island; and that the state, never having relinquished title to the island, retained ownership when the island became attached to the point, thus coming into possession of the point itself.

The Coast and Geodetic Survey had made frequent topographic and hydrographic surveys of the locality, the records dating back to 1835. While the experts for the litigants differed as to the method of growth of the point, both made use of Bureau surveys to uphold their respective theories.

The New York Court of Claims found against the State of New York, saying: "We are firmly impressed . . . by the vast amount of documentary evidence introduced, including maps and charts of all kinds, that for a considerable period of time before the state released its claim the growth of Rock-

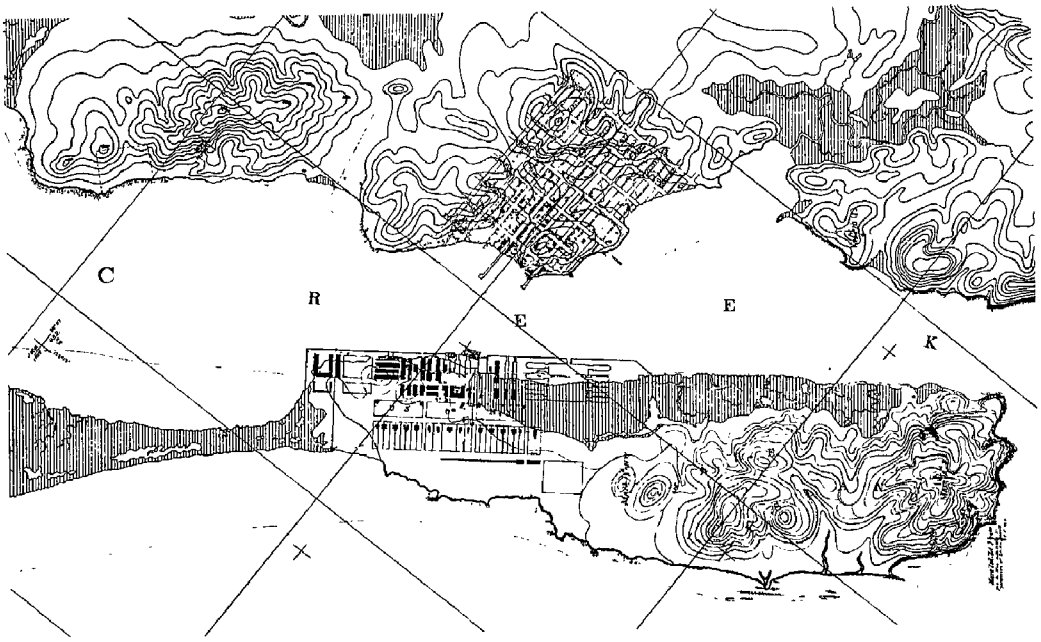

FIGURE 101.—Section of topographic survey of 1856 showing narrow neck of marshland in the "Mare Island in All Its Extent" controversy (*see* 414).

away peninsula to the west had been by the continual and gradual process of accretion" and "has not been by avulsion, not by annexation of islands." [5]

414. "MARE ISLAND IN ALL ITS EXTENT"

Early surveys find many legal applications in waterfront property disputes, particularly in areas where improvements have been made and it becomes necessary to know where the high- or low-water line was located as of a prior date.

In a case involving a Spanish grant in 1841 of Mare Island, Calif., "in all its extent," it was important to determine the physical condition and outline of the island at the time of the grant in order to ascertain what was actually included by the conveyance. The area in controversy consisted of marshland (*see* fig. 101), since reclaimed and improved. The land had been used by the Government as a naval reservation on which some $2,000,000 in improvements had been expended. Suit was brought by the Government to quiet its title to the

5. *Rockaway Pacific Corp.* v. *State*, 203 N.Y. Supp. 279, 286, 288 (1924). The judgment was affirmed *per curiam* by the New York Court of Appeals. *Rockaway Pacific Corp.* v. *State*, 154 N.E. 603 (1926). (*See* note 123 *infra*.)

land. The defendants, who claimed under a patent from the State of California, contended that the lands in question were below high tide and therefore not within the exterior boundaries of Mare Island, but passed to California under the Swamp Lands Act (*see* 361).

The Government made an elaborate presentation of evidence which consisted of surveys by the Coast Survey since 1850, as well as some early Spanish maps. A Bureau official gave testimony on the interpretation of the surveys. Based on this evidence, the lower court found for the Government and this was affirmed by the Supreme Court of the United States.

With regard to the contention that the lands were below high tide, the Supreme Court held that the resolution of this issue turned upon the appraisal of the evidence, particularly the surveys and charts, and the inferences to be drawn from it. Since both lower courts found against the defendants on this issue, the Court said it would accept their findings that the lands in question were within the original grant of "Mare Island in all its extent." [6]

415. The "Tidelands" Controversy

Of the recent cases in which the Bureau participated, perhaps the most important were those dealing with ownership of the submerged lands in the open sea. These are commonly, but erroneously, referred to as the "tidelands" cases.[7]

The Bureau's association with these cases began shortly after the Supreme Court in 1947 declared that the State of California was not the owner of the submerged lands off its coast seaward of the ordinary low-water mark and outside of the inland waters of the state, but that the Federal Government had paramount rights in and full control over them.[8] For the purpose of determining the precise boundary between federal and state jurisdiction, the Court named a Special Master to hold hearings and to make recommendations.

At the request of the Attorney General of the United States, the Bureau assisted the Department of Justice in preparing its case before the Special Master. The spheres in which the Bureau participated related to the meaning and location of the ordinary low-water mark along the California coast, and the ascer-

6. *United States* v. *O'Donnell*, 303 U.S. 501, 508 (1938).

7. Tideland is the land covered and uncovered by the daily rise and fall of the tide. More specifically, it is the zone between the mean high-water line and the mean low-water line along a coast, and is commonly known as the "shore," "foreshore," or "beach." (*See* figs. 2 and 20, Volume One.) In the "tidelands" controversy, the land in litigation was the submerged lands seaward of the low-water line (*see* Volume One, Part 1, 111).

8. *United States* v. *California*, 332 U.S. 19 (1947).

tainment of the seaward limits of inland waters at indentations—both of which defined the federal-state boundary. Officials of the Bureau also appeared as expert witnesses before the Special Master and gave testimony on our tidal practices, on our cartographic usage, and on the interpretation of our early surveys.

The final report of the Special Master to the Supreme Court was favorable to the Government on all matters in which the Bureau assisted.[9]

42. UTILIZATION OF BUREAU SERVICES

The Coast Survey is not a regulatory agency such as the Interstate Commerce Commission, nor is it clothed with legal functions such as are vested in the Justice Department. It could not, for example, of its own volition undertake to determine the boundary between territorial waters and the high seas, or between two states, because it is not charged specifically with such functions, nor are they necessary for a proper administration of the duties that are conferred on the Bureau by law (*see* Part 1, 14). But because of our association with and interest in the sea, together with our long experience in surveying and charting, it would be entirely appropriate for the Bureau to render such advice as may be sought in arriving at a formula of delimitation. And once a formula has been established, it would be within the Bureau's competence to apply it in accordance with its best technical judgment, and either lay it down on the charts or demarcate it on the ground pursuant to a court order, an act of Congress, or a compact between states. The Bureau's advice and services in such matters have been repeatedly sought. Several such cases will be noted because of their still current interest.

421. The Maryland–Virginia Boundary Dispute

4211. *The 1877 Arbitration*

In the Maryland–Virginia boundary dispute, the advice and services of the Coast Survey were sought by the two states in the matter of the interpretation of the Award of the Arbitrators of 1877 insofar as it pertained to the south bank

9. For a full discussion of this controversy, the participation of the Coast Survey, and an analysis of the Special Master's recommendations, *see* Volume One, Part 1, *passim*.

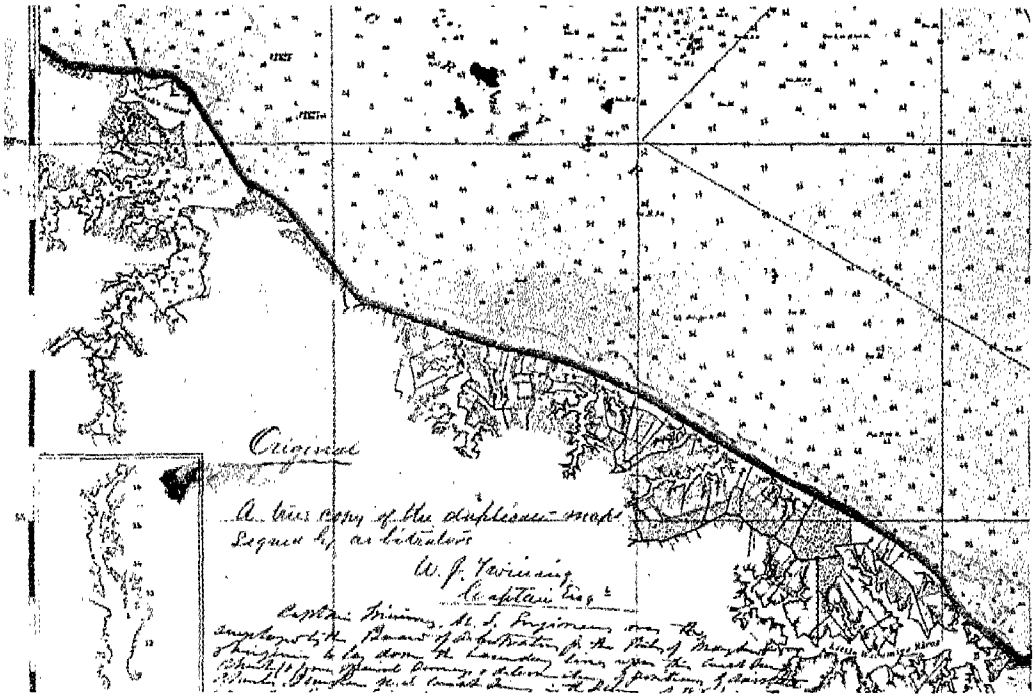

FIGURE 102.—Map accompanying the Award of the Arbitrators of 1877 (Maryland–Virginia boundary).

of the Potomac River between Jones and Smith Points.[10] The boundary from about 1 mile west of Judith's Creek on the lower Potomac (*see* fig. 102) to the Pocomoke River, was laid down by the arbitrators on Coast Chart No. 33 (Chesapeake Bay) of the Coast and Geodetic Survey (Sheet No. 3, Potomac Entrance, Tangier and Pocomoke Sounds, issue of 1877), and latitudes, longitudes, courses, and distances measured thereon and included in the award. The award, with accompanying map, was approved, confirmed, and ratified by the General Assembly of Virginia (Acts of 1877/8, chap. 246, approved Mar. 14, 1878) and accepted by the General Assembly of Maryland (Acts of 1878, chap. 374, approved Apr. 1, 1878). The consent of Congress was obtained Mar. 3, 1879 (20 Stat. 481).[11]

10. The Award of the Arbitrators of 1877 was the culmination of interstate controversy, discussion, and settlement which began about 1661, an important milestone being the Compact of 1785. For a history of the events leading up to the arbitration, *see* MATHEWS AND NELSON, REPORT ON THE LOCATION OF THE BOUNDARY LINE ALONG THE POTOMAC RIVER BETWEEN VIRGINIA AND MARYLAND IN ACCORDANCE WITH THE AWARD OF 1877 (1928).

11. *Id.* at 9. The chart referred to was filed as part of the award. A copy of this chart is available in the archives of the Coast Survey.

The award proper [12] dealt for the most part with the boundary from Chesapeake Bay to the Atlantic Ocean, over which the principal dispute centered. The arbitrators were not in agreement as to this portion of the boundary but were unanimous as to the boundary along the Potomac River. The arbitrators were of the opinion that the intent of the charter from Charles I to Lord Baltimore on June 20, 1632, was to include the whole of the Potomac River, and that there was nothing in the charter which required the line to leave the river bank. They held it was highly improbable that the two termini of the line should both have been fixed on the south side of the river (the right bank or right-hand side when facing downstream) without a purpose to put the line itself on the same side. They found that by the original charter the boundary line of Maryland was set at the high-water mark along the south bank of the Potomac,[13] but since Virginia from the earliest period of her history used the south bank of the river as if the soil to low-water mark had been her own, together with the fact that the Compact of 1785 declared that "the citizens of each State respectively shall have full property on the shores of Potomac and adjoining their lands, with all emoluments and advantages thereunto belonging, and the privilege of making and carrying out wharves and other improvements," they considered it as established that she had a proprietary right on the south shore to that mark.[14]

The boundary portions of the award contained two provisions which gave rise to later uncertainty and with which the Bureau became associated. The basic provision defined the boundary on the Potomac as "following the meanderings of said river by the low-water mark, to Smith's Point."

In further explanation of the award, the arbitrators added the following provision: "3. The low-water mark on the Potomac, to which Virginia has a right in the soil, is to be measured by the same rule [that used in determining the line on the Pocomoke River], that is to say, from low-water mark at one headland to low-water mark at another, without following indentations, bays, creeks, inlets, or affluent rivers." [15]

Obviously, these provisions are not sufficiently precise to permit laying down the line along all parts of the river without first resorting to certain

12. *Opinions and Award of Arbitrators of 1877*, MARYLAND AND VIRGINIA BOUNDARY LINE. This published volume is undated, but was received in the Coast Survey library Aug. 8, 1899.

13. The language of the charter was in Latin and read "*ad ulterioram predicti fluminis ripam et eam sequendo* etc.," which the arbitrators translated as "to the further bank of the aforesaid [Potomac] river and following it." *Id.* at 7, and *Marine Ry. & Coal Co.* v. *United States*, 257 U.S. 47, 63 (1921).

14. *Opinions and Award of Arbitrators, supra* note 12, at 8, 15, 16. The compact provided that the Potomac should be considered as a common highway for navigation and commerce to citizens of both states, with a common right of fishing. In return, Virginia permitted the free passage of Maryland ships through the lower Chesapeake Bay between the Virginia capes. For recent developments concerning this compact and the adoption of a new compact, *see* 4214.

15. *Id.* at 29, 31. The arbitrators also expressed the opinion that certain islands were "not *in*, but *upon* the river" and were situated on the Virginia side at the low-water mark. *Id.* at 17.

interpretative principles. The line drawn on the south shore of the Potomac so far as it goes follows the shoreline, crossing the minor indentations, but the award does not indicate which of the indentations that diverge from the course of the main river are to be included in the headland-to-headland provision. With the exception of the 17-mile stretch of the river from Smith's Point to Judith's Creek, which was shown on the chart accompanying the award (*see* text accompanying note 11 *supra* and fig. 102), there was no cartographic expression by the arbitrators concerning the location of the line for the rest of the Potomac River.

4212. *Coast Survey Participation*

The first involvement of the Coast Survey in this boundary dispute came in 1889 when both Maryland and Virginia requested the Superintendent of the Coast Survey to detail an officer to examine and locate that portion of the boundary line near Hog Island in the lower Potomac River (*see* fig. 103).[16] The problem turned upon the technical interpretation of the data given in the award as applied to the projection of a line representing the thread of a stream (the Pocomoke River) to that of a line along the shore (the right bank of the Potomac River). Henry L. Whiting, an assistant in the Survey, was named as sole arbiter in the case.[17]

Based on an examination of the award and the accompanying chart, Whiting laid down the following principle of interpretation: " 'The *low-water mark is to be measured*'—from headland to headland—without following indentations, bays, creeks, inlets, or affluent rivers; for the reason that such lateral features are incidental to the general system of the river and can not properly be made factors in determining its true physical limits." He concluded that the line on the map "clearly illustrates the intended location of the boundary line, and conforms to the terms and meaning of the award," thus ruling out the Geological Survey delineation.[18]

16. It appears that subsequent to acceptance of the award by the two states and its approval by Congress the maps of the U.S. Geological Survey showed the location of the boundary line in accordance with its interpretation of the intent of the award. The significant difference between this interpretation and the chart accompanying the award was in the vicinity of Hog Island near the western end of the chart. (*See* maps attached to MATHEWS AND NELSON (1928), *op. cit. supra* note 10.)

17. Annual Report, U.S. Coast and Geodetic Survey 92–94 (1890).

18. *Id.* at 622, 623. Latter-day elaboration of this principle by the Bureau is to the effect that the award of the arbitrators indicated an intent to give to Maryland ownership of the main highway by which the waters of the Potomac find their way to the sea, but did not include certain features on the Virginia side which were collateral to but not an integral part of the main waterway. Tributary waterways, such as bays, creeks, inlets, and affluent rivers were considered pertinent to the bank rather than to the bed of the river and therefore embraced within the headland-to-headland proviso of the award. Letter of June 19, 1950, from Director to Commonwealth Attorney of Virginia.

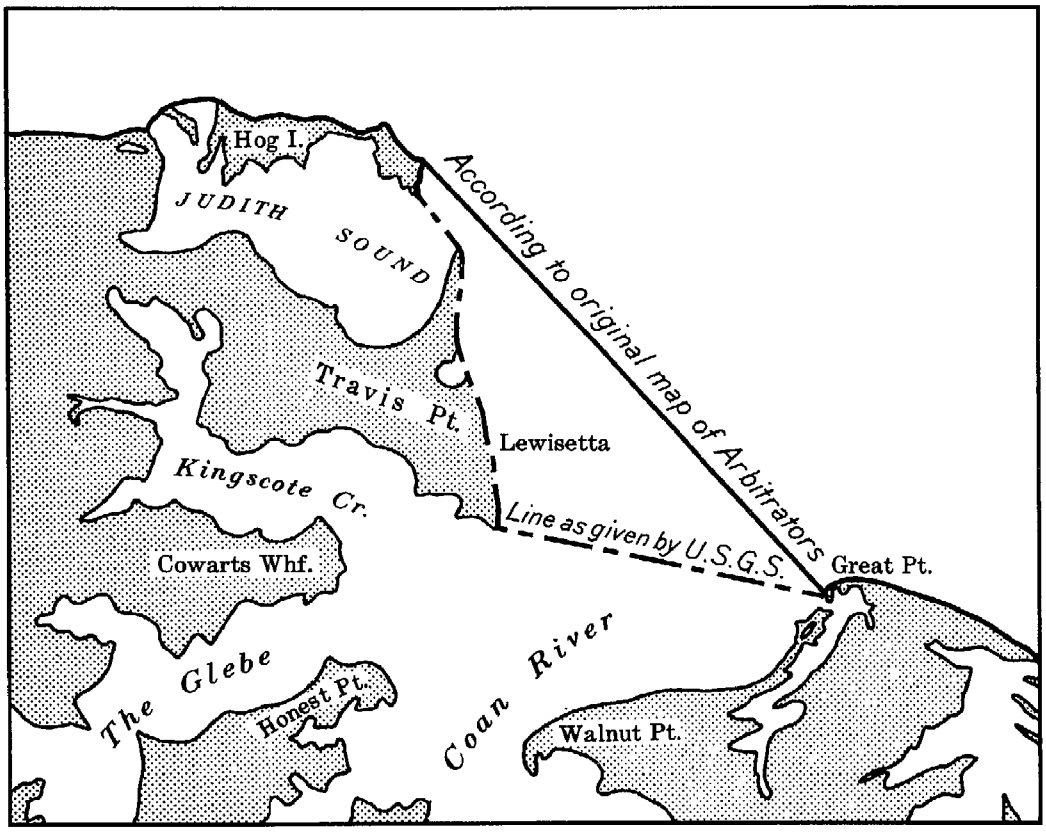

FIGURE 103.—Maryland-Virginia boundary in vicinity of Hog Island (*see* 4212).

While the Whiting decision disposed of the Hog Island area, it still left open the question of applying the provisions of the award and the interpretation of Whiting to the rest of the boundary along the Potomac and representing them on a map. This was referred to the State Geologists of Virginia and Maryland in 1927.[19]

In laying down the line on the maps, the geologists found that the line drawn on the map accompanying the award "follows the shoreline, crossing the minor indentations due to creeks but does not indicate that the line was to follow a straight line from headland to headland where the indentations are slightly divergent from the course of the main river and not the result of erosion by entering tributary streams." They, therefore, agreed that "the arbitrators had in mind to follow in a general way the course of the south bank of the river as shown by its general figure and the erosion of its banks by its waters without

19. MATHEWS AND NELSON (1928), *op. cit. supra* note 10, at 2, 13.

taking into consideration the minor sinuosities due to the entrance of streams or the flooding of low areas due to an erosion of the shore below low-water mark by such tributaries." [20]

A map delineation of the boundary line from Jones Point in Alexandria to Smith's Point at the mouth of the river was laid down on six charts of the Coast Survey and bound with the geologists' report (*see* note 10 *supra*).[21] The geologists recommended the demarcation of the boundary to be accomplished by skilled and impartial engineers under the supervision of commissioners representing both states. They submitted a proposed bill for concurrent acceptance by the legislatures of the states which recited that the drawing of the boundary line on maps by them is in accordance with their interpretation of the Award of 1877; that after ratification by both states, the Coast and Geodetic Survey, or other federal agency, be solicited "to supply the necessary skilled and impartial engineers who shall survey said line and properly mark and document it on the ground with sufficient points to insure that it may be readily recognized or restored if destroyed"; and that after the line is surveyed and marked on the ground, congressional approval be sought "in order that thereafter there may not arise any question of controversy." [22]

A. DEMARCATION OF BOUNDARY LINE

The commissioners conferred with the Bureau requesting the appointment of an engineer "to supervise the actual marking of the line and to determine the location of the reference points in order that the matter might be redetermined or relocated at any time in the future by reference to the general triangulation system of the United States Coast and Geodetic Survey." [23] This was the second involvement of the Coast Survey in the Maryland-Virginia boundary dispute.

Between July and October 1929, 58 boundary witness monuments were erected above the high-water line and their geographic positions determined. All were marked with the standard mark of the Virginia-Maryland Boundary

20. *Id.* at 15, 16.

21. The line is shown in red on the charts and the variations based on maps prepared by the U.S. Geological Survey shown in blue.

22. *Id.* at 47, 48. The line and recommendations were approved by Virginia (Acts of Assembly 1928, chap. 477) and by Maryland (Acts of Assembly 1929, chap. 50) and the geologists were commissioned to define the line on the ground.

23. MATHEWS AND NELSON, REPORT OF THE MARKING OF THE BOUNDARY LINE ALONG THE POTOMAC RIVER IN ACCORDANCE WITH THE AWARD OF 1877, 3 (1930). This is in the same volume with MATHEWS AND NELSON (1928), *op. cit. supra* note 10.

Commission. The work was tied in horizontally to the triangulation network of the country, but no tidal control was used for determining the low-water line, points on the boundary to which references were made by distance and azimuth being selected from a physical inspection of the shore and predicted tides.[24]

The work of the Coast Survey was approved in December 1929 by the commissioners acting for the two states. Consent of Congress to the marked boundary line was held unnecessary by the Legislative Counsel of the U.S. Senate because acceptance by Congress of the Award of 1877 implicitly gave the states authority to carry the award into effect.[25]

The most recent involvement of the Coast Survey in the Maryland–Virginia boundary dispute grew out of a proceeding to determine whether a pier on the Virginia shore in the vicinity of Fairview was in Maryland or Virginia. The Coast Survey was approached by the State of Virginia for a reinterpretation of the "headland-to-headland" provision of the Award of 1877 with respect to the area in question. The Bureau was of the opinion, however, that whatever speculation may have remained as to the intent of the arbitrators to include or exclude portions of the river from Maryland or Virginia ownership was resolved when the boundary line was marked on the ground and accepted by both states. That determination placed the boundary in the vicinity of Fairview at the low-water mark and not on a line between headlands. *See* letter noted in note 18 *supra*.[26] In the litigation that ensued, Virginia contended that a *de novo* interpretation of the boundary was in order because the boundary constituted a compact between the two states and required the approval of Congress. The court however ruled that approval of the Award of 1877 was sufficient, as the

24. E. B. Latham was the Coast Survey engineer in charge of the project. The geodetic definition of points on the boundary line with distance and azimuth references to the marked monuments and descriptions of the monuments and stations, together with sketches showing the relation of the monuments to the boundary line, are contained in MATHEWS AND NELSON (1930), *op. cit. supra* note 23. These are unadjusted field positions on the North American datum. The positions of the marked boundary witness monuments have now been adjusted to the North American 1927 Datum and may be obtained from the Coast Survey archives. Points on the boundary line as located in 1929 may be obtained from the distance and azimuth values measured at that time. (At boundary witness monument 39, the distance to the point on the boundary line should be 40 feet instead of 276 feet as published in *id.* at 11. This was disclosed during the adjustment made in 1959.)

25. *Id.* at 32. A boundary between two states may be changed by agreement of the state legislatures, but this agreement must be approved by Congress. This follows from Art. I, sec. 10, cl. 3, of the Constitution of the United States which provides that "No State shall, without the Consent of Congress . . . enter into any Agreement or Compact with another State." Neither can the United States change a state boundary without the consent of the State. The conditions under which ratification by Congress is essential are described at length in *Virginia* v. *Tennessee*, 148 U.S. 503 (1893) (*see* 342).

26. If the more modern rule of the semicircle for determining when an indentation in a coast is part of the inland waters of a nation (*see* Volume One, Part 1, 421), so as to justify the drawing of a headland-to-headland line across the indentations, were to be applied to the Virginia shore of the Potomac River, the net result would be essentially the boundary line marked by the Coast Survey in 1929.

survey was made merely to carry the award into effect (*see* text at note 25 *supra*).[27]

4213. *A Shifting or Fixed Boundary*

The question has arisen whether the low-water boundary established in 1929 between Maryland and Virginia is a fixed or a shifting boundary. It is a well-settled principle of riparian law that where the sea or an arm thereof is a boundary, gradual and imperceptible changes brought about by *erosion* (a washing away of the soil or an encroachment of the water) or *accretion* (a deposit of alluvial soil or recession of the water) operate to change the boundary of the riparian land (*see* note 34 *infra*). This has sometimes been referred to as the ambulatory or shifting nature of a water boundary. The rule is, however, not inflexible and two riparian owners with a common water boundary may agree that the boundary as established at a given time shall remain so forever. Where the language of an agreement is specific and definite, no uncertainties will arise. But where the language is unclear, then the intent of the parties must be deduced from the circumstances surrounding the establishment of the boundary.[28]

This aspect of the status of the Maryland–Virginia boundary line along the Potomac River has never been adjudicated, and it would be beyond the purview of this publication to express an opinion on this point. However, certain technical circumstances exist that may have an important bearing on the status of the boundary. It is these that will be considered and clarified.

As discussed in 4211 and 4212, four significant dates are associated with the establishment and marking of the boundary line, to wit: 1632, the date of the charter to Lord Baltimore; 1877, the Award of the Arbitrators; 1927, the map de-

27. The decision of the arbitrators as to the low-water mark on the Virginia shore being the boundary between Maryland and Virginia was approved by the Supreme Court of the United States in the case of *Maryland* v. *West Virginia*, 217 U.S. 577, 580 (1910) and applied to the Maryland–West Virginia boundary.

28. Thus, for example, in the Chamizal Arbitration between the United States and Mexico in 1910 over the movement southward of the Rio Grande into Mexican territory, the question was whether the river boundary under the treaties of 1848 and 1853 was a fixed or a shifting one. The International Boundary Commission said that because there was a legitimate doubt as to the true construction of these treaties, "the subsequent course of conduct of the parties, and their formal conventions, may be resorted to as aids to construction." This conduct, together with the language of the conventions, it held, was "wholly incompatible with the existence of a fixed line boundary." *The Chamizal Arbitration Between the United States and Mexico*, 5 AMERICAN JOURNAL OF INTERNATIONAL LAW 782, 798 (1911). On the other hand, the United States-Canadian boundary was held by the International Boundary Commission to be a fixed boundary in the position as marked, regardless of later changes which may occur in streams. This was based on the Treaty of Apr. 11, 1908, between the United States and Great Britain, which contained the following statement: "The line so defined and laid down shall be taken and deemed to be the international boundary." DOUGLAS, BOUNDARIES, AREAS, GEOGRAPHIC CENTERS, AND ALTITUDES OF THE UNITED STATES AND THE SEVERAL STATES (2d ed.) 22, BULLETIN 817, U.S. GEOLOGICAL SURVEY (1932).

lineation of the boundary line by representatives of the two states; and 1929, the date of marking the boundary on the ground by the Coast and Geodetic Survey.

In considering these several dates, it is important to note that in their award the Arbitrators of 1877 made no reference to the low-water mark as it existed in 1632, but rather showed the boundary line in a portion of the Potomac River on a chart published in 1877. And it is significant that while the original grant to Lord Baltimore placed the Maryland boundary at the high-water mark along the Virginia shore, the arbitrators set the boundary at the low-water mark (albeit on the basis of prescription) in order to give to Virginia the continued use of its shore.[29]

When in 1927 the representatives of the two states interpreted the Award of 1877, they delineated the boundary on then current charts rather than on charts that reflected an 1877 shoreline.[30] What needed clarification was not so much the actual location of the boundary, but rather an interpretation of the award with respect to the meanderings of the river and the effect of bays, creeks, and other tributary waterways on the boundary. For an actual map location of the boundary line with respect to geographic coordinates, the charts are of too small a scale (1: 40,000, or 1 in. = 3,333 ft.) to represent with accuracy a boundary along the low-water line. The map delineation can at best be considered pictorial only.[31]

Up to the time of marking the boundary line in 1929, the technical evidence seems clear that a shifting boundary theory was followed. And the question raised is whether the circumstances surrounding the marking of the line in 1929 altered this theory.

The survey of 1929 established 58 boundary witness monuments by triangulation between Jones Point and Smith's Point with an equal number of points on the low-water line referenced to the monuments by azimuth and distance (*see* text at note 24 *supra*). The survey covered a linear distance of 100 nautical miles on the Virginia shore, so that points were located on the boundary at an average of 2 miles apart. No survey was made of the low-water line between these points nor were the points themselves determined by levels from tidal bench marks, but a selection was made based on the physical appear-

29. This could only be accomplished on the theory of a shifting boundary. If otherwise, any accretion that came about would have the effect of depriving Virginia of its shoreline and the boundary would no longer follow the "meanderings of said river by the low-water mark, to Smith's Point," as provided in the award (*see* text at note 15 *supra*, and note 60 *infra*).

30. The charts are actually based on surveys of 1902–1907.

31. This delineation was approved by the legislatures of the two states and a survey and marking of the boundary authorized. MATHEWS AND NELSON (1930), *op. cit. supra* note 23, at 3.

ance of the shore and predicted tides.[32] It would seem that if the line was intended to be a fixed boundary, a survey would have been made of the actual low-water line (as determined from tidal bench marks) on a reasonably large scale. In the demarcation of the District of Columbia–Virginia boundary line (*see* 4223 A), the high-water line was determined by levels from tidal bench marks and the line mapped at a scale of 1:4,800 or 1 in.=400 ft., even though the law establishing the boundary recognized the shifting boundary theory.[33]

It is recognized that points on the boundary line were determined in latitude and longitude (*see* note 24 *supra*), a facet which would seem to favor a fixed-boundary theory, yet these are points at the extremities of sections of the line that depart from the low-water line to cut across tributary waterways (*see* MATHEWS AND NELSON (1930)), *op. cit. supra* note 23, at 2–33. Such sections of the boundary line might properly be considered relatively fixed.[34]

32. This method was also used in establishing the low-water boundary between New Jersey and Delaware on the New Jersey side of the Delaware River. *See* Brittain, *Report on Marking the Delaware–New Jersey Boundary,* Special Rept. 202 of 1934 (Coast Survey archives).

33. 59 Stat. 552 (sec. 101) (1945). In *New Jersey* v. *Delaware* (Decree), 295 U.S. 694 (1935), where the low-water mark was established along the New Jersey shore of the Delaware River in much the same way as in the Maryland–Virginia boundary line (*see* note 32 *supra*), the Supreme Court retained jurisdiction "for the purpose of a resurvey of said boundary line in case of physical changes in the mean low water line . . . which may, under established rules of law, alter the location of such boundary line." *Id.* at 698.

34. In this connection, *Raglan* v. *Johnston Rock Co.,* 123 P. 2d 883 (1942) (Calif.), is of interest. A boundary line, which fixed the dividing line as the center of a non-navigable stream "as now situated" and then delineated the line by "metes and bounds" (*see* 3741 C) was held to be simply a determination that the center of the stream *at present* has a definite and fixed location and is not a permanent dividing line. *Id.* at 885. In *Ghione* v. *State,* 175 P. 2d 955, 961 (1946), although involving river bed lands not subject to tidal flow, the Supreme Court of Washington stated the rule of accretion, or the moving boundary theory to be as follows: "A thorough review of the policy and precedent which give rise to the rule will be found in *Jefferis* v. *East Omaha Land Co.,* 134 U.S. 178 (1890). It is said that this rule of accretion is everywhere admitted and applies to both tidewaters and fresh waters." This is part of the broad doctrine that, under our dual sovereignty system (*see* 211), the title and rights of riparian proprietors in the soil below high-water mark of navigable waters are governed by the laws of the several states rather than by federal law. This control extends to such attributes of ownership of waterfront property as the right of ingress and egress, the right to wharf out, the right to accretions to the land, and rights in the tidelands themselves—commonly called riparian rights. Thus, some states have extended riparian titles outward to the low-water mark or to the thread of non-tidal navigable streams. This is the normal situation and appellate Federal courts accept the interpretation of the highest court of a state as to what the state law is. However, where a situation involves a federal question, federal law applies. This was established by the Supreme Court in *Borax Consolidated, Ltd.* v. *Los Angeles,* 296 U.S. 10 (1935) (*see* Volume One, Part 1, 6413), and was recently followed in *United States* v. *Washington,* 294 F. 2d 830 (1961), where the United States Court of Appeals upheld the Government's contention that federal law should apply because of the underlying federal title (the lands in question were part of the public domain until patented to a Quinault Indian). And since accretion is an attribute of title, the determination of its limits is also a right asserted under federal law. (Federal law follows the common law of England (*see* 251) which holds that the owner of land bounded by the sea owns any additions thereto resulting from accretion.) The Court of Appeals thus recognized the shifting boundary theory. It also followed the rule established in the *Borax* case, *supra,* that the boundary of the land in question is the line of ordinary high water as determined by the course of the tides and is the average elevation of all high tides as observed through a complete tidal cycle of 18.6 years. (If state law applied, then it was contended that "ordinary high water" has been interpreted by the Washington courts to mean the line of vegetation.) The decision was finalized in Mar. 1962, when the Supreme Court declined to review the finding of the lower court. *United States* v. *Washington,* 369 U.S. 817 (1962).

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The reference in the report of the geologists that the line be marked "in order that the matter might be redetermined or relocated at any time in the future by reference to the general triangulation system" (*see* text at note 23, *supra*), is interpreted to mean that any future location of the low-water line could be made from the established triangulation markers.[35]

4214. *Recent Developments—A New Compact*

The Maryland–Virginia Compact of 1785 was again catapulted into the news in 1957 when the Maryland Legislature voted to abrogate the compact and enacted a statute requiring all Virginians who may desire to fish in the Potomac River to apply for a Maryland license.[36] Virginia challenged Maryland's right to take such unilateral action and filed suit in the Supreme Court. The Court appointed a Special Master who was to develop the facts by calling witnesses and taking testimony and then to make recommendations to the Court on legal points. Through the Master's efforts a joint group was set up to explore the possibility of working out a new compact. This was accomplished late in December 1958 when the Potomac River Compact of 1958 was created. This was ratified by both states,[37] after which Congress gave its consent on September 27, 1962.[38] This was signed by the President on October 10, 1962, and it became Public Law 87–783 (76 Stat. 797).

Insofar as the Maryland–Virginia boundary line along the Potomac is concerned, the new compact makes no change. Maryland retains its territorial jurisdiction over the waters of the Potomac to the mean low-water line on the Virginia shore "as defined in the Black-Jenkins Award of 1877 and as laid out in the Mathews-Nelson Survey of 1927, beginning at the intersection of the

35. In *Steelman* v. *Field,* 128 S. E. 558, 560 (1925), involving lands at Assateague Anchorage, the Supreme Court of Appeals of Virginia held to the shifting boundary theory and stated the law to be according to Sec. 3574 of the 1919 Code that riparian rights along bays, rivers, creeks, and shores of the sea extends to low-water mark, and "however this line may thus change, either for the advantage or disadvantage of the riparian owner, low-water mark remains his true boundary under the Virginia statute. The court cited with approval the holding in *Lamprey* v. *State and Metcalf,* 53 N. W. 1139, 1142 (1893) (Minn.) that the purpose of such rule is "to preserve the fundamental riparian right—on which all others depend, and which often constitutes the principal value of land—of access to the water." In Maryland, the 1951 Code (Art. 54, sec. 45) provides that "The proprietor of land bounding on any of the navigable waters of this State, is hereby declared to be entitled to all accretions to said land by the recession of said water, whether heretofore or hereafter formed or made by natural causes or otherwise." *Wagner* v. *Baltimore,* 124 A. 2d 815, 818 (1956).

36. The basis for this action was that since the Constitution of the United States (adopted 4 years after the Compact of 1785) rendered the "free passage" clause of the compact obsolete (*see* note 14 *supra*) there was no longer a *quid pro quo* agreement and hence the compact was invalid.

37. Both states agreed to the compact by means of concurrent legislation, being Chap. 269 of the Acts of the General Assembly of Maryland of 1959, and Chaps. 5 and 28 of the 1959 Extraordinary Session of the General Assembly of Virginia.

38. H. J. Res. 659, 87th Cong., 2d sess., and S. Rept. 2155 (1962). One of the essential provisions in the new compact is the creation of a bistate Potomac River Fisheries Commission charged with the regulation of the river's fishing laws.

Potomac River and the District of Columbia line at Jones Point and running to Smiths Point" (*see* 4211 and 4212).[39]

422. The District of Columbia–Virginia Boundary Line

The demarcation of the District of Columbia–Virginia boundary line is another example of cases in which the Bureau's services were sought in a legal-technical capacity. An act of Congress, approved October 31, 1945 (59 Stat. 552), directed the Coast and Geodetic Survey to survey and mark the line separating the two jurisdictions which the act determined to be the present (the effective date of the act) mean high-water mark along the Virginia shore, except at Alexandria where it follows the established pier-head line.

4221. *Background of the Controversy*

The original limits of the District of Columbia included an area 10 miles square on both sides of the Potomac River ceded to the Federal Government by Maryland and Virginia.[40] On March 30, 1791, President Washington issued a proclamation in which the exact boundaries of the District were set out as follows:

> Beginning at Jones's Point, being the upper cape of Hunting Creek, in Virginia, and at an angle in the outset of 45 degrees west of the north, and running in a direct line 10 miles for the first line; then beginning again at the same Jones's Point and running another direct line at a right angle with the first across the Potomac, 10 miles for a second line; then, from the termination of the said first and second lines, running two other direct lines, of ten miles each, the one crossing the Eastern Branch aforesaid, and the other the Potomac, and meeting each other in a point.[41]

39. 76 Stat. 800 (1962). Under the new compact, citizens of each state enjoy equal fishing rights in the Potomac River, the same as they did under the Compact of 1785, and existing rights of riparian owners of each state along the shores of the river are perpetuated. *Id.* at 797 and 803.

40. On Dec. 23, 1788, Maryland passed an act ceding to the United States any district in the state not exceeding 10 miles square for use as the seat of government of the United States. And on Dec. 3, 1789, Virginia passed a similar act ceding an area not more than 10 miles square for the same purpose. Douglas (1932), *op. cit. supra* note 28, at 132.

41. *Id.* at 133–134. This proclamation was issued pursuant to two acts of Congress, approved July 16, 1790 (1 Stat. 130) and Mar. 3, 1791 (1 Stat. 214), respectively, accepting the cessions of the two states and providing for a survey and demarcation of the 10-mile square District. *Ibid.* The District of Columbia originally was divided into two counties—the County of Washington, comprising the area lying on the east side of the Potomac River, and the County of Virginia consisting of the area on the west side of the river. 2 Stat. 103, 105 (1801). Although originally planned to be exactly 10 miles square, it has been found that the northeast side measures 263.1 feet more, the southeast side 70.5 feet more, the southwest side 230.6 feet more, and the northwest side 63.0 feet more than 10 miles. The lines do not bear exactly 45° from the meridian, the greatest variation being 1′.75. Also the northern point is not exactly north of the southern point, but bears 5′19″.7 west of north of it which corresponds to a distance of 116 feet. Baker, *Surveys and Maps of the District of Columbia,* 6 The National Geographic Magazine 149, 152–153 (1894).

The portion of the District originally ceded to the United States by Virginia was receded to Virginia in 1846.[42] The southwestern boundary of the District thus became coincident with that part of the boundary of Maryland prior to December 23, 1788, the date of the original cession by Maryland (*see* note 40 *supra*). However, January 24, 1791, the date when President Washington issued a proclamation naming commissioners to survey and define the District, has been accepted as determinative of the boundary with Virginia.[43]

The question as to the exact location of the boundary line on the Virginia shore (whether high-water line or low-water line) had been the subject of controversy ever since the retrocession in 1846 to Virginia of lands ceded by it to the United States. Finally, by an act of Congress, approved March 21, 1934 (48 Stat. 453), and an act of the Virginia General Assembly, approved March 24, 1932, a commission was named "for the purpose of surveying and ascertaining the boundary line between the District of Columbia and the State of Virginia," and to mark the boundary line by suitable monuments.[44]

In determining the location of the boundary line, the Commission was instructed to take into consideration, among other things, the "several decisions of the Supreme Court of the United States in relation thereto, the findings and reports of the Maryland and Virginia Boundary Commission of 1877" [this must mean the Arbitration of 1877 (*see* 4211)], and "the Compact of 1785" between the two states (*see* 4211).[45]

In the Arbitration of 1877, it was established that the original charter from Charles I to Lord Baltimore gave to Maryland the entire Potomac River "to the further bank of the aforesaid river" (*see* note 13 *supra*), which the arbitrators determined to be the high-water line on the Virginia shore. However, in the light of the Compact of 1785, which gave to the riparian owners of each state rights and privileges in the shores of the Potomac, and the long user by Virginia of the soil to low-water mark, the arbitrators decided that the boundary between the two states in 1877 is at the low-water mark along the Virginia shore. The boundary between Maryland and West Virginia (carved from Virginia in 1862) was adjudicated by the Supreme Court of the United States in 1910 as along the low-water line of the West Virginia shore of the Potomac on the basis

42. 9 Stat. 35–36 (1846). This act was declared in full force and effect by Presidential Proclamation on Sept. 7, 1846. *Id.* at 1000.

43. RICHARDSON, 1 MESSAGES AND PAPERS OF THE PRESIDENTS 100 (1789–1897). *See also* comments of Department of Justice on Establishing a Boundary Line Between the District of Columbia and the Commonwealth of Virginia in H. Rept. 595, 79th Cong., 1st sess. 3 (1945), and 59 Stat. 552 (1945).

44. The act of 1934 creating the Commission is included in the Report of the District of Columbia–Virginia Boundary Commission, H. Doc. 374, 74th Cong., 2d sess. 1 (1936).

45. *Ibid.* The Commission understood this instruction to mean that it was to take account not only of the legal rights of the two sovereignties but also their respective equitable rights. *Id.* at 3.

of the Compact of 1785 and the Arbitration of 1877.[46] These several pronouncements settled, in the view of the boundary commissioners, the boundary question along the Potomac River except for the 10- or 12-mile stretch that is common to the District of Columbia and Virginia.

The boundary aspect of the controversy therefore centered around the question of what cognizance should be taken in 1935 of the findings of the arbitrators in 1877 in a controversy that concerns a cession of land made by Maryland to the United States in 1791.

The legal principle involved in waterfront boundary disputes is that the boundary shifts with changes brought about by natural forces, such as erosion and accretion, but not by artificial causes, such as reclamation or filling. Therefore, the critical date for the determination of the boundary line was January 24, 1791 (*see* text at note 43 *supra*), except as later modified by natural changes.

The Boundary Commission in its findings considered the location of the 1791 line (high water or low water) to be a matter of conjecture and since it could not be definitely reestablished, the equitable solution, in its judgment (following the arbitrators of 1877 (*see* 4211)), was to locate "the low-water mark as of today [1935, the date of rendering its report] . . . running from headland to headland across creeks and inlets." The Commission stated that the boundary line as recommended "is based upon the fact that by every act and function of government, by continued occupation and possession and the exercise of ownership, from its earliest history to the present time, the Commonwealth of Virginia has exercised and acquired full and complete sovereignty and jurisdiction over the territory involved." [47]

46. *Maryland* v. *West Virginia*, 217 U.S. 577 (1910). Although the question of a high-water boundary or a low-water boundary along the Potomac was not placed squarely in issue but arose from the opposing decrees proposed by the two litigants, the Court followed the reasoning of the Arbitrators of 1877 and stated that "the privileges therein reserved [in the Compact of 1785] respectively to the citizens of the two States on the shores of the Potomac are inconsistent with the claim that the Maryland boundary on the south side of the Potomac River shall extend to high-water mark." It therefore held the boundary to be at low-water mark. *Id.* at 580, 581.

47. Report of the District of Columbia–Virginia Boundary Commission, *supra* note 44, at 19, 20. This was contested by the Government on the ground that the maps and surveys submitted to the Commission (some of which originated with the Coast Survey) established with all necessary certainty the high-water line of 1791. (Personnel of the Bureau interpreted the early surveys and maps for the Commission.) A composite map was submitted showing the original high-water line in relation to the existing high-water line. Statement on behalf of the United States before the Judiciary Committee of the House of Representatives 42–45, in *Hearing on H.R. 9670*, 74th Cong., 2d sess. (1936). (The statement contains reproductions of surveys made between 1791 and 1864.) For a comprehensive list of maps of Washington and the District of Columbia up to 1894, *see* Baker, *supra* note 41, at 167–178. A detailed topographic survey of the District of Columbia was made by the Coast Survey between 1880 and 1891 at a scale of 1:4,800. The survey comprised 43 sheets. A series of published maps (58 in number) based on these surveys and at the same scale was completed in 1895. These surveys and maps do not cover the central portion of the city which is covered by the King Plats surveyed in 1803 at a scale of 1:2,400 and published in map form (16 in number) at the same scale.

Following the Commission's report, a bill was introduced in Congress embodying substantially the recommendations of the Commission and charged the Coast and Geodetic Survey with the duty of surveying and marking the line on the ground.[48] As written, the bill was emphatically opposed by the Department of Justice on the ground that the Compact of 1785 had been construed by the Supreme Court and found that it neither changed nor affected the boundary line in question, and that upon a full reconsideration of the subject the Court said that the construction adopted by the arbitrators of 1877, and recited in *Maryland* v. *West Virginia, supra* note 46, was a mistaken construction.[49]

4222. *The Act of October 31, 1945*

In 1945, legislation was again initiated looking toward a settlement of the boundary question which had been mooted for a great many years. The Committee report on the bill stated that its purpose was "to establish a definite clear-cut boundary line, easy to recognize and convenient for police and court jurisdiction, between the District of Columbia and the Commonwealth of

48. H.R. 9670, 74th Cong., 2d sess. (1936). This bill was never enacted into law.

49. Statement on Behalf of the United States, *supra* note 47, at 8–17. Several cases had been before the Supreme Court of the United States involving ownership along the Potomac River and, although Virginia was not a party in these suits, the Court had construed the boundary of the District of Columbia to be at the high-water line along the Virginia shore. The first of these was *Morris* v. *United States,* 174 U.S. 196 (1899). Although this was a controversy between the United States and private individuals as to reclaimed land on the District of Columbia side of the river, the Court stated that the grant to Lord Baltimore in 1632 by King Charles I carried the title on the Potomac River to the high-water mark on the Virginia shore. *Marine Railway & Coal Co.* v. *United States,* 257 U.S. 47 (1921), involved the validity of a claim asserted by the railway company to a strip of land in Battery Cove on the Virginia side which was below the low-water mark but which had been filled in by the United States and enclosed with a fence at the high-water mark. The Court held that the Compact of 1785 had no bearing on the case because it was a regulation of commerce only and left the question of boundary open to long continued disputes until settled by the Arbitration of 1877. But that was an arbitration, the Court said, as to the boundary between the two states as they then were and did not purport to affect the boundary of the District. And the Court said further that they knew of no reason for construing the charter to Lord Baltimore as meaning to low-water mark and that it should be drawn from headland to headland. (If this had been upheld then a line so drawn at Battery Cove would have placed the filled-in land in Virginia.) Finally, in *Smoot Sand and Gravel Corporation* v. *Washington Airport,* 283 U.S. 348 (1931), the airport sought to prevent the gravel company, operating under a Government contract, from excavating, filling, and constructing a wall between high- and low-water mark on the Virginia side of the river opposite the District of Columbia. The sole question was whether the boundary line between Virginia and the District of Columbia was at the high- or low-water mark on the Virginia side of the Potomac. The Court held that under the original charter the Maryland boundary ran to high-water mark on the Virginia shore and that nothing had happened since then (insofar as the Virginia–District of Columbia line was concerned) to change that boundary, thus following the holding in *Marine Railway & Coal Co.* v. *United States, supra.* The Court distinguished *Maryland* v. *West Virginia, supra* note 46, as being a suit to settle a portion of the boundary line between those states and could not affect the District of Columbia. It reiterated its disagreement with the construction given the Compact of 1785 by the Arbitration of 1877.

Virginia.[50] The bill was approved October 31, 1945, and became Public Law 208, 79th Cong., 1st sess. (59 Stat. 552).

A. BOUNDARY PROVISIONS OF THE ACT

The basic boundary provisions of the act are embodied in Section 101 which establishes the boundary line between the District of Columbia and the Commonwealth of Virginia as follows:

> Said boundary line shall begin at a point where the northwest boundary of the District of Columbia intercepts the high-water mark on the Virginia shore of the Potomac River and following the present mean high-water mark; thence in a southeasterly direction along the Virginia shore of the Potomac River to Little River, along the Virginia shore of Little River to Boundary Channel, along the Virginia side of Boundary Channel to the main body of the Potomac River, along the Virginia side of the Potomac River across the mouths of all tributaries affected by the tides of the river to Second Street, Alexandria, Virginia, from Second Street to the present established pierhead line, and following said pierhead line to its connection with the District of Columbia–Maryland boundary line; that whenever said mean high-water mark on the Virginia shore is altered by artificial fills and excavations made by the United States, or by alluvion or erosion, then the boundary shall follow the new mean high-water mark on the Virginia shore as altered, or whenever the location of the pierhead line along the Alexandria water front is altered, then the boundary shall follow the new location of the pierhead line. (*See* fig. 104.)

Section 104 construes the reference to "present" mean high-water mark as the mean high-water mark existing on the effective date of the act.

Section 105 authorizes, empowers, and instructs the United States Coast and Geodetic Survey "to survey and properly mark by suitable monuments the said boundary line as described in Section 101." The Bureau is further empowered to monument from time to time those sections of the boundary line as may be changed in accordance with the provisions in Section 101.[51]

50. H. Rept. 595 (to accompany H.R. 3220), 79th Cong., 1st sess. 1 (1945). The report states further that the United States Supreme Court has set the boundary line at the high-water mark of the Potomac on the Virginia shore as it existed when the District of Columbia was created in 1791, and that the line has never been specifically determined and monumented and has been greatly altered by various federal projects so that the boundary line lies in many places some distance from the river. *Ibid.* The report is accompanied by a map, dated Feb. 1943 (prepared by the National Capital Park and Planning Commission), showing lands owned by the United States on the Virginia side of the Potomac River in relation to the high-water mark of 1791.

51. Other sections of the act provide for the land between the present mean high-water mark and the mean high-water mark of Jan. 24, 1791, being "ceded to and declared to be henceforth within the territorial boundaries, jurisdiction, and sovereignty of the State of Virginia," the United States retaining concurrent jurisdiction over such area (Sec. 102); for the retention of "right, title, or interest of the United States to the lands lying between the mean high-water mark as it existed January 24, 1791, and the boundary line as described in section 101" (Sec. 103); for the applicability of the U.S. Criminal Code to the George Washington Memorial Parkway and the Washington National Airport as are situated within the Commonwealth of Virginia (Sec. 106); and for the consent by Virginia to exclusive jurisdiction by the United States over the Washington National Airport, subject to certain rights reserved to Virginia (Sec. 107).

4223. *Coast Survey Participation*

The boundary survey by the Coast Survey was begun officially on March 27, 1946, when single-lens photographs were taken of the project area at a scale of approximately 1 : 6,800. On May 9, 1946, instructions were issued covering the preparation of planimetric maps, at a publication scale of 1 : 4,800, of the boundary line and adjacent areas.

The project was to include the entire southwest boundary of the District from Chain Bridge to Jones Point and was to extend from the approximate mean low-water line inshore to Washington Street in Alexandria, to the Jefferson Davis Highway from Alexandria to Rosslyn, to the top of the bluff line from Rosslyn to Chain Bridge. It was also to include the National Airport, the Pentagon area, the street system of Rosslyn, and the east shoreline of the river from Memorial Bridge to Chain Bridge as well as the islands. (*See* fig. 104.)

The greatest emphasis, both as to detail and accuracy, was of course placed on the mean high-water line, and the pierhead line at Alexandria. Well-defined natural and cultural features were to be within 0.5 mm. of correct geographic position on the published maps, and the mean high-water line within 0.3 mm. of correct position. These limits correspond to ground accuracies of 2.5 m. and 1.5 m., respectively.

A. DEMARCATION OF BOUNDARY LINE

For demarcating the boundary line, a combination of geodetic and photogrammetric methods was used.

(*a*) *Geodetic Work.*—The existing triangulation in the area was extended by second-order triangulation and traverse to boundary witness monuments located on the fast land near the water's edge. A total of 15 such monuments, numbered 1 to 11 and 11A to 14, were established spaced less than a mile apart, monuments 1 and 14 being placed as nearly as possible on the extension of the northwest and southeast boundary lines of the District of Columbia, by computing the position of a preliminary stake and placing the station by measurement in relation to the stake. In addition to the latitude and longitude, the elevation above mean high water was also determined for each boundary witness monument from existing Coast Survey bench marks.[52] At each boundary

52. The mean high water for the locality was found to be 1.86 feet above the datum of the precise level net, which is mean sea level (*see* note 54, *infra*).

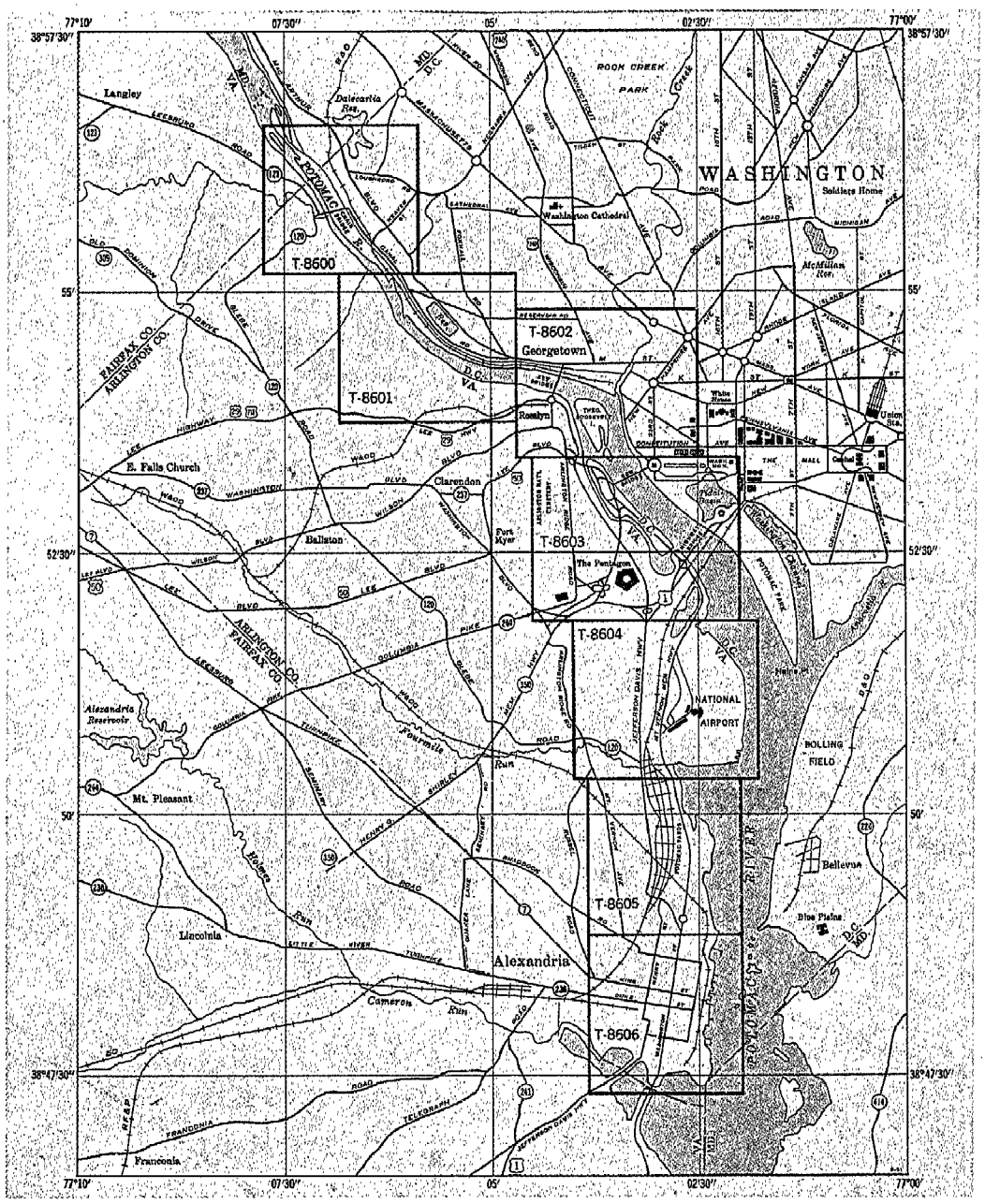

FIGURE 104.—Index of planimetric maps covering the District of Columbia–Virginia boundary.

witness mark a distance and direction was taken to the mean high-water mark as determined by spirit leveling.[53]

(*b*) *Photogrammetric Work.*—Prior to compilation of the manuscript maps, the mean high-water line was identified on the photographs from a field examination. Various methods were used to accomplish this depending upon the character of the area. Around Chain Bridge, it was impossible to identify sufficient points on the photographs to accurately sketch the line. Planetable methods were used working directly on the photographs from identifiable points but without the aid of elevations. Below Chain Bridge to approximately Key Bridge, the mean high-water line was definite and could be identified on the photographs. Small sections not otherwise easily identified were determined by short taped distances from identifiable points. In most of the other areas, spirit leveling was resorted to, the lines starting and closing on established bench marks (in a few cases, short sections of the line were started but did not close on bench marks), the line being plotted by taking measurements to nearby identifiable points on the photographs.[54]

In compiling the manuscript maps, the position of the mean high-water line on the photographs, as determined during the field inspection, was used. The low-water line was derived from photographs taken at low water.

After compilation of the planimetric maps on the Zeiss stereoplanigraph,[55] and the establishment of the 15 boundary witness monuments with reference distances to points on the mean high-water line (*see* text at note 53 *supra*), the map manuscripts were field edited. All the newly established boundary witness monuments were occupied with the planetable and the mean high-water line run in for about 200 feet on each side of the station. The reference measurements from the witness monuments to the mean high-water line were also checked.[56]

53. For the record of the geodetic work, *see* Bolstad, *Triangulation and Traverse, Virginia–District of Columbia Boundary Line,* Season's Rept. 4 of 1947, and GTZ computations (Accession No. G–7079) in Coast Survey archives.

54. *See* Descriptive Report for Registers Nos. T–8600 (1947) and T–8601 (1947), at pages 3 and 4 of Field Inspection Report. The leveling is based on bench-mark elevations determined from tide observations made between 1932 and 1942 by the Coast and Geodetic Survey. The elevation of mean high water is 3.27 feet above the low-water datum for Washington, the latter being 1.41 feet below the datum for the precise level net, thus making the elevation of mean high water 1.86 feet above the precise level net. *Id.* at page 3 of Compilation Report.

55. The stereoplanigraph is an advanced stereoscopic plotting instrument, utilizing full-size diapositives (contact prints from the aerial film onto $\frac{3}{16}$-inch glass plates). SWANSON, TOPOGRAPHIC MANUAL (Part II) 468–469, SPECIAL PUBLICATION No. 249, U.S. COAST AND GEODETIC SURVEY (1949).

56. Descriptive Report for Registers Nos. T–8600 (1947) and T–8601 (1947) at page 2 of the Field Edit Report.

B. THE PUBLISHED MAPS

The District of Columbia–Virginia boundary line is published in a series of seven planimetric maps (no contours), at a scale of 1:4,800 (1 in.=400 ft.), numbered consecutively from Register No. T–8600 to Register No. T–8606 inclusive.[57] The maps are based on a geographic grid using a polyconic projection and are referred to the North American 1927 Datum. In addition, tick marks for two rectangular grids are also shown—the Washington Suburban Sanitary Commission grid and the Virginia (North Zone) State Coordinate System grid.

The mean high-water line is shown by a heavy solid line and generally marked "D.C." on one side and "Va." on the other side. The boundary witness monuments are identified by a triangle with a dot in the center and marked "D.C.–VA. BOUNDARY W. M. No. _____ 1946," and are numbered consecutively from 1 to 14, including one numbered 11A, beginning at a point about one-half mile above Chain Bridge near where the high-water line intersects the northwestern boundary line of the District of Columbia. The approximate low-water line is indicated by a dotted line lighter in weight than the high-water line.

That part of the boundary line formed by the pierhead line at Alexandria is symbolized by a long and two short dash heavy line and labeled "Pierhead Line."[58]

(*a*) *Oblique Boundary at Second Street, Alexandria, Va.*—The oblique boundary in the vicinity of Second Street at Alexandria, Va. (*see* Register No. T–8605 (1946–1948)), is a cartographic determination. The centerline of Second Street was projected eastward (true bearing of S. 81°00′ E.) until it intercepted the mean high-water line. From here, the boundary line was drawn as a straight line to Point D′, an unmarked point in the water, denoting the northerly end of the Alexandria pierhead line, the position of which was determined from the Army Engineers coordinates. The scaled bearing of this line is S. 63°54′ E. (true), and the scaled distance is 738 feet, which must of course be considered approximate because it is not a computed value. (*See* fig. 105.) The former published distance of 667 feet is therefore in error.

(*b*) *Maryland–Virginia Boundary Line.*—At the southern terminus of the District of Columbia–Virginia boundary line in the vicinity of Jones Point (*see* Register No. T–8606 (1946–1948)), the cartography also includes the location of

57. These maps are lithographic prints in black and white, approximately 20 by 28 inches in size, and are identified as T-sheets. They were completed in 1948 and are now available at the Washington Office of the Coast and Geodetic Survey.

58. The pierhead line was transferred from Plans 1 and 2 (scale, 1:2,000) of the Army Engineers.

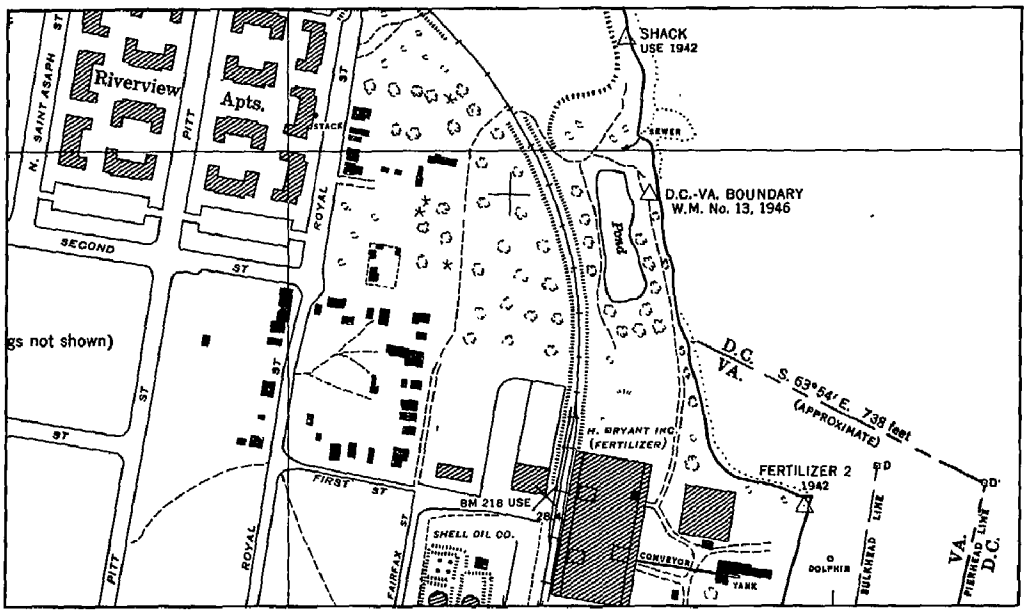

FIGURE 105.—Detail of District of Columbia–Virginia boundary in vicinity of Second St., Alexandria, Va. (*see* 4223 B(*a*)).

the Maryland–Virginia boundary line immediately southward from its junction with the District of Columbia–Virginia boundary line, in order to have complete cartographic representation within the map limits. This delineation of the Maryland–Virginia boundary around Jones Point is the first to be based upon an accurate topographic map showing present conditions (1946). It conforms to the Award of the Arbitrators of 1877 that the boundary is to follow "the meanderings of the said river [the Potomac] by the low-water mark, to Smith's Point" (*see* 4211). The Maryland–Virginia boundary line must therefore continue along the southeast boundary of the District of Columbia extended until it intercepts the low-water mark along the Virginia shore.[59] From here the boundary follows the low-water mark around Jones Point in a southerly and westerly direction until it meets the Maryland–Virginia boundary line across Hunting Creek (*see* fig. 106).[60]

59. This is so because if the Act of Oct. 31, 1945 (*see* 4222) had not established the pierhead line as the boundary, the District of Columbia–Virginia boundary would have extended to the high-water mark along the Virginia shore.

60. This final leg of the Maryland–Virginia boundary line (between a point on the low-water line near Reference Monument 57 and a point on the low-water line near Reference Monument 58) was determined in 1929 to be in azimuth 181° 45'12". MATHEWS AND NELSON (1930), *op. cit. supra* note 23, at 13. The distance from Reference Monument 58 to the boundary point on the low-water line was found in 1929 to be 42 feet. This boundary point on the present survey falls just inshore of the mean high-water line,

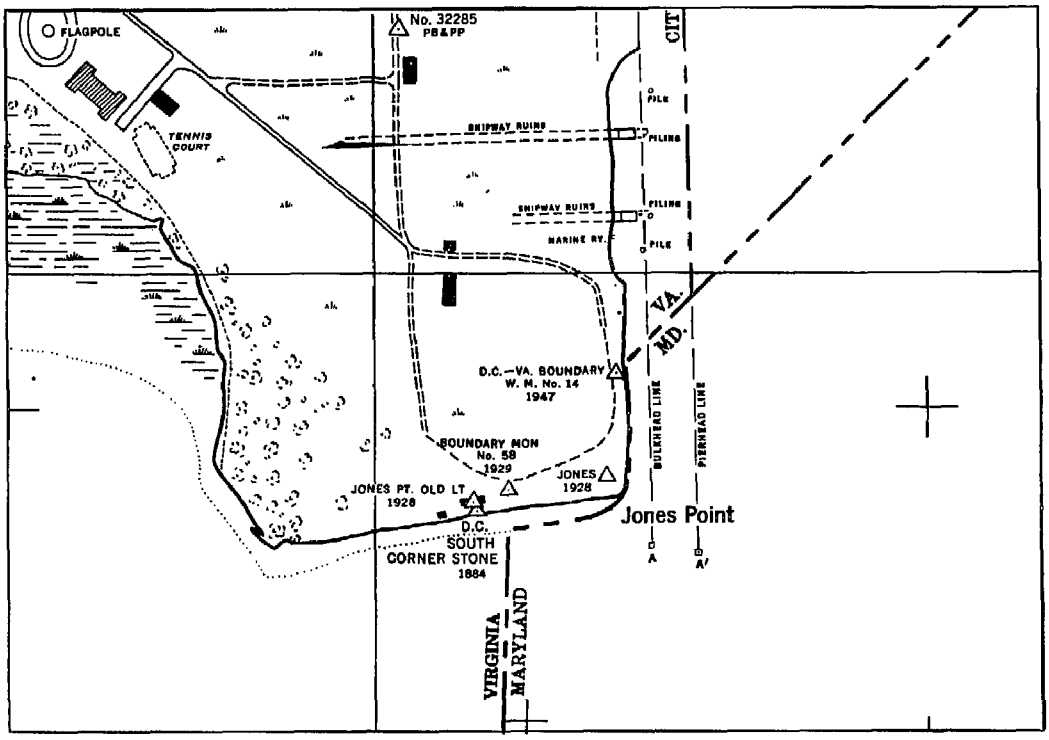

FIGURE 106.—Southern terminus of District of Columbia–Virginia boundary in vicinity of Jones Point showing also Maryland–Virginia boundary (*see* 4223 B(*b*)).

(*c*) *Boundary at Tributary Waterways.*—Although the law as written would seem to confine the provision "across the mouths of all tributaries affected by the tides of the river" (*see* 4222 A) to the section of the river between the southern end of Boundary Channel (*see* Register No. T–8603 (1946–1948)) and Second Street, Alexandria (*see* Register No. T–8605 (1946–1948)), it is believed that the intent was to have this qualification apply to the entire boundary line from the northwest boundary line of the District to Second Street, Alexandria, thus following in general the Award of 1877 for the Maryland–Virginia boundary (*see* 4211). The boundary line as delineated on the maps does not show a headland line across tributaries, but this fact should be kept in mind in the consideration of the boundary line at such tributaries as Roaches Run and Four-mile Run (*see* Register No. T–8604 (1946–1948)).

showing an accretion to have taken place, the 1946 low-water line (verified in 1949) in this area being 87 feet from Reference Monument 58. This points up the weakness of the fixed boundary theory where a water boundary is concerned (*see* 4213). If this theory were applied to the area around Jones Point, Virginia's boundary would no longer be at the low-water line and the intent of the Award of 1877 (*see* text following note 14 *supra*) would be defeated.

423. Low-Water Line Survey of Louisiana Coast

A recent example of the utilization of Bureau services for a comprehensive boundary determination is the cooperative agreement entered into in 1957 between the State of Louisiana, the Bureau of Land Management, and the Coast and Geodetic Survey for mapping the low-water line along the Louisiana coast. The purpose of the survey was to establish an accurate baseline from which the seaward boundary of Louisiana was to be measured, thereby defining the federal-state boundary under the Submerged Lands Act (67 Stat. 29 (1953)), and the Outer Continental Shelf Lands Act (67 Stat. 462 (1953)). The field work and preparation of the maps (60 in all) were accomplished exclusively by the Coast Survey. Photogrammetric procedures were used in which the aerial photography was closely coordinated with actual tidal conditions as determined from a number of tide stations established in the area. For a detailed description of this project, *see* Volume One, Part 2, 17.[61]

43. NAVIGABLE WATERS

What have been heretofore discussed are some of the more obvious legal aspects of the Bureau's work—that is, where the Bureau participates directly, or through its records and data. In addition, it deals indirectly with a wide variety of subjects, some of which have legal significance. One of these is in the field of navigable waters.

The Coast and Geodetic Survey has more than a passing interest in navigable waters, since they form the natural habitat of a major part of the Survey's operations. The organic act establishing the Coast Survey provides for the making of surveys and charts for the safe navigation of marine commerce, which presupposes an interest and operation in navigable waters (*see* Part 1, 1211). In addition, the law of navigable waters is intimately bound up with the ebb and

61. Associated with this low-water line survey and representing another facet of the utilization of Bureau services, is the professional advice furnished the Department of Justice on the location of the entire Louisiana "coast line" as defined in the Submerged Lands Act (*see* Volume One, Part 2, 123). This request was made by the Solicitor General of the United States as being "within the particular competence of the Coast and Geodetic Survey." Involved was an examination of principles proposed by the Department of Justice and the specific technical questions raised, all considered in the light of the position advocated by the United States at the 1930 Hague Conference for the Codification of International Law; of the proceedings before the Special Master in *United States* v. *California* and his technical recommendations to the Supreme Court; of the 1956 draft articles of the International Law Commission; and of the 1958 Geneva Convention on the Territorial Sea and the Contiguous Zone. *See* Volume One, *passim*. This study was made by the author and the results embodied in a comprehensive memorandum dated Apr. 18, 1961, from the Director to the Solicitor General. A copy of the memorandum and associated correspondence is filed in the Coast Survey library and is identified as Accession No. 62515.

flow of the tide, historically and currently, in the matter of the public right of user of such waters, and in the ownership of the soil under them.

The law of navigable waters has had an interesting development in American jurisprudence. It begins with Article I, section 8, clause 3 of the Constitution—known as the commerce clause—which gives Congress the power "To regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes." The full import of this grant of authority did not appear until 1824—many years after the adoption of the Constitution—when the Supreme Court of the United States in a landmark case laid down the doctrine that state action affecting interstate or foreign commerce which is in conflict with congressional action is invalid.[62] This was the first clear indication of the extent of the power granted under the commerce clause.

In addition to establishing the doctrine of supremacy of a federal law over a state law in this area of constitutional interpretation, the Supreme Court also settled two other momentous questions which the case raised: (1) What constitutes commerce, that is, whether it includes navigation; and (2) to what commerce the power of the Federal Government extends. As to the first, the Court said: "The mind can scarcely conceive a system for regulating commerce between nations, which shall exclude all laws concerning navigation, which shall be silent on the admission of the vessels of the one nation into the ports of the other . . . . The power over commerce, including navigation, was one of the primary objects for which the people of America adopted their government . . . . a power to regulate navigation, is as expressly granted, as if that term had been added to the word 'commerce'." [63]

As to the second—the commerce to which the federal power extends—the Court held it applied to every species of commercial intercourse between the United States and foreign nations, and no trade of any kind can be carried on between this country and any other to which this power does not extend. And the same applies to commerce among the several states which of necessity must be commerce with the states. It is commerce which concerns more states than one. But it does not apply to the completely internal commerce of a state, the latter regulation being reserved for the state itself.

62. *Gibbons* v. *Ogden*, 9 Wheat. 1 (22 U.S., 1824). The State of New York under a statute had granted to two individuals the exclusive right to navigate the waters within its jurisdiction with vessels propelled by steam. Gibbons, the appellant, was operating steamboats between New York and New Jersey under authority of a coasting license under a 1793 act of Congress (1 Stat. 305). The New York court upheld the validity of the statute which virtually established a monopoly in the grantee. On appeal, the Supreme Court reversed this holding on the basis that the New York law was inconsistent with the license granted under the act of Congress.

63. *Id.* at 83–85. By judicial interpretation, therefore, the Court established the doctrine that the power to control and protect navigation on navigable interstate rivers and other bodies of water was a necessary incident of the power to regulate commerce, so far as that navigation may be connected with commerce with foreign nations, or among the several states, or with the Indian tribes.

The *Gibbons* case marked the beginning of a long line of decisions that established the power of the United States to regulate interstate commerce free from state infringement. When Congress by an expression of its will occupies the field, that action is conclusive of any right to the contrary asserted under state authority. *Wisconsin* v. *Duluth,* 6 Otto 379, 387 (96 U.S., 1878). The case, however, left unsettled the important question whether a state may lawfully legislate regarding subjects pertaining to interstate or foreign commerce upon which Congress had passed no law. This arose in a later case involving the regulation of pilots.[64]

431. The English Doctrine of Navigability

The next important development in the law of navigability in the United States was predicated upon a misapplied doctrine of the English law. The English rule emanated from a case involving ownership of part of a fishery in the Banne River, about 2 leagues from the sea where the stream was tidal, under a grant of land from the Crown adjoining the fishery together with the fisheries within the land, but excepting three parts of the fishery. The question raised

64. *Cooley* v. *The Board of Wardens of the Port of Philadelphia,* 12 How. 299 (53 U.S., 1852). This case involved a Pennsylvania statute establishing a system of regulations affecting pilotage in the port of Philadelphia and imposing certain monetary penalties for failure to comply with such rules. The law was enacted under authority of Sec. 4 of the Act of Aug. 7, 1789 (1 Stat. 54) which provides "That all pilots in the bays, inlets, rivers, harbors and ports of the United States, shall continue to be regulated in conformity with the existing laws of the States respectively wherein such pilots may be, or with such laws as the States may respectively hereafter enact for the purpose, until further legislative provision shall be made by Congress." Although the Pennsylvania law was a regulation of commerce, the Supreme Court upheld it on the ground that it concerned a matter properly lending itself to local state control, rather than requiring a uniform law, and one for which Congress had not legislated other than to indicate an intention to leave such regulation to the states. The application of this doctrine in a given case is not always a simple matter because of the absence of definite criteria for distinguishing whether a particular subject of commercial regulation admits of and requires uniform and national control, or whether it is sufficiently local in character to make state regulation permissible. For a history of pilotage in the United States, *see* Jones, Pilotage in the United States, Special Agents Series—No. 136, U.S. Department of Commerce (1917). Pilotage information for the various U.S. ports is contained in the *Port Series,* published jointly by the Corps of Engineers, Dept. of the Army, and the Maritime Administration, Dept. of Commerce. Pilotage information contained in the various *Coasts Pilots* of the Coast and Geodetic Survey is based on the *Port Series.* A summary of state laws pertaining to pilotage is contained in *Responsibilities and Qualifications of Pilots Under State Laws,* American Pilots' Association (1937).

Great Lakes Pilotage.—Pilotage on the Great Lakes is under federal control. This was established by the Act of June 30, 1960 (74 Stat. 259), identified as the "Great Lakes Pilotage Act of 1960." Prior to this there was no statutory requirement for compulsory pilotage of registered vessels of the United States or foreign vessels navigating U.S. waters of the Great Lakes. Opening of the St. Lawrence Seaway resulted in an upsurge of the entry of foreign vessels into these waters. This, together with the entry of U.S. ocean vessels into the area, presented a definite threat to safe navigation, which called for remedial action. S. Rept. 1284, 86th Cong., 2d sess. 3, 4, 10 (1960). The act is under the administration of the Secretary of Commerce and this authority has been delegated by the Secretary to the Great Lakes Pilotage Administration under Department Order No. 169, effective Sept. 8, 1960, and Department Order No. 169 (revised), effective Nov. 13, 1962. For regulations governing Great Lakes pilotage as promulgated by the Great Lakes Pilotage Administration, *see* 26 Fed. Reg. 951 (1961).

was whether the grant carried with it ownership of the fourth part. The court answered this in the negative.[65] The court classified rivers as of two kinds—navigable and not navigable—and said: "Every navigable river, so high as the sea flows and ebbs in it, is a royal river, and the fishery of it is a royal fishery, and belongs to the King by his prerogatives; but in every other river not navigable, and in the fishery of such river the terre [land] tenants on each side have an interest of common right." [66] But the court did not define a navigable river. It merely said that in navigable rivers subject to tidal influence, the title to the soil was in the King, but that in non-navigable rivers the title is in the adjoining land owners. This left a strip of navigable water—from the point where the tide ceased to the point where the navigable character of the river ceased—upon which the court made no ruling as to ownership of the soil. Yet the inference has been drawn, erroneously, that in England the only rivers that are navigable are those in which the tide ebbs and flows.

The true English doctrine seems to be that navigable water is not synonymous with or limited to tide water. Lord Hale, in his treatise *De Jure Maris* (By the Law of the Sea), which was written soon after the decision in the *Banne* case, makes no distinction between fresh and salt rivers in point of navigability, for he says "there be other rivers, as well fresh as salt, that are of common or public use for carriage of boats and lighters. And these, whether they are fresh or salt, whether they flow and reflow or not, are prima facie *publici juris* [of public right] common highways for man or goods." And in other passages, Lord Hale refers to public rivers as those capable of being navigated, and whenever he wishes to make a distinction depending on tide water, he always refers to navigable waters where the tide ebbs and flows, thus indicating that he did not consider it sufficient to refer to tidal water by the word navigable only.[67]

65. *The Royal Fishery of the Banne,* Davies Rep. 149 (circa 1604). *See also* ANGELL, LAW OF TIDE WATERS 75 (1847). This case was decided at a time when ownership of the land was carefully apportioned so that every part of it had, in theory at least, an owner. All that was not in private ownership was held to belong to the King, but the fact that he held his title for the benefit of his subjects was not clearly perceived. FARNHAM, 1 THE LAW OF WATERS AND WATER RIGHTS 108 (1904).

66. *Id* at 109. The basis of the King's interest in such navigable tidal rivers is that they partake of the nature of the sea (his proper inheritance) and is said to be a branch of the sea so far as it flows. The King has the same prerogative and interest in the branches of the sea as he has in the sea itself.

67. *Id.* at 113, 114. The decisions of the courts are even more explicit. When examined, the rule is found to be fairly uniform that navigable waters are those which are navigable in fact, and not those which are merely tidal. Thus, in *Blount* v. *Layard,* decided by the English Court of Appeals and reported in a note in [1891] 2 Ch. 681, it was said: "We are dealing with the Thames, which is not a tidal river at the place in question. But on the other hand, it is a navigable river,—that is, all the Queen's subjects have the right of passing and repassing on it." And in *Lenconfield* v. *Lonsdale,* L.R. 5 C.P. 665, the court said: "There is a part of the river, intermediate between the tidal flow and the upper fresh water, where the river is navigable, but not tidal." For other English cases dealing with the subject, *see* FARNHAM, *supra* note 65, at 114–117, and note to *Willow River Club* v. *Wade,* XLII L.R.A. (1913 ed.) 305, 307–309 (1898).

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432. The American Doctrine of Navigability

4321. *The Tidal Test—Palmer* v. *Mulligan*

The misinterpreted *Banne* case, *supra* note 65, was the basis for the early American doctrine of navigability and had the effect of excluding for two generations the admiralty jurisdiction from our great rivers and inland seas.[68] It was Chancellor Kent, of the New York Supreme Court, who ruled in the early case of *Palmer* v. *Mulligan* [69] that according to the common law of England only tidal streams were navigable, and since the Hudson River at the place in question was above the influence of the tide it was not a navigable river in the common-law sense; therefore, title to the soil was in the owners of the adjoining land.

This doctrine of limiting navigable waters to tide waters was carried by Chancellor Kent into his *Commentaries* and was later adopted by Angell in his work on *Tide Waters,* both widely used text books at the time. The eminence of the authors and the lack of original authorities led many of the state courts to follow it.[70]

68. *Admiralty law* is that branch of the body of the law which governs in maritime matters. Admiralty law does not have its antecedents in the English common law, as does the body of our other unwritten laws (*see* 251), but originated with the customs and usages of the countries bordering the Mediterranean and the Baltic seas. Admiralty jurisdiction in the United States has as its origin Art. III, sec. 2, cl. 1 of the Constitution, which provides that, "The judicial Power [of the Federal Government] shall extend . . . to all Cases of admiralty and maritime Jurisdiction." This has been held by construction to confer legislative power in Congress, independent of its power over commerce. Therefore, the admiralty law of the United States is administered by the Federal courts as a distinct legal system. This jurisdiction is exclusive, and cannot be enlarged or restricted by state legislation. For the exercise of admiralty jurisdiction, two concurrent elements must be present: (1) a navigable waterway which is part of an interstate or international highway, and (2) a vessel or craft used or capable of being used as a means of transportation on such waterway. In the adjudication of admiralty cases, one of the important principles applied is the legal personality of the vessel. This assumes to make the vessel herself the wrongdoer and gives the courts power to proceed *in rem,* that is, against the offending vessel or cargo (the vessel is sued or "libeled"), instead of *in personam,* as in the ordinary courts, against the owner of the vessel. This extraordinary power to proceed in rem is based on the practical consideration of obtaining monetary satisfaction by arresting the offending vessel and subjecting it to judicial sale, although the owner may be a citizen of and resident in a foreign State, and thus not subject to the ordinary process. As a matter of public policy this doctrine has not been applied to public vessels (naval and other Government owned) because it would remove them from service. However, under a special statutory provision the Government permits itself to be sued as an owner in personam, but the damage sustained is adjudicated the same as it would be were the action in rem between the vessels themselves. *Watts* v. *United States,* 123 Fed. 105 (1903). Another principle peculiar to American admiralty courts is the doctrine of equal responsibility for unequal fault. If both vessels have violated a rule and collision results, each vessel is liable for 50 percent of the total loss, regardless of her degree of fault. *The Marian,* 66 F. 2d 354 (1933). Admiralty jurisdiction has grown through congressional action and through judicial interpretation to keep pace with the needs and development of our waterborne commerce.

69. 3 Caines 307 (1805), 2 Am. Dec. 270. This case involved title to the soil of the Hudson River at Stillwater, N.Y., and the right to place structures on its bed.

70. In *Veazie* v. *Dwinel,* 50 Me. 479, 484 (1862), a statute permitting the construction of dams in non-navigable rivers was held to authorize them in all cases where the tide did not ebb and flow. And in *Welles* v. *Bailey,* 10 Atl. 565 (1887), it was decided that the rule that rivers were navigable in fact was never formally adopted in Connecticut, which implies that rivers above the ebb and flow of the tide, although navigable in fact, are not considered navigable waters.

The doctrine of Chancellor Kent was also followed for many years in the Federal courts in connection with admiralty jurisdiction, and it was assumed in the early cases that such jurisdiction was limited to cases arising upon the high seas and upon rivers as far as the ebb and flow of the tide extended.[71]

4322. *The Navigability Test—The Genesee Chief* v. *Fitzhugh*

The tidal test was successfully maintained in the Federal courts until the year 1851 when a new test of navigability was invoked by the Supreme Court. In a libel brought under the Act of February 26, 1845 (5 Stat. 726), which extended the admiralty jurisdiction of the Federal district courts to certain cases upon the lakes and navigable waters connecting them, the Court was called upon to pass upon the constitutionality of the 1845 Act.[72] In reexamining its former decisions, which declared the admiralty jurisdiction to be limited to waters subject to the ebb and flow of the tide (*see* note 71 *supra*), the Court pointed out that the tidal test in England was a reasonable one because there was no navigable stream of importance in that country beyond the ebb and flow of the tide. Tide water and navigable water thus became synonymous there. And as there could be no use for an admiralty jurisdiction where there could be no navigation, this test of navigability of those waters became substituted as the rule, instead of the navigability itself.[73] Such a rule could have no pertinency to the rivers and lakes of this country because of the broad differences existing between the topography of the British island and that of the American Continent. Since many of our rivers could be navigated successfully for a thousand miles above the head of tide water as they could below, it was not reasonable to adopt such an artificial rule as the test of admiralty jurisdiction in this country. "It is evident," the Court said, "that a definition that would at this day limit public rivers in this country to tide-water rivers is

71. In both *The Steamboat Thomas Jefferson,* 10 Wheat, 428 (23 U.S., 1825) and *The Steamboat Orleans* v. *Phoebus,* 11 Pet. 175 (36 U.S., 1837), the Supreme Court denied admiralty jurisdiction to the Federal district courts because the vessels libeled were not on tide waters.

72. *The Genesee Chief* v. *Fitzhugh,* 12 How. 443 (53 U.S., 1851). The case arose as a result of a collision on Lake Ontario. The *Genesee Chief* was libeled for damages in a Federal district court sitting in admiralty. The 1845 Act was challenged on the ground that the admiralty power conferred by the Constitution on Federal courts did not extend to cases originating above tide water in our rivers and lakes, and that Congress could not extend it by legislation. Both lower courts held for the libelant, and this was affirmed by the Supreme Court.

73. This definition, which had been adopted in England, the Court pointed out, was equally proper in this country at the time of the adoption of the Constitution and our courts of admiralty went into operation. In the Thirteen Original States, the far greater portion of the navigable waters are tide waters, and in the states which were at that period in any degree commercial, every public river was tide water to the head of navigation. *Id.* at 455.

utterly inadmissible. We have thousands of miles of public navigable water, including lakes and rivers in which there is no tide. And certainly there can be no reason for admiralty power over a public tide-water, which does not apply with equal force to any other public water used for commercial purposes and foreign trade. The lakes and the waters connecting them are undoubtedly public waters; and we think are within the grant of admiralty and maritime jurisdiction in the Constitution of the United States." (*See* note 68 *supra.*)[74] The 1845 Act was therefore a legitimate extension of that jurisdiction to navigation on the lakes and the navigable waters connecting them. The Court then expressly overruled its former restrictive decisions and adopted the more liberal principle that the test of navigability is the actual navigable capacity of the waterway and not the extent of tidal influence.

The decision in *The Genesee Chief, supra* note 72, having removed the imaginary line of tide water which was supposed to circumscribe the jurisdiction of the admiralty courts, there no longer existed any reason why the general admiralty powers conferred on all the district courts by the Judiciary Act of 1789 should not be exercised wherever there was navigation which could give rise to admiralty and maritime causes. The foundation was thus laid for extending this jurisdiction to the great rivers of the country above the head of tide water. Thus, *Fretz* v. *Bull,* 12 How. 466 (53 U.S., 1851), upheld jurisdiction of a collision on the Mississippi River above tide water; and *Jackson* v. *The Magnolia,* 20 How. 296 (61 U.S., 1858), upheld jurisdiction on the Alabama River far above the ebb and flow of the tide on a stream whose course was wholly within the limits of the State of Alabama.[75]

While the admiralty jurisdiction conferred on the district courts of the United States is exclusive of the state courts, the latter do deal with the question of navigability as it affects the public use of certain waters, the public right to fish, and questions of riparian ownership. These are matters of local law, and Federal courts consider themselves bound by local decisions in such matters, unless a federal question is involved (*see* note 34 *supra*).

74. *Id.* at 457. The Court noted that the rule laid down is in accord with Sec. 9 of the Judiciary Act of 1789 (1 Stat. 76), which declared that the district courts "shall also have exclusive original cognizance of all civil causes of admiralty and maritime jurisdiction . . . on waters which are navigable from the sea by vessels of ten or more tons burthen." The jurisdiction is thus made to depend upon the navigable character of the water, and not upon the ebb and flow of the tide. *Ibid.*

75. The latter case, decided 6 years after *The Genesee Chief,* was thought to present an occasion when the doctrines announced there might be reconsidered, and modified, if not overruled. But the principles established were reaffirmed after a careful and full consideration. And this has been the law ever since without question.

433. Legal Concept of Navigability

While the decision in *The Genesee Chief* was a jurisdictional one, once the tidal test was jettisoned and the doctrine of that case firmly established in our jurisprudence, the way was cleared for the courts to define more specifically the test of navigability, insofar as it related to the regulatory power of Congress under the commerce clause (*see* 43). Accordingly, in 1871, the Supreme Court laid down its oft-quoted definition of navigability, namely:

> Those rivers must be regarded as public navigable rivers in law which are navigable in fact. And they are navigable in fact when they are used, or are susceptible of being used, in their ordinary condition, as highways for commerce, over which trade and travel are or may be conducted in the customary modes of trade or travel on water.[76]

This test of navigability does not depend upon the manner or mode by which commerce is or may be conducted, nor upon the difficulties attending navigation, such as those caused by falls, rapids, or sandbars. The true criterion is the capability of use by the public for purposes of transportation and commerce, rather than the extent and manner of that use. If a stream is capable in its natural state of being used for purposes of commerce, no matter in what mode the commerce may be conducted, whether in vessels propelled by steam, sail, oars, or poles, it is navigable in fact and becomes in law a public highway. But this does not mean that every ditch or inlet in which the tide ebbs and flows, nor every small creek in which a fishing skiff or gunning canoe can be made to float at high water is a navigable highway. To have the character of a navigable stream it must be generally and commonly useful to some purpose of trade or agriculture.[77]

4331. *Navigable Waters of the United States*

For waters to come within the meaning of the acts of Congress, whether for purposes of admiralty jurisdiction or for regulation, they must not only be navigable but they must also be *navigable waters of the United States*. And to constitute such waters they must "form in their ordinary condition by themselves, or by uniting with other waters, a continued highway over which commerce is or may be carried on with other States or foreign countries in the customary modes in which such commerce is conducted by water." This was the doctrine laid down by the Supreme Court in *The Daniel Ball, supra* note

76. *The Daniel Ball* v. *United States,* 10 Wall. 557, 563 (77 U.S., 1871). This was a suit against a steamer drawing 2 feet of water and navigating entirely within the State of Michigan on a short river emptying into Lake Michigan.

77. *The Montello,* 20 Wall. 430, 442 (87 U.S., 1874).

76, at 563.[78] And it falls within this category even if it is an artificial canal, as long as it forms a means of communication between ports and places in different states, even though the canal is wholly within the body of a state and subject to its ownership and control.[79]

The rule of *The Daniel Ball* and *The Montello* regarding navigable waters of the United States had not been departed from, although it had been interpreted and applied in many different factual situations. Even as late as 1935 it was held that an interstate stream is navigable in fact only when it is so used or susceptible of being used in its "natural and ordinary condition." *United States* v. *Oregon,* 295 U.S. 1 (1935). But in 1940 and 1941, two cases were decided by the Supreme Court—the *Appalachian Power Co.* case and the *Atkinson* case (sometimes referred to as the *Red River* case)—both of which extended the legal concept of navigability, and served to increase materially the power of the Federal Government over the waters of the United States.[80] These decisions must be read against the background of increasing interest by the Federal Government—beginning with the Federal Water Power Act of 1920 (41 Stat. 1063)—in the streams and rivers of the country from the standpoint of their multipurpose use for power, reclamation, and navigation.[81]

(*a*) *The Appalachian Power Case.*—This case related to the construction of a hydroelectric dam by the Appalachian Electric Power Co. on the New River just above Radford, Va., and involved the scope of the federal commerce power in relation to conditions in licenses required by the Federal Power Commission for the construction of such dams in navigable waters of the United

78. This is in contradistinction to navigable waters of a state, which comprise those waterways that lie wholly within its limits and have no navigable connection with any navigable waters outside the boundaries of the state. Such intrastate waters are subject to regulation and control by state laws and do not fall within the jurisdiction of Congress nor of the laws enacted by it for the preservation and protection of navigable waters of the United States. *The Montello,* 11 Wall. 411, 415 (78 U.S., 1870).

79. *Ex parte Boyer,* 109 U.S. 629 (1884), and *The Robert W. Parsons,* 191 U.S. 17 (1903). The first involved a collision on the Illinois and Lake Michigan Canal, an artificial navigable waterway, 60 feet wide and 6 feet deep, connecting the Mississippi River with Lake Michigan and wholly within the State of Illinois (it was held immaterial that one or the other of the vessels was on a voyage within the state); the second involved the Erie Canal which connects the Hudson River with Lake Erie but entirely within the State of New York. Other examples of such canals are the St. Clair Ship Canal connecting St. Clair River with St. Clair Lake; the St. Mary's Canal connecting Lake Superior with Lake Huron; and the Welland Canal between Lake Ontario and Lake Erie.

80. *United States* v. *Appalachian Electric Power Co.,* 311 U.S. 377 (1940); *Oklahoma ex rel. Phillips* v. *Guy F. Atkinson Co.,* 313 U.S. 508 (1941). In the *Appalachian* case, *amici curiae* briefs were filed in behalf of the Appalachian Company by the attorney generals of 41 states on the ground that the power to prohibit the erection in navigable waters of structures deemed to impair navigation does not comprehend a power to exact conditions, unrelated to navigation, for the permission to erect such structures.

81. Under the act, Congress created a Federal Power Commission with authority to license the construction of dams in navigable waterways under certain specified conditions. Major multiple-purpose projects have been authorized by the Boulder Canyon Project Act (45 Stat. 1057 (1928)), and upheld in *Arizona* v. *California,* 283 U.S. 423 (1931); the Tennessee Valley Authority Act (48 Stat. 58 (1933)), and upheld in *Tennessee Electric Power Co.* v. *Tennessee Valley Authority,* 306 U.S. 118 (1939); the Fort Peck Dam, Bonneville Dam, Parker Dam, Grand Coulee Dam, and Central Valley Project (49 Stat. 1028 (1935)).

States. The determination of the case rested on the question whether the New River, a tributary of the Kanawah and Ohio Rivers, is or is not a navigable water of the United States. The Supreme Court answered this in the affirmative and thereby reversed the concurrent findings of the two lower Federal courts.[82]

Although the Court reaffirmed the doctrine of *The Daniel Ball* (*see* text at note 76 *supra*), insofar as the basic concept of navigability was concerned, it held, in addition, that, while navigability is a factual question, in appraising the evidence of navigability it is erroneous to consider only the natural and ordinary condition of the waterway, but "its availability for navigation must also be considered." Said the Court:

> "Natural and ordinary condition" refers to volume of water, the gradients and the regularity of the flow. A waterway, otherwise suitable for navigation, is not barred from that classification merely because artificial aids must make the highway suitable for use before commercial navigation may be undertaken. Congress has recognized this in section 3 of the Water Power Act [41 Stat. 1063 (1920)] by defining "navigable waters" as those "which either in their natural or improved condition" are used or suitable for use . . . . Nor is it necessary that the improvements should be actually completed or even authorized. The power of Congress over commerce is not to be hampered because of the necessity for reasonable improvements to make an interstate waterway available for traffic.[83]

Based on the *Appalachian* decision, it must now be held that the phrase "susceptible of being used in their ordinary condition," in *The Daniel Ball* definition, is not to be construed as eliminating the possibility of determining navigability in the light of the effect of future reasonable improvements. This was the Government's contention. And it appears that considerable latitude may be exercised in the application of this doctrine, for although the Chief of Engineers found that the cost of improving the New River would involve the "expenditure of vast and prohibitive sums," (*United States* v. *Appalachian Electric*

82. The basis for the Court's reversal of the factual findings of both lower courts, usually not disturbed on appeal unless clear error is shown (*Brewer Oil Co.* v. *United States*, 260 U.S. 77, 86 (1922)), was that the circumstances called for the application of judicial standards for determining whether the conditions in respect to the capacity of the New River for use in interstate commerce make it a navigable stream within the constitutional requirements. "Both the standards and the ultimate conclusion," the Court said, "involve questions of law inseparable from the particular facts to which they are applied." *United States* v. *Appalachian Electric Power Co., supra* note 80, at 404.

83. *United States* v. *Appalachian Electric Power Co., supra* note 80, at 407, 408. In appraising the evidence of navigability of the New River, the Court re-emphasized some of the legal tests of navigability it formerly enunciated, to wit: A waterway once found to be navigable remains so; navigability does not require continuous use of the waterway since the character of the region, its products, and the difficulties or dangers of navigation influence such use; small traffic compared to the available commerce of the region is sufficient; absence of use over long periods of years, because of changed conditions, the coming of the railroad, or improved highways, does not affect the navigability of rivers in the constitutional sense; and navigability may be of a substantial part only of the waterway in question. Such evidences of non-navigability in whole or in part are to be appraised in totality to determine the effect of all. *Id.* at 408–410. (*See* 435.)

Power Co., 23 F. Supp. 83, 96 (1938)), the Supreme Court, nevertheless, concluded it was navigable.[84]

(*b*) *The Atkinson or Red River Case.*—The doctrine of the *Appalachian* case was extended in the *Red River* case, *supra* note 80, so as to apply to any stream or watershed which contributes to a navigable stream or river and itself becomes subject to the control and regulation of the Federal Government. Involved was the validity of a federal statute authorizing the construction of a dam and reservoir for flood-control purposes in the *non-navigable* upper reaches of the Red River.[85] The State of Oklahoma sought to enjoin construction of the dam on the ground that its primary purpose was the generation of power rather than flood control, and that no part of the Red River in Oklahoma was navigable (the Supreme Court so found). In denying the injunction and upholding the statute, the Supreme Court stated that one purpose behind construction of the dam was the promotion of navigation downstream, that flood control had a vital relationship to the broader aspects of the commerce power, and that the power of flood control extends to the non-navigable tributaries of navigable streams. The Court held there was "no constitutional reason why Congress or the courts should be blind to the engineering prospects of protecting the nation's arteries of commerce through control of the watersheds" or why they should not "treat the watersheds as a key to flood control on navigable streams and their tributaries . . . . The fact that ends other than flood control will also be served, or that flood control may be relatively of lesser importance, does not invalidate the exercise of the authority conferred on Congress." [86]

Hence, from the standpoint of federal control over the navigable waters of the United States, the case stands for the doctrine that flood control and waterway development are now recognized as of equal validity with the maintenance of navigation as constitutional objectives of Congress. Such control now extends

84. Two justices dissented from the majority view, their strongest objection being that the announced doctrine means that if by reasonable improvement the stream may be rendered navigable then it is navigable without such improvement. In their view, such a doctrine would mean that "every creek in every state in the Union which has enough water, when conserved by dams and locks or channeled by wing dams and sluices, to float a boat drawing two feet of water, may be pronounced navigable because, by the expenditure of some enormous sum, such a project would be possible of execution. In other words, Congress can create navigability by determining to improve a non-navigable stream." *Id.* at 433.

85. The Red River forms part of the boundary between Oklahoma and Texas and is a tributary of the Mississippi River. The act passed by Congress in 1938 (52 Stat. 1215) authorized among other things the construction of the Denison Reservoir on the Red River in Texas and Oklahoma. It was established that the lower reaches of the Red River were at one time used for navigation and that at the time of the decision the river was navigable from its conflux with the Mississippi for 122 miles upstream.

86. *Oklahoma* v. *Atkinson, supra* note 80, at 526, 534.

to a program for the development of an entire watershed, not merely the navigable portions of streams in that watershed.[87]

434. Summary of Development of Law of Navigability

From the decisions cited it would appear that in the development of the law of navigability in the United States we have indeed moved far from the restrictive doctrine of Chancellor Kent (*see* 4321). These developments, chronologically, may be summarized as follows:

1787—Congress given power to regulate interstate and foreign commerce (Art. I, sec. 8, the Constitution of the United States).

1805—Tidal test for navigable waters adopted by Chancellor Kent of the New York Supreme Court (*Palmer* v. *Mulligan,* 3 Caines 307, 2 Am. Dec. 270).

1825—Tidal test followed by Supreme Court in denying admiralty jurisdiction to Federal district courts because vessels libeled were not on tide waters (*The Steamboat Thomas Jefferson,* 10 Wheat. 428 (23 U.S.)).

1851—Tidal test overruled by Supreme Court and navigable waters of the United States declared not to be limited by the flux and reflux of the tide but rather by the actual navigable capacity of the waterway, thus extending the admiralty jurisdiction to the lakes and rivers above the head of tide water (*The Genesee Chief* v. *Fitzhugh,* 12 How. 443 (53 U.S.)).

1871—Public navigable waters defined as those waters that are susceptible of being used in their ordinary condition as highways of commerce over which trade and travel are or may be conducted in the customary modes of trade or travel on water (*The Daniel Ball,* 10 Wall. 557 (77 U.S.)).

87. The doctrines of the *Appalachian* and *Red River* cases were cited with approval by the Supreme Court in the later case of *United States* v. *Grand River Dam Authority,* 363 U.S. 229 (1960). Under the Flood Control Act of 1941 (55 Stat. 638, 645), Congress incorporated the Grand River plan into a comprehensive plan for regulation of navigation, control of floods, and production of power on the Arkansas River and its tributaries. Pursuant to the act, the Federal Government constructed a dam, for flood control and power purposes, at Fort Gibson, Okla., on the Grand River, a non-navigable stream but a tributary of the Arkansas River which is navigable. The Grand River Dam Authority, a State of Oklahoma agency, planned a similar dam at Fort Gibson and had made preliminary surveys and acquired lands, easements, and rights-of-way prior to construction by the Federal Government. The Authority sued the Government seeking compensation, under the 5th amendment to the Constitution, for the taking of its water rights and its franchise to develop electric power at that site. The United States Court of Claims upheld the Authority's claim on the ground that while the right of a state to control and utilize the water of a non-navigable stream within its boundaries is subordinate to the right of the United States to control such waters to the fullest extent necessary to improve or regulate navigation on a navigable river to which the non-navigable stream is a tributary, if the Government's action results in the taking of private property, the United States must pay just compensation for the property so taken. And the Court of Claims found there was a taking because the State of Oklahoma, under its doctrine of prior appropriation for beneficial use, owns the waters of the Grand River, a non-navigable stream. *Grand River Dam Authority* v. *United States,* 175 F. Supp. 153, 155, 156, 157 (1959). On appeal, the judgment was reversed, the Supreme Court holding that when the United States appropriates the flow either of a navigable or a non-navigable stream pursuant to its superior power under the commerce clause, it is exercising established prerogatives and is beholden to no one. "The Court of Claims," it said, "erred in failing to distinguish between an appropriation of property and the frustration of an enterprise by reason of the exercise of a superior governmental power . . . . The United States did not appropriate any business, contract, land, or property of respondent . . . . The frustration . . . which resulted when the United States chose to undertake the project on its own account did not take property from respondent in the sense of the Fifth Amendment." *United States* v. *Grand River Dam Authority, supra,* at 233, 236.

1884—Doctrine of *The Daniel Ball* extended to include an artificial canal which forms a means of communication between ports and places in different states (*Ex parte Boyer,* 109 U.S. 629).

1940—Concept of navigability broadened to include waterways that may be made available for navigation through future reasonable improvements (*United States* v. *Appalachian Electric Power Co.,* 311 U.S. 377).

1941—Navigability concept further broadened to include the non-navigable upper reaches of an entire watershed for the purpose of flood control and the promotion of navigation downstream (*Oklahoma* v. *Atkinson Co.,* 313 U.S. 508).

435. Some Indicia of Navigability

Besides the legal tests of navigability which the Supreme Court reemphasized in the *Appalachian* case (*see* note 83 *supra*), there are other indicia which courts have applied to particular situations. The important difference between navigable and non-navigable bodies of water is in the right of the public to use them. Where the stream in question is not navigable the overwhelming weight of authority is to the effect that the owner of the land in which the waterway is located has complete control over the stream, to the exclusion of everyone else. In the case of navigable streams, while the state laws differ as to ownership of the beds, they are in agreement as to the public right of passage, regardless of who owns the beds.

The basic test of navigability of waters in the United States is whether they are navigable in fact, without regard to tidal flow. But irrespective of whether the tidal test of navigability is recognized or rejected, all tidewater is prima facie navigable. This presumption, however, is not conclusive, and a river, creek, or inlet into which the tide flows is not navigable unless it is actually adapted for public navigation.[88] Where the tidal test is applied, tide waters are those in which the tide ordinarily ebbs and flows, including the sea, and also bays, rivers, and creeks, so far as they answer this description. A body of water cannot be considered as tidal merely because under unusual conditions the level of the water is affected by the tide, nor is the amount of salt in the water at the place in question material.[89] And it is immaterial whether current is present, as where the water is a bayou of a navigable river.[90] A stream or other body of water

88. *Van Cortlandt* v. *New York Cent. R. Co.,* 250 N.Y. Supp. 298 (1931). The court here said: "The fact that the tide ebbs and flows thereon does not necessarily tend to demonstrate its navigable character." *Id.* at 305. However, there are some jurisdictions that recognize only the tidal test as determinative of whether the waters are public or private. And a waterway though navigable in fact but not subject to tidal influence would not be a public water. This is the law in New Jersey as expressed in the case of *Schultz* v. *Wilson,* 131 A. 2d 415, 420 (1957). State sovereignty over submerged lands is determined by the same test in New Jersey. *Id.* at 423.

89. Tiffany, A Treatise on the Modern Law of Real Property 591 (1912).

90. *Turner* v. *Holland,* 33 N.W. 283, 289 (1887) (Mich.).

is not made non-navigable by the presence of obstructions such as falls, rapids, and sandbars;[91] and waters navigable at high tide but not at low tide are still navigable.[92]

A test of navigability frequently applied is whether the stream or other body of water, by its depth, width, and location is rendered available for commerce, whether or not it is actually so used. The ease or difficulty of navigation is not controlling, and it is immaterial what kind of vessels are or can be employed, or whether the stream is used by boats or rafts or for floating logs.[93]

Another test sometimes recognized is that the stream or waterway must lead from one public terminus to another either alone or in connection with other waters, or at least the existence or absence of such termini or connection is a factor to be considered in passing on the question of navigability.[94]

(*a*) *Proof of Navigability.*—The navigability or non-navigability of a body of water is ordinarily a question of fact to be established by appropriate evidence, including opinions of persons who by training and experience are competent, and to be resolved by a jury. This is particularly true where navigability is doubtful. But where the facts are undisputed or ascertained, the question may be one of law.[95] However, courts will take judicial notice of the navigability of streams constituting great national highways of commerce, as well as the navigability or non-navigability of smaller streams within its jurisdiction.[96]

(*b*) *Public Use of Navigable Waters.*—Navigability, when asserted as a right arising under the Constitution of the United States, under an international treaty, or under a federal statute, is determined according to federal law. But when these are not involved, then the law of the place where the lands are situated governs. These laws are not uniform. The law seems generally clear that the public right of navigation extends to a new navigable channel over the land of a person who has obstructed the flow of water in the original channel, and to a stream as improved by straightening and deepening, as well as a slip

91. *United States* v. *State of Utah*, 283 U.S. 64, 86 (1931).

92. *Oakland* v. *Oakland Waterfront Co.*, 50 Pac. 277, 285 (1897) (Calif.).

93. *United States* v. *State of Utah, supra* note 91, at 82; *Wisconsin Public Service Corp.* v. *Federal Power Commission*, 147 F. 2d 743, 747 (1945).

94. *Taylor Fishing Club* v. *Hammett*, 88 S.W. 2d 127, 129 (1925) (Tex.).

95. *Coates* v. *United States*, 110 F. Supp. 471 (1953). The nautical charts and hydrographic surveys of the Coast and Geodetic Survey showing depths, width, and location of a body of water would be taken into consideration in appraising the evidence of navigability and in establishing its capability of use for transportation and commerce. And where the tidal test prevails, as in New Jersey (*see* note 88 *supra*), the tidal records of the Bureau could be a controlling factor.

96. In *Continental Land Co.* v. *United States*, 88 F. 2d 104, 108 (1937), a Federal court took judicial notice that the Columbia River is a navigable stream in fact as well as in law. On considerations of actual capacity and utility for purposes of navigation, numerous specific rivers and waters have been declared to be navigable, or public, either in whole or in part. These are set out in 65 *Corpus Juris Secundum*, at 58–60.

after it has been widened and lengthened. But where navigable water is created by the work of man out of privately owned land, the decisions are not in agreement.[97]

The public use of navigable waters is entirely separate and distinct from the rights of the owner of the land under water. And this is true whether ownership of such land remains in the state or has been conveyed to private individuals. *Lewis Blue Point Oyster Cultivation Co.* v. *Briggs,* 229 U.S. 82 (1913).

(*c*) *Public Use of Shores.*—The public has a right, equal with the riparian owner, to a reasonable use of the shore of a tidal stream between high- and low-water marks. And where the shore belongs to the state, the public right to use it extends to all lands below high-water mark not used, built on, or occupied. *Rhode Island Motor Co.* v. *Providence,* 55 Atl. 696 (1903). But these rights have been said to be of a restricted nature and include only passing, fishing, bathing, hunting, and navigation. *People* v. *Brennan,* 255 N.Y. Supp. 331, 334 (1931).

44. RIPARIAN RIGHTS

Another of the legal aspects of the Bureau's work, which flows from the nature of its work and the area in which it operates, is in the field of riparian rights—that is, rights inherent in the ownership of lands bordering navigable waters. Broadly speaking, these rights include ownership of the strip of land between high and low water, commonly known as the shore (beach) or tidelands, and this will be discussed first.

97. Thus, in New Jersey it was held that where the waters of a lake were so raised by a dam built across its outlet that a swamp about 3,000 feet long and from 200 to 500 feet wide, which had previously been separated from the lake by a causeway, was flooded to a depth of 3 feet at high water, the right of the public to navigate the lake proper did not extend to the swamps on its being flooded, and that the public was without right to navigate the channel dredged across it. *King* v. *Muller,* 67 Atl. 380, 384 (1907). On the other hand, in Wisconsin it was held that "When the owner of the land raised the lake level so as to cover it, such land immediately became subject to use by the public as a part of the natural lake bed . . . by the same right that the public used any other part of the lake . . . . The principle is well settled that if the volume or expanse of navigable waters be increased artificially, the public right is correspondingly increased." *Village of Pewaukee* v. *Savoy,* 70 N.W. 436, 438 (1899). The doctrine of this case was applied to a situation where a man-made harbor (created out of land in private ownership) that opened on Long Island Sound, on the ground that one who creates, or allows to continue, a condition whereby his land is submerged by navigable waters which the public may reach without trespassing on his upland, should be required to accept the public right of navigation as a legal concomitant of that condition. And this appears to be the rule in the majority of jurisdictions. *People of the State of New York* v. *Kraemer, et al.,* 164 N.Y.S. 2d 423, 431 (1957). This right includes the right to anchor. *Id.* at 433. The court in this case took judicial notice of the *Coast Pilots* of the Coast Survey describing the area in question. *Id.* at 426–427.

441. The Shore Lands or Tidelands

The Bureau receives many inquiries pertaining to this subject. Many of these carry the impression that the Federal Government as such is the owner of the shore as well as the lands underlying navigable waters, probably arising from the fact that it exercises control over such waters or because it surveys and charts such areas. To clarify this it is necessary to go back to the historical development of our country and to the relationship existing between the several states and the Federal Government (*see* 211).

The English possessions in America were claimed by right of discovery by subjects of the King in trust for the people. After the American Revolution the Thirteen Original Colonies became sovereign states and, as successors to the Crown, became vested with the title to all lands within their boundaries, including those over which the tide ebbed and flowed and to the beds of inland navigable waters.

With the adoption of the Constitution and the formation of the Federal Government, the latter succeeded only to such rights as the states chose to surrender. The primary purpose was to carve from the general mass of legislative powers then possessed by the states such portions as were thought desirable to vest in the central government, leaving those not included in the enumeration still in the states (*see* 2111). While the right to regulate commerce was expressly conferred, and impliedly the concomitant right to control navigation, no title to the tidelands nor to the submerged lands under navigable inland waters was thereby conferred. As the United States Government is one of delegated, limited, and enumerated powers, any power not expressly granted or necessarily implied in the Constitution is beyond its scope. These therefore remained in the several states, to be disposed of by them as they deemed fit, or to be reserved for their own uses, subject generally to the public rights of navigation and fishing. New states, entering the Union subsequent to the adoption of the Constitution, were admitted on an equal footing with the Original States (*see* 341) and therefore acquired the same rights in the tidelands and submerged lands under inland navigable waters.[98]

Each state has dealt with this matter according to its own views of justice and policy, some retaining title in such lands, while others have recognized them as appurtenant to the upland, and still others have granted rights therein

98. These doctrines were laid down by the Supreme Court in two early cases that have become landmarks in the field of riparian law—*Martin* v. *Waddell,* 16 Pet. 367 (41 U.S., 1842), involved the ownership of an oyster bed in Raritan Bay, N.J. (one of the Original States); and *Pollard's Lessee* v. *Hagan,* 3 How. 212 (44 U.S., 1845), involved ownership of tidelands along Mobile River, Ala. (one of the subsequently admitted states).

to individuals, independent of the ownership of the uplands. For example, in Massachusetts, by virtue of an old colonial ordinance dating back to 1641–1647, the title of the owner of land bounded by tidewater extends from high-water mark over the shore or flats to low-water mark, if not beyond 100 rods (1,650 feet) from the high-water mark.[99] On the other hand, in New Jersey the courts have held that a riparian owner owns to high-water mark and that the state can convey the land between the high- and low-water marks to anyone free from any rights of the abutting upland owner.[100] And in Virginia the upland owner has title to ordinary low-water mark.[101]

(*a*) *The Rule in the Federal Courts.*—The rule in the Federal courts as to title to the shore lands and the right of alienation by the state is that the titles are in the several states, subject to the powers granted to the Federal Government for regulating and improving navigation, but that the policies to be followed in granting rights in the shore lands to individuals, and the effect of such grants, must be determined by the states themselves through their legislatures and courts. This was stated by the Supreme Court in the leading and oft-cited case of *Shively* v. *Bowlby*.[102] After a thorough review of the authorities, including the laws in the Original States as to ownership of the shore and the rights of an upland owner, the Court summarized its findings as follows:

> Lands under tide waters are incapable of cultivation or improvement in the manner of lands above high water mark. They are of great value to the public for the purposes of commerce, navigation and fishery. Their improvement by individuals, when permitted, is incidental or subordinate to the public use and right. Therefore the title and the control of them are vested in the sovereign for the benefit of the whole people.
>
> At common law [*see* 251], the title and the dominion in lands flowed by the tide were in the King for the benefit of the nation. Upon the settlement of the Colonies, like rights passed to the grantees in the royal charters, in trust for the communities to be established. Upon the American Revolution, these rights, charged with a like trust, were vested in the

99. *Iris* v. *Town of Hingham*, 22 N.E. 2d 13, 15 (1939) (Mass.). Grants made by the colony prior to the adoption of the ordinance ran only to high-water mark.

100. The New Jersey law with reference to grants in the shore was reviewed by the Supreme Court of the United States in *Hoboken* v. *Pennsylvania Railroad Co.*, 124 U.S. 656 (1888), and the right of the state to make such grants upheld. The Court stated: "the lands below high-water mark, constituting the shores and submerged lands of the navigable waters of the State, were, according to its laws, the property of the State as Sovereign. Over these lands it had absolute and exclusive dominion, including the right to appropriate them to such uses as might best serve its views of the public interest." *Id.* at 688. In New Jersey, as in almost all states, the boundary of upland bordering the sea is the ordinary high-water mark (*see* note 104 *infra*).

101. *Miller* v. *Commonwealth*, 166 S.E. 557 (1932) (Va.). The court stated the rule in Virginia as follows: "Wherever the land granted was bounded by a tidal water so as, under the common law [*see* 251], to pass title to high-water mark, this act [Act of Feb. 16, 1819] extended the limits of the grant to ordinary low-water mark." *Id.* at 566.

102. *Shively* v. *Bowlby*, 152 U.S. 1 (1894). The case involved the question of the effect of a grant by the United States of certain lands below high-water mark along the Columbia River, Oreg., while Oregon was still a territory, as against deeds of conveyance to the same lands from the state (*see* note 103 *infra*).

original States within their respective borders, subject to the rights surrendered by the Constitution of the United States.

Upon the acquisition of a Territory by the United States, whether by cession from one of the States, or by treaty with a foreign country, or by discovery and settlement, the same title and dominion passed to the United States, for the benefit of the whole people, and in trust for the several States to be ultimately created out of the Territory.

The new States admitted into the Union since the adoption of the Constitution have the same rights as the original States in the tide waters, and in the lands under them, within their respective jurisdictions. The title and rights of riparian or littoral proprietors in the soil below high water mark, therefore, are governed by the laws of the several States, subject to the rights granted to the United States by the Constitution.

The United States, while they hold the country as a Territory, having all the powers both of national and of municipal government, may grant, for appropriate purposes, titles or rights in the soil below high water mark of tide waters. But they have never done so by general laws; and, unless in some case of international duty or public exigency, have acted upon the policy, as most in accordance with the interest of the people and with the object for which the Territories were acquired, of leaving the administration and disposition of the sovereign rights in navigable waters, and in the soil under them, to the control of the States, respectively, when organized and admitted into the Union.[108]

Except in matters governed by the Federal Constitution or by acts of Congress, the law to be applied by the Federal courts is the law of the state, and decisions of the highest state courts are a part of such law (*see* 23 and text at note 32 thereof). And in the *Shively* case, *supra,* the Court held that the title and rights of riparian or littoral proprietors in the soil below high-water mark of navigable waters are governed by the local laws of the several states, subject to the rights granted to the United States by the Constitution.[104]

103. *Id.* at 57. The Supreme Court affirmed the finding of the Oregon court that the grant from the United States passed no title or right, as against the subsequent deeds from the state, in lands below high-water mark, stating that "Grants by Congress of portions of the public lands within a Territory to settlers thereon, though bordering on or bounded by navigable waters, convey, of their own force, no title or right below high water mark, and do not impair the title and dominion of the future State when created; but leave the question of the use of the shores by the owners of the uplands to the sovereign control of each State, subject only to the rights vested by the Constitution in the United States." *Id.* at 58.

104. *Diversity of State Laws.*—A useful compilation of the laws in the various states dealing with ownership of shore lands, and other riparian matters was made in 1960 by Col. H. C. Gee for the American Society of Civil Engineers and embodied in a report entitled "State Regulation of Coastal Structures." The report is based on a questionnaire sent to the governors and attorney generals of the 30 coastal states of the Union bordering on the Great Lakes, the Atlantic Ocean, the Gulf of Mexico, and the Pacific Ocean. Six questions were propounded dealing with the following matters: (1) the upland boundary of tidal and submerged coastal lands of the state, (2) the name and address of the agency which administers tidal and submerged lands for the state, (3) the rights of the upland owner in the adjoining submerged lands of the state, (4) a citation of laws designed to protect an upland owner against damage caused by a neighbor, (5) the delegation of authority by the sovereign state to any subordinate political subdivision in the general field of coastal engineering, and (6) provisions of laws of the various states dealing with the protection of sovereign rights in bottom lands under tidal waters.

As an indication of the absence of uniformity in state laws, the report cites the answers to question (1) which showed the following: Of the seven Great Lakes states, four use the water's edge, one the low-water mark, one the high-water mark, and one ordinary high water; of the five Pacific Ocean states, four use mean high water and one, Alaska, uses mean low water; of the five Gulf states, two use mean high water, one uses lower high water, one highest water during winter, and one mean higher high water; and

442. Nature of Riparian Rights

The owner of land contiguous to a navigable body of water acquires by virtue of that ownership certain rights—termed riparian rights—which include principally the right of access to the navigable waters; the right to build piers, wharves, docks, and other improvements to the line of navigation; the right to reclaim land; and the right to accretions to his lands.[105] These rights do not depend upon ownership of the soil under water but upon lateral contact with the water. It is a universal rule that for riparian rights to attach to a tract of land, the water must form a boundary of the tract. And if a particular tract is entirely cut off from a river by an intervening tract and the latter is gradually washed away until the remoter tract is reached by the river, the remoter tract becomes riparian as much as if it had been originally such.[106] In common with the public, a riparian owner enjoys the right of navigation, bathing, and fishing in such waters, as well as in the foreshore.

4421. *The Right of Access*

The right of access to navigable water is a fundamental riparian right which a riparian or littoral owner has, in the absence of an otherwise controlling local law limiting such right. This is distinct from, and in addition to, the general right of the public to use such waters, or to use the beach.[107] The right of access has been held to be the basis for recognizing the doctrine of accretion.[108] It

of the 15 Atlantic states, eight use mean high water and seven use mean low water, with one of the latter group, Maryland, using mean high water for Chesapeake Bay.

The answers to question (3) showed that all but four states recognize that upland owners have rights of ingress and egress, fishing, hunting, boating and wharfage on the navigable waters covering the adjoining submerged land. A majority of the states also recognizes that the public has certain rights on and over the tidal land which include free and unrestricted passage along the shore of tidal waters between mean high water and mean low water.

The report contains a tabular summary of the replies to questions (1) through (5), and an Appendix giving in detail the reply of each of the 30 states to the six questions propounded.

A copy of this report was furnished the author by Colonel Gee, with permission to use all or any part of it. The report is filed in the Coast Survey library and is identified as Accession No. 62516.

105. While the word "ripa," which is the foundation of the word "riparian," properly means "banks," as distinguished from "shores of the sea," the word in its general use is broad enough to cover ownership of land in both situations, and the rights upon both kinds of water are of the same nature. Farnham, 1 The Law of Waters and Water Rights 281 (1904). The word "littoral" is often used with respect to sea waters or the waters of a lake.

106. *Welles* v. *Bailey, supra* note 70, at 566.

107. *United States* v. *River Rouge Imp. Co.*, 269 U.S. 411 (1926).

108. In *Lamprey* v. *State and Metcalf*, 53 N.W. 1139, 1142 (1893) (Minn.), the court pointed out that the usual reason given for the right to accretion is that the riparian owner is liable to lose soil by the action or encroachment of the water. "But it seems to us," the court said, "that the rule rests upon a much broader principle, and has a much more important purpose in view, viz. to preserve the fundamental riparian right—on which all others depend, and which often constitutes the principal value of land—of access to the water." (*See also* text at note 120 *infra*.)

attaches to the entire frontage of the riparian owner and does not ordinarily depend on the ownership of the lands between low-water mark and the line of navigability, or of land below high-water mark.

(*a*) *Wharfing Out.*—The right of access includes the right to wharf out to deep water—that is, the right to construct and maintain a wharf, dock, or pier from his land to the navigable portion of adjoining waters—subject to the general rules imposed by the legislature (*see* 443).[109] This right has been placed on various grounds. One is that the riparian owner's right of access includes the right to connect his waterfront with the point of navigability.[110] It has also been placed on the ground that the owner of the upland has a qualified interest in the soil under the edge of the water at the shore, so as to give him a right to construct and maintain piers.[111] The doctrine has also been placed on the ground of usage. The limitation upon the right to construct wharves and piers is that they must not unreasonably interfere with the right of public navigation. Where a wharf is to be constructed in a navigable water of the United States (*see* 4331), permission from the Secretary of War must first be obtained, but such license does not authorize the erection without the consent of the state or its grantee which owns the land under water.[112] And where the act of Congress requires affirmative authorization by Congress before wharves may be erected to new harbor lines established by the Secretary of War, such establishment is not in itself a sufficient authorization.[113]

(*b*) *Use of Shores by Riparian Owner.*—Generally a riparian owner has the right to the exclusive use of the land between high- and low-water marks (the shore), and he may use it in any way not inconsistent with the public right of navigation nor inconsistent with the rights of other riparian owners. And where the seashore belongs to the state, the public right to use it for passage,

109. A *wharf* is an artificial landing place for the purpose of loading or unloading goods. It may be built out from the upland and form an extension thereof or it may be made on the land at the water's edge. A *dock* is an artificial basin or inclosure in connection with a harbor, for the reception of vessels; the slip or waterway extending between two piers or projecting wharves, or cut into the land for the reception of ships. A *pier,* in its customary sense, means a structure extending from the solid land out into the water to afford convenient passage for persons and property to and from vessels alongside the pier. In this sense, it is the same as a projecting wharf. 94 *Corpus Juris Secundum,* at 567, 568, 570.

110. *Miller* v. *Mendenhall,* 44 N.W. 1141 (1890) (Minn.). The court in this case said "the right of access and communication with the navigable waters, which pertain peculiarly to the ownership of the upland . . . necessarily includes the right to fill in and to build wharves and other structures in the shallow water in front of such land, and below low-water mark, and the exercise of such rights, though subject to state regulation, can only be interfered with for public purposes." *Ibid.*

111. *Tuck* v. *Olds,* 29 Fed. 738 (1886).

112. It was held in *Strandholm* v. *Barbey,* 26 P. 2d 46, 52 (1933) (Oreg.), that a license issued by the United States Engineers authorizing construction of a wharf on Sand Island, Oreg., was a mere declaration that the structure would not interfere with navigation, and not a declaration by authority of Congress that licensee could erect the wharf without first obtaining authority from the State of Oregon.

113. *White, Gratwick & Mitchell* v. *Empire Engineering Co.,* 210 N.Y. Supp. 563 (1923).

navigation, and fishing extends to all lands below high-water mark not used, built on, or occupied.[114]

Where the riparian owner owns to low water, as in Massachusetts, the right to use of the shore is exclusive, subject to the public right of navigation until built on or enclosed. On this, the Supreme Court of the United States, in its interpretation of the decisions of the Massachusetts courts involving the ordinance of 1641–1647 (*see* text at note 99 *supra*), has said that the right of the owner of such land has always been subject to the following rule: "that until he [the owner] shall build upon his flats or inclose them, and whilst they are covered with the sea, all other persons have the right to use them for the ordinary purposes of navigation; so long as the owner of the flats permits the sea to flow over them, the individual right of property in the soil beneath does not restrain or abridge the public right." [115]

4422. *The Right to Reclaim Land*

In a number of states, the owner of land on tide water may make use of the shore, though it belongs to the state, for the purpose of reclaiming it to low-water mark, as long as it does not interfere with the public rights of fishing and navigation, and in so doing conforms to all regulations imposed by the state.[116] Where this has been complied with, the made land becomes an integral part of the owner's upland and his title will extend to the new high-water mark.[117]

4423. *The Right to Accretion*

One of the most valuable of rights that inures to the ownership of land bordering navigable waters is the right to preserve contact with the water by appropriating the accretions which form along the shore; that is, the right to the land formed by natural causes through the action of the water to which the land is contiguous. Such additions fall into two classes—accretion and reliction. With these will be considered the processes of erosion and avulsion, both of which effect a loss of riparian land. It is important for those dealing with these problems to be able to determine whether the changed condition

114. *Rhode Island Motor Co.* v. *Providence*, 55 Atl. 696 (1903) (R.I.).

115. *The City of Boston* v. *Lecraw*, 17 How. 426, 433 (58 U.S., 1855).

116. *Panama Ice & Fish Co.* v. *Atlanta & St. A.B. Ry. Co.*, 71 So. 608, 609 (1916) (Fla.).

117. *United States* v. *Mission Rock Co.*, 189 U.S. 391, 406 (1903). In California, the upland owner is entitled to accretion from natural causes alone, and all artificial fills belong to the state or its grantees. *Los Angeles* v. *Anderson*, 275 Pac. 789, 791 (1929).

of a stream or waterfront is due to any of these processes. This might require the use of extrinsic evidence (*see* text following note 122 *infra*).

(*a*) *Accretion.*—This is defined as the process of gradual and imperceptible addition to riparian land made by the water to which the land is contiguous.[118] The key words are "gradual and imperceptible." If the addition is not of this character, then it is not accretion. The addition must be so gradual that no one can tell how much is added at each moment of time. A test frequently used as to what is gradual and imperceptible is that although the witnesses may see from time to time that progress has been made, they could not perceive it while the process was going on.[119] The law on the subject is based on the impossibility of identifying from day to day small additions or subtractions from land caused by the constant action of running water.

The case for the doctrine of accretion has been stated by the Minnesota court, in applying the rule to an inland lake, to be as follows: "The incalculable mischiefs that would follow if a riparian owner is liable to be cut off from access to the water, and another owner sandwiched in between him and it, whenever the water line had been changed by accretions or relictions, are self-evident, and have been frequently animadverted on by the courts . . . . If the rule contended for by the appellants is to prevail, it would simply open the door for prowling speculators to step in and acquire title from the state to any relictions produced in the course of time by the recession of the water, and thus deprive the owner of the original shore estate of all riparian rights, including that of access to the water (*see* note 108 *supra*). The endless litigation over the location of the original water lines, and the grievous practical injustice to the owner of the original riparian estate, that would follow, would, of themselves, be a sufficient reason for refusing to adopt any such doctrine." [120]

Accretion is to be distinguished from "alluvion." While the terms are frequently used synonymously, a more accurate usage would be to consider accretion as the act or process and alluvion as the deposit itself.[121]

118. *Crow* v. *Johnston,* 194 S.W. 2d 193, 196 (1946) (Ark.). Accreted lands are additions to areas of realty from gradual deposit by water of solid material, whether mud, sand, or sediment, producing dry land which before was covered by water, along banks of navigable streams. *Smith* v. *Whitney,* 74 P. 2d 450, 453 (1937) (Mont.). The term "accretion" includes sediment and silt deposited on the riparian owner's land as well as that deposited along the shore. *Tallassee Power Co.* v. *Clark,* 77 F. 2d 601, 604 (1935).

119. *Crow* v. *Johnston, supra* note 118, at 196. The word "imperceptible" means that the addition is such that its progress is not perceptible, although the fact of the addition may be perceptible after a long lapse of time.

120. *Lamprey* v. *State and Metcalf, supra* note 108, at 1142.

121. *Cunningham* v. *Prevow,* 192 S.W. 2d 338, 341 (1945) (Tenn.). "Batture" is a term used to denote an elevation of the bed of a river under the surface of the water, and sometimes used to signify the same elevation when it has risen above the surface. *Conkey* v. *Knudsen,* 8 N.W. 2d 538, 541 (1943) (Neb.).

A variant of the accretion doctrine is where changes in shoreline are brought about by natural causes but induced by artificial structures, as, for example, where jetties or breakwaters have been built, and, thereafter, by gradual and imperceptible processes, accretions to the shoreline occur as a result of the artificial structures. The rule applied in the Federal courts is to treat such changes as natural accretions for the benefit of the adjacent riparian owner.[122]

In determining whether true accretion has taken place, sources of evidence frequently resorted to are topographic and hydrographic surveys showing conditions of the physical geography of our coasts at various dates and the nature and rate of change at a particular place. In *Rockaway Pacific Corp.* v. *State,* 203 N.Y. Supp. 279, 286 (1924), extensive use was made of the progressive surveys of the Coast Survey, dating back to the year 1835, to show the method of growth of Rockaway Point, Long Island. In finding that the Point grew westward as a result of true accretion, the court said, significantly: "We are firmly impressed . . . by the vast amount of documentary evidence introduced, including maps and charts of all kinds, that for a considerable period of time . . . the growth of Rockaway peninsula to the west had been by the continual and gradual process of accretion." (*See* 413.)[123]

In *Horne* v. *Howe Lumber Co.,* 190 S.W. 2d 7, 10 (1945) (Ark.), it was held that the evidence, including plat of the original survey made by the Federal Government in 1825 and geodetic surveys made by the War Department, established that the land in controversy resulted from accretion.

(*b*) *Reliction.*—Reliction (or dereliction) is the term applied to land that has been covered by water but which has become uncovered by the recession of the water from the land, due, for example, to a lowering of sea level, or, in the case of a lake, to the drying up of the bed.[124] As in the case of accretion, the recession of the water must be gradual and imperceptible. Temporary subsidence of the water due to the seasons does not constitute reliction. Although, technically speaking, land uncovered by a gradual subsidence of the water is not an accretion but a reliction, the terms are often used interchangeably, and the law relating to accretions applies in all its features to relictions.[125]

122. *County of St. Clair* v. *Lovingston,* 23 Wall. 46, 66–69 (90 U.S., 1874). In California, a different rule is applied, with accretions so added being regarded as artificial in character, and, as against the state or its grantee, the riparian owner is not entitled to claim such accretion (*see* note 117 *supra*). *Carpenter* v. *City of Santa Monica,* 147 P. 2d 964, 972–975 (1944).

123. Copies of Bureau charts and surveys used in this litigation are contained in the brief for the Rockaway Pacific Corp., filed in the Supreme Court of the State of New York (Appellate Division), a copy of which has been placed in the Coast Survey library and identified as Accession No. 62517.

124. *McClure* v. *Couch,* 188 S.W. 2d 550, 553 (1945) (Tenn.).

125. *Hanson* v. *Thornton,* 179 Pac. 494, 496 (1919) (Oreg.).

(*c*) *Erosion.*—The rule which operates in favor of a riparian owner, increasing his land holding as a result of accretion or reliction, also operates against him when the water by slow process encroaches on his land. Such process is known as erosion or submergence. It is sometimes given as the justification for the doctrine of accretion, since a riparian owner must run the risk of losing some of his land by erosion (*see* note 108 *supra*). Erosion has been defined judicially as the gradual eating away of a riparian or littoral owner's soil by the operation of currents or tides.[126] Where a riparian tract completely disappears by erosion so that an adjoining nonriparian tract becomes adjacent to the water, the latter tract becomes riparian and the new tract carries with it all the riparian rights that the original tract had.[127]

(*d*) *Avulsion.*—Avulsion has been defined as the loss of lands, such as those bordering on the seashore, by sudden or violent action of the elements, perceptible while in progress.[128] The property of the part thus separated continues in the original proprietor, and in this respect avulsion differs from accretion in that in the latter case the addition becomes the property of the owner of the lands to which the addition is made.[129] Where running streams are the boundaries between states, the same rule applies as between private proprietors, and, if the stream from any cause, natural or artificial, suddenly leaves its old bed and forms a new one by the process of avulsion, the resulting change of channel works no change of boundary, which remains in the middle of the old channel though no water may be flowing in it, and irrespective of subsequent changes in the new channel.[130]

126. *Michelson* v. *Leskowicz,* 55 N.Y.S. 2d 831, 838 (1945).

127. *Welles* v. *Bailey, supra* note 70, at 566. The owners of land submerged by the creation of a navigable lake by an earthquake have been held not to lose title to their tracts as long as they can be reasonably identified. *State* v. *West Tennessee Land Co.,* 158 S.W. 746, 752 (1913) (Tenn.). The court found no existing precedent for this situation, but it did find that many of the boundary monuments of the various tracts could be identified in the clear waters of the lake.

128. *Schwartzstein* v. *B.B. Bathing Park,* 197 N.Y. Supp. 490, 492 (1922). Accretion, reliction, and erosion are gradual processes, whereas avulsion is a sudden process.

129. *Rees* v. *McDaniel,* 21 S.W. 913, 915 (1893) (Mo.).

130. *Arkansas* v. *Tennessee,* 246 U.S. 158, 173 (1918). To constitute avulsion, rather than accretion, so as to preclude a change in the boundary, the general rule is that there must be a detachment of earth from one side of the river and a deposit of the same earth on the other side in such a manner that it can be identified as the land of the other owner. *Nebraska* v. *Iowa,* 143 U.S. 359, 366 (1892). But under a statute, it has been held that if the change is so sudden that the owner of the land washed away is able to point out approximately as much land added to the opposite bank as he had washed away, the doctrine of avulsion applies, and there is no change in the boundary line. *Willett* v. *Miller,* 55 P. 2d 90, 94 (1935) (Okl.). The decisions of the Supreme Court establish the following criteria for the differentiation between accretion and avulsion: (1) Due regard must be given to the speed of the accretion as well as the rapidity of the tearing down of the bank, and (2) that there must be conclusive evidence that the earth forming the new bank originated in the bank torn down. SKELTON, THE LEGAL ELEMENTS OF BOUNDARIES AND ADJACENT PROPERTIES 343 (1930).

A. DIVISION OF ACCRETIONS

In the division of accretions between riparian owners, as with the apportionment of flats, dock privileges, made land, and similar rights, many nice questions have arisen which courts have frequently been called upon to resolve. To formulate a general rule, applicable to all situations, is virtually an impossibility because of the diversity and irregularity in the form of the seashore. Courts have recognized this. Therefore, the aim in all cases has been to apportion the accretions so as to do justice to each adjoining owner. The principle applied is to give to each proprietor a width at the new shoreline proportional to that which he had at the old shoreline before the accretion took place. This has been referred to as the "proportionate shoreline method."

In an early Massachusetts case, *Inhabitants of Deerfield* v. *Pliny Arms,* 34 Mass. 41, 45 (1835), the court stated the rule to be, as follows: "The rule is, 1. To measure the whole extent of the ancient bank or line of the river [usually the high-water shoreline], and compute how many rods, yards or feet, each riparian proprietor owned on the river line. 2. The next step is, supposing the former line, for instance, to amount to 200 rods, to divide the newly formed bank or river line into 200 equal parts, and appropriate to each proprietor as many portions of this new river line, as he owned rods on the old. Then, to complete the division, lines are to be drawn from the points at which the proprietors respectively bounded on the old, to the points thus determined as the points of division on the newly formed shore." [131]

While the above is the general rule, courts also recognize exceptions by taking into account particular circumstances. For example, where there is a deep indentation or a sharp projection on the original shoreline, the general line of the shore would be taken in computing the proportion, irrespective of the irregularity.[132]

The general rule for the division of accretions is equally applicable to the division of cove flats, where adjoining riparian owners are entitled to such flats under a statute. The boundary line of low-water mark (a line joining the headlands of the cove) is divided between the several riparian owners in proportion to their respective holdings at high-water mark. Thus, if the length

131. This doctrine was confirmed by the Supreme Court of the United States in *Johnston* v. *Jones,* 1 Bl. 209, 222 (66 U.S., 1861), and was cited in the more recent case of *Swarzwald* v. *Cooley,* 31 P. 2d 381, 383 (1934) (Calif). The new lines, thus formed, will be either parallel, divergent, or convergent, depending on whether the new shoreline equals, exceeds, or falls short of the old; that is, whether it is straight, convex, or concave. For illustrations of the proportionate shoreline method as applied to these three types of shoreline, *see* BROWN, BOUNDARY CONTROL AND LEGAL PRINCIPLES 206 (1957).

132. In apportioning accretions in a circular body of water, as where a lake has dried up, a method sometimes used is to draw radiating lines from the center of the lake to the terminal points of the various parcels of land at the old shoreline of the lake. *Scheifert* v. *Briegel,* 96 N.W. 44 (1903) (Minn.).

of the line of low water is 1,000 feet and the length of the line of high water is 2,000 feet, then each riparian owner would be entitled to one-half of the width of his high-water mark holding.[133]

443. Governing Laws

It was previously pointed out that rights of riparian or littoral proprietors in the soil below high-water mark are governed by the laws of the several states, subject to the powers granted to the Federal Government for regulating and improving navigation (*see* 441(*a*)).[134] While the principles of riparian rights are much the same in all the states where riparian lands exist, the extent of such rights is a matter governed by the statutes and court decisions of the various states, and these must be consulted as far as each particular state is concerned. For example, each state has power to settle for itself the title to land formed by accretion within its boundaries.[135]

It is sometimes thought that an owner of riparian lands has a right of access to the water as a matter of right, by reason of the contiguity of his lands to such waters, with the resultant right to build or wharf out to the line of navigation. This is the rule in some of the states; others give to the upland owner merely a preferential right to acquire same, but subjecting such lands to state regulation and control as far as placing any piers, wharves, or structures thereon, or making any other use thereof.[136]

133. *Rust* v. *Boston Mill Corp.*, 23 Mass. 158 (1828); *Wonson* v. *Wonson*, 96 Mass. 71 (1867) (this deals with a situation where the low-water mark extends beyond the headlands of the cove). A variant of this rule, applicable under certain conditions, is to run a base line across the mouth of the cove and from the terminals of the various parcels at high-water mark draw lines at right angles to the base line. *Gray* v. *Deluce*, 59 Mass. 9 (1849). For a comprehensive treatment of the surveying and legal aspects of division of accretions; apportionment of navigable waters; division of docking privileges; division of flats, coves, and lakes; and related matters, including many illustrations and citations to adjudicated cases, *see* Clark, A Treatise on the Law of Surveying and Boundaries (2d ed.) Chap. 14 (1939).

134. Wherever a federal question is involved, federal, not state, law applies. *Borax Consolidated, Ltd.* v. *Los Angeles*, 296 U.S. 10, 22 (1935).

135. *Iowa* v. *Carr*, 191 Fed. 257, 261 (1911).

136. For a discussion of this phase of riparian rights, *see* Brown, Shore Control and Port Administration 61–72, Corps of Engineers, U.S. Army (1923). A summary outline of the rights of riparian owners, in 39 of the states in conterminous United States, is contained in Clark, A Treatise on the Law of Surveying and Boundaries (3d ed.) 618–627 (1959).