TOWARDS AN OBJECTIVE ANALYSIS OF SPECIAL CIRCUMSTANCES

BAYS, RIVERS, COASTAL AND OCEANIC ARCHIPELAGOS AND ATOLLS

by

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and

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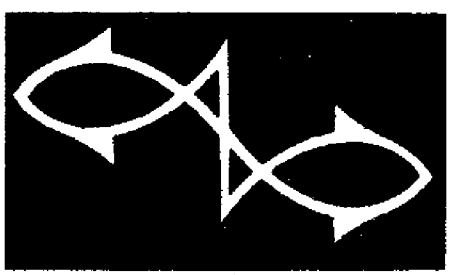

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The Law of the Sea Institute - University of Rhode Island, Kingston, Rhode Island

TOWARDS AN OBJECTIVE ANALYSIS OF SPECIAL CIRCUMSTANCES

Bays, Rivers, Coastal and Oceanic Archipelagos and Atolls

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INTRODUCTION

The measurement of the territorial sea of any state would be a relatively simple, almost mechanical, operation were the low water coastline of a state to constitute the sole baseline from which the territorial sea could be measured. International law and custom, however, have provided for many exceptions to an absolute rule of mainland shoreline. Certain of these anomalies are codified and are considered to be conformable, even though they do constitute "special circumstances". They are, in effect, aberrations to the use of the natural coastal baseline of a state for the purpose of determining the territorial sea of that state.

The 1958 Geneva Convention on the Territorial Sea and the Contiguous Zone specifically deals with certain of these special circumstances. By no means does the Convention hint of all variations which states have claimed to date, and probably will conceive in the future. Nevertheless, the special circumstances which have been raised at Geneva concern:

1) closing lines for rivers;
2) closing lines for legal bays;
3) means to treat over-large bays;
4) straight baselines for deeply indented and cut into coasts;
5) straight baselines for fringing islands, i.e. coastal archipelagos;
6) other islands, islets and drying rocks as basepoints;
7) historic bays as internal waters; and
8) waters involving a dominant historic-economic dependence of the local inhabitants

Other instances of special circumstances have been raised by states and by courts in their attempts to ajudicate disputes over and under the seas. The International Court of Justice in the North Sea Cases, and the International Law Commission in the preparatory work for the Convention and the Convention on the Continental Shelf, have dealt with special circumstances. One of the most difficult of those discussed, but not settled by the Commission, concerned mid-oceanic archipelagos.

The authors hope to discuss eventually the entire range of geographic and economic factors which may be considered to constitute special circumstances for the sea and the seabed. In this present paper, however, interest has been concentrated on four major geographic issues which the Convention on the Territorial Sea has failed to define precisely or which it has avoided entirely. These four issues are:

1) the determination of natural entrance points for bays and rivers in which the language of the Convention is subject to varying interpretations;

2) objective criteria for the construction of an equitable system of straight baselines about a coastal archipelago to supplement the vague guidelines;

3) a proposed system of baselines about a mid-oceanic archipelagos which preserve the geographic cohesion of the entity, while protecting the historic rights of passage; and

4) baselines about atolls, which were discussed by the International Law Commission but not by the Convention.

The issues are raised to determine if objective criteria and standards may be established to balance the historic interests of the coastal states with those of maritime nations. Most of the techniques have already been employed; some have many examples in state practices while others have had limited use. While several of the concepts have been utilized by departments of the United States Government, the authors advance them in this form in the hope that suggestions and comments from the readers may improve and clarify the techniques. The papers should not be deemed to represent official United States Government approval.

The basic rationale for claims to special circumstances, we believe, is not to extend greatly the claimed territorial sea of a coastal state. If this were indeed the basic intent, a coastal state would better and easier accomplish this effect by extending the breadth of its territorial sea. Rather, the condition of special circumstances aims to include primarily within the internal--and less rarely within the territorial--waters of a state adjacent areas of the sea which are closely dependent on, if not directly subject to, the regime of the land. Special circumstances, in effect, are to be determined where the geography of the coastal or insular waters deviates markedly from the norm and where, for the sake of an equitable allocation, a special regime must be provided.

In virtually every instance, an artificial baseline must be provided to "close" these special waters.

Strohl, in The International Law of Bays, theorizes that "there lurks the thought provoking social question whether dominion over sheets of sea water near the coast stems from man's use and need for these waters or from his avarice or uncompromising desire for exclusive ownership."[1] There should be no cause for question or purpose, if "special circumstances" are applied in a proper manner. The land-sea relationships of the waters in question should constitute the proper basis for their incorporation within a state's domain.

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[1]Strohl, M. P., The International Law of Bays, p. 9, The Hague, 1963.

The Geneva Convention on the Territorial Sea and the Contiguous Zone provides in Articles 7 and 13 for the automatic, i.e. self-executing, closure of bays and rivers for the determination of the baseline from which the breadth of the territorial sea is measured.[2] In contrast, Article 4 requires that straight baselines be plotted on official charts to which due publicity must be given. The configuration of bays is generally delimited in both shape and size while the rivers must rely on the general understanding of their nature. No specific dimensions of configurations are noted in the Convention with respect to rivers except that they must flow directly into the sea, i.e. not through a bay or an estuary. While certain other features may presumably be confused with rivers, the problems obviously did not trouble the negotiators and need not be deemed serious. Article 13 states simply "If a river flows directly into the sea, the baseline shall be a straight line across the mouth of the river between points on the low-tide line of its banks." No width maximum is noted and, for major rivers such as the St. Lawrence or the Amazon, the length of line could presumably exceed the maximum limit specified for a bay-closing line.

A major problem remains without guidance: If these features are enclosed automatically by baselines into the internal waters of a coastal state without the need for enactment into public law and without the need to be published on official, publicized charts of the state, how may a mariner know, without question, the precise position of the closing line? A glance at any chart will show a multiple choice for closure and the selection of the wrong line could result in the violation of the territorial sea of the coastal state. There is no doubt, as a result, that objective criteria must be established for the proper selection of the sole, correct closing line or the Convention must be changed to require the lines to be charted by the coastal state.

BAYS

The principal problem involves the selection of the "natural entrance points" of bays. From the language of the Convention and the earlier Report of the Committee of Experts, it appears obvious that bays are defined as two dimensional phenomena which exist along the shores of a coastal state; the depth of the water contained within the feature is essentially irrelevant. Nowhere does the Convention require that a bay be navigable; in fact, in discussing bays, the Committee of Experts never mentioned either depth of water or navigability as criteria for the definition of a bay.[3] Both non-navigable and navigable bays may be enclosed if they meet other criteria.

The two-dimensionality factor, however, is essential, we believe, for the determination of area to meet the requirements specified in Article 7. These points were discussed in full by the Committee of Experts and later by the International Law Commission. The final language of the Geneva Convention Article on bays states:

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[2]Bays and rivers are not closed by the Convention. A coastal state must declare or legislate the provisions of the Articles. The state, however, does not have to publish the closing lines.

[3]UNGA A/CN. 4/61/Add 1, 18 May 1953; International Law Commission Fifth Session, Addendum to the Second Report of the Regime of the Territorial Sea by J.P.A. Francois, Special Rapporteur.

Article 7

1. This article relates only to bays the coasts of which belong to a single State.[4]

2. For the purposes of these articles, a bay is a well-marked indentation whose penetration is in such proportion to the width of its mouth as to contain landlocked waters and constitute more than a mere curvature of the coast. An indentation shall not, however, be regarded as a bay unless its area is as large as, or larger than, that of the semi-circle whose diameter is a line drawn across the mouth of that indentation.

3. For the purpose of measurement, the area of an indentation is that lying between the low-water mark around the shore of the indentation and a line joining the low-water marks of its natural entrance points. Where, because of the presence of islands, an indentation has more than one mouth, the semi-circle shall be drawn on a line as long as the sum total of the lengths of the lines across the different mouths. Islands within an indentation shall be included as if they were part of the water area of the indentation.

4. If the distance between the low-water marks of the natural entrance points of a bay does not exceed twenty-four miles, a closing line may be drawn between these two low-water marks, and the waters enclosed thereby shall be considered as internal waters.

5. Where the distance between the low-water marks of the natural entrance points of a bay exceeds twenty-four miles, a straight baseline of twenty-four miles shall be drawn within the bay in such a manner as to enclose the maximum area of water that is possible with a line of that length.

6. The foregoing provisions shall not apply to so-called "historic" bays, or in any case where the straight baseline system provided for in Article 4 is applied.

A. Well-marked indentation of the coast

The first criterion for the determination of a bay is that it constitute a well-marked indentation of the coast. A major change in direction will not suffice; the bay must "constitute more than a mere curvature of the coast". A minimum objective test of the status is essential and is furnished with the Convention's semi-circular rule which determines the point. The rule is illustrated in Figure 1.

In this simplified illustration no question appears to exist on the landward limits of the bay. Practically, however, certain questions can and do arise. Man has conceptualized geographic features and assigned to them common generics to express these points of commonality. "River", for example as a generic term, evokes in the minds of the user or the reader certain physical characteristics, i.e. water flowing from 1) a higher elevation to a lower; 2) between parallel banks; and 3) of a magnitude greater than a run, creek or rill. These common factions constitute an irreducible minima in the character of "Riverness". In the Covention on the Territorial Sea and the Contiguous Zone, bays alone are discussed are not subsidiary features or tributary waters. The logic of the limitation appears obvious. If tributary waters could be included, a major

[4]Underlining supplied.

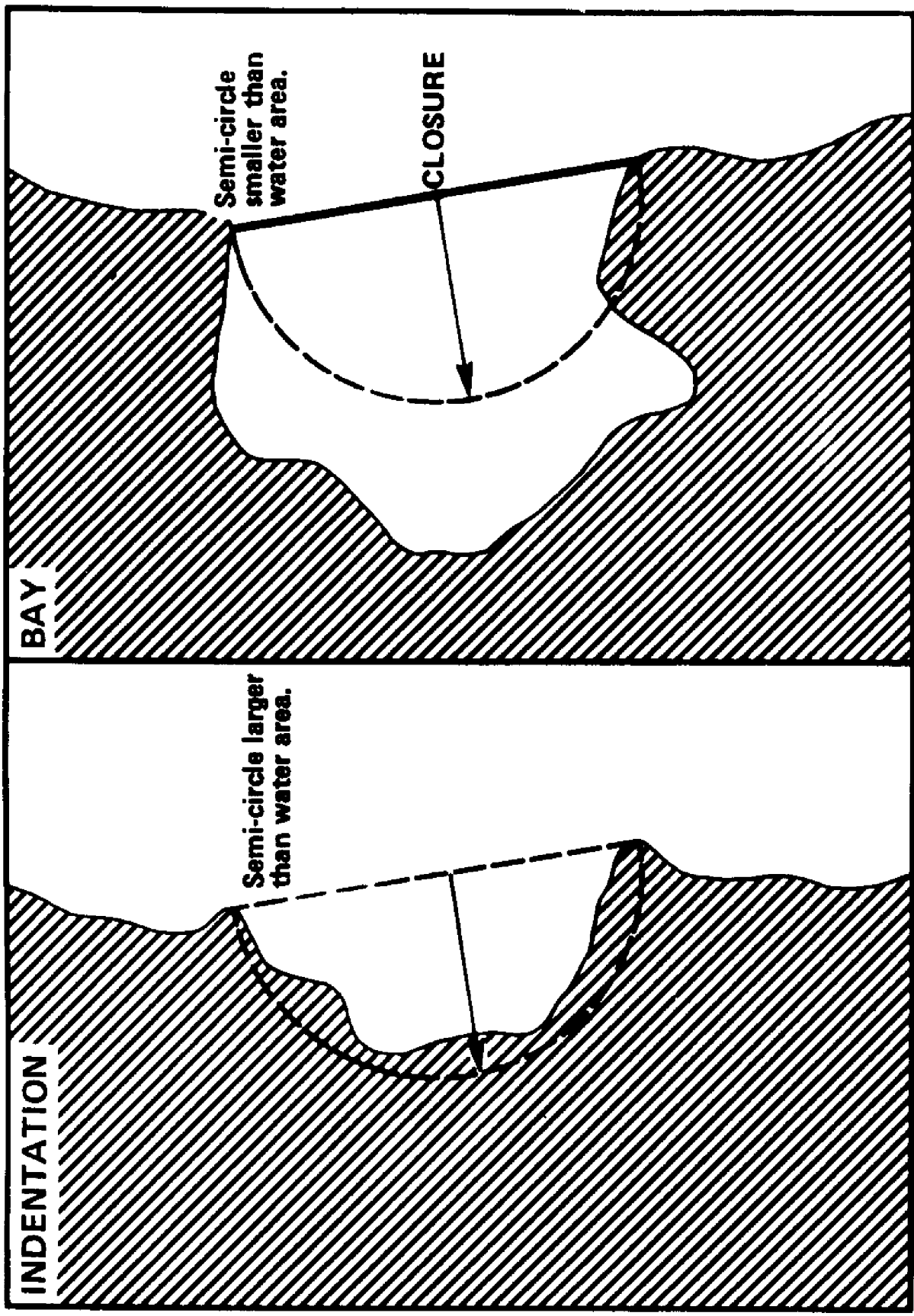

Figure 1. Semi-circle Test for Bay Determination.

river system's area could be added to the "bay" to assure its total area requirement for the semi-circle test. If the river flowed through an extensive lake system, the area of these lakes could also be added to the area of the bay. Thus, logic implies that only the true bay, i.e. the real indentation of the coast, should be measured to meet the area requirement.

Certain standard definitions are given below to illustrate the concept of bay as a generic term:

a) "an inlet or arm of the sea partly surrounded by land, usually smaller than a gulf;" Manual of Physiographic Terms, Army Map Service, n.d., mimeograph;

b) "a comparatively gradual indentation in the coastline, the seaward opening of which is usually wider than the penetration into the land," Glossary of Terms used on Admiralty Charts and in associated publications. Part II. Physical Features. Hydrographic Department Professional Paper No. 11. 2nd ed. Admiralty, London 1953.

c) "an inlet of the sea, usually smaller than a gulf, but of the same general character. The name is used, often for large tracts of water, around which the land forms in a curve, or for any recess or inlet between capes or headlands. 2. A small body of water set off from the main body...," New International Dictionary, Merriam-Webster. 1943.

To determine the unique character of a bay it is necessary to isolate all water surfaces which do not conform to the general definition of a bay and are geographically isolated from it or which do not conform with those of other categories of features, i.e., rivers, canals, estuaries, etc.[5] These hydrologic or hydrographic types are then geographically detached from the specific bay under examination. Rivers, lagoons, subsidiary bays, channels and the like should be separated as shown in Figure 2.[6] Their areas, as a result, may not be used for the determination of the area of the bay in relation to the semi-circle test. In most instances, the mariner may accomplish the evaluation visually; most bays are not "border-line" in their relation to the area of the semi-circle. In a few instances, a precise measurement might have to be made.

B. Contains land-locked waters

The second consideration for the determination of a bay is that it contains land-locked waters. The concept of land-locked is imprecise and, as a result, may call for subjective judgments. The semi-circular test, discussed in Section A, may relate also to the character of waters being land-locked as well as to the determining of a well marked indentation. The test places an absolute, minimum limit on what can be recognized as satisfying these requirements. (See United States v. Louisiana, 394 U.S. 11,54.)

A semi-circle, by definition, is twice as wide as it is deep. The opening represents the maximum width. Since this definition characterizes the absolute

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[5]A sub-bay, in the form of an open lobe of the main bay or one enclosed by islands, would naturally constitute an area of the bay. However, when the sub-bay is isolated by a narrow closure of the mainland or by a non-bay like intermediate feature, it should be treated as a separate identity.

[6]The precise method of drawing the closing lines will be developed later in the article.

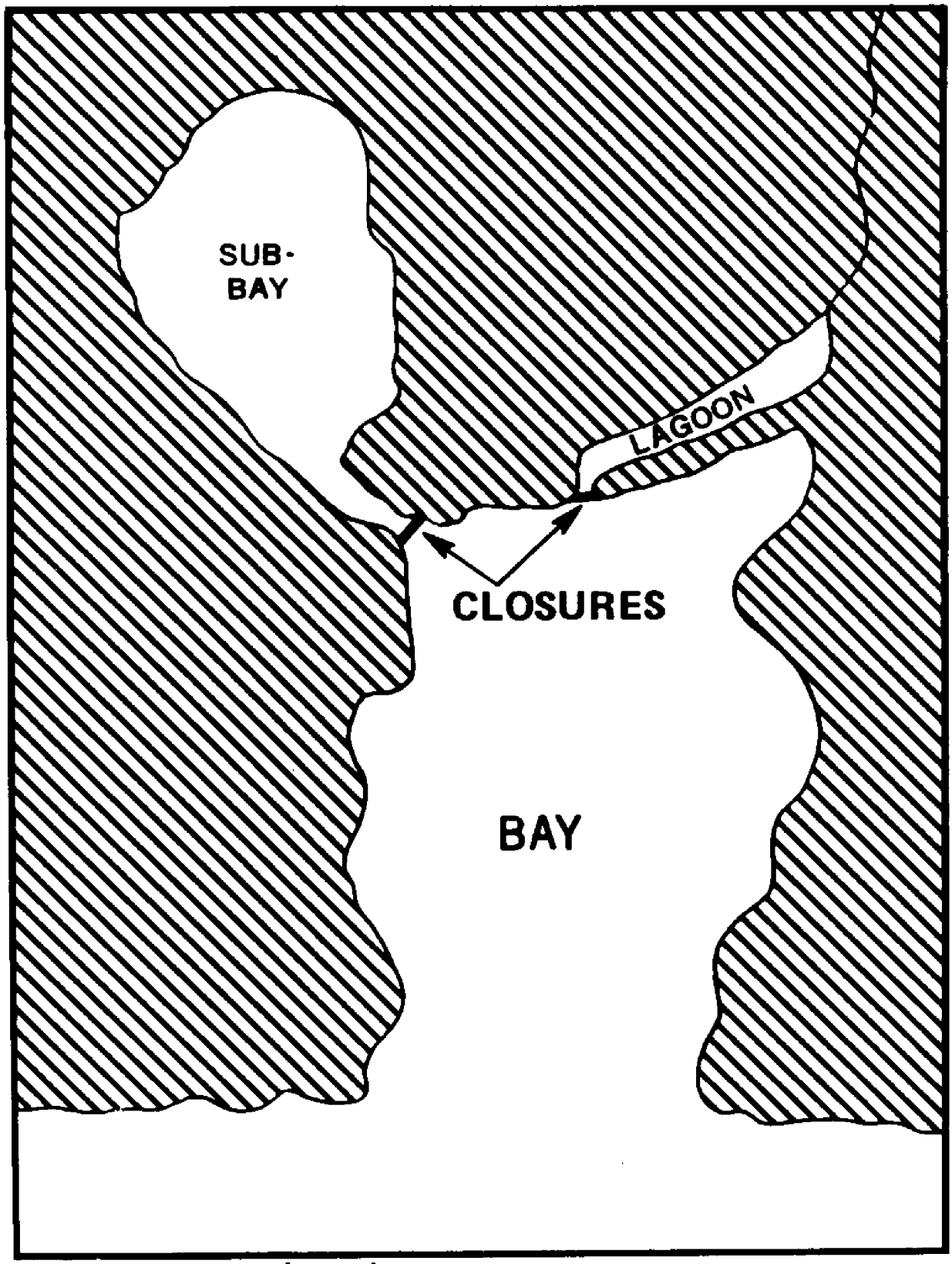

Figure 2. Closure to Eliminate Sub-features.

minimum, true land-locked conditions should require that the opening (of the bay) be narrower than a principal lateral axis of the bay. This condition should prevail, in particular where the penetration of the bay is shallow in relation to its width, i.e. where conditions near a ratio 1:2 prevail.

However, since most bays are not circular other factors influenced by the shape of the body of water may be considered. The scale of the body must also be considered. Basically, the character of the bay must lead to its being perceived as part of the land rather than of the sea. Or, conversely, the bay, in a practical sense, must be usefully sheltered and isolated from the sea. Isolation or detachment from the sea must be considered the key factor. This factor naturally relates directly both to shape and scale.

In nature, bays may have all types of shapes, except those which are truly geometric (nature is said to abhor straight lines). For the sake of discussion, however, the shapes may be compared to semi-circles, triangles, squares, rectangles, etc. Most bays fall into the first two general categories. In the case of semi-circles, it has been noted that this shape represents an absolute minimum condition. In fact, we do not believe that a true semi-circular bay would contain land-locked waters. A lateral dimension greater than the mouth would be vital to ensure isolation.

In the case of a triangular bay, assuming the base and not the apex represents the opening to the sea, different conditions could prevail. Triangles may take many forms or proportions, as long as they have three sides. The wide side may be to the sea and two short sides to the land. This condition obviously could not constitute either a major indentation of the coast or the containing of land-locked waters. However, if a situation occurs where a narrow side faces the sea and the two long sides penetrate into the land, both criteria could prevail. Conditions greater than semi-circularity must exist; i.e. depth of penetration exceeds width of mouth by a ratio greater than 1:2. As will be noted in the following article on baselines, fjords penetrate the land by ratios always locked and while they may be closed by straight baselines within a system, even a single feature with these projections should be closed; the depth of penetration provides the isolation and protection from the sea which the mouth configuration would not otherwise indicate.

The question then may be raised on how to determine the depth of penetration. Several alternatives may be offered (Figure 3):

1) a median line constructed with shoreline basepoint from the bay-closing line to the head of the bay;

2) a straight line perpendicular to the midpoint of the bay-closing line to the opposite shore;

3) a straight-line perpendicular to any point on the bay-closing line which would result in the deepest penetration;

4) the longest straight line which may be drawn from any point on the closing line to the head of the bay.

We believe that the last alternative is the most logical method. It represents, for any configuration of a bay, the practical line determining true penetration of the water into the land.

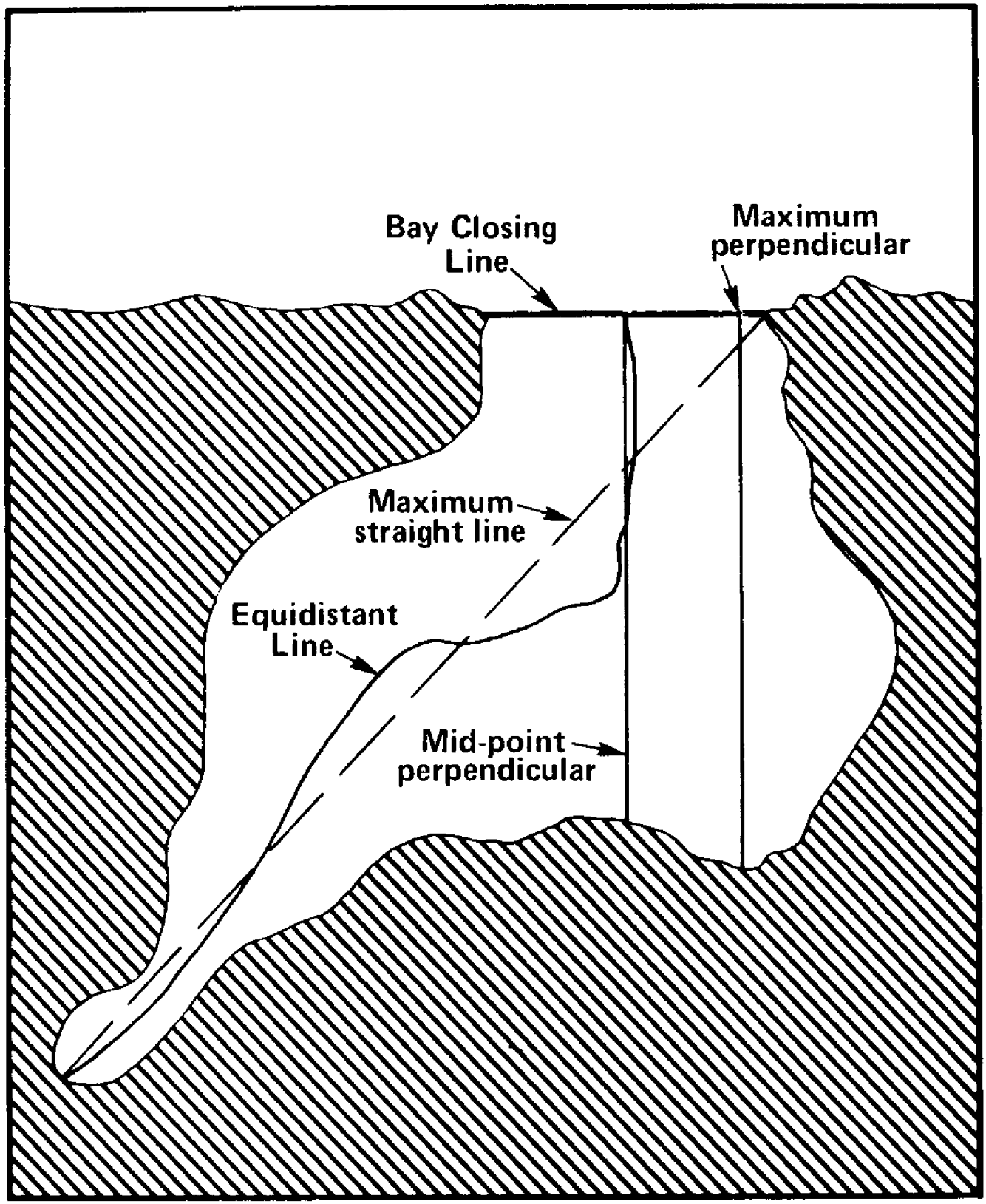

Figure 3. Methods to Determine "Penetration" into the Land.

C. Natural entrance points

The selection of the natural entrance points, i.e. the landward origin of the conditions natural to a bay, has presented the greatest difficulty due to a wide variety of subjective opinion utilized. Shalowitz, for example, notes that problems exist when he states "...with respect to true bays and rivers, the line marking the seaward limit of inland waters is a headland-to-headland line."[7] He continues that a headland can "be defined generally as the apex of a salient of the coast; the point of maximum extension of a portion of the land into the water; or a point on the shore at which there is an appreciable change in the general direction of the coast."[8] Thus we are offered three choices although he tends to stress the dynamics of the processes by adding "The shores of the headlands are formed by two different groups of forces--those of the ocean and those of the estuary or tributary waterway. The points sought are where the shores resulting from these forces meet."[9]

The efforts required to obtain these points of "equilibrium" could be extensive. We would prefer to view the features statically. What is sought is not a point of dynamic balance of forces but rather a point where the two dimensional character of a "bay" or "river" is replaced by that of the "sea" or "ocean". There is, we suggest, an objective method of determining the "natural entrance points" of a bay, or any other topo-hydrographic features, in relation to the sea which will lead to universal, or near-universal, selection of a single pair of desired points. The choice is made by determining if the general direction of the shore within the selected natural entrance points; they are the points where the direction of the shore changes from one facing on the bay, or other subsidiary features, to one facing on the sea. The primary test for determination is based on mathematics/trigonometry; the line of 45° represents the dividing line or the mid-line between two lines of opposite direction. The process of determination may be illustrated by the example in Figure 4.

On the chart, the outermost points which may delimit the character of a bay are chosen. In the illustration these are marked A and B. A line is drawn between points A and B to serve as the first bay-closing line. The next inward--i.e., landward of Line A - B--headland point is selected on one shore (A_1) and connected with point A. The line A - A_1 in effect, marks the general direction of the intervening coast or shore. In the angle formed by B - A - A_1 is more than 45°, the A - A_1 shore faces onto the bay and, conversely, if less than 45°, it faces more onto the sea. In the event that the latter condition prevails, the procedure is repeated, i.e. the line is drawn from B - A_1 and a third headland point A_2 is selected to determine the angle of the shore direction to the bay-closing line. The procedure is repeated until an angle of 45° or greater is encountered. The procedure, of course, should be carried out for the opposite shore concurrently until both angles meet the test. The natural entrance points of the bay have been located. The landward shore faces onto the bay and the seaward shore faces away from the bay towards the sea. The points marking the line of separation have been found and with them the closing line of the bay.

Several conditions may exist where the rule does not prevail. In one instance, the shores or one shore of the bay may be a smooth curve or arc and the selection of a "natural point" to indicate the change between sea-facing and

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[7]Shalowitz, A., Shore and Sea Boundaries, vol. I, p. 63, Washington, D.C. 1962.

[8]Ibid., pp. 63-64.

[9]Ibid., p. 64.

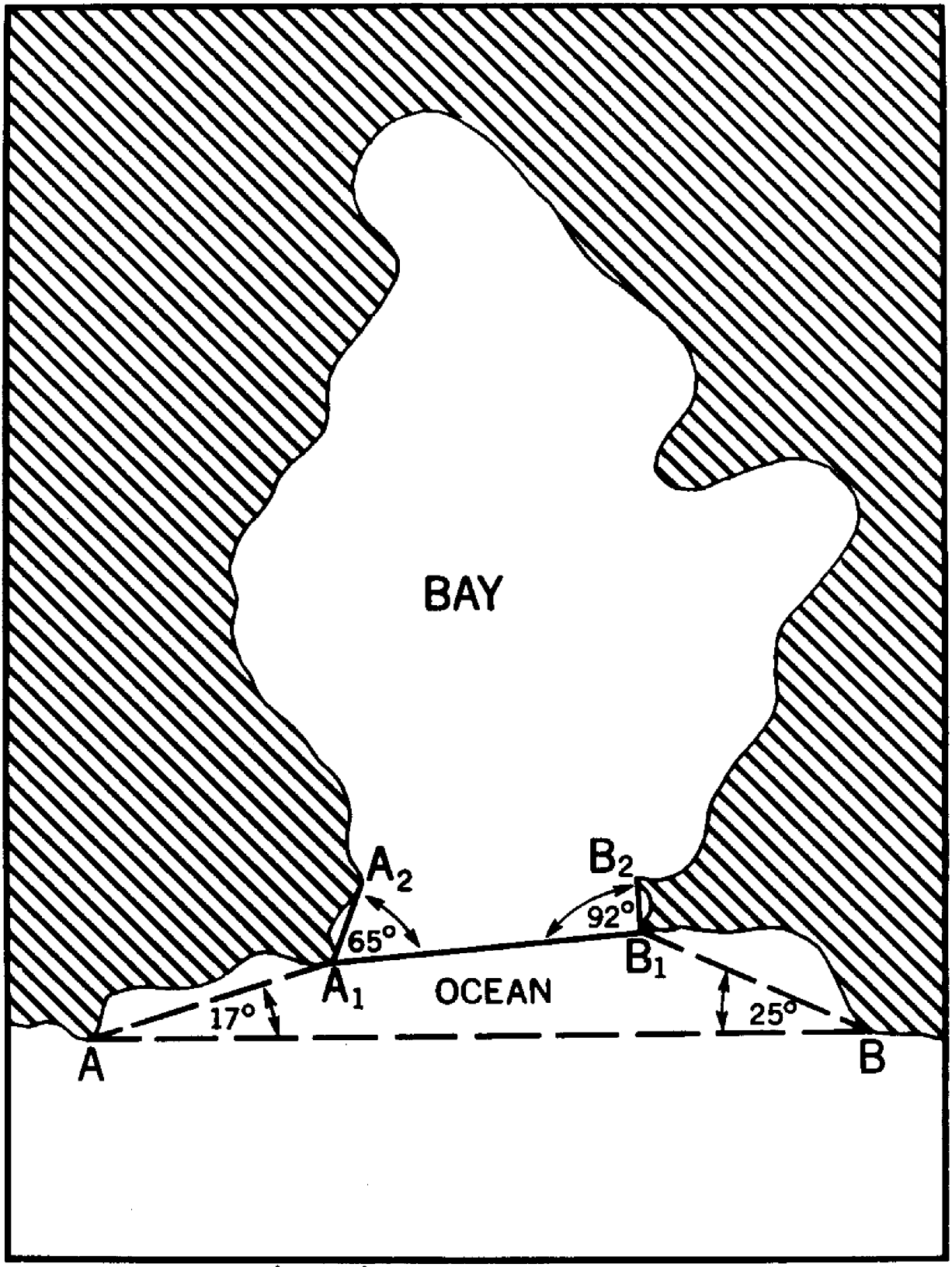

Figure 4. Application of 45° Test to Determine A_1-B_1 as Proper Bay Closing Line.

bay-facing shores is not possible. In this event, the use of the bisector of the two tangents marking the general directions of the shores may be used. The method is illustrated in Figure 5.

In a second case, a point landward of the originally selected headland may project for a considerable distance into the bay. It is obvious that the spit or point if an anomaly and the intervening shore faces bayward. This characteristic is rare but instances have been found in isolated areas. The anomaly, depending on the specific geographic relationships which exist, will or may cause the rule noted above to be suspended. The problem is illustrated by Figure 6.

A question may be raised, depending on the relationship between the bay and the spit, if an anomaly actually exists. Should the spit be situated close to the mouth of the bay and extend far across the bay, the waters seaward of the spit would obviously not constitute land-locked waters. In this event, the spit would form a natural headland of the bay.

A third situation may also qualify the use of the 45° test. In the case of a two-headed--or dual mouthed--bay (Figure 7), a coastal point situated on a deeply indented shore and the next landward point may not meet the 45° test. However, if the intervening waters between these selected headlands meet the qualifications of a bay, the single closing line may enclose the two adjacent bays. This situation has prevailed in places along the U.S. mainland and usually involves bays with diverging axes of penetration. Not to enclose them with a single line would be illogical and inequitable.

The 45° test, however, will serve in virtually all instances as an effective and objective method for the determination of the natural entrance points for the construction of a "self-executing" bay-closing line. In the same manner, the rule may be applied to determine the river-closing line based upon the average direction of the intervening shorelines. The problems of determination are virtually identical and the closing line determination may be derived through the application of the same procedures.

D. Islands and the mouth of a bay

Paragraph 3 of Article 7 of the Territorial Sea Convention relates to islands in the mouth of a bay insofar as they affect the length of a bay-closing line. Islands may relate to the bay-closing line in three distinct manners:

1) those situatd within the mouth of a bay;
2) those which screen the mouth of a bay; and
3) those which form the headland of a bay.

In the first of these situations, the method of drawing the bay-closing line is relatively simple. If the selected closing line intersects an island in the mouth of a bay, that island will be used to form a part of the bay-closing line. The 45° test will be utilized to determine the natural entrance points as described above. Should these lines, or their continuations, intersect other islands, they too may form part of the closure line following the same application of the rule. Islands not intersected by the line between natural entrance points should not be utilized in the closing line.

Figure 8 illustrates the technique.

The purpose of the bay-closing line is obviously to enclose a natural feature, the bay, where a line does not normally exist in nature. Under certain circum-

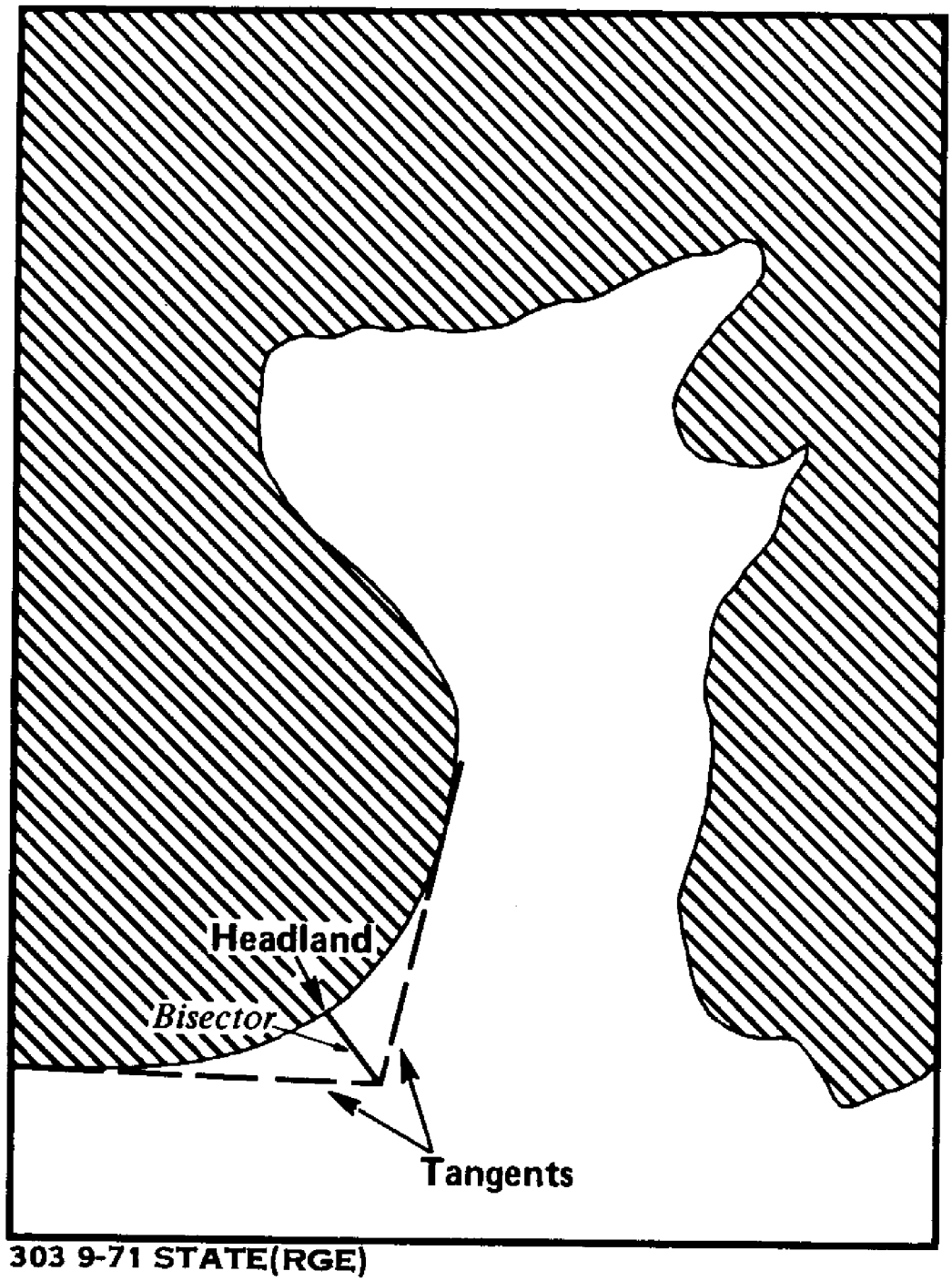

Figure 5. General Trend of Coast Tangents.

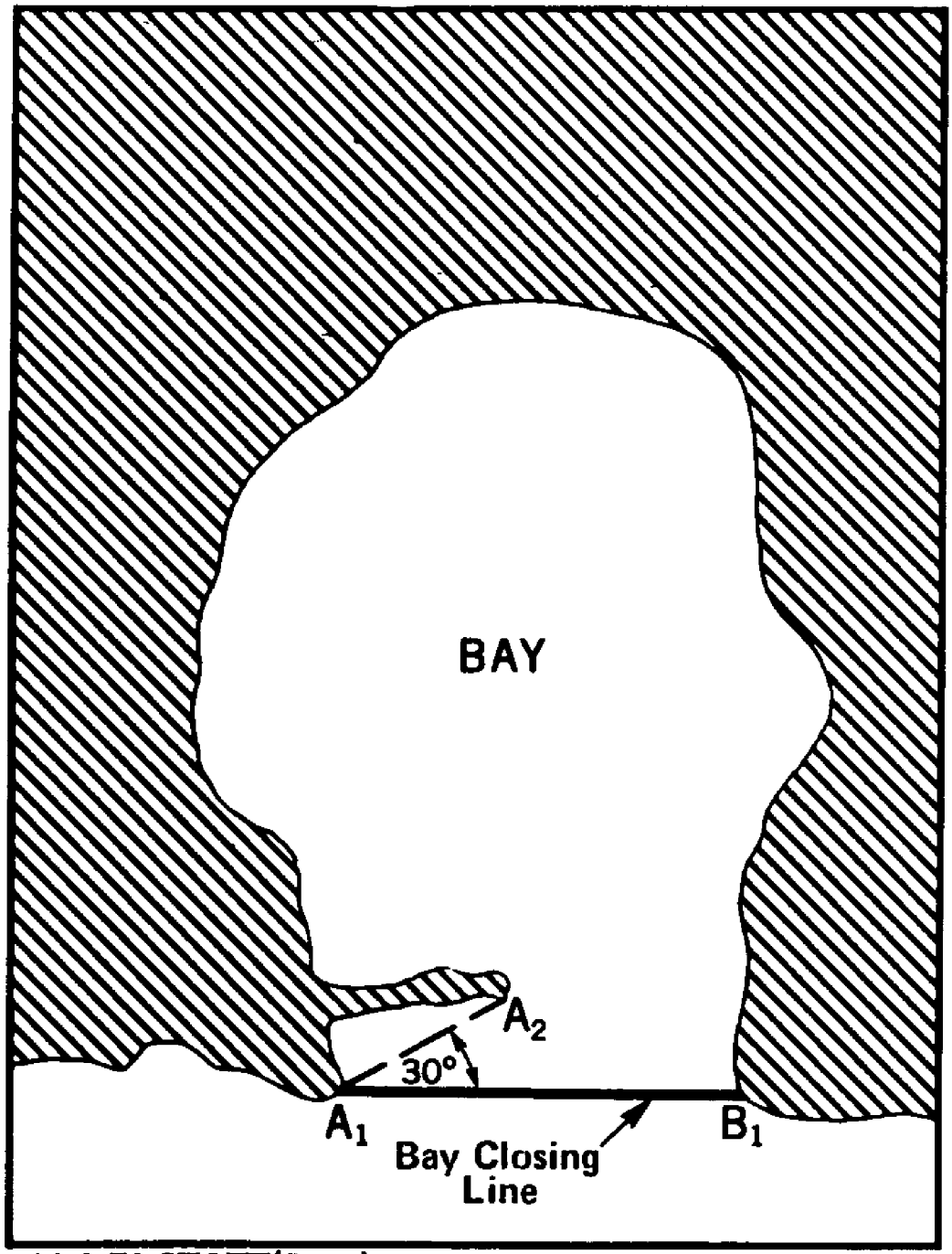

Figure 6. Condition Which Reduces Validity of 45° Test.

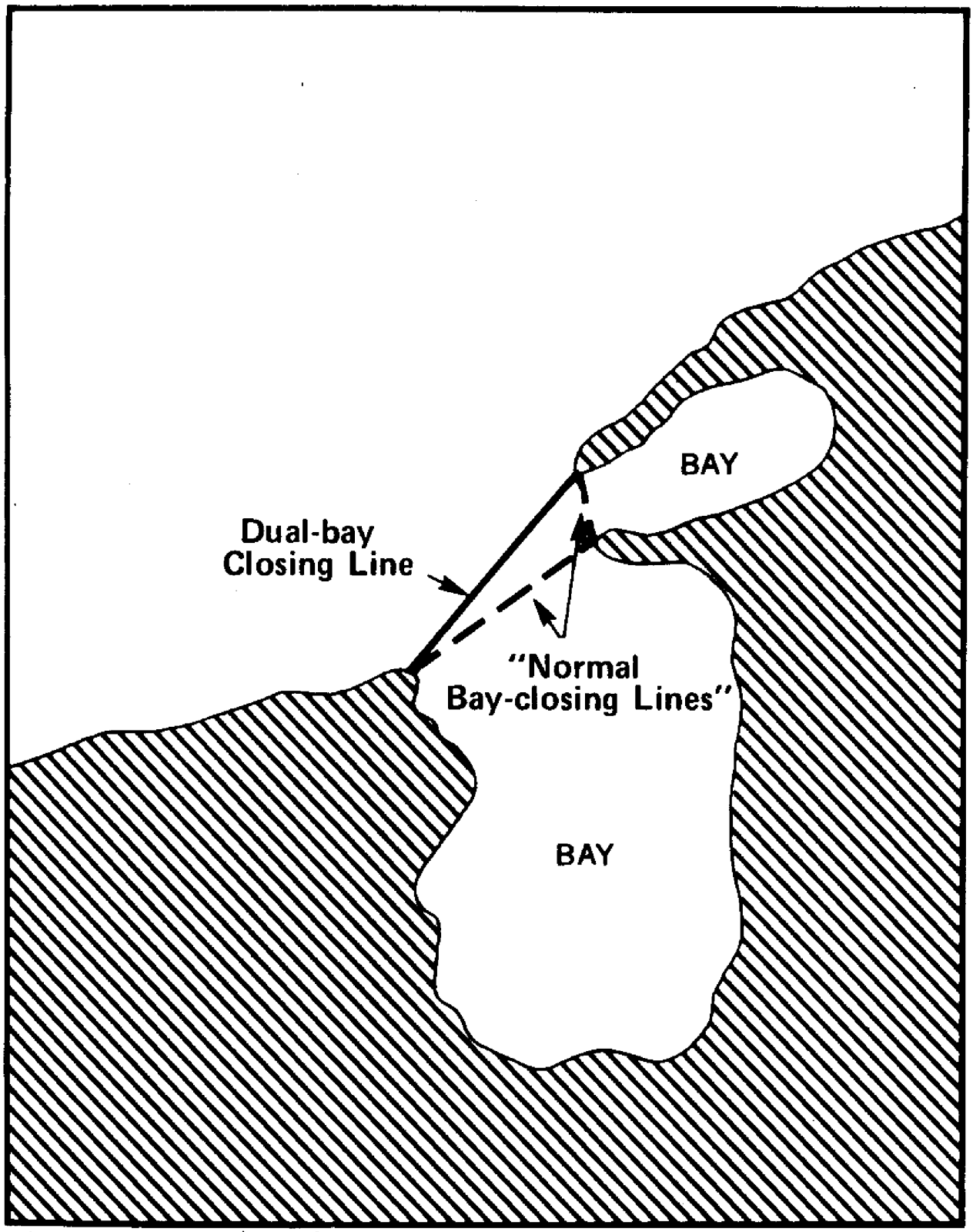

Figure 7. Two-Headed Bay.

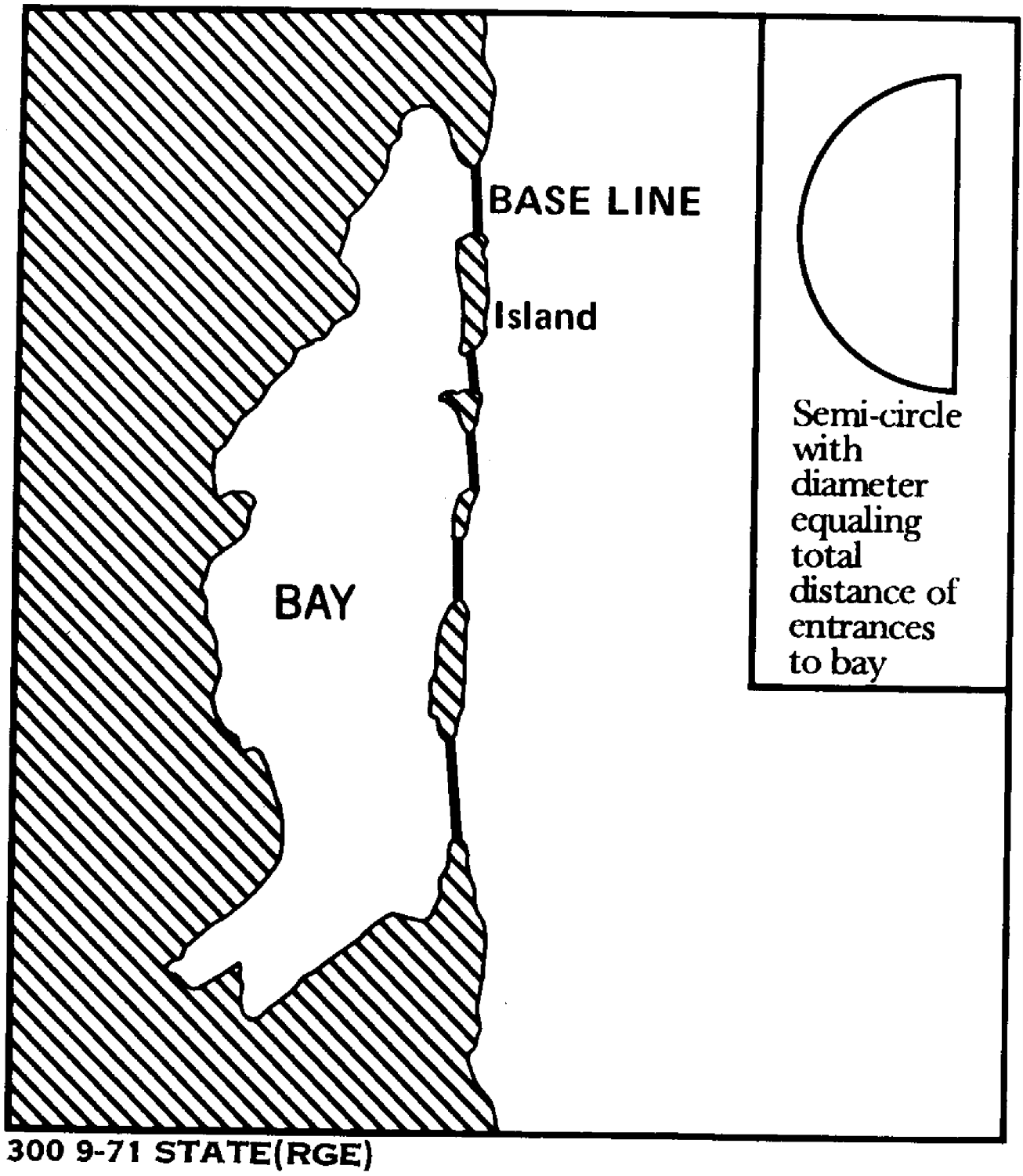

Figure 8. Multi-mouth Bay.

stances, however, a series of islands exists which naturally "screen" the mouth of a bay. If the islands serve to block more than one-half of the opening of a bay, they may be judged to "screen" the mouth of the bay from the sea. Since the greater condition, i.e., more than half, of the mouth is represented by islands, it should be considered to be the dominant geographic characteristic of the mouth and serve to enclose the water within the bay; these islands screen the bay from the sea. Under this condition the islands must be considered to form the natural closure for the bay even if they are not situated directly in the mouth of the bay. Since the islands are the natural line which terminates the conditions of a land-locked or bay-like enclosure, the bay-closing line must be drawn utilizing the screening islands. The string of islands, however, may project landward or seaward of the line joining the natural entrance points of the bay. In either case, the bay closing lines must utilize them as illustrated in Figure 9.

The 45° test should also be applied to determine the natural entrance points on the island headlands as shown by Figure 10.

Occasionally, the screening islands will continue beyond one or both of the natural entrance points of this bay. In this instance the bay-closing line would not continue along the line of islands, for this would constitute a system of straight baselines. Rather the 45° test should be the determinant to locate the entrance point in the nearest island to the original bay entrance point.

Finally, islands themselves may constitute the headlands of a bay under certain conditions. These islands must closely relate to and be associated with the adjacent mainland. To be used as headlands, however, they should form a natural prolongation of the two dimensional coastline formation as viewed on a nautical chart.[10] Moreover, the area of the island should be greater than the area of water area enclosed between it and the true mainland. A matter of scale is also involved which relates directly to the nature of the feature. Under normal conditions, the islands used as headland will be relatively small, so as not to dwarf the true proportions of the original bay feature and hence change its entire character. The intervening water area, ideally, should resemble a channel in configuration. Where conditions of doubt may arise, the channel should not be a principal route for navigation which would tend to isolate the island from the coastal headland.

The character of a channel may be easily established by relating the length of the water course to its average width. Closing lines may be drawn at the natural entrance points. These would, of course, be determined by the application of the 45° test as in the bay situation. The average width, assuming

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[10]The "two-dimensional" concept of physical features has been stressed in the sections on "self-execution" referring to the normal representation of the natural feature on a standard nautical-type chart. The two dimensions equate with the length and width of the river, bay, island etc. disregarding the third dimension of absolute height above or depth below the tidal datum. A bay may be a juridical bay without reference to the elevation of the surrounding land or the depth of water below the tidal level on the chart. In this instance, islands must be viewed from the chart representation, and interpretation as to geological or historical association should not be considered relevant. The two-dimension representation is the evidence available to the mariner and he must rely on these data. Obviously, in claims to historic bays or to straight baselines, both of which are proclaimed and publicized, other factors should and will enter into the equation.

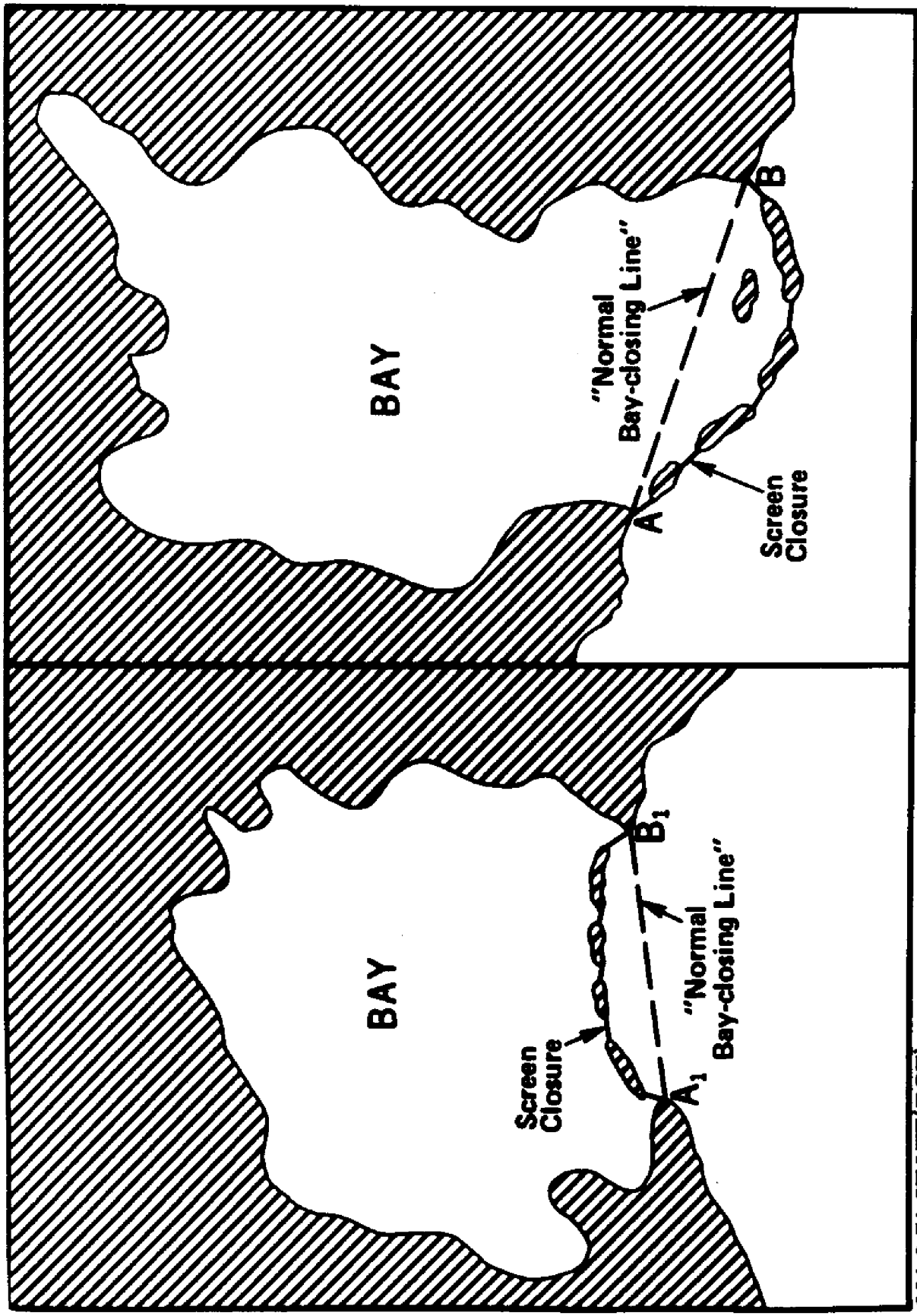

Figure 9. Screening Islands.

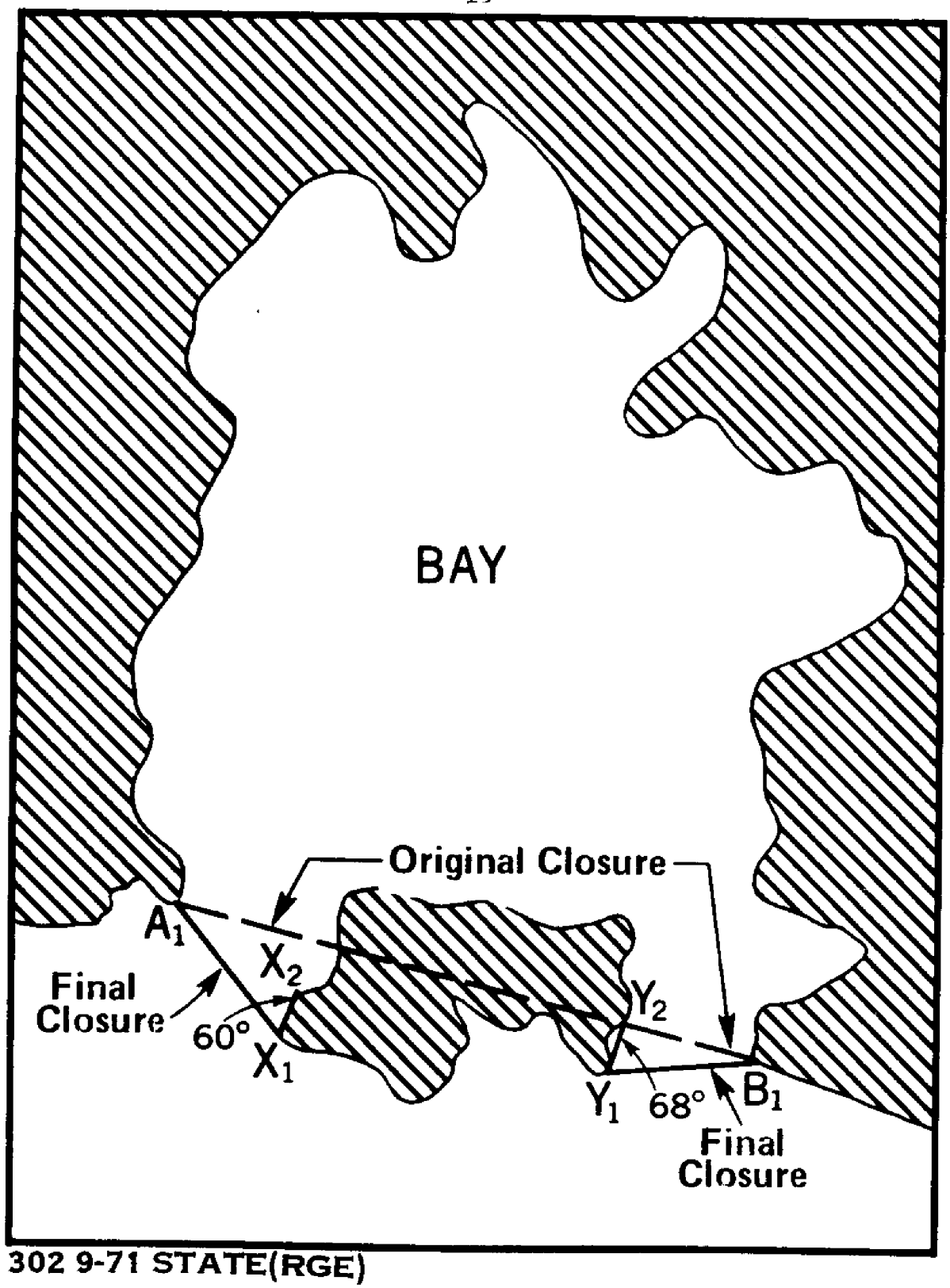

Figure 10. 45° Rule as Applied to Island in Mouth of Bay.

nearly parallel banks for the channel, may be determined by averaging the lengths of the two closing lines. The length of the channel may be measured along a line connecting its mid-points of the two closing lines. To be true channel-like the ratio of length to average width should be 3:1 or greater. A lesser ratio would not exhibit that the true riverine characteristics of a channel (Figure 11). Rather, the feature would be more bay-like in its two dimensional configuration.

SUMMARY

The nature of a bay is determined by its two dimensional character which is best represented by the low water line printed on an official, nautical chart of appropriate scale. The bay, to qualify for incorporation into the inland waters, must form a significant indentation of the coast and contain land-locked waters. While the juridical bay must meet the semi-circle test, a perfect semi-circle (which would not exist in nature) would not in itself meet the criterion of being landlocked.

The critical judgment in closing the bay involves the proper selection of natural entrance points for the feature. Since the bay is determined by its two-dimensional characteristics, the logical natural entrance points will mark the headlands which delimit the change in coastal direction from sea-facing to land-facing or more properly, bay-facing. These points may best be determined by the application of the described 45° test. The result will be the precise points, objectively determined, which mark the change in character of the coastal configuration, of bay and open shore.

The concept of "natural" entrance points does not necessarily require that the points be, in effect, created by natural forces or processes. Rather, the points are those at which the nature of a bay is first encountered. In virtually all instances, the "natural" points are indeed the consequence of a physical processes induced by nature. However, under certain conditions man-made points, e.g. jetties, breakwaters, etc. could be utilized. The feature, however, should not be constructed for the sole purpose of extending a bay-closing line. A functional requirement related to the bay should be necessary.

Islands may have special relationships to the mouth of a bay or to its headlands. If the islands are intersected by the line joining natural entrance points, the islands may be considered to form a part of the line. They do not have to be accounted for in meeting the 24 nautical mile limit for the bay-closing line. The 45° test would continue to be used to determine the natural entrance points on the mainland and on the island or islands intersected.

If a line or group of islands relate to the mouth of a bay so as to exceed in length more than 50% of the length of the bay-closing line, the islands screen the mouth of the bay and form a natural limit for the land-locked waters. The natural line of closure need not lie in the direct line between headlands or be intersected by the "normal" closure.

Finally, islands may form the headlands of a bay if the islands relate closely to the mainland. Essentially, the islands must not be situated at any great distance from the shore and the area of the island should be greater than the surface of the intervening water body. The latter, in configuration, should ideally be channel-like but it should not form a principal channel of navigation.

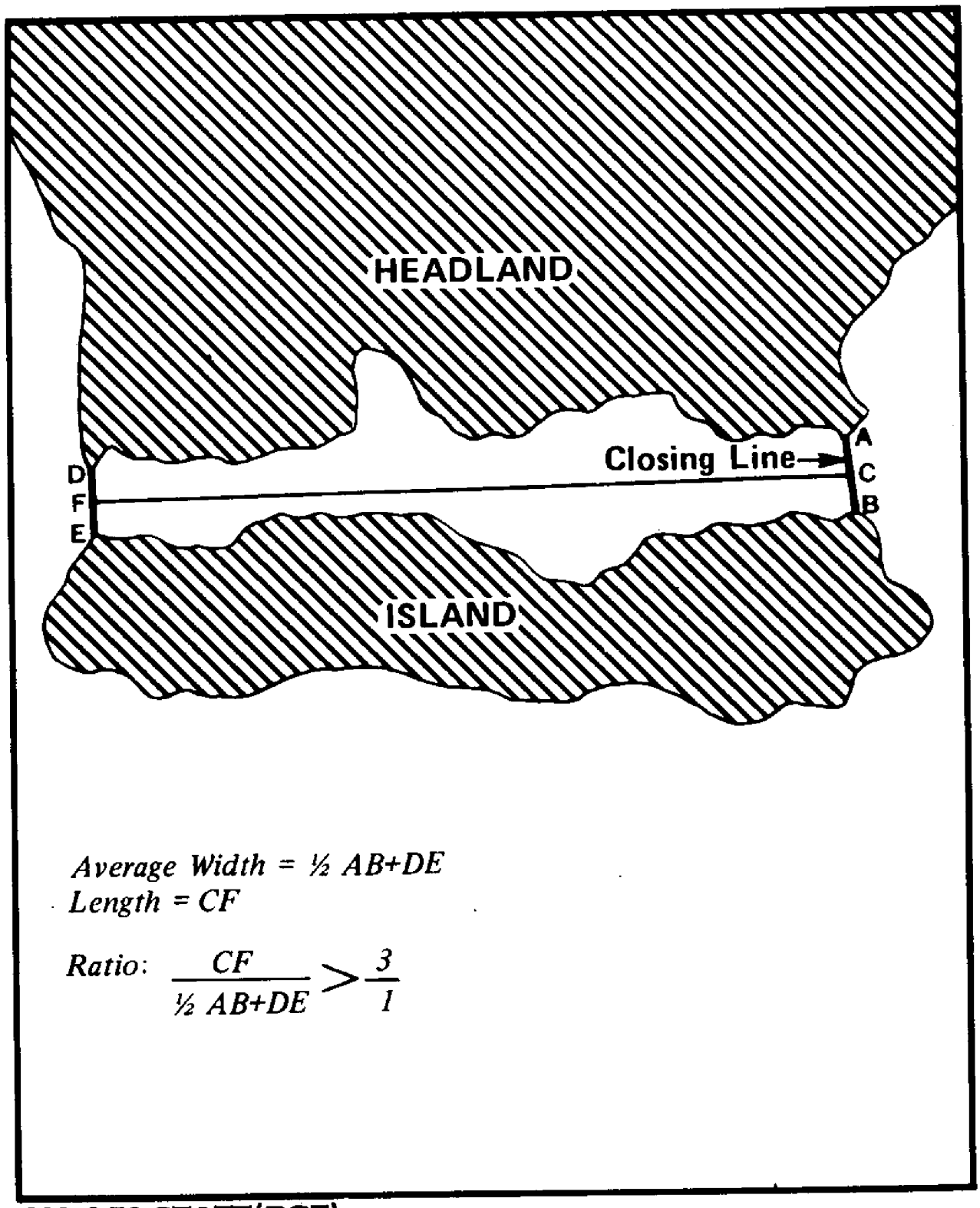

Figure 11. Channel Ratio.

If these simple, objective criteria are followed, a single, rational and logical bay-closing line may be drawn for any bay. The same rules are also applicable when constructing closing lines for rivers. The criteria will furnish the mariner with the natural baseline from which a state may measure its territorial sea for these so-called self-executing features. Inherent in the method, however, is the requirement that the most recent, appropriate-scale and official nautical charts be utilized.

The baseline, as defined by the Convention on the Territorial Sea and the Contiguous Zone, remains ambulatory. As a consequence bay and river-closing lines may change with the coastal baseline points. The coastal state must, however, revise its charts regularly, in areas of changing coastal configuration, or abide by the baseline as represented on the most recent charts.[11] The only logical alternative would be to revise the Convention to require the charting of all bay and river closing lines as has been done, in Article 4, with straight baselines.

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[11]Gross alterations in coastal configuration, however, should not be ignored; one must obviously take these changes into consideration.

TOWARDS AN OBJECTIVE ANALYSIS OF STRAIGHT BASELINES: THE NORWEGIAN EXAMPLE:

INTRODUCTION

The design or purpose of a state's drawing of a system of straight baselines rather than resorting to the more normal arcs of circles method should not be primarily to extend seaward the external limits of the national claims to the territorial sea. Rather, the application of the principle should enclose within the internal waters of the state a transitional, but still maritime, zone in which, because of geographic peculiarities, the regime of the land prevails. The straight baseline, in effect, becomes the new, albeit, artificial shoreline of the state. The direct definition in international law for the addition to internal waters is the rule of the bay--the enclosed waters must meet the test of semi-circularity. The International Court of Justice in the Anglo-Norwegian Fisheries case specified this rule as the accepted physical reason for enclosing internal waters. It should be noted, however, that the Court did accept the right of a nation to include "historic" waters as well. However, the Court noted clearly:

> When a coast is deeply indented and cut into, as is that of Eastern Finnmark, or where it is bordered by an archipelago such as the skjaergaard along the western sector of the coast here in question, the baseline becomes independent of the low water mark (of the mainland). Such a coast, viewed as a whole, calls for ... a different method.[12]

In discussing the reasons for drawing of straight baselines, the International Court of Justice stated that one must consider the "close dependence of the territorial sea upon the land domain for it is, after all, the land which gives to the state rights to the adjacent sea." Noting certain criteria, the Court cited their lack of precision but insisted that they do provide courts with an adequate basis which can be adapted to the diverse facts in question. Unfortunately, the straight baseline adaptations have been many and varied and the results often quite confusing. There should be, however, a way to make the meaning of the court more precise, to quantify the values so to speak. The three specific qualifications which a straight baseline had to meet, according to the Court, were:

1. [straight] "baselines must not depart to any appreciable extent from the general direction of the coast";

2. They must enclose sea areas which "are sufficiently closely linked to the land domain to be subject to the regime of internal waters";

3. "Finally, there is one consideration not to be overlooked...that of certain economic interest peculiar to a region, the reality and importance of which are clearly evidenced by long usage."

These criteria were clarified by specific language and example which, it is hoped, permit an objective analysis of the resulting straight baselines and the factors upon which they are based.

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[12]Report of Judgments, Advisory Opinions and Orders: Fisheries Case (United Kingdom v. Norway), Judgment of December 18, 1951, ICJ, Leyden.

A leading expert on the geographical aspects of the Law of the Sea has suggested that the basis for an analysis could lie in calculating the increase in total sea area, i.e. its increase in absolute or percentage terms, as related to the territorial sea without baselines. The concept seemed promising and it was pursued. Unfortunately, the correlation ran from as little as a 20% increase where fjords did not exist to as much as 200% or more where they did. It did not, because of the inverse correlation, appear to offer a direct relationship which could be easily utilized. As a result, we examined less what the Court did and more what the judges said they had done. Certain direct relations have become apparent although others, we must confess, remain still rather obscure.

Firstly, the Court recognized two Norwegian coastlines and it treated them quite distinctly.[13] In the north along the Arctic, the Court identified a shoreline "deeply indented and cut into", i.e. Eastern Finmark from the Russian border to North Cape. Elsewhere, the coast was "bordered by an archipelago such as the skjaergaard along the western sector", i.e. the Atlantic coast. Where these conditions exist, the "baseline" becomes "independent of the low water mark of the mainland."[14] The Court seemed to recognize the need for straight baselines where one or the other conditions exist, i.e. both conditions need not be present.

Northern Norway, the Arctic shore, geographically is a series of peninsulas with very narrow land bases. In the east, the Varanger Fjord extends from the Russian-Norwegian boundary more than 50 nautical miles along an east-west axis into the land of Norway. (Figure 12) To the west and north, the Tana Fjord slices into the land along a north-south axis for an equal distance. The eastern rim of the Tana Fjord reaches to within seven miles of the head of the Varanger Fjord. Slightly to the west of and parallel to the Tana lies the double penetration of the Lakse (nearly 40 miles) and the Porsanger Fjords (over 80 miles). (Figure 13) Lateral, subsidiary heads of these fjords reach to within five miles of the Tana creating a series of pinched land bridges joining the bulbous peninsular heads to the mainland of Norway.

The total length of the Norwegian baselines for this sector, from Point No. 1 to No. 12 inclusive, measures approximately 160 nautical miles. The straight baselines closing the four fjords[15] totals approximately 94 nautical miles. The coast line for the remainder, approximately 40% of the total, is indented but not to the measure of the former. Certain inlets meet the criteria for a juridical bay while others do not. It is thus concluded that the Court placed heavy emphasis on the general nature of the coast. This characteristic may be determined by sectors totaling as little as 60% of the total length. The remainder of the coast, however, should not deviate markedly from the norm. To the court, the general nature of Arctic Norway was the fjord.

As seen from the definition, a fjord is a narrow inlet of the sea between high banks or rocks. "Narrow" in this sense means that the mouth or opening is

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[13] A detailed examination shows three types as will be seen below.

[14] Fisheries Case, op.cit., p. 129.

[15] Fjord - noun, a narrow inlet of the sea, between high banks or rocks. adjective, a cleft.

Figure 12

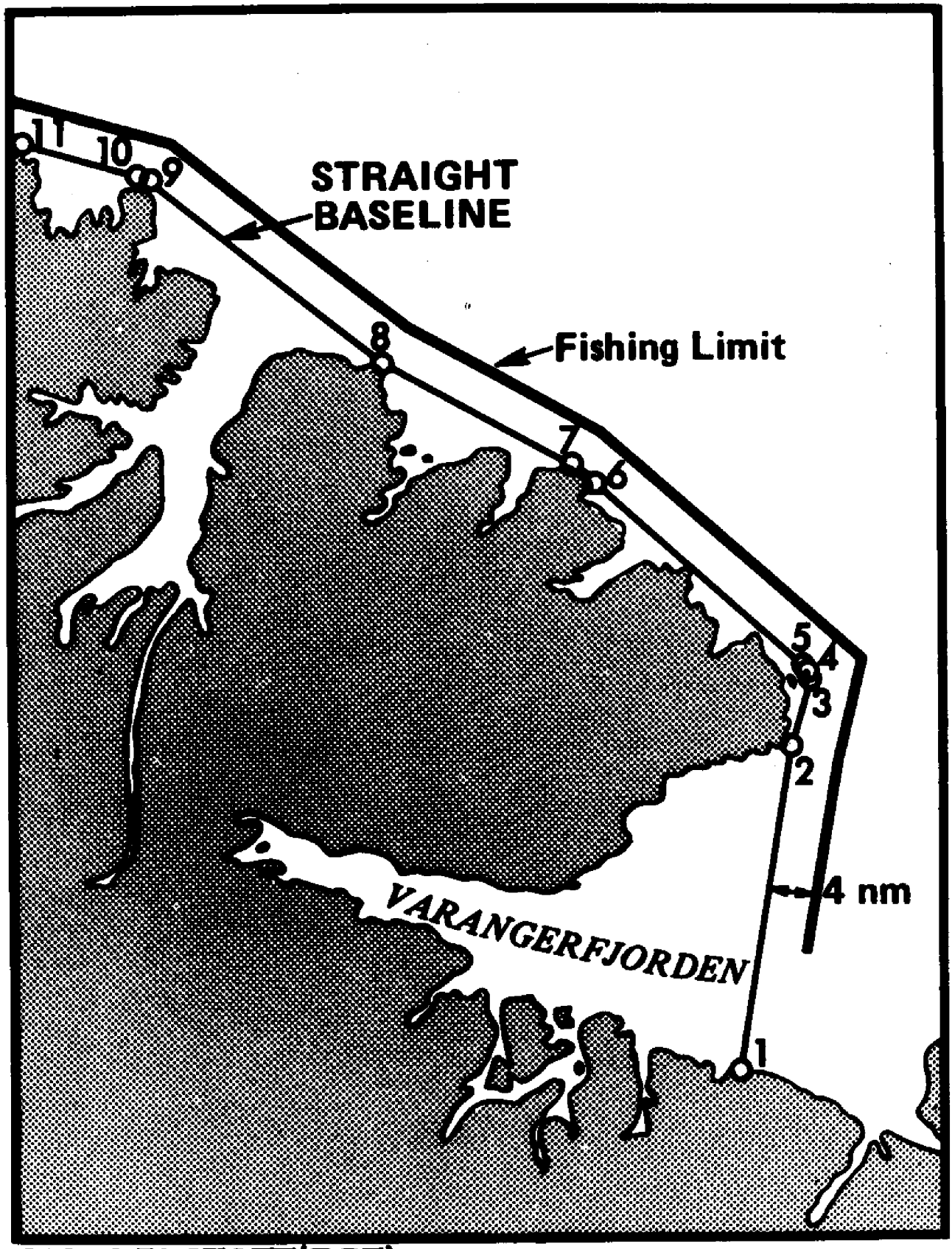

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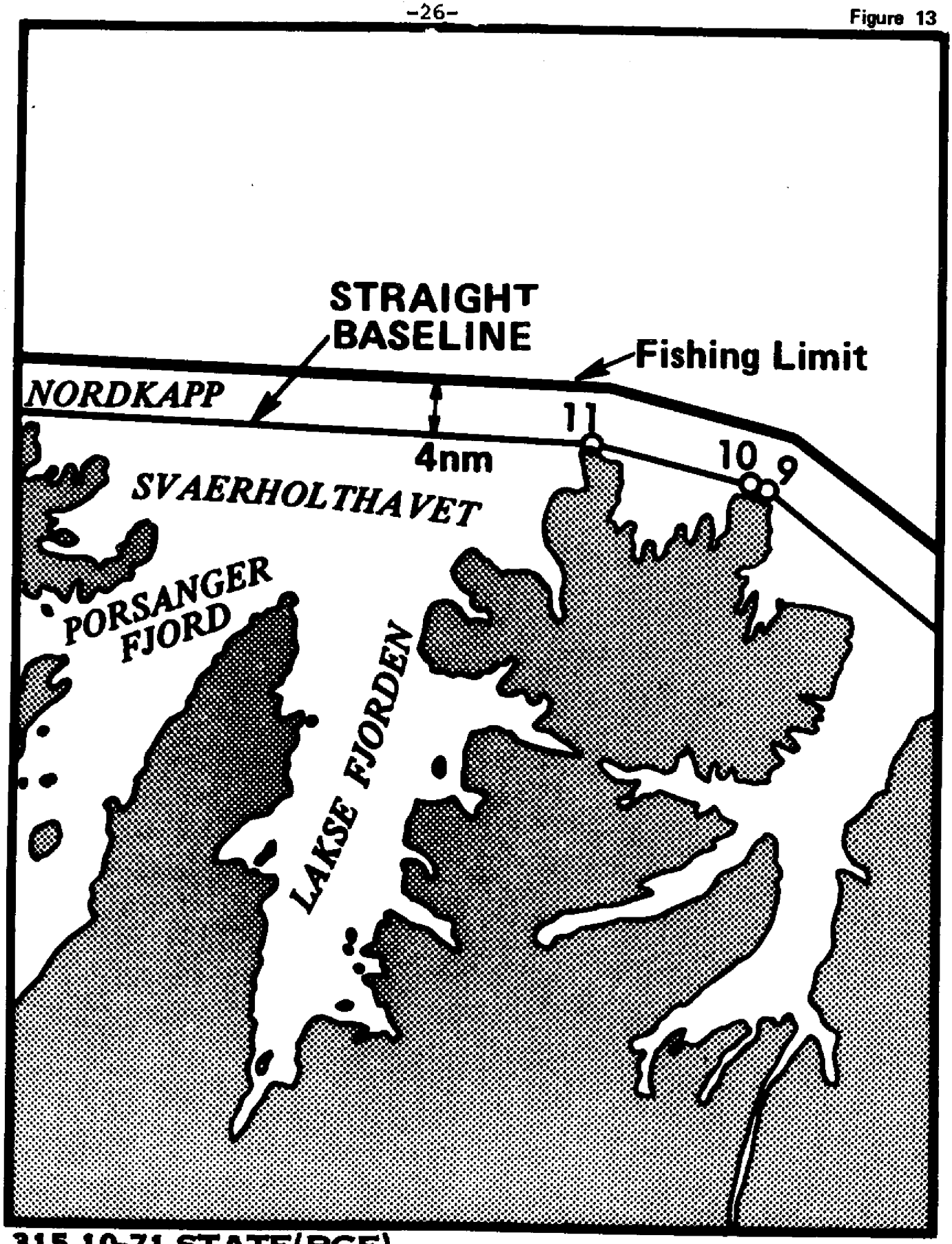
Figure 13



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small in relation to the penetration of the water body. An examination of the charts, it should be noted, shows that the width does not increase or decrease markedly for most of the length once the "funnel" mouth is passed. Since the Court accepted the fact that a bay is internal waters enclosed by a straight baseline, the analogy must be drawn between a bay and a fjord. The U.K. objected that the baseline between points 11 and 12 did not include waters meeting the definition of a bay. The United Kingdom held that the waters of the Svaerholthavet, north of the headlands of the two mainland-bound fjords of Porsanger and Lakse, in effect, were not a bay but part of the open sea. The Court's view of what constituted the geographic limits of a fjord obviously differed in interpretation. The Court overruled the U.K. objection stating that all of the waters of the fjord must be considered and not just those at the "mouth". As a result, it ruled all Norwegian fjords meet the criteria of a bay and hence are internal waters. Furthermore, in stating there was a "lack of any maximum length for such [straight baselines]..." the Court, in effect, approved the drawing of straight baselines across all fjords if the water surface enclosed meets the definition of a bay.

The problem then seems to revolve around the definition of a fjord in contrast to an overlarge bay or major indentation of the coast. A narrow but deep penetration by the sea of the land, speaking two dimensionally for the moment, is one dictionary definition of a fjord. In the cases of the three fjords in question, the depth of the penetrations relate to the width (of the baselines) by ratios of 5 to 3, 8 to 5 and 3 to 2. The last example is the complex of the double Lakse-Porsanger Fjord. If the individual penetrations of each fjord are totaled, or if the total length of the baseline is divided between the two fjords, their ratios are closer to 3 to 1. If the smallest ratio, 5 to 3, proved acceptable to the Court then it may serve as a rough, objective test of the quality of being a fjord. The Court summed this concept up as follows: "It is the distances between the disputed baselines and the most inland point of these fjords, 50 and 75 sea miles respectively, which must be taken into account in appreciating the proportion between the penetration inland and the width of the mouth."[16] (underlining added.)

In contrast, the relation of the length of the baseline to the depth of the penetration could be manipulated to have little bearing. The nature of the fjord itself may possibly be the dominant factor. While a general relationship between the two ratios may exist, the ratios of the former could be affected by a judicious selection of baseline points, i.e. to shorten the closing line would reduce the requirement of penetration into the land. In contrast, the geographic character of a fjord remains relatively constant. The ratios of mouth width to penetration range from 1:3 to as high as 1:80. Accepting the lowest, a fjord (1:3) exceeds a bay (2:1) in penetration by a factor of 6. (Figure 14).

From the definition arises the question of the third dimension: to be a fjord must the embayment be in a mountainous land? The Court implied that it might. One of the dissenting judges, Justice McNair, even raised the question as to why mountainous lands should have an advantage over flat lands. The elevations along the sides of the fjord appear to reinforce the domination of the water by the land. Unfortunately, in Denmark, for example, and in Northern Germany, fjords--so named--exist without truly mountainous walls. Geologically a fjord may develop in any land of coastal subsidence where the sea drowns existing river valleys. Although the maintenance of the valley pattern is most

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[16] Fisheries Case, op.cit., p. 141.

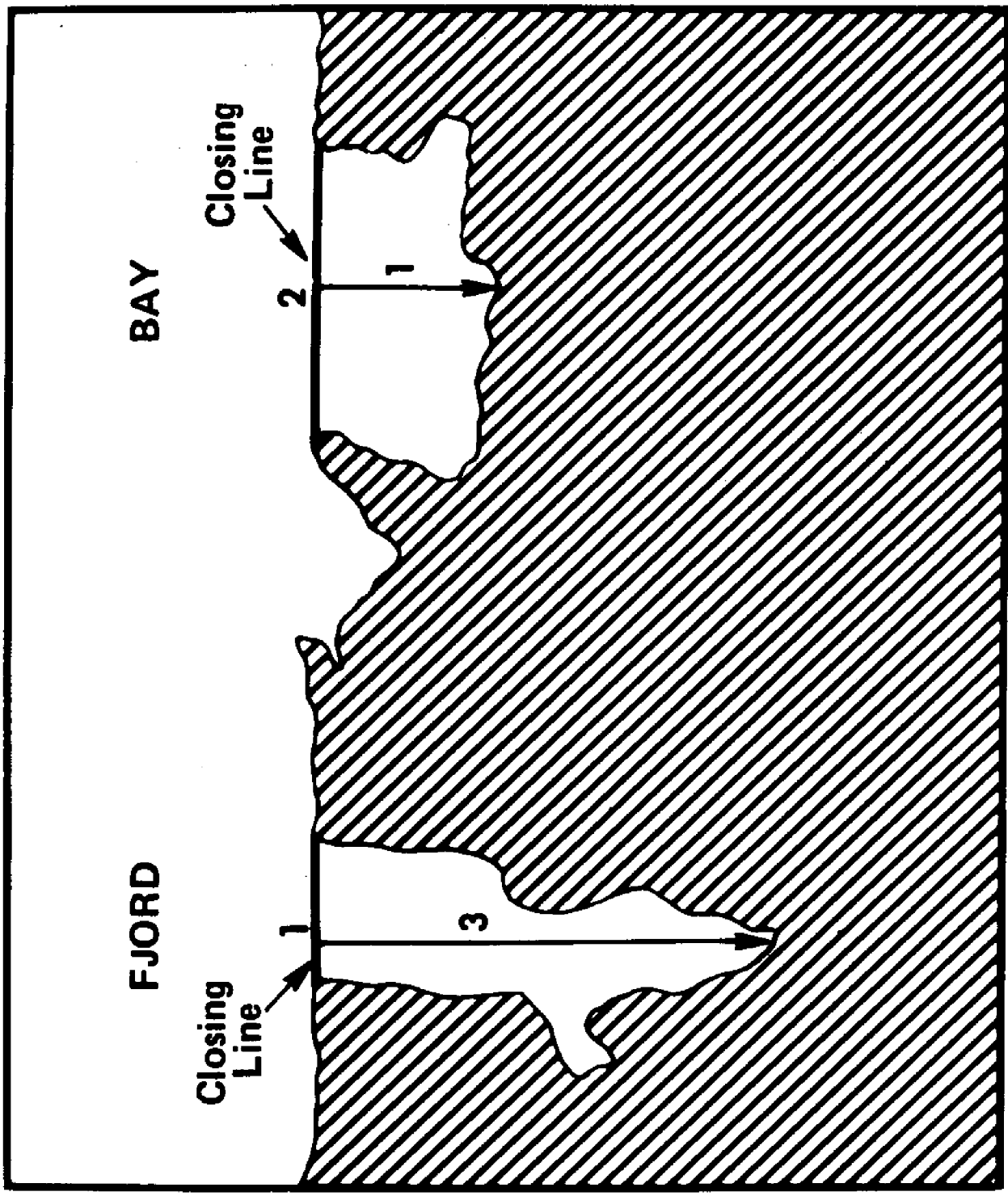


Figure 14. Fjord-Bay Ratios.

likely to occur where glaciation has deeply scoured the valleys while leaving relatively high banks.

To generalize then from the Arctic coast, we have derived from the Fisheries Case the following "rules" which appear to be valid objective criteria for determining straight baselines:

a) the general nature of a coast may be determined by the character of approximately 60% of the coast provided that the remainder does not deviate markedly from this norm. The Court stated "such a coast, viewed as a whole, calls for ... a different method"; i.e., straight baselines.

b) all fjords are internal waters for they meet the requirements of a bay, the determinant for coastal waters to become internal waters through the use of straight baselines;

c) there is no restriction on the length of the straight baseline used to close a fjord providing the water surface requirement of a bay is met and that the inland penetration of the sea exceeds the length of the baseline by a ratio of 5 to 3, or the fjord itself is defined by a penetration to mouth ratio of 3:1. The coastline also should be mountainous or possessing of significant elevation or steep banks, seemingly a psychological reinforcement linking the water to the land domain;

d) the factors of islands, in relation to "deeply indented and cut into coastline" is irrelevant. Where they exist, however, and form a continuation of the land trajectory of the headlands, the islands may be used to extend seaward the headlands of fjords;

e) the precise points to be chosen for the origin or termination of a straight baseline enclosing a fjord is the outermost point marking the reasonable extremity of the feature or coastal type. The Norwegians stated this fact as part of their traditional code and the Court found the entire system in conformity with international law.

Three questions arise:

1) Now that the Geneva Convention on the Territorial Sea limits bay closing lines to 24 nautical miles, has a limitation been placed on natural fjord closing lines?

2) The Court made a point of the uniqueness of Norway. One may wonder if the rules may be applied except in two rather obviously similar places in the world? The Court, for example, called Norway unique in Europe. What does this do to Denmark, Scotland, western Ireland, Dalmatia, Greece? Obviously, they must qualify, but perhaps, under modified criteria.

3) How much elevation is required to make a fjord a fjord rather than an estuary? The Court indicates the elevation must be considerable but the requirement appears to be psychological rather than physical.

ATLANTIC NORWAY

The character of the Norwegian coastline changes markedly in the vicinity of North Cape, where the Arctic and Atlantic shores meet. The Atlantic coastline breaks down into three distinct segments, all rimmed with islands. According to the Court, the Norwegian coastline measures approximately 1,500 miles in length without considering fjords, bays and minor indentations. The Norwegian Government estimated, for the ICJ presentation, that 120,000 islands, islets, rocks and low-tide elevations exist off the coast. Since for the first 160 miles of the Arctic coast virtually no islands were found, the Atlantic sector of 1,360 miles, i.e. approximately 88 per mile of coastline, has practically all of them. Taken as an absolute, the average certainly appears to have little meaning; curiously, the Court does not appear to have considered the total number as important, mentioning it once in passing.

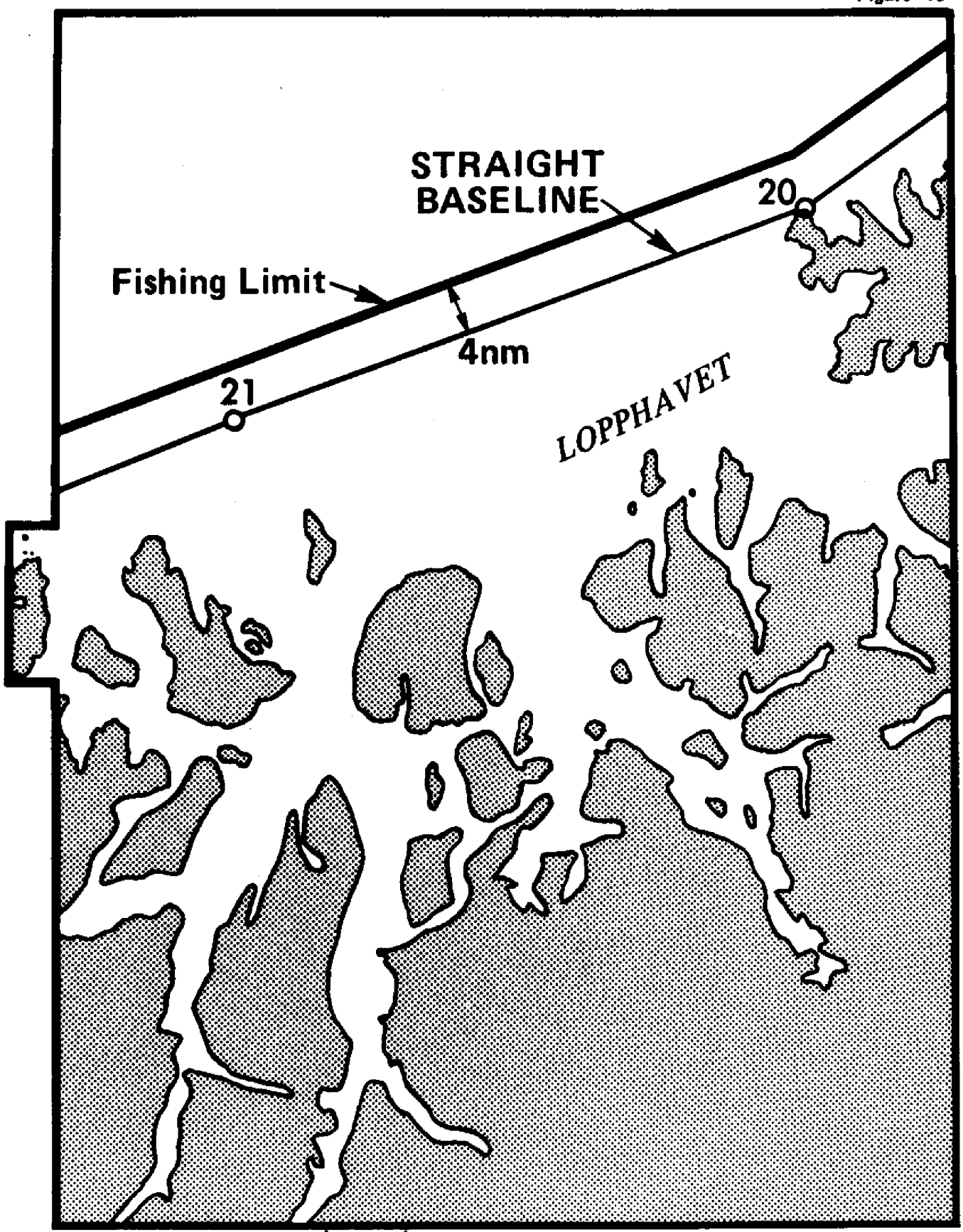
The Court did say again and again that the coastline was paralleled by an archipelago or skjaergaard. Unfortunately, these terms do not have very specific meanings. The original derivation of archipelago, in fact, referred to a broad sea--the Aegean--which was interspersed with a group or groups of islands. By transfer, the term has come to mean the groups of islands themselves. Skjaergaard, according to the jurist McNair, equates with the skerries of Scotland. These have been defined as rocky islands or insulated rocks or reefs; insulated in the sense of detached or isolated so that mutual attraction is insensible. The Norwegian definition refers to a "rock rampart".

In dealing with the straight baselines along the Atlantic the Court separated out for special treatment two large areas: 1) the Lopphavet and 2) the Vestfjord. The former "constitutes an ill-defined geographic whole. It cannot be regarded as having the character of a bay. The baseline has been challenged on the grounds that it does not respect the general direction of the coast." In spite of seemingly agreeing to the U.K. position the Court then agreed with Norway that Lopphavet has "such [historic] rights, founded on the vital needs of the population and attested by very ancient and peaceful means [which] may legitimately be taken into account in drawing a line which...appears...to have been kept in bounds of what is moderate and reasonable." (Figure 15) The Lopphavet, although definitely not a bay and described by a "moderate and reasonable" line totaling 36 nautical miles (base point 24 to 26) in length, was accepted as internal waters because Norway proved it to be historic waters.

In contrast, the Court passed the Vestfjord by with a mere statement that it was a fjord and the specific closing line for the fjord was to be determined by Norway. The fact is interesting inasmuch as the western shore of this fjord is composed entirely of islands! Eight major islands separated by very narrow straits flank each other so as to form, in appearance, a continuous land wall for 90 nautical miles, the remaining 40 or more miles of the fjord being comprised of smaller and more isolated islands.

It would appear that if the Court saw these "overlapping" islands as a natural shoreline capable of enclosing internal waters of the fjord then the same conditions elsewhere should also create "internal waters". A detailed examination of the charts submitted by Norway showed that, with the single exception of the "historic" Lopphavet, the entire coastline from the North Cape to the Vestfjord was shielded from the sea by flanking islands. (Figure 16) Where the islands formed a deep inlet, they flanked each other so as to create a "natural" fjord. Many of these sea bodies even bore the generic designation "fjord" as had the Vestfjord.

Figure 15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21
LOPPHAVET
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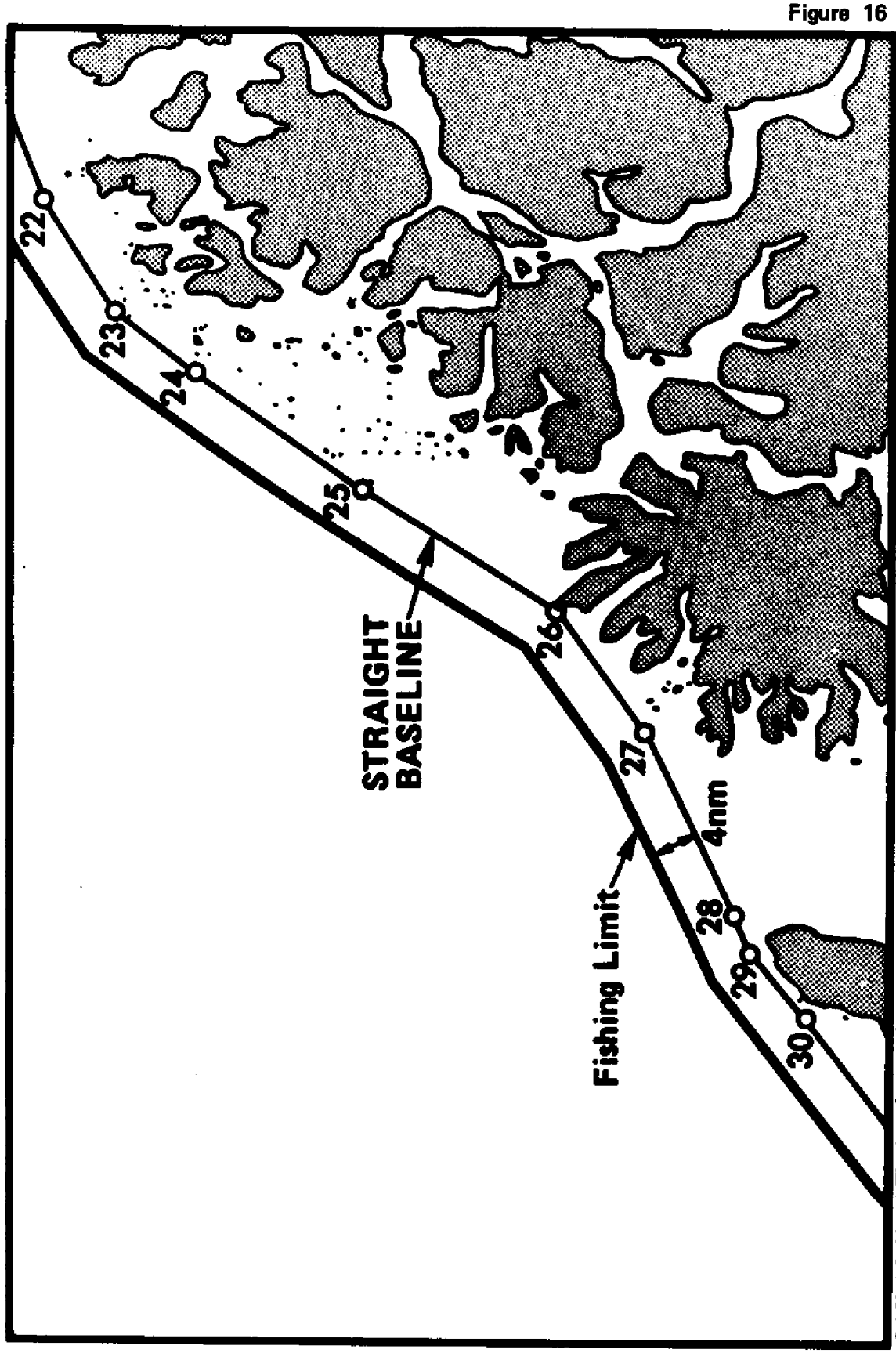
Figure 16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STRAIGHT BASELINE
Fishing Limit
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The Court, in effect, has added a new dimension in accepting a body of water continuously bounded by islands for its entire length as a fjord or bay. All definitions require the penetration into the "land" of a narrow water body. Land now may be formed by a string of islands sufficiently closely linked so as to constitute the appearance of a continuous shoreline. The previously described characteristics of a fjord or bay must, of course, be maintained.

It may be of further interest to note that the islands from the North Cape to the Vest Fjord, with the exception of the historic Lopphavet, are separated by channels narrower than twice the claimed Norwegian territorial sea, i.e., 8 nautical miles. In every instance, the strait would be closed at one point or more by the normal Norwegian claim to the territorial sea. This factor may have influenced the Court in its determination of islands separated by "narrow" channels. However, no mention is made of the fact. One may hesitate to relate the width to the claimed territorial sea for the nations claiming a wider sea would gain a distinct advantage while the narrower-claiming states would be penalized. It would appear rather that the absolute value of less than eight miles would be more pertinent than the direct relation to twice the claimed territorial sea. One is also struck by the physical similarity between the channels and fjords. The former relate in all proportions; they lack only a "head" to close them off. In any event, the waters "enclosed" certainly meet the semi-circle requirements of a bay.

The distance of eight miles has another objective basis than double the Norwegian claim. A seaman, on a platform 15 meters above sealevel can see the horizon at a distance of 8.025 miles. If the platform is reduced to 5 meters, his range is about 5 nautical miles. Mountainous terrain occupy a considerable segment of the vertical arc on the horizon. To carry the point several steps further, elevations of 100 feet (above the horizon) can be seen at a distance of 14 miles; 200 feet, 18 miles; 300 feet, 21 miles; and 400 feet, 23 miles. Elevations on the Norwegian islands average more than 1,000 feet and hence, are highly visible at distances greater than one-half of the longest straight baseline.

This discussion tends to establish that Norway, north of the Vest Fjord, is flanked by islands in a number and size sufficient enough to obscure the entire mainland from the sea. However, in drawing the straight baselines Norway did not often utilize these flanking islands as basepoints. The outermost points, whether on reefs, rocks, islets or islands were selected as the turning points of the baselines. Point No. 21 is a low-tide elevation. Many of these points are quite far distant from the flanking islands; more than double the width of the territorial sea in certain instances. In the southwestern end of the Vest Fjord, the islands used as basepoints are small and dispersed. However, as seen in the section on the Arctic, their use may be justified in that they extend the mouth of the fjord, forming a continuation of the land trajectory and nature. The "land" in this instance, of course, is the fringe of flanking islands.

From the examination of the northern sector of Atlantic Norway, the following points may be determined:

a) The Lopphavet, although not a "bay", was proven to be "historic" waters by Norway, i.e. the responsibility for exceptions to the geographic factors--historic or economic--must be proven by the claimant;

b) A "fjord" may be formed by continuous, overlapping, flanking islands

which give the appearance of a "natural" wall or shore;

c) Islands, to be separated by narrow channels, must be closer to each other than 8 nautical miles providing that the channels have fjord-relations of width to length;

d) The outermost points, even if not directly related to the flanking islands, are to be used as the points for the straight baselines; and

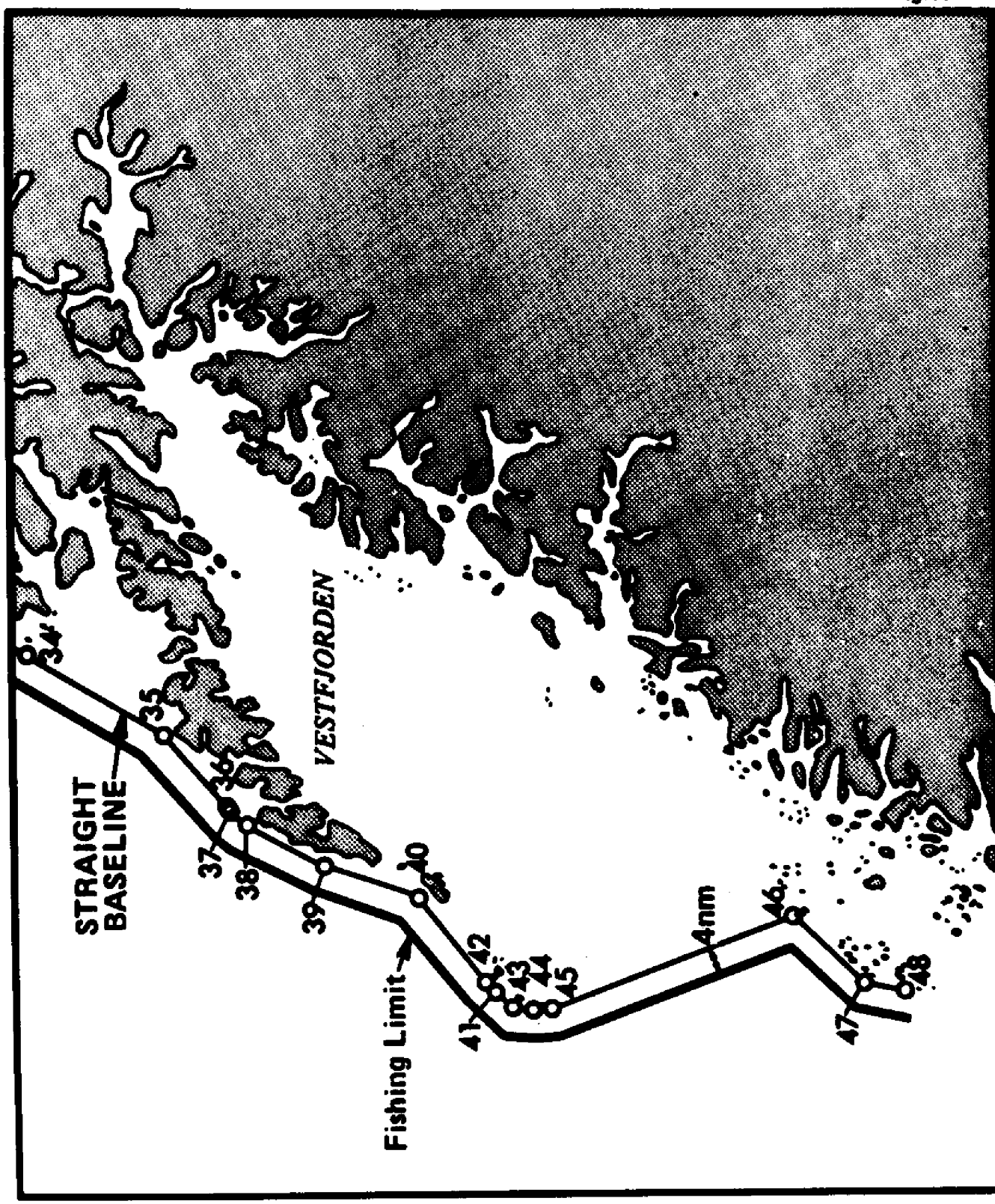
e) If a body of water is established as a fjord, the country may draw the closing line as it sees fit; the Court was not concerned.

Certain questions again arise as a result of the Geneva Conventions. Norway used a low-tide elevation for a turning point; the Convention prohibits their use unless permanent above-water structures are built on them. This action presumably supercedes the Court's decision in the case of Norway. However, the ICJ action probably would not negate Norway's continued use of Point No. 21. What then would be the status of straight baselines drawn by other countries after the Anglo-Norwegian Fisheries Case and before the Geneva Convention on the Territorial Sea became operative? We would gather that Sweden, for example, would be justified in its use of low-tide elevations according to the Norwegian example. Canada, however, drawing its lines after the Convention, would not be able to utilize them.

If the Norwegian case had ended with the closing of the Vest Fjord, the lessons to be learned would be relatively simple. The Norwegian straight baselines, however, extend approximately 20 miles south of the closing line of the Fjord. (Figure 17) The basepoints, as in the north, utilize the outmost islands, islets and rocks. However, a marked change in the nature and structure of the islands occurs. While north of the fjord the islands are large, in the sense of lateral extent in the direction of the coast, south of the fjord the islands are smaller, more linear and more dispersed. While close together, they do not overlap and do not form the virtually solid line of "coast" characterized by the northern islands. Furthermore, for the first time the generic designation fjord is utilized for channels between chains of dispersed islands. The names are applied seemingly in a random manner for any long, narrow channel between islands which form a semi-continuous chain. Fjords exist perpendicular to the coast and parallel to the coast as well as at all angles in between. Unlike fjords, as normally conceived, however, these channels lack "heads". Moreover, in paralleling the coast, the outermost points utilized for the baselines can not, in any manner, be conceived as extending the natural mouths or openings of the fjords. In effect, these islands and islets are beyond the "walls" of the fjords rather than of the mouths. As a result, an entirely different set of conditions prevail. Presumably, the acceptance of this small portion of the Norwegian baselines by the ICJ has been used by many states as the basis for their claims to straight baselines where "natural" fjord conditions do not prevail.

As the ICJ stated, the principle for the inclusion of waters within a baseline relates directly to the semi-circularity of a bay. Natural fjords, with solid mainland shores are obviously bays. Vest Fjord has been accepted as a "bay" even though one shore is composed entirely of islands. These, it has been seen, are large enough, flank each other, and are close enough together to create the illusion of a solid, continuous mainland shore. Now we are faced with the fact that the Court accepted as a fjord a channel defined by two shores composed of islands and islets which do not form continuous banks and which lack

Figure 17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precise heads and mouths. Furthermore, the outermost points used as the base-points for the straight baselines do not relate to the mouths of the fjords.

The Court did not specifically mention this region and hence must have considered the channels to be fjords. As such, they would fall within the general statement that all Norwegian fjords are internal waters.

An attempt has been made to analyze the last portion of the baseline to determine if quantitative relationships exist. The total length of the straight baseline south of the Vest Fjord is 21.95 nautical miles. The geographic groupings extend slightly above and below the lines and total 23.35 nautical miles. This region comprises several distinct types:

a) an island cluster of 29 rocks and islets occupies the first 1.5 nautical miles;

b) an open water stretch of 1.0 nautical miles;

c) a second island cluster of 34 rocks and islets occupies the next 2.25 nautical miles;

d) a second stretch of open water extends for 5.6 nautical miles; and

e) a major cluster of over 350 islands, islets and rocks extends for 13.0 nautical miles. The largest island measures approximately 1.5 miles in its lateral extent, i.e. parallel to the coast.

Open water constitute approximately 28.3% of the "rock rampart" facing the sea. Conversely, island clusters occupy 71.7%. For the 16.75 nautical miles of "rock rampart" there are over 413 rocks, islets and islands--approximately 25 high tide elevations for every mile of rampart. It is unfortunate that the "sample" area is so small.

To generalize from what is available, however, certain conclusions may be drawn:

a) A "fjord" may be formed by a discontinuous grouping of islets and rocks providing they are "clustered" and of sufficient number (25 per mile?) to characterize them as possessing the "regime of the land";

b) The outermost rocks may be used as base points even if they do not constitute a continuation of the fjord mouth;

c) The general nature of a coast may be determined by the character of approximately 70% of the area providing the remainder does not depart significantly from the norm. (This figure is similar to but not identical with the 60% figure determined for the Arctic coast.)

d) Enclosed water must meet the qualification of a bay, i.e. the semi-circularity test.

One major point of the Court's decision has been ignored to this point. The ICJ stated first that the straight baselines "must not depart to any appreciable extent from the general direction of the coast." Later, seemingly as a qualification to this point, the decision said "...one cannot confine oneself

to examining one sector of the coast alone, except in a case of manifest abuse..."[17]

This principle has two points which must be examined: 1) the application to Norway and 2) how the rule may be applied to other countries. In the case of Norway, there really is no problem. The Court states, on several occasions, "...what really constitutes the Norwegian coastline, is the outer line of the 'skjaergaard'." If this condition is accepted, then any line joining these points must follow the general trend of the coast. The Court did not consider that the "mainland" of Norway formed the coast nor "as it does practically all other countries, a clear dividing line between land and sea."[18]

As a result, a direct analysis of the relationship of the straight baselines to the "general direction of the coast" as accepted by the Court shows that they are in fact identical. The Court implies that an identical coastal formation in another country should be treated in the same manner. In expressing its cautions about the "general trend of the coast", the Court, it appears to us, was not speaking of a small sector of coast as the determinant factor. Rather the justices looked at coasts as having general trends over considerable distances and these directions determined the angular direction of the straight baselines. Even serrated coasts have a general trend which is established by the line of headlands. Deviations from a norm exist but it is not a difficult process to eliminate those which fall short or extend beyond the general line. Where a marked change in the direction occurs, then the baseline must conform. The stressing of "manifest abuse" of the general trend leads one, according to the Court, to a detailed analysis of the small sector. In Norway, for example, the straight baselines do not vary from the general direction of the coast by more than approximately 15° except in the closing line of the Vest Fjord.[19] The line manifestly abuses the general direction of the Norwegian coast by an angle of approximately 45°. However, the large-scale chart examination of the area shows that, except for a small range of choices, the line has to be drawn approximately as Norway did. The line represents a reasonable connection between two approved straight baselines.

To generalize, straight baselines must conform to the general direction of the coast. A local departure of 15° from the norm is within the acceptable limits of the court decision. The general trend of the coast is to be determined from small-scale maps and charts (1:1,000,000) and not from detailed and large-scale charts. In cases of manifest abuse of the 15° limitation, large-scale charts should be examined to determine if an exception has to be made. The implication is that the geography of the local region must determine that a deviation must be made. Historical and economic factors, of course, may affect the line if the state proves to the court (or world) that the waters contained within the straight baseline meet the court's standards for "historic" waters.

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[17] Ibid., p. 142.

[18] Ibid., p. 127.

[19] The "coast" in this instance was determined to be formed by the major islands where they existed and the mainland where they did not. Since the major islands shield the coast virtually 100%, these seem a better determinant of the "general trend of the coast" than did the obscured mainland.

SUMMARY AND CONCLUSIONS

The ICJ based its judgment on the following criteria:

a) straight baselines must not depart to any appreciable extent from the general direction of the coast;

b) the sea areas contained within the straight baselines must be sufficiently closely linked to the land domain to be subject to the regime of internal waters; and

c) that certain economic interest peculiar to the region exist, the reality and importance of which are clearly evident by a long usage.

We propose to examine these criteria in the reverse order. This method is chosen merely for ease of exposition.

HISTORIC AND ECONOMIC FACTORS

In accepting the Norwegian contention that the Lopphavet was inland waters, the Court agreed Norway had proved to its satisfaction that the region's historic rights were "founded on the vital needs of the population and attested by very ancient and peaceful usages..." Such rights can only be established by the claimant state; therefore it appears necessary that the claimant prove to the satisfaction of the Court or of another state or states that their claims are valid. No precise rules can be established, e.g., 85% of the population dependent on the sea; 75% of the local economic product, etc. These factors could change markedly from one economy to another and from one social system to another. However, the proof of the "rights" rests upon the claimant.

RELATION OF BASELINES TO THE GENERAL DIRECTION OF THE COAST

In theory, the Court determined that the line of the outermost islands, islets and rocks of Norway was the coastline of the state. Given this contention, any line joining the outermost points will not only follow the general trend of the coast but it will be the coast. As a result, it is difficult to see if one can assess the value of the specific line in order to determine its relationship to other straight baselines. An attempt is made below, however, to find such a relationship.

In practice, the Norwegian straight baselines did not depart from the general direction of the coast, as determined by the mainland or by main islands, by more than 15% with the exception of the Vest Fjord closing lines. The Court ruled that the general trend of the coast was not to be determined by an examination of large-scale charts. Thus, the general trends must be gained by a free examination of small-scale charts and maps, i.e. (1:1,000,000). The general trend must represent just that--the relatively long distance flow of coastal direction. In turn, straight baselines must conform within 15° of this norm, changing directions markedly only when the coast does so. Major deviations, i.e. manifest abuses of the general direction of the coast, must be dictated by the physical geography as determined through an examination of large-scale maps and charts. Even in the case of "historic rights", the Court agreed that the straight baselines of Lopphavet had to and did follow the general trend of the coast and were reasonable.

Inherent in the problem of maintaining a consistent relationship between the general trend of the coast and the direction of the straight baseline is the choice of intermediate points on the straight baseline. Often where three islets exist, they are not in a direct or semi-direct line. The middle point (B) may lie considerably seaward of landward from a line joining the two outer points (A and C). If the lines A-B or B-C were to deviate more than 15° from the general line of the coast, the state involved could merely choose to ignore point B. This can act to eliminate "unwanted" intermediate points which might alter the general relationship between the coast and the straight baseline. It can be seen that the elimination might be carried to an extreme. By lengthening the straight baseline segments, one could eliminate or reduce to a minimum the factor or the relationship with the general trend of the mainland coast. It appears to us that the term "reasonable", as introduced by Norway, enters into the picture as a limit, imprecise though it may be, to the length of individual straight baseline segments. As such it serves as a crude measure of the number of intermediate points which cannot be ignored.

The criterion of reasonableness may be applied in two or three distinct manners. The first involves a ratio of land area to water area in the enclosed territory within the straight baseline and the normal mainland coast. It has been determined by planimetric measurement that the ratio in the Norwegian case is 3.5:1; within the coast and straight baselines, water exceeds land at this ratio. If the length of the straight baselines are extended too greatly, the amount of water surface will be increased, thus, the ratio will become excessive.

A second measure is directly related to the length of the straight baseline. As the Court stated no limit was placed on the length of the straight baselines utilized. Norway, however, specifically affirmed that the lines were drawn so no point on the line was ever out of sight of land. In the section above, we related the distance which could be seen from a fixed point 15 meters above the water line on a clear day; the horizon is visible for a distance slightly over 8 miles. If the elevation of the land on the horizon increases to 300 feet, the land sighting distance grow to 21 miles. Here is a factor which not only relates the length of the straight baseline to the Norwegian criterion but also takes into account the factor of mountainous nature which seemed to influence the Court's thinking: The higher the coastal elevations the longer the baseline segments may be and the further they may be from the land. However, land must be in sight from all points on the straight baseline.

A third possible factor relates to the additional water surface enclosed by the straight baseline system in relation to the "normal" procedures. The increase should not be unreasonable. At this writing no percentage or ratio has been determined. However, we feel that the concept has merit and will endeavor to pursue the factor further.

A major problem which develops with the measurement of area relationship involves the breadth of the territorial sea--the wider the territorial sea the less area is enclosed proportionately by an extension of straight baselines. Thus, when one develops a "factor", a reverse relationship arises. The narrower a territorial sea a state claims, the less sea area may be added by straight baselines; the greater the claim, the more may be added. This factor stems from the use of fewer basepoints for the measurement of the wider sea.

As a result, it would appear that the relationship should be developed on the basis of a consistent claim to the territorial sea--either 3 nautical miles or 12 nautical miles--in spite of the claim of the individual state. Since the Territorial Sea Convention permits a contiguous zone to 12 miles and the baselines are utilized to determine the zonal limits, we would favor the use of 12 nautical miles as a standard for the determination.

If these three measures--a) ratio of land to water within the straight baseline and the coast; b) the water area added by the use of straight baselines compared to "normal" practices; and c) all straight baseline points never beyond the sight of land (in normal clear weather)--can be maintained as guides to reasonableness, then it would appear a mathematical criterion may be established, which, when combined with the direct relationship to the general trend of the coast--15°--permits an objective and direct evaluation of one aspect of straight baseline development.

RELATION TO THE REGIME OF THE LAND

The Court, as we have seen, related the regime of the land and the water to the criterion of a bay--did the enclosed water meet the semi-circular test required for a bay? Fjords did so according to the Court. Since the Court found no Norwegian line unreasonable, no limit was placed on the length of closing lines and furthermore the outermost rocks, as continuations of the land, could be utilized for the closing line points. Our analysis established that fjords had a minimum relationship between the width of mouth, or the closing line, and the depth of penetration into the land. First, however, it is necessary to know what the Court recognized as a "fjord". Actually, four distinct types exist along the coast in question. These, briefly, may be described as follows:

a) Land-locked fjord. The best example of this is the Varanger Fjord situated on the Soviet-Norwegian boundary. The fjord possesses a wide mouth; it decreases abruptly to a narrow, deep-water channel--bordered by steep and mountainous banks--which penetrates far into the land. The mouth of the fjord is totally without an island "fringe". A fjord, in this instance, is entirely a penetration of the sea into the mainland. The natural coastal headlands were utilized as closing points for the straight baselines.

b) Land-locked fjords with supplemental islands. The Tana Fjord is an example. The bulk of the fjord clefts deeply into the mainland but, for a considerable portion of its total length, islands supplement and extend the coastal banks. In this instance the Norwegians utilized, and the Court sanctioned, the use of the most seaward rocks and islets for closing lines.

c) Fjords flanked by major islands. The Vest Fjord, as we have seen, can be described as having one "bank" formed entirely by the mainland and one by the large, flanking islands, creating the illusion of a solid and continuous bank. As in the case of the second category, the Court permitted the use of the rocks and islets at the mouth to serve as points on the closing straight baseline, one of the longest segments utilized by the Norwegians. The line further departed from the general direction of the coast but recognizing the fjord to be a fjord forces a closing line to be delimited here--i.e. the physical geography of the coast dictates a line which must be drawn at a large angle to the direction of the mainland coast.

d) Fjords with both banks formed by small islands. The fjords paralleling the baseline for the last two baseline segments characterize this last type of fjord. They really are narrow channels bearing the generic designation of fjord situated between chains of many small islands, islets and rocks. The Norwegians apparently consider them as fjords since they meet all requirements other than they lack a head, a land terminal. The skerries which constitute parts of the banks of the fjords are utilized as basepoints for the drawing of the straight baselines.

The Court stated all Norwegian fjords were internal waters and hence were to be enclosed by straight baselines. They have been--all four categories. There is no question, if one accepts the islands as a wall or a bank, that the waters enclosed in the narrow channels of the fjords meet the semi-circularity requirements of a bay. How, then to relate them to the geographical requirements of a bay? The definition of the Norwegian coastline, accepted by the Court, was the outermost points of the skjaergaard. The dictionary definition of coastline is where "land" and "water" meet. The Court substituted "regime of the water" and "regime of the land" for the single nouns. Moreover, as we have seen, the Court accepted various coastal types as typical of the larger region. In the Arctic North, the true fjords, in contrast to coastal indentations, constituted slightly more than 60% of the coast. The island chains of the south formed more than 70% of the "coast line", the remainder being channels or fjord openings. The islands, however, were not continuous although nearly so. No serious effort has been made to measure all of the widths of the islands and the channels for the entire length due to the lack of available very large-scale maps. However, an estimate would reduce the "land" factor to approximately 65% of the total "shore line" with intervening water totalling the remaining 35%. This figure of 65% corresponds rather closely with the norm for the Arctic coast and may serve as an objective indicator of the requirements to be classified as "the coast or shore".

Notwithstanding the various types, fjords are all "funnel-shaped" bodies of water which have certain mathematical relations. In the Norwegian case, the fjords all penetrated into the "land", in relation to their closing baselines, at a ratio of 5:3 or larger. Furthermore, if one ignores the closing lines and examines the "shore feature", the ratio of penetration to width is closer to 3:1 at a minimum. Compared to a bay, a fjord is a deeply-penetrating narrow body of water. All Norwegian fjords, but not all fjords, are rimmed by mountainous land.

To obtain the designation of a fjord, and its advantages if any, these relations must be met.

UNANSWERED QUESTIONS

The examination and analysis of the Anglo-Norwegian Fisheries case leaves certain unanswered questions. The major point involves the uniqueness of the Norwegian example. The Court stated again and again that Norway was unique in Europe and that it possessed a "peculiar geography" which gave it a coast of "a very distinctive configuration". The question raised then is, having performed the exercise, can the results be applied to another coastline?

While unable to answer the question with certainty, two points favor the view that the same rules may, perhaps slightly relaxed, be applied successfully. Many countries have drawn straight baselines citing the Norwegian case. This fact implies that they see certain parallels if not direct relations between their own situation and that of the Norwegians. Secondly, the ICJ in certain of its statements seemed to be looking beyond Norway. While agreeing that the "general toleration of foreign states...is an unchallenged fact"[20] (p. 138) for straight baselines, the Court added "only the coastal state is competent to undertake it [their delimitation]." Furthermore, the Court stated that "[straight] baselines must be adapted to the special conditions obtaining in different regions.."(p. 133).

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[20]Note "general toleration" and not "acceptance", "approval", etc.

The second question, in effect, comes out of the first. Need other states meet all of the criteria to the same extent as Norway did? If the Court saw Norway as unique--i.e. presumably the most embayed, cut-into and fringed coast--the adaptations to "special conditions obtaining in different regions" implies change in the standards applied to Norway. This could take the form of relaxing (reducing) the percentages or ratios to the favor of another state, or not requiring all of the criteria to be met. If the latter situation prevailed, we would say that the last requirements to be reduced would involve the relationship between the straight baselines and the general trend of the coast and that the enclosed waters meet the semi-circular requirements of a bay. The former criterion is vital to maintain a direct relationship between the direction of the straight baselines and the mainland coast which the islands fringe. It is not believed that a system would be acceptable, for example, were an island chain to extend perpendicular to the coast or even to trend considerably beyond the limit of the mainland. The latter criterion, which is also vital to the concepts developed, relates directly to the maintenance of the land/water relationships which constitute the principle, if not sole basis, for the delimitation of internal waters, i.e. waters within the system which relate directly to the regime of the land.

The final question is the most complex and, as a result, most difficult to answer. To what degree has the subsequent Geneva Convention on the Territorial Sea superseded the ICJ Decision and developed into customary international law? Several points arise here:

a) Use of low-tide elevations for baselines development. Norway claimed it would use these points to determine its straight baselines. In fact, one point (No. 21) has been established as a low-tide elevation. The Convention specifically excludes their usage unless a permanent, above-water structure has been erected upon them. If this requirement replaces the Court's decision, what is the status of straight baselines using low-tide elevations between 1951 and the coming into force of the Convention?

b) The absence of bay-closing length limitations. The Convention specifically, except for historic bays, limits bay-closing lines to 24 miles or less. Fjords are bays, special bays but nevertheless bays. If the Convention prevails, can a nation no longer close off a fjord, such as the Vest Fjord, except where a 24-mile line may be applied? Or is a fjord, due to its deep penetration into the land, a special body of water exempt from the rules of bay closing lines? Does the same principle apply to estuaries, limited to the length of closing line by shore elevations?

The Convention, interestingly, repeated much of the language of the Decision virtually verbatim. It did change the aspect of relating the regimes of land and water, replacing the criterion by the concept of fringing islands. This change could be interpreted as an effort to clarify the final two segments where true fjord characteristics tend to diminish, i.e. relating them to islands and not to fjord-channels.

The unanswered questions could be resolved by adding to the developed criteria a maximum length of a baseline segment. If this limitation were added, the excesses which have been legislated by certain states could be avoided. The Norwegian case offers a possibility. The longest geographic segment, 45-56, measures 40.0 nautical miles.[21] As an absolute limit, we suggest this length would resolve many of the problems of objectively determining a permissible system of straight baselines, assuming the other specified criteria have been met.

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[21]Segment 20-21 is longer but it encloses historic waters and is not geographic in basis.

APPENDIX I

The Norwegian Straight Baseline Regime: A Geographic Brief

Summary

Length (Total)		645.90 nautical miles
Basepoints		48
Mainland	12	
Insular	35	
Low-tide	1	
Segments		47
Longest	43.6 (20-21)	
Shortest	c..1	
Average	11.9	

Individual Analysis

Lines between Points	Length in Nautical Miles
1 - 2	29.75
2 - 3	6.4
3 - 4	Less than 1.0
4 - 5	0.5
5 - 6	24.75
6 - 7	3.0
7 - 8	18.8
8 - 9	25.0
9 - 10	Less than 1.0
10 - 11	10.3
11 - 12	39.0
12 - 13	18.75
13 - 14	12.8
14 - 18	2.0
18 - 19	26.5
19 - 20	20.5
20 - 21	43.6
21 - 22	18.1
22 - 23	10.3
23 - 24	9.0
24 - 25	16.4
25 - 26	29.3
26 - 27	12.8
27 - 28	18.5
28 - 29	3.2
29 - 30	7.0
30 - 31	16.5
31 - 32	16.3
32 - 33	11.8
33 - 34	6.7
34 - 35	23.0
35 - 36	14.0
36 - 38	3.4
38 - 39	13.6
39 - 40	15.0
40 - 41	16.5
41 - 42	1.3
42 - 43	3.5
43 - 44	3.2
44 - 45	1.7
45 - 46	40.0
46 - 47	14.75
47 - 48	7.2
Total	645.90

THE DELIMITATION OF THE TERRITORIAL WATERS OF ARCHIPELAGOS

One of the "special circumstances" existing among the offshore areas of the globe is the presence of island groups and archipelagos, concerning which the normal rules of baseline delimitation and territorial waters, as laid down by the Geneva Conventions, may not apply. For over three-quarters of a century this problem of jurisdiction over water areas within mid-ocean archipelagos has plagued statesmen, jurists, and boundary experts. At the 1930 Hague Codification Conference, and again in the preparatory work for the 1958 Geneva Conference, the matter of archipelagos was carefully studied, but in the end, because of geographic complexities, the question remained unresolved, subject to further study by experts. Since 1958 few analyses have been made of the juridical status of mid-ocean archipelago waters; yet in recent years a number of archipelago countries have become independent. In addition to Indonesia and the Philippines are such units as Fiji, Tonga, Mauritius, and Western Samoa. The Bahamas are scheduled for independence in the relatively near future. And there are many non-independent archipelagos, such as the Faeroes, the New Hebrides, or the Solomons, for which special territorial regimes have been, or may in the future be contemplated. This report seeks to lay down certain tentative guidelines for the establishment of such special regimes.

Three distinctions should at the outset be noted. A first is between the terms "archipelago" and "island group". Presumably some sort of special regime might be permissable for archipelagos, but not necessarily for island groups. The concept of "archipelago" has various connotations. One dictionary refers to it as "a large group of islands", another to "any cluster of islands". Jens Evensen, who has researched the problem in some depth defines archipelago as "a formation of two or more islands (islets or rocks) which geographically may be considered as a whole", while Max Sorenson speaks of "islands situated in such propinquity that they form a natural geographic unit". The factor of adjacency is a key one. If the islands, islets, or rocks are located a considerable distance from one another, then the inter-island waters are hardly "adjacent" to the land. Such might be the case, for example, of some of the Cook Islands, or of eastern units of the Tuamotu Archipelago.

In addition to adjacency, the element of configuration might also be important, but here again past or current practices offer few clues to the problem. References have been made to such "archipelagos" as the Hawaiian Islands, the Florida Keys, and the Aleutians, although in each case these are essentially a chain of islands, rather than a cluster. An important difference between these and such cluster-like groups as the Fijis and the Solomons is that the latter contain within the island group a type of semi-enclosed sea over which they may seek to establish some forms of sovereignty, even though mid-points are a considerable distance from the nearest land.

A second distinction should be made between coastal and mid-ocean or outlying archipelagos. The former often have the character of island fringes and as such may be treated through the straight baseline provisions of Article 4 of the Geneva Convention on the Territorial Sea and the Contiguous Zone. The Norwegian skjaergaard is perhaps the classic example of this coastal feature. Straight baselines join the outer limits of this archipelago with one another and with the mainland.

Outlying archipelagos are more difficult to handle, first because they exhibit such a wide variety of physical conditions, and second because it may be very difficult to decide the conditions under which they merit a special juridical regime. It is with these outlying archipelagos that this report is primarily concerned.

Finally, some note must be taken of the diversity of the conditions under which a special regime might be established for an outlying archipelago. A first situation might be that of adjacency--the units are so located with respect to one another that the group may be considered as a geographic whole. Second, there is the element of history. Countries may claim that a certain island group--and its inter-island waters--have traditionally been considered as a single political unit, regardless of the factor of adjacency. In this case the question comes up, on whom is the burden of proof of such historic claims--the island country or the international community? Finally, there is the economic argument, namely that regardless of physical geography or history, the island peoples have a unique dependence on their coastal waters, and thus are entitled to special considerations so far as jurisdiction over these waters is concerned. Associated with this may in time be claims to preservation of the ecology. Following the analogy of the Canadian Arctic Waters Pollution Prevention Act, it is not unreasonable to expect island countries in the near future to press their claims to competence over nearby waters on the grounds of the possibilities of some ecological hazard.

Conditions of adjacency. It is suggested here that some specific limitations to adjacency could be set up in the case of archipelagos; unless such limitations are established and are accepted by a majority of the world's nations almost any situation in which islands, islets, rocks, banks, and shoals are located in some proximity to one another may be considered as meriting a special territorial regime.

According to the proposal outlined here, straight lines up to a maximum of forty nautical miles in length would be permissable between adjacent basepoints; the waters associated with, and enclosed by, these lines, if they are not already within the territorial sea as normally delimited, would be designated as "insular waters", over which the country would have jurisdiction, subject to certain restrictions. The details of this suggestion are as follows:

1. The straight lines constructed between appropriate basepoints within an archipelago are to be known as "construction lines" to differentiate them from a system of straight baselines.

2. Twelve miles seaward of the construction lines the outer limits of the insular waters will be delimited. All waters within these outer limits, not already included within the traditional twelve-mile territorial limits of the land area, are designated as insular waters.

On Figure 18, the dashed line marks the outer limits of the twelve-mile territorial sea about islands (A & B) and a rock (C), while the solid line is the construction line between the three features. The shaded area marks the extent of the insular waters. These, together with the territorial waters inside the twelve-mile limit, represent the area of water over which the islands have jurisdiction. If breaks exist between basepoints which are more than 40 miles in length, they cannot be bridged by construction lines. On Figure 19, it is more than 40 miles from islands A or B to islands C or D.

3. Insular waters shall have the same juridical status as territorial waters, except that all ships and aircraft in transit shall enjoy the same freedom of navigation and overflight for the purpose of transit through and over such waters, as they have on the high seas. The coastal State may designate corridors suitable for transit by all ships and aircraft through such waters.

Figure 18

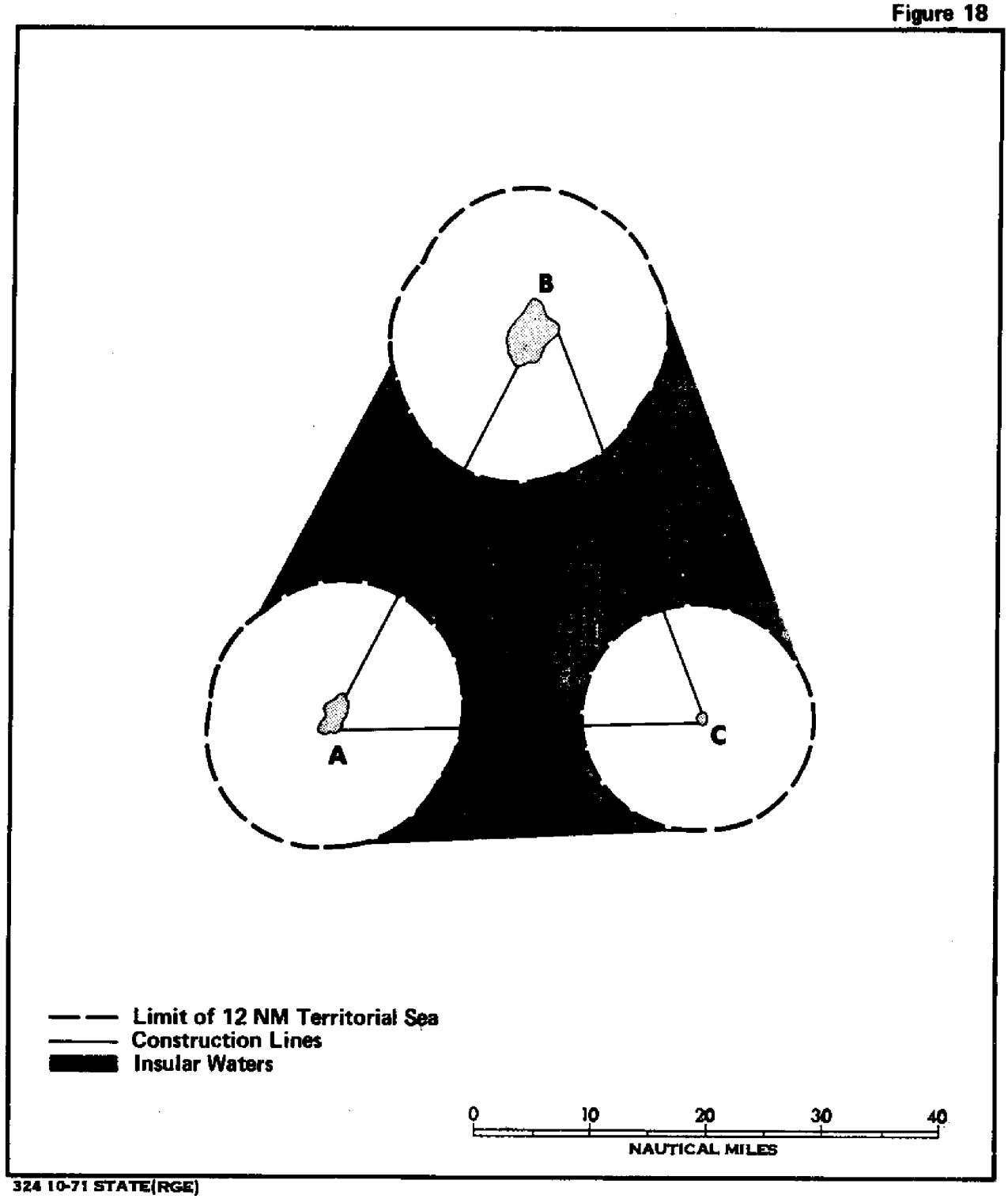

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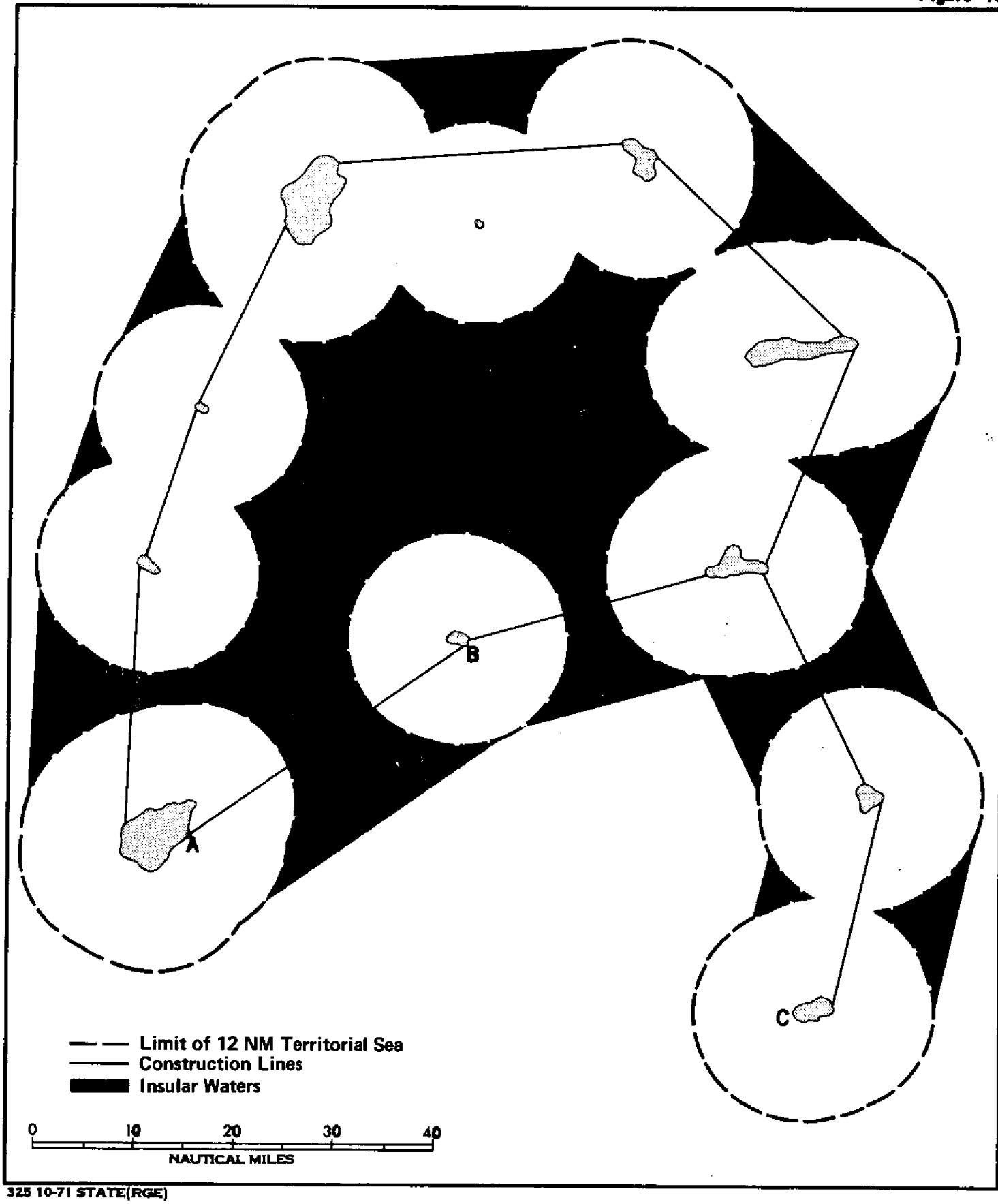
Figure 19



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4. If, in the case of islands of the archipelago, the coastline is deeply indented and cut into, or if there is a fringe of islands along the coast in its immediate vicinity, the method of straight baselines joining appropriate points may be employed, in accordance with Article 4 of the Geneva Convention on the Territorial Sea and the Contiguous Zone.

5. As regards coral atoll reefs, the edge of the reef as marked on large-scale nautical charts, shall be accepted as the low-water line for measuring the construction line and the territorial sea.

6. With respect to any closed system of construction lines, the total area of insular waters contained within the 12-mile limits calculated from the construction lines may not exceed the aggregate of areas contained within circles 12 miles in radius calculated about each of the basepoints used.

On Figure 20 this condition is satisfied, but on Figure 21 the extent of insular waters enclosed exceeds the total area of territorial waters within the lines. Thus, on the basis of adjacency the delimitation on Figure 21 would be disallowed.

Rationale for the proposal. The system suggested here is designed to afford archipelago areas an opportunity, under certain prescribed conditions, to assert competence over their inter-island waters. The construction lines are in a sense artificial baselines. From them the seaward limits of insular waters are measured, and all areas of insular waters must be within twenty-four miles of these seaward limits, or the basepoints themselves. Thus, if adjacency in archipelagos can be taken as less than, or equal to, twice the breadth of the territorial sea (measured as twelve miles) then the principle of adjacency is not violated in this proposed scheme.

Waters within twelve miles of the basepoints would be subject only to the normal regime of territorial waters, and not to the additional restrictions of "insular" regimes, so far as freedom of transit and overflight are concerned. The system suggested here implies also that territorial waters may be delimited in the case of coral reefs, as suggested in the Addendum of the Second Report on the Regime of the Territorial Sea in preparation for the 1958 Geneva Conference. Many of the island groups of the world, such as the Maldives, Truk Islands, and the Palau group have extensive coral formations which themselves form a part of the geographic whole. It would hardly make sense to exclude these features in the delimitation process.

The various restrictions noted here would apply only in the case of delimitations based on the principle of adjacency. If special circumstances exist, either on the ground of history or of economic need, some adjustments in delimitation restrictions may be necessary. There are many situations in which special competence of the coastal country over activities well away from its coast can, in theory at least, be justified. But under no conditions should the freedom of navigation and overflight for purposes of transit, beyond the twelve-mile territorial limits, be compromised. Like the regime for straight baselines, this archipelago system should require delineation on officially recognized large-scale charts to which due publicity should be given.

Applications of the proposed system. Because of the great number and variety of archipelagos throughout the world, it has not been possible to assess the impact of the proposed system on more than a few concrete situations. The Hawaiian Islands, because of their linear arrangement, would gain very little additional water area. Kauai Channel, which is sixty-four nautical miles across at

Figure 20

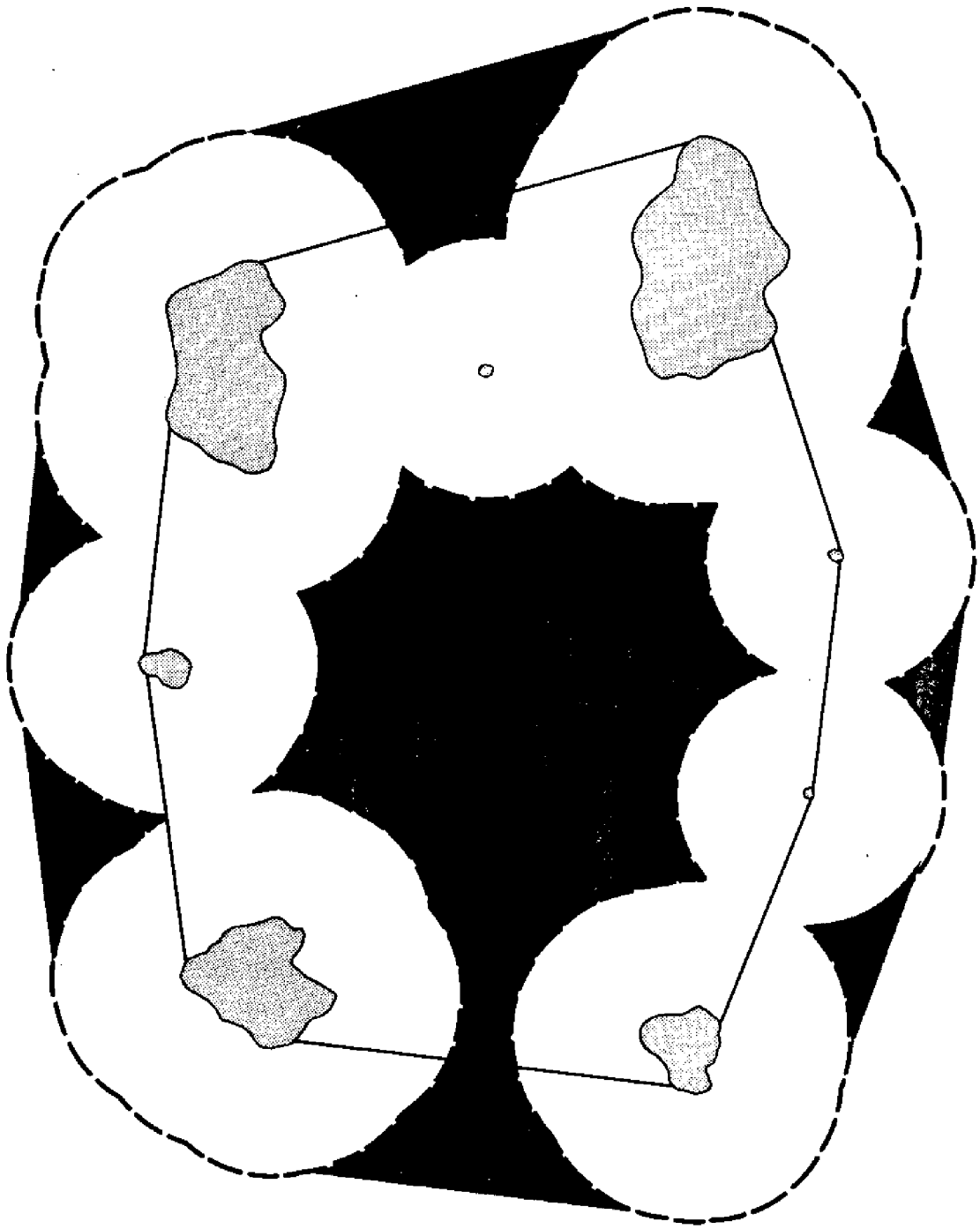

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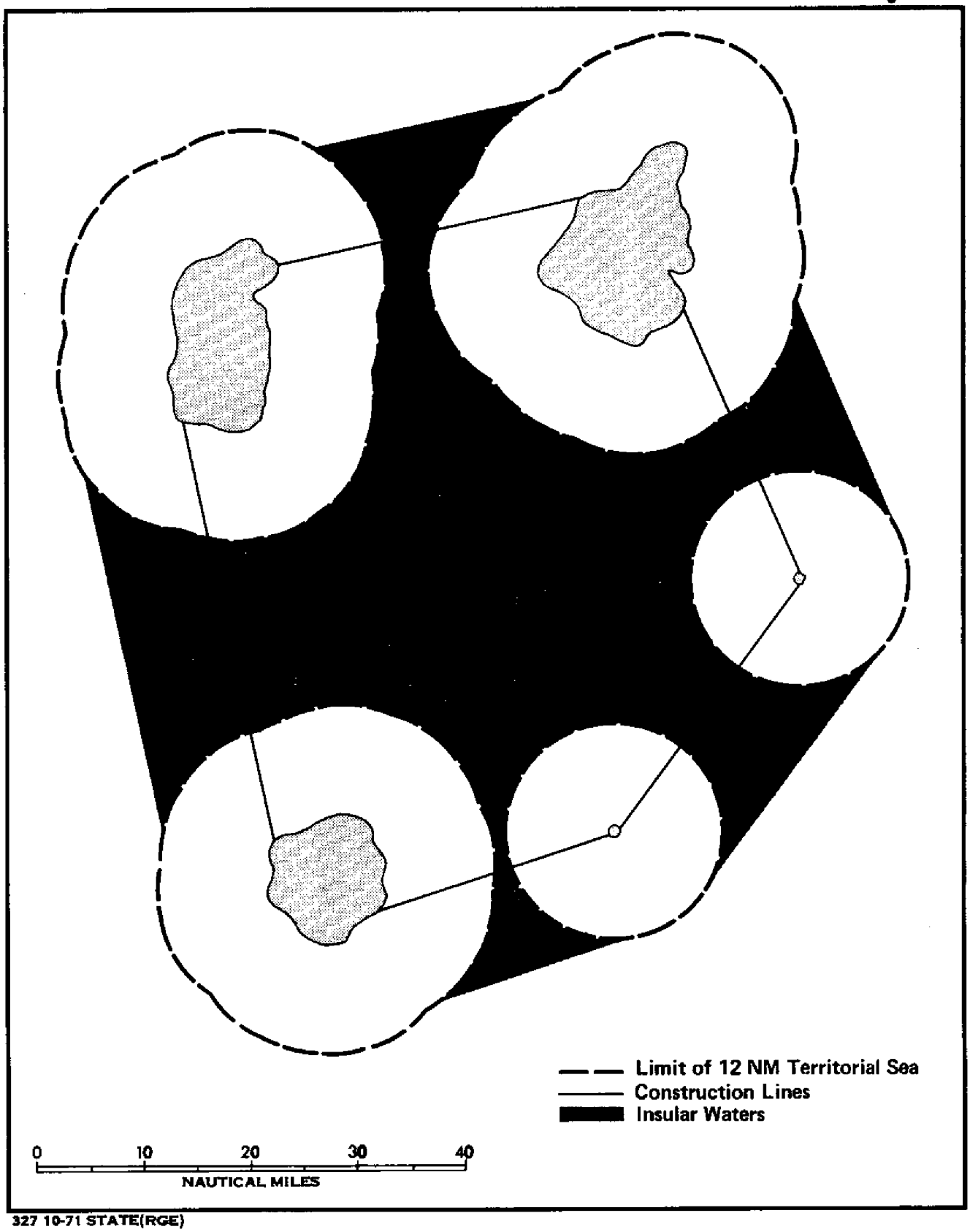
Figure 21



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its narrowest point, would not be closed off. Kauai and Nihau Islands would constitute a separate territorial unit. Similarly, there would be little additional space enclosed as insular waters in the case of the Aleutians. Three channels would remain open in the island chain--between Unalga and Semisopochnoi Islands, between Kiska and Buldir Islands, and between Buldir and Ingenstrem Rocks to the east of Attu.

The Bahama Islands would be joined together by insular waters from Little Bahama Bank in the north to Santo Domingo Cay and Acklins Island in the south--a distance of some 400 nautical miles. But a break would exist between this and the boundaries of Great Inagu Island on the northern side of the Windward Passage. Also, much of the southwestern part of the Great Bahama Bank, between Andros Island and Cuba, would not be covered either by territorial or insular waters.

Turning to the Pacific, the suggested delimitation system was applied to two newly-independent archipelago countries, Fiji and Tonga. The islands of Fiji are arranged about the Koro Sea in such a way that practically all of its waters would be classed as either territorial or insular. But Vuata Vatoa in the southeast, and Kanduva in the southwest of the archipelago are too far removed from Matuku in the center at the mouth of the Koro Sea to be connected directly with it by construction lines.

The Tonga Islands are more linear and exhibit a band of territorial or insular waters about 80 miles wide and 180 miles long, with narrower projections at both the northern and southern ends.

The delimitation system suggested here must, of course, be applied to many other island conditions throughout the world before a final decision can be made as to whether or not it is viable, or creates more problems than it is designed to resolve. Perhaps all or some of the restrictions should be modified. But a delimitation system, such as this, may in time be able to accommodate the legitimate interests of island countries with those of the international community as it seeks freedom of transit through and over inter-island waters.

THE CHOICE OF BASELINES ABOUT ATOLLS

Atolls are composed primarily of a chain of tiny, low limestone islets (motus) which partially crown a circular or oval coral reef. The reef normally is completely submerged at high tide but heads may dry at low water. Geomorphically, an atoll may present several external forms dependent on its stage of development or genesis. They may be characterized as true atolls, almost atolls, part-raised atolls and raised atolls. Basically, the major difference in the external character affects the nature and character of the lagoon contained within the reef. In a true atoll, the reef is virtually continuous, islands are limited and the lagoon is expansive and completely marine. In the raised atoll, the lagoon has become a saucer-like depression in an island completely above sea level. The two remaining categories form intermediate steps.

The true atolls and raised atolls represent the major problem area in the development of an equitable and logical baseline for the measurement of the territorial sea. The reefs are formed, almost entirely, by coral skeletal structures which live in a restricted environment. The skeleton of the coral polyp develops by cells on its bottom and sides which excrete calcium to protect the otherwise defenseless marine organism. The coral builds upward upon the skeletons of its dead ancestors. While live coral may be found in water depths to 1,000 feet, most exist between 20 feet below sea level and 160 feet. The reef

becomes a cemented mass of skeletal material, modified by dissolution and recrystallization through the actions of sea water. Wave action will break off huge chunks of reef, which eventually may be pulverized and reduced to sand. The top surface of the reef is covered with this debris in all sizes and forms.

The reef corals can live only under restricted geographic conditions. They cannot survive except within the temperature range of 65° F. - 96°F. The ideal water temperatures range about 80°F. Consequently, atoll development is restricted to tropical and warm subtropical waters of the Pacific, Indian and Caribbean seas. Moreover, their major development is situated in the central and western portions of these bodies.

The coral reef has a characteristic profile. The outer or seaward edge of the reef drops steeply to the sea floor. The inner, or lagoon side, shades gradually to a flat shallow basin, the atoll lagoon. These bodies of water are characteristically clear, beautifully blue and teem with marine life. Coral, characteristically, cannot survive in silty or polluted waters; hence, the purity and richness of the lagoon flora and fauna.

In virtually every instance, the rim of the coral reef is nearly continuous; perimeter coverage is generally greater than 75 percent and usually averages about 90 percent. Lagoon openings are situated normally on the lee side of the motus. The motus, in the true atoll, characteristically are limited in number and in linear extent. Rarely do they attain 50 percent of the total perimeter; normally they total much less. In certain atolls, the motus may constitute less than 10 percent of the total perimeter.

An atoll forms a geographic and ecologic unity. The lagoon, which constitutes the center of life in the atoll, has the definite character of landlocked waters. The lagoon is generally calm, exceedingly clear and possesses a characteristic color distinct from the general ocean. Wind-induced wave action is broken by the seaward extent of the reef. Other physical factors such as temperature, salinity, etc. show marked differences from the oceanic norm. However, the most important feature of the lagoon is the rich and varied biota. Most atoll lagoons generally teem with fish and other marine life. The economic well being of the indigenous population depends to a very large measure on the harvest of the lagoon fishery. This relates to the absolute lack of land surface and the even greater restrictions for cultivation in the normal atoll. Moreover, the sterility of the limestone soils and the lack of indigenous animal life on the motus are factors to be considered. Coconuts are the primary agricultural products although some root crops are also grown. Vital protein, however, comes primarily from the lagoon. (On some near atolls and raised atolls, pigs and other domesticated animals are raised in limited numbers. They generally are insufficient to meet the requirements of the population.)

The reef not only forms the lagoon which sustains the population but its existence is essential for the maintenance of the motus themselves. Without the reefs, the motus would soon be destroyed by wind and wave action. Thus the reef gives the motus both life and survival. The recent threat of reef destroying crown-of-thorns starfish represents an unusual danger to the inhabitants of these atolls for the destruction of the coral eventually means the end to the islets through erosion.

For survival, the inhabitants require all three: the reef, the lagoon and the motus. As a result, it is impossible, geographically, to separate the three

interrelated elements. While man may be destined to live his life on the motus, to maintain his existence he must harvest the lagoon formed and nurtured by the reef.

This need, which is basically one of economic survival, must be reflected politically. To protect the resource upon which life depends, the inhabitants must be in a position to control the lagoon. To accomplish this fact the territorial sea of an atoll must be measured from a baseline formed by the seaward side of the reef.

From this concept, the following should develop:

1) the lagoon forms internal, land-locked waters of the state or the atoll as part of a state;

2) the territorial sea should be measured seaward from the outer limit of the reef, even where it is submerged mean low water as shown on official charts;

3) the contiguous zone should be measured in the same manner as the territorial sea;

4) a system of straight baselines, if the conditions permit, may be drawn so as to use the reefs rather than the motus as turning points;

5) where openings in the reef are greater than twice the claimed territorial sea, the opening may be closed at the natural entrance points of the reef, in a manner similar to bays on a mainland shore.