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Delimitation of Continental Shelf Areas: A New Approach

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INTRODUCTION

In Article 57 of the 1982 Convention on the Law of the Sea (82CONLOS) a clear and unambiguous limit is given for the breadth of the exclusive economic zone:

> The exclusive economic zone shall not extend beyond 200 nautical miles from the base lines from which the breadth of the territorial sea is measured.

In Article 76 of 82CONLOS the seaward limit of the continental shelf is defined. As can be seen from the working of paragraphs 2–6 this definition is complicated and less clear. It is to be expected that this cumbersome text will give rise to differences of interpretation. Quite a few of these differences will be caused by the hydrographic and geological provisions contained in Article 76, as well as by the considerable amount of maritime surveying that will be required in order to implement its conditions properly.[1]

Paragraph 10 of Article 76 contains an important waiver:

> The provisions of this article are without prejudice to the question of delimitation of the continental shelf between States with opposite or adjacent coasts.

Quite a substantial amount of literature exists regarding the methods and problems related to the seaward delineation of continental shelf areas, especially because of the concerns evoked by the wording and conditions of Article 76. Publications on the question of delimi-

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[1] A. Kerr & M. Keen, *Hydrographic and Geological Concerns of Implementing Article 76*, 42 International Hydrographic Review 139 (1985).

tation of the continental shelf between States with opposite or adjacent coasts refer mainly to the supposed inequity ensuing from the application of any particular method of delineation.

Lateral Delimitation

In Articles 74 and 83, paragraph 1 of 82CONLOS nearly identical terms are used, as follows:

> 1. The delimitation of the exclusive economic zone [Art. 74]/the continental shelf [Art. 83] between States with opposite or adjacent coasts shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statutes of the International Court of Justice, in order to achieve an equitable solution.

This wording is different from that in Article 76 principally in that it contains no indication at all regarding technical methods to be employed or surveys to be carried out before delimitation can be effected. On the contrary, Articles 74 and 83 stress the need for agreement between States Parties based on the equitable outcome of the method of delimitation to be adopted. It is this notion of "equity" which—being utterly subjective—will give cause for prolonged disagreements and grim negotiations.

It should be kept in mind that the delimitation of the territorial sea between States with opposite or adjacent coasts is to be carried out according to a different approach, viz. Article 15 of the 82CONLOS:

> Where the coasts of two States are opposite or adjacent to each other, neither of the two States is entitled, failing agreement between them to the contrary, to extend its territorial sea beyond the median line every point of which is equidistant from the nearest points of the baselines from which the breadth of the territorial seas of each of the two States is measured. The above provision does not apply, however, where it is necessary by reason of historic title or other special circumstances to delimit the territorial seas of the two States in a way which is at variance therewith.

As this straightforward method of delimitation might present problems where the lateral borderline of the territorial sea is to meet with the landward point of the lateral continental shelf boundary, the last sentence of Article 15 is of particular importance, as it enables negotiators to delimit the territorial sea in a different way when special circumstances so compel.

In this article the lateral delimitation of the continental shelf and that of the exclusive economic zone are considered to be based on

identical principles and rules of international law, as was concluded by Peters and Tanja[2]. For this reason the term "continental shelf" will hereinafter be used exclusively.

The Equidistance Method

Article 15, describing the method of delimitation of the territorial sea between opposite or adjacent States, is the only instance in 82CONLOS where the equidistance method of delimitation is still mentioned. In Article 6 of the 1958 Convention on the Continental Shelf, paragraphs 1 and 2, the possible use of the equidistance method was clearly foreseen. However, the not always acceptable results obtained by equidistance partitioning were among the reasons for the adoption of a more general concept of delimitation in 1982.

As early as 1969 the relative imperfection of the equidistance method was emphasized in a judgment of the International Court of Justice.[3] In the same paragraph the use of the equidistance method of delimitation was declared not obligatory; nor was the use of any other single method of delimitation declared obligatory in all circumstances.

This judgment declares that delimitation is to be effected by agreement in accordance with equitable principles, taking into account all the relevant circumstances in such a manner as to leave to each State Party to the extent possible such parts of the continental shelf as constitute a natural prolongation of its land territory into and under the sea. The question is indeed whether—if the above condition is to be taken into account—the equidistance method of delimitation would be the obvious approach.

The judgment stressed that an equitable partitioning of continental shelf areas between adjacent (or opposite) States should show a reasonable degree of proportionality between the extent of the continental shelf area appertaining to the coastal State and the length of its coast, measured in the general direction of its coastline. Here again the question can be asked whether the equidistance method of partitioning will bring about this proportionality in all circumstances.

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[2] P. Peters & G. Tanja, *Lateral Delimitation of Continental Shelf and Exclusive Economic Zone*, in Report of the Netherlands Branch of the ILA to the ILA International Committee on the EEZ, p. 12 (April 1984).

[3] See paragraph 101, points C(1), D(2) and D(3) of the Judgment of 20 February 1969, in the North Sea Continental Shelf Cases, I.C.J. Reports 1969, p. 3, Sales No. 327, pp. 54–55.

Mitigation of Equidistance

The foregoing reservation with regard to the usefulness of the equidistance method of delimitation does not at all imply that the method is of secondary importance. It suffices to look at Judge Shigeru Oda's remarks in his dissenting opinion[4] in the case of the continental shelf between Tunisia and the Libyan Arab Jamahiriya, where he wrote:

> . . . It can be shown, both as a geometrical theorem and empirically, that the plotting of an equidistance line will normally satisfy this requirement of equity, provided certain preliminary conditions . . . are observed before the plotting is undertaken. The qualified equidistance method is thus the equitable method *par excellence*, and for this reason alone should be tried before all others.

Under "preliminary conditions" Judge Oda considered geographical circumstances such as major changes in the direction of the low-water line, the existence and demographic and economic importance of offshore islands, the existence of low-tide elevations in the offing, etc. As no two delimitation problems are identical no hard and fast rules can be applied here, and each situation has to be judged on its own merits. The equidistance method of partitioning applied after the relevant preliminary conditions have been taken into account is called by Judge Oda the "qualified" equidistance method.

However, recent practice shows that more often than not mitigating measures of a different nature are taken in order to counterbalance certain disproportionate results that would occur from an indiscriminate application of the equidistance method of delimitation. These measures may take the form of changing the direction of an equidistant boundary line in a more or less arbitrary manner, or using half-effect or partial-effect boundary lines. All this will not be gone into here; the author has described elsewhere some of the inequitable results which may come from the application of the equidistance method of delimitation, as well as some mitigating measures which have been taken fairly recently.[5]

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[4] See paragraph 181 of Judge Oda's dissenting opinion, p. 255, Case Concerning the Continental Shelf (Tunisia/Libyan Arab Jamahiriya), Judgment of 24 February 1982, I.C.J. Reports 1982, p. 18, Sales No. 473, p. 309.

[5] W. Langeraar, *Surveying and Charting of the Seas*, Elsevier Oceanography Series No. 37, p. 512; W. Langeraar, *Equitable Apportionment of Maritime Areas through the Equiratio Method*, 36 Hydrographic Journal 19 (April 1985); W. Langeraar, *Maritime Delimitation: The Equiratio Method—A New Approach*, 10 Marine Policy 3 (January 1986).

However, as illustrations of some of the recently applied measures of mitigation the reader may note the novel way of applying "half-effect" to islands mentioned in the judgment of the International Court of Justice in the continental shelf case between Tunisia and Libya.[6]

A different manner of giving "half-effect" to an island follows from the case of Seal Island, as stated in the judgment of the International Court of Justice in the continental shelf case between Canada and the United States concerning the Gulf of Maine area.[7]

Finally, an insufficiently elucidated shift or "transposition" of an equidistance boundary line can be found in the judgment of the International Court of Justice in the case concerning the continental shelf between Libya and Malta.

The Equiratio Method

From the complications cited above it may be concluded—in the case of States with adjacent or opposite coasts—that the need exists for a method of delimitation of the continental shelf preferably meeting the following conditions:

1. it should be unambiguously defined;
2. it should be applicable in all geographical circumstances;
3. it should be able to meet the greatest possible variety of notions regarding equity; and
4. it should result in a (composite) boundary line that can be constructed easily and accurately.

It is clear that the equidistance method of delimitation meets conditions 1, 2 and 4 mentioned above. As regards condition 3 the method is rather rigid and derives whatever mobility it can muster from the application of mitigating measures. These latter, however, do not always meet conditions 1 and 4. Moreover, it should be mentioned that from a purely mathematical point of view equidistance is but one special case of a more general theory. If condition 3 is to be met the method of delimitation concerned must not be governed by a mathematical rule which is rigidly framed as one mid-value of a system with much wider limits.

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[6] Supra note 4.

[7] International Court of Justice, Case Concerning Delimitation of the Maritime Boundary in the Gulf of Maine Area (Canada/United States of America); Judgment of 12 October 1984, paragraph 129, I.C.J. Reports 1984, p. 246, Sales No. 505, p. 148.

If the median and equidistance line is defined as a boundary line every point of which is equidistant from the nearest point of the base line, then the limitation of this definition lies in the fact that any point of the boundary line has a distance from the nearest point of the base line of State A that is the same as the distance from the nearest point on the base line of State B. It is this coercive notion of the "same distance" which restricts the applicability of the equidistance method when opposing Parties are trying to agree on a mutually acceptable notion of equity, often in the face of contrariety.

In order to satisfy the notion of equity it might well be desirable to have a boundary line "every point of which is at a distance from the nearest point on the base line of State A which is a certain fraction of the distance from the nearest point on the base line of State B."

Changing this fraction will result in a shift of the boundary line. If the fraction is smaller than unity the boundary line will move to that side of the equidistance line that is nearer to State A. If the fraction is greater than unity the boundary line will shift to the other side of the equidistance line. It is now also easier to see why the equidistance line represents only one special case in a system with wider limits, i.e. the case when the fraction equals unity.

The *equiratio method of delimitation* of maritime areas can then be defined as follows:

> A boundary line between the offshore areas under the jurisdiction of two coastal States, with either adjacent or opposite coast lines, will be called an *equiratio* line when every point of it is defined by a constant fraction, or ratio, of its distance from the nearest point of the base line from which the breadth of the territorial sea of each of the two States is measured.

It is apparent from this definition that the equiratio method would enjoy a more universal degree of applicability than the equidistance method. The former, therefore, is adaptable to a considerable range of different requirements and as such would be a powerful tool in the hands of international negotiators, when considering the political options open to the negotiating Parties they represent.

These negotiators cannot normally be expected to find their way through the labyrinth of geodetic datums, chart projections, rhumb lines and geodesics, or the intricacies of constructing various concepts of boundary lines on nautical charts. It is for this reason that generally hydrographic surveyors, chartered surveyors or marine cartographers would assist such negotiating teams. Their task would consist of advising negotiators and carrying out the construction of

boundary lines according to tentative or provisionally agreed upon delimitation methods.

In order to illustrate the feasibility and ease of construction of equiratio boundary lines, a few examples will be given below.

The Equiratio Method of Delimitation Applied to a Hypothetical Case.

In Figure 1 is shown a highly simplified illustration of a composite low-water line (L.W.L.) consisting of stretches of straight lines, in this case consisting of the lines JH, HF and FD. At points J, G, E and D the boundaries between the coastal States A, B and C intersect with the L.W.L. The approximate outer limit of the continental shelf is shown as the curved line Q-V-P-O-N-M-L-K. To facilitate some measures of comparison the inland boundary lines of States A, B and C are also portrayed, and are all at the same distance from the L.W.L. The reader will be able to verify that all three coastal States have the same length of L.W.L., which length is arbitrarily fixed at eight units. As shown in the illustration, this implies that the land areas of the three States have the following surfaces: State A, 15; State B, 33; and State C, 24 square units, respectively.

Partitioning the available continental shelf area between the three coastal States on the basis of the equidistance method of delimitation at once shows the inequitable result it would yield. State A, in the illustration the smallest of the three countries, would acquire jurisdiction over the largest of the three shelf areas, i.e., the one between the line J-Q-V-P-O-N-T-G-H-J, with a surface of about 63.5 square units. Boundary line TG is the delimitation between the continental shelf areas appertaining to States A and B; the leg NT is the one between the continental shelf areas appertaining to States A and C. This favourable outcome for State A is caused by the convex form of its L.W.L., just as the concave form GPE of the L.W.L. of State B results in the jurisdiction of that State over only the area G-T-U-E-F-G, with a surface of not more than 17 square units. This seems all the more unpalatable since State B is the largest of the three. Finally, State C will acquire jurisdiction over area E-U-T-N-M-L-K-D-E, covering some 50 square units.

A situation such as that portrayed in Figure 1 will give rise to the adoption of some mitigating measures aimed at procuring for State B a larger part of the total continental shelf area to be partitioned. It is the purpose of this article to show that application of the equiratio method of delimitation can provide negotiators with an adaptable tool

Table No. 1

The influence of the use of different fractions on lateral boundary lines constructed on the basis of the equiratio method of delimitation.

State	Unit Length of Coast Line	Approx. Surface of Land Territory	Approx. surface of continental shelf		
				Equiratio method	
			Equidistance	0.9	0.8
A	8 u.	15 u.^{2}	63.5 u.^{2}	53.5 u.^{2}	48 u.^{2}
B	8 u.	33 u.^{2}	17 u.^{2}	32 u.^{2}	42.5 u.^{2}
C	8 u.	24 u.^{2}	50 u.^{2}	45 u.^{2}	40 u.^{2}
			130.5 u.^{2}	130.5 u.^{2}	130.5 u.^{2}

enabling them to meet most demands for improved equity in the offshore areas to be alloted to the coastal States. In Figure 1 the dashed lines GTN and EUTN represent the unacceptable delineation based on the equidistance method of delimitation. The dashed-triple-dotted lines GO and ESM are the boundary lines that would be found if negotiators had agreed to an equiratio delimitation of 0.9 to the advantage of State B.

As can be seen from Figure 1 and Table No. 1 this result might still not be acceptable to State B. The adaptability of the method is illustrated by the drawing of still another set of boundary lines, i.e., those based on an equiratio method of delimitation of 0.8 to the advantage of State B, yielding the lines GP and ERL. The approximate results of these different ratios can be seen in Table No. 1.

It is, of course, not at all necessary to arrive at equal fractions for the delimitation solution for both pairs of contesting coastal States. For instance, the ratio between States B and C could well be fixed at 0.8, whereas the ratio between States A and B could be agreed at 0.7. This latter value has been used for the construction of boundary line GV. In that case the continental shelf[8] areas appertaining to the three States A, B and C would cover approximately 44.5, 46 and 40 (unchanged) square units, respectively.

It is well understood that negotiations to arrive at mutually acceptable delimitation ratios will often be long, but the same applies to negotiations aiming at any other acceptable set of measures of mitigation. The advantage of the equiratio method of delimitation lies

[8] International Court of Justice, (1985); Case Concerning the Continental Shelf (Libyan Arab Jamahiriya/Malta); Judgment of 3 June 1985, paragraph 73, I.C.J. Reports 1985, p. 13, Sales No. 513, p. 178.

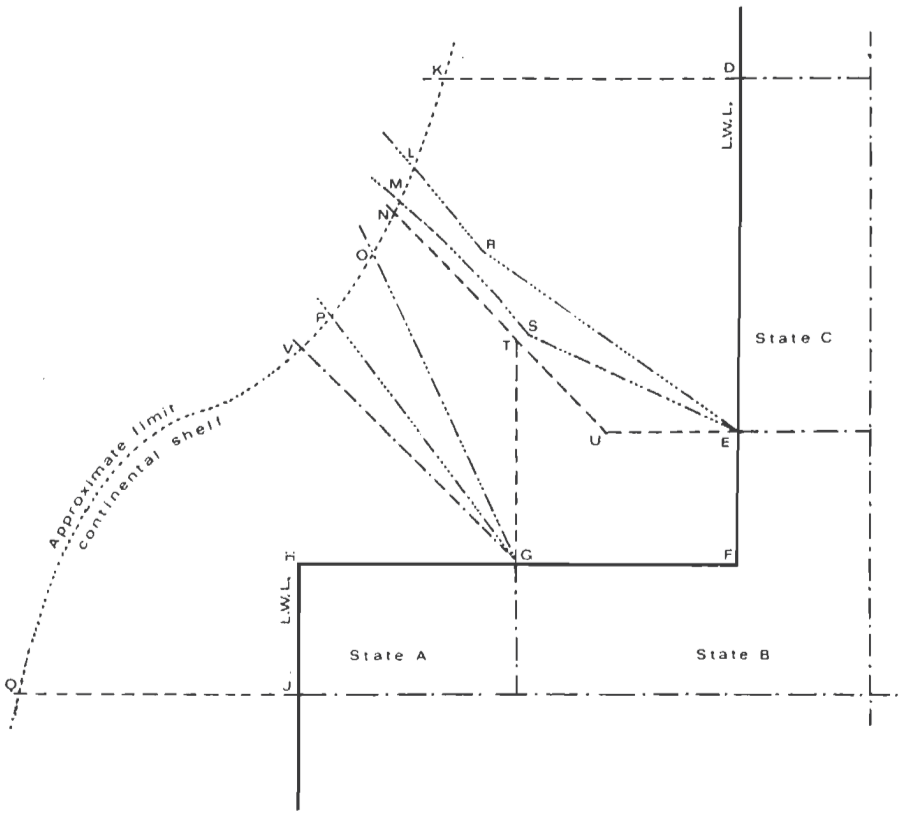

Figure 1.
A simplified, straight-lined, composite low-water line (L.W.L.) is shown of which the legs make right angles at points H and F. The continental shelf areas appertaining to coastal States A, B and C are shown. The dashed lines in the offshore area represent delineations based on the equidistance method of delimitation. A 0.9 equiratio delimitation to the disadvantage of States A and C is portrayed by lines GO and ESM respectively. A 0.8 equiratio is represented by the lines GP and ERL. Line GV is a 0.7 equiratio delineator to the disadvantage of State A.

in its adaptability, the straightforwardness of its unambiguous construction and its being objectively applicable in all geographical circumstances.

Nothing will be said here of the methods of construction of the different boundary lines shown in Figure 1. Those who are intrigued by the mathematics and methods of constructing offshore boundary lines are referred to Shalowitz[9] for the equidistance method, and to an

[9] Shalowitz, *Shore and Sea Boundaries*, 230–235, U.S. Department of Commerce, Coast and Geodetic Survey, (1962, Vol. I).

earlier article by this author[10] for some of the underlying principles of equiratio partitioning. Of course actual practice on our physical earth shows that there hardly ever exists a straight low-water line, let alone a composite one of which the straight legs are at right angles to each other. But just as the equidistance method can conveniently be applied to delimitation problems occurring in actual practice with irregular low-water lines, the equiratio method can equally well be used in all geographical circumstances. In a following paragraph this will be shown in more detail.

It is a well-known fact that generally not every single point on the irregular low-water (base) line exerts its influence on the direction of a lateral boundary line or on the distance offshore of a boundary line partitioning the continental shelf areas between two States with opposite coast lines. Only a restricted number of *principal points*, often consisting of capes, promontories, seaward ends of jetties, etc. will prove to be significant when constructing such boundary lines. Principal points will occur no matter whether the equidistance or the equiratio method of delimitation is used. However, these prinicpal points need not necessarily be identical in both cases.

Figure 2 portrays a hypothetical situation of two States, State 1 and State 2, situated opposite each other. The principal points on the low-water lines of both States are denoted A to C for State 1 and D to H for State 2. Also shown are the composite median line (based on the equidistance method of delimitation) M-N-O-P-Q-R-S-T and the composite 0.7 equiratio boundary line, constructed to the advantage of State 1. This equiratio line is indicated by K-L-U-V-W-X-Y-Z. It will be remembered that the 0.7 equiratio implies that every point of the equiratio boundary line has a distance from the nearest principal point on the base line of State 2 which is 0.7 times its distance from the nearest principal point on the base line of State 1.

It is clear that the 0.7 equiratio can also be constructed favouring State 2 instead of State 1, in which case a composite equiratio line would be found resembling (but not quite identical to) a symmetrical reflection with relation to the median line, of the one favouring State 1. Whatever the case will be depends on the outcome of negotiations between the two states, just as any other ratio than 0.7 could be agreed upon.

It should also be remembered that the separate legs making up the composite equiratio boundary line are not straight lines, but arcs of

[10] W. Langeraar, *Equitable Apportionment of Maritime Areas Through the Equiratio Method*, 36 The Hydrographic Journal 19 (April 1985).

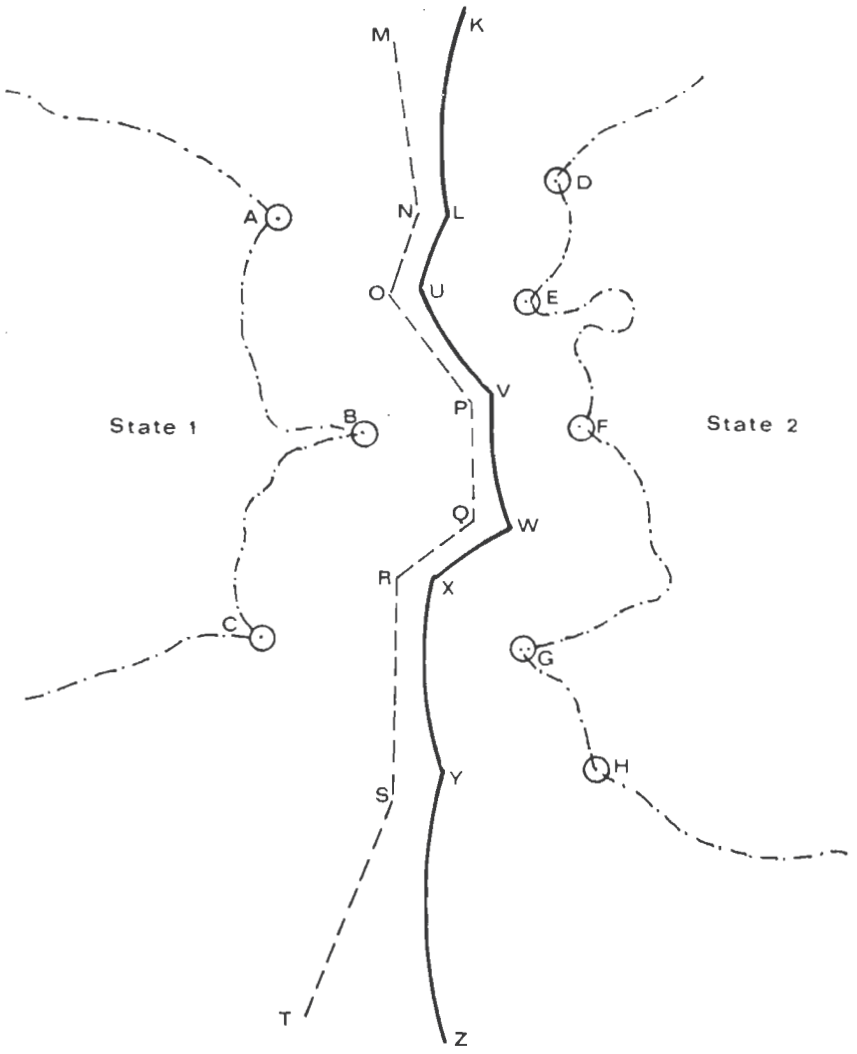

Figure 2.
Two coastal states, State 1 and State 2, have opposite low-water lines (represented by dashed-dotted lines), of which the principal points A to C for State 1 and D to H for State 2 are shown. The dashed line M to T is the median line, i.e. constructed according to the equidistance method. The drawn curvi-linear line K to Z is the composite equiratio boundary line based on an equiratio of 0.7 to the disadvantage of State 2, which implies 1/0.7 = 1.43 (approx.) to the advantage of State 1.

circles. The actual construction (not at all difficult) will not be gone into here; it is sufficient to note that the parameters of the different arcs are functions of the ratio in question and of the prinicpal points to which the arcs refer.

The reader will observe that in the neighbourhood of the prinicpal points the arcs do not diverge excessively from the corresponding legs of the median line. Only further offshore, such as for the arc YZ, does the divergence from leg ST become more pronounced. This is an important fact. It is known that any inequitable results produced by the application of the equidistance method of delimitation tend to become increasingly annoying further offshore. The fact that the equiratio boundary line tends to diverge increasingly from the equidistance line further offshore hints at a remedial capacity of the equiratio line there, where the equidistance line is most deficient.

The author has applied the equiratio method[11] of delimitation in a few cases where the International Court of Justice in its judgments had availed itself of different measures of mitigation in cases of manifest inequity brought about by certain (mostly equidistance) methods of delimitation. As was shown there, the equiratio method of apportionment would have enabled negotiating Parties to arrive at a simpler, less arbitrary and more adaptable method of delimitation than the one they tried to uphold and which finally led to the submission of their case to the International Court of Justice.

Some Areas of Possible Contention

It is understandable that delimitation problems tend to occur more frequently in areas where a vast continental shelf borders a number of coastal states' territorial seas. This is all the more true when an irregularly shaped coast line will bring about the existence of shelf-locked and other geographically-disadvantaged States.

One such area is the Sunda Shelf shown in Figure 3. Around this vast expanse of shallow sea some five or six countries are situated which show a variety of hugely different continental shelf possibilities; some front on the open ocean, while others are constrained by the presence of continental shelf areas appertaining to, or claimed by, neighbouring States.

In the Gulf of Thailand, Kampuchea and Thailand are shelf-locked countries. Vietnam, however, fronts on the open ocean. According to Yong Leng Lee[12] the continental shelf of Kampuchea is a disputed area where claims of Thailand, Vietnam and Kampuchea overlap and

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[11] W. Langeraar, *Maritime Delimitation, The Equiratio Method—a New Approach*, 10 Maritime Policy 3 (January 1986).

[12] Yong Leng Lee, *The 1982 Convention on the Law of the Sea and Continental Shelf Problems in Southeast Asia*, 9 Ocean Management 61 (1984).

Figure 3.
Part of the vast continental shelf area in Southeast Asia with emphasis on the Gulf of Thailand and the Sunda Shelf. Some possible utilizations of the equiratio method are shown between Thailand and Kampuchea and between Vietnam and Indonesia. The geographical situation and shelf-locked positions of certain countries make it difficult to diverge considerably from the equidistance boundary lines, which are portrayed by dashed lines in the picture.

clash. How far the offshore delimitation between Kampuchea and Vietnam develops into an internal problem now that Kampuchea—at least for the time being—has come under the influence of Vietnam, will become clearer in the future.

In any event, there remain the incompatible claims of Thailand and Kampuchea. If both countries were to agree to the equidistance method of delimitation, partitioning of the continental shelf area between them would take place approximately according to the line UEF.

If, however, for one reason or another, Kampuchea were to agree to a 1.25 equiratio delimitation to the advantage of Thailand (i.e. 0.8 to the disadvantage of Kampuchea), then the line UGH would act as the offshore boundary line. It is clear that in that case application of the equiratio method would not aid Thailand materially, but might give some advantages, such as in areas of historic rights or the inclusion of concessions already granted. McDorman[13] gives a clear description of the complicated situation in the Gulf of Thailand.

Another area that may become contentious is shown in Figure 3, between the islands of Con San (Vietnam) and Pulu Laut (Indonesia), two principal points, one in each of the two opposing coastal States. The median line between the base lines around these islands is denoted AB in the illustrations. It seems that this longitudinal partitioning based on the equidistance method (taking account of offshore islands) is contested by one or both Parties. Here also an equiratio construction might provide the solution. Again in this case the advantage of this method would be found in the possible inclusion of areas of historic rights or of concessions already granted, rather than in jurisdictional gain over extended offshore areas. To illustrate this the dashed-dotted line CD portrays the approximate equiratio boundary line, based on a ratio of 1.25 to the advantage of Indonesia, corresponding to a ratio of 0.8 to the disadvantage of Vietnam. In case of a 1.25 fraction to the advantage of Vietnam, the line CD would more or less be mirrored (not shown in the illustration) around median line AB.

It may be argued that this manner of transposing the boundary line does not differ at all from the arbitrary one reported at page 73 of the 1985 judgment of the International Court of Justice[14] cited above. There is, however, a material difference. What is shown in Figure 3 is the result of a mutually agreed ratio to be applied to the distances of all points of the boundary line from the nearest points of the base lines of both States. Once this ratio was agreed upon, and the resulting delimitation considered as acceptably equitable, the construction of the boundary line would have nothing of an arbitrary nature, but would follow perfectly unambiguous mathematical rules.

A different situation is shown in Figure 4, where North Korea, in the Bay of Korea, is hemmed in between the People's Republic of China to the north and west and by South Korea to the south. The

[13] T. McDorman, *Thailand and the 1982 Law of the Sea Convention*, 9 Marine Policy 292, 295 (1985).

[14] Supra, note 8.

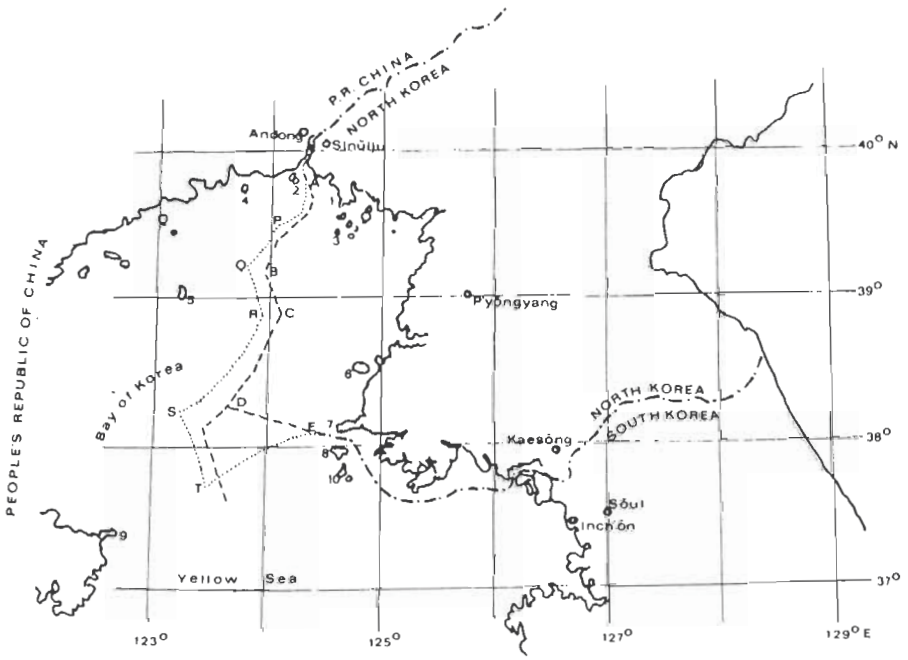

Figure 4.
In the Bay of Korea the State of North Korea is shelf-locked. Delimitation of the available area of the continental shelf according to the equidistance method yields the dashed boundary line A-B-C-D-E between on the one hand North Korea and on the other the People's Republic of China and the Republic of South Korea respectively. The dotted line A-P-Q-R-S-T-E is an equiratio boundary line of 0.8 to the disadvantage of China and of 0.9 to the disadvantage of South Korea. The principal points utilized are denoted 1 to 10.

two mutual boundaries between the three States are depicted (approximately) by dotted-dashed lines. As always, the principal points on the three base lines—the points actually deciding the course of the delimiting lines—are relatively few and, in the illustration, have been numbered from 1 to 10.

If the People's Republic of China and North Korea, on the one hand, and North and South Korea on the other, were to decide to partition the available continental shelf area in the Bay of Korea between them according to the equidistance method, then this delineator would have, approximately, the form of the dashed line A-B-C-D-E. The points A and E (again indicated approximately) are the points where the equidistance boundary lines of the territorial seas between the three States (see Article 15 of 82CONLOS) intersect with the 12 nautical mile offshore limit of the territorial sea. These

points, consequently, are the landward points of the continental shelf equidistance boundary lines.

It is not inconceivable that North Korea, being severely shelf-locked, would object to such a method of delimitation and would try to negotiate a more equitable partitioning. Between North Korea and China this might, for instance, lead to an equiratio of 1.25 to the advantage of North Korea. Such an equiratio line would approximately coincide with the dotted boundary line A-P-Q-R-S-T. Between North and South Korea a fraction of 1.1 to the advantage of North Korea (i.e. 0.9 to the disadvantage of South Korea) might be agreed upon, which would result in the curvi-linear boundary line TE.

Three observations should be made here:

(1) Principal points 9 and 10 are not needed for the construction of the equidistance boundary line, but have to be included when equiratio lines are considered. For the construction of equidistance line ED the principal points 7 and 8 will suffice, but for the equiratio line ET point 10 is also needed.

(2) Because of the irregular form of the boundary line between North and South Korea it would not be possible to construct a 0.8 equiratio line between them offshore, as such a boundary line would have so small a radius of curvature that it would not intersect with the curved leg ST at all.

(3) Though in Figure 4 points A and E, as endpoints of the equiratio boundary lines, are the same as those used in the case of the equidistance delimitation, they do not coincide in actual practice. The second part of Article 15 of 82CONLOS may refer to such a situation:

> . . . The above provision [of *equidistance*] does not apply where it is necessary by reason of historic title or other special circumstances to delimit the territorial seas of the two States in a way which is at variance therewith.

This might cause an equiratio delimitation of the territorial sea as well.

This latter construction is not absolutely necessary, as is shown in Figure 5, where the territorial sea is partitioned according to the equidistance method of delimitation and the continental shelf according to a 0.9 equiratio to the disadvantage of State Q.

In the illustration the low-water line (L.W.L.) and the dashed territorial sea offshore limit are shown as a straight line as a matter of demonstration, rather than as the portrayal of an actual situation. At point U the territorial boundary line between States P and Q intersects with the L.W.L. The composite equidistance/0.9 equiratio

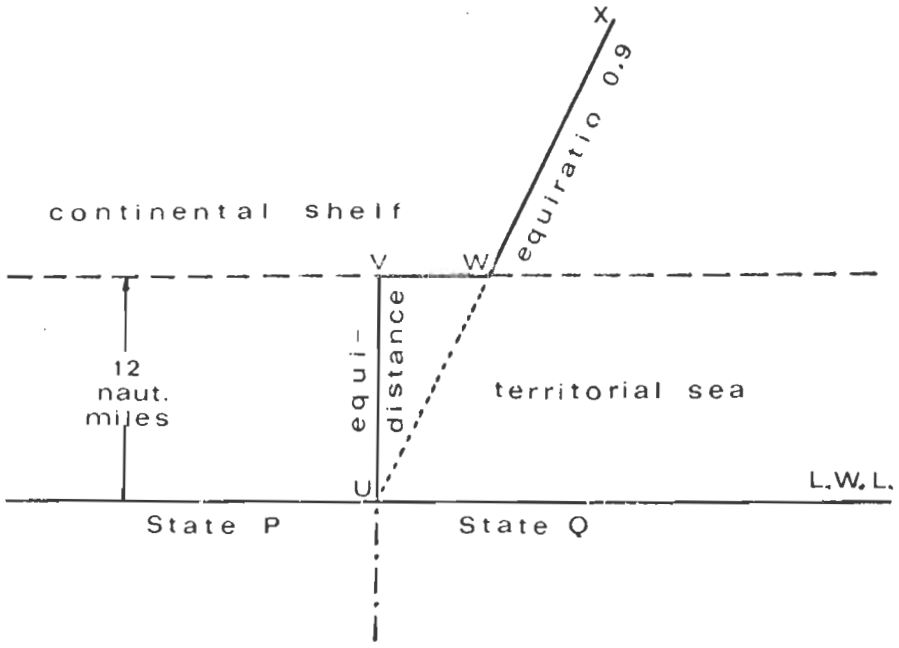

Figure 5.
A straight-lined simplified figure of two coastal States P and Q with their territorial sea of 12 nautical miles width. A possible solution is shown in case the territorial sea were to be delimited according to the equidistance method and the adjacent continental shelf according to e.g. a 0.9 equiratio method to the disadvantage of State Q. Composite line U-V-W-X is suggested as the offshore boundary line.

boundary line is now represented by line U-V-W-X. In the illustration, where UV = 12 nautical miles, the length of line VW equals approximately 5.8 nautical miles.

It should be stressed here that the geographical situations referred to in this paragraph were chosen more or less at random and purely for illustrative purposes. The suggestions, objections and possible solutions mentioned there do not reflect viewpoints or statements of governments concerned but spring exclusively from the author's imagination with a view to pointing out the versatility of the equiratio method of delimitation.

Finally, it should be kept in mind that according to Smith[15] some 376 potential maritime boundaries can be recognized, of which as of 1982 about 285 awaited the opening of conferences regarding their delineation. From Table 1 prepared by Smith this author has calcu-

[15] R. Smith, *A Geographical Primer to Maritime Boundary-Making*, 12 Ocean Development and International Law Journal 1 (1982).

lated that in the area of the Indian Ocean and its periphery and the Western and Central Pacific Ocean, some 85 potential maritime boundaries still remain to be negotiated. It is certain that a great many of these boundaries will be negotiated without any major trouble. It is equally certain that in a number of cases rather extensive mitigation will be needed so as to ensure a more equitable outcome than would have been the case if the equidistance method had been utilized indiscriminantly. The author hopes the equiratio method of delimitation may be a tool to be utilized with success in any conflict where equitable delimitation is at stake.

CONCLUSIONS

1. There exists no single method of delimitation of offshore areas which will yield an equitable result in all circumstances. The equidistance method in many cases may produce an equal division of an area, but equality and equity are not synonymous.

2. To arrive at an equitable partitioning negotiators first have to strive for the ascertainment of a mutually acceptable degree of equity, after which a method of delimitation (preferably continuously adjustable) has to be utilized, capable of yielding the desired result.

3. The equiratio method of delimitation, of which the equidistance one is only one special case, complies with the conditions laid down in this article, i.e., it is unambiguously defined; it can be applicable in all geographical circumstances; it is able to meet the greatest possible variety of ideas regarding equity; and it results in a (composite) boundary line that can be constructed easily and accurately.

4. This article does not contain the mathematical definitions and background of the equiratio method; these can be found in another article by the author. Though in Figures 1 and 5 straight low-water lines are used for illustrative purposes, it should be remembered that the equiratio method can just as easily be employed in the case of irregular terrestrial features. Essentially, the construction of an equiratio boundary line does not differ from that of an equidistance one, the same "trial-and-error" method, well known to hydrographic surveyors, can be used.