THE BOUNDARY BETWEEN SCOTLAND AND ENGLAND IN THE PORTOLAN CHARTS.

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One of the most characteristic features of those early nautical maps which are known as Portolan Charts is that they confine their attention almost exclusively to coastal features, seaports and islands. Representations of internal physical features are comparatively rare,[1] especially in the work of the earlier period, and where introduced indicate by their inaccurate and conventional forms either a want of knowledge or a lack of interest on the part of the draughtsmen. Political boundaries of countries, states, and kingdoms are altogether omitted, and even their natural frontiers are seldom indicated.[2]

The borderland between Scotland and England appears, however, to be one of the exceptions to this rule; for, although it does not present any features of importance to the navigator, yet some form of natural frontier is very generally represented. This representation takes different forms in the work of different cartographical schools, executed at different dates (Pl. I.); but the complete separation of Scotland from England, which is a common feature in the sixteenth century, has been so often insisted upon that there is a grave danger of supposing that this is the normal form in all Portolan Charts.[3]

[1] E. L. Stevenson, *Portolan Charts, their Origin and Characteristics*, New York (Hispanic Society), 1911, p. 24; A. E. Nordenskiöld, *Periplus*, Stockholm, 1897, p. 18*a*.

[2] K. Kretschmer, *Die italienischen Portolane des Mittelalters*, Berlin, 1909, p. 44.

[3] J. E. Shearer, *Old Maps and Map Makers of Scotland*, Stirling, 1905, pp. 9, 10; P. Hume Brown, *Early Travellers in Scotland*, Edinburgh, 1891, Introduction, p. ix.

The twofold object of this paper is to point out that it is quite exceptional to find Scotland and England represented as two distinct islands in charts of the fourteenth and fifteenth centuries, and to suggest that the complete separation which is to be found in so many charts of the sixteenth century is due to the unintelligent copying of earlier examples, which did not indicate it, rather than to any real belief in the insularity of Scotland.

To establish the first proposition a comparative study has been made of the representation of the British Islands in as many as possible of the early charts which are known to include them. The lack of a sufficient number of reproductions, and the reduced size and unsatisfactory presentation of some of these, has made it necessary to obtain full-sized photographs, taken directly from the originals. All the recorded charts of the fourteenth century, twenty-two in number, have been examined; but unhappily a similar completeness cannot be claimed for those of the fifteenth century. For this period eighty-one examples have been scrutinised. Sixteen other charts belonging to this century have been recorded, of which four by Gratiosus Benincasa probably do not differ from the eighteen examples by this author already studied, all of which are remarkably similar. The remaining twelve, which may or may not include the British Islands, were recorded by Uzielli over forty years ago, but either cannot now be traced by the authorities of the libraries to which they were assigned, or are in inaccessible private collections in Italy, some of which have apparently been dispersed since that time.

A comparative examination of this considerable mass of original material indicates that, so far as the representation of the British Islands is concerned, the charts of the fourteenth and fifteenth centuries may be classified according to four distinct types. The schemes adopted by cartographers for the boundary between Scotland and England are also four in number. Fifteen charts exhibit no division whatever between the two kingdoms. Forty-four examples adopt as a boundary, either in pictorial or symbolic form, a central mountain, from which flow two rivers, one to the eastern and the other to the western sea. In twenty-seven charts the frontier is only partially defined; two river estuaries or wide arms of the sea run inland to a greater or less distance, but do not meet, and the central mountain is wanting. A completely insular form is given to Scotland in eight examples only; while three others, which divide Scotland from England by a continuous but narrow river joining the eastern and western estuaries, may be described as of semi-insular type. Six charts are so much damaged or so indistinct in this region as to be valueless for our purpose.

FIG. 1

FIG. 2

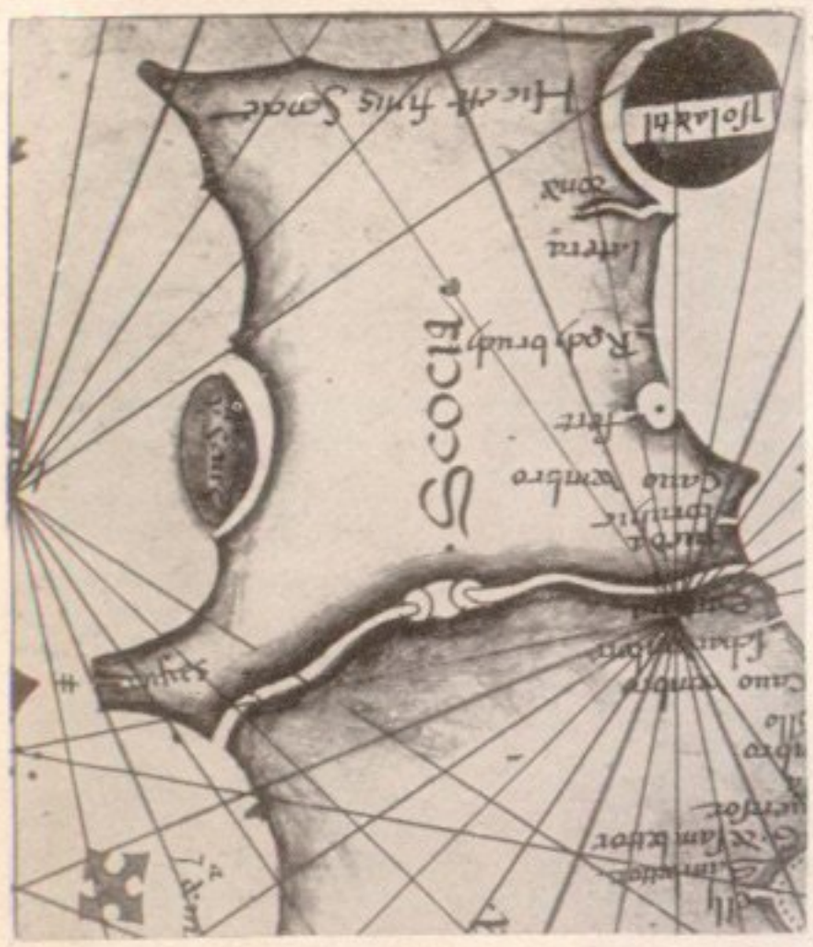

FIG. 3

FIG. 4

PLATE I.—SCOTLAND IN THE PORTOLAN CHARTS.

Fig. 1. 1413 Meca de Villadestes, PARIS, Bibliothèque Nationale, Ge. AA. 566.
Fig. 2. 1480 Gratiosus Benincasa, WIEN, K. K. Hofbibliothek, Cod. 355.
Fig. 3. 1553 Matheus Prunes, SIENA, Biblioteca Comunale, Cart. Naut. S.V. 3.
Fig. 4. 1583 Joan Martines, CHICAGO, Newberry Library, Ayer Collect. No. 11.

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Except in the earliest period, when the River Clyde was indicated, all these forms agree in fixing upon the Solway Firth as the western frontier. No such uniformity is, however, to be found where the eastern river is concerned. Identified in the earlier charts with the Firth of Forth, the boundary was soon removed from its erroneous northern position to one still more erroneous in the south, and the River Humber separated Scotland from England. Later, the most popular representation of the fifteenth century settled upon an intermediate position, and the River Tyne became the boundary line. But while the Tweed was preferred in a few charts of this period, the correct boundary was not generally adopted until the sixteenth century. (See Appendices I. and II.)

As these typical arrangements of the frontier do not in general correspond with the typical forms of Great Britain as a whole, but are to be found in different combinations with them, it will be most convenient to examine each of the four general types of the island separately, noting at the same time the various forms of boundary used with them.

Type I. Genoese.

The earliest known Portolan Charts which include Scotland are of Genoese origin, and, with the exception of one attributed to Giovanni da Carignano, are the signed and dated work of Petrus Vesconte and Perrinus Vesconte, or are introduced as illustrations in the early fourteenth-century codices of the *Liber Secretorum Fidelium Crucis* of Marino Sanudo the elder. Though anonymous, these are probably by the hand of one or the other of these cartographers.[1] The chart of 1311 by Petrus Vesconte, which is the earliest known dated example, shows only the Eastern Mediterranean. The atlas of 1313 by the same draughtsman, while including England, does not extend far enough to the north to indicate the border district; but in seven charts, dating from 1318 to 1327, this region is clearly shown. Scotland is apparently separated from England by two short and wide rivers, which flow from very nearly the same place east and west into two large bays or gulfs (Pl. II., fig. 1). In this early period the chart-makers of the Mediterranean knew little of Great Britain beyond the southern and eastern coasts of England, from Land's End to the Humber. On the west coast, which is drawn in a very defective manner, even the Bristol Channel is omitted. Scotland appears to have been still less familiar to them, for only a small portion of its southern parts is shown,

[1] K. Kretschmer, "Marino Sanudo der Ältere und die Karten des Petrus Vesconte," *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, Band xxvi. No. 4, 1891, pp. 352–70; A. Magnocavallo, "La Carta 'De Mari Mediterraneo' di Marin Sanudo, 'il Vecchio,'" *Bollettino della Società Geografica Italiana*, fasc. v., 1902.

leaving the north entirely unfinished. The kingdom is named *Scocia*, but no place-names are recorded. This lack of any precise knowledge is responsible for a remarkable error; for the ostensible division between Scotland and England does not really represent the natural frontier of the Solway Firth, Cheviot Hills, and the River Tweed, but indicates the narrow central part of Scotland itself, between the Firth of Clyde and the Firth of Forth.[1] The fact that the cartographer has placed the name *Beruich* (Berwick) in the region of this boundary may be thought a strong argument against this assumption, but that it is only due to a confusion of thought is clearly seen from the position of Scotland relatively to Ireland and to the Isle of Man in the later maps of the series. In the atlases of 1313 and 1318 neither of these islands appear, while in that of 1320, although Ireland is included, it is placed in such an erroneous position that no information can be gleaned from it. In the later charts, from 1321 onward, Ireland assumes its typical early form, in which the north-east angle nearly approaches the coast of Scotland. Athough this part of Scotland remains unnamed, it is quite evident, from the position of the Isle of Man, that the Mull of Galloway is represented by the rounded excrescence just to the north of it. As the division of the two kingdoms is carried well to the north of this point, it appears that only the Firth of Clyde and Firth of Forth can be intended. It is perhaps worthy of notice that a similar separation of northern from southern Scotland, by the Clyde and Forth meeting at the Bridge of Stirling, had already been emphasised in the thirteenth-century maps of Matthew Paris; but there are no grounds whatever for suggesting that these essentially mediæval land maps could have had any influence upon the work of the marine cartographers.[2]

The undated chart mentioned as being attributed to Carignano is perhaps even earlier than those just examined, from which it differs widely. Unfortunately, its present state does not (in a photograph, at any rate) justify any definite conclusion as to the borderland; all that can be said is that the boundary, if indicated at all, appears to be formed by two rivers.

[1] This mistaken idea, that the sources of the Clyde and Forth nearly approached one another, was long accepted. It appears in the *Scotorum Historiæ* of Hector Boece, 1526. John Bellenden, in his translation made for James V., and published about 1536, reads: "Not far fra the fontanis of Clyde springis the fontanis of Forth, quhilk discendis, with ample and braid boundis, in the Almane seis."—*Cosmographe and Description of Albion*, chap. viii. Edinburgh, 1821, vol. i. p. xxx.

[2] For reproductions of the Matthew Paris maps, see R. Gough, *British Topography*, London, 1780, vol. i. Plates ii., iii., and iv.; K. Miller, *Mappæ Mundi*, Stuttgart, 1895, vol. iii. figs. 21, 22, and 23; A. E. Nordenskiöld, *Periplus*, plate xxxiii.; *Facsimiles of National Manuscripts of Scotland*, Edinburgh, 1870, Part II. No. v. One fine example in a codex by John of Wallingford (British Museum, Cotton, Julius D., vii. fol. 49, v.) has not been reproduced.

Type II. Venetian.

The work of the Venetian school, from the later years of the fourteenth century until the middle of the fifteenth, still confesses an almost complete ignorance of Scotland, the northern parts of which are left entirely unfinished. Amongst the first of these may be mentioned the chart of Franciscus Pizigano of 1373, and that of Franciscus de Cesanis of 1421, which, together with three anonymous charts of the same period, show no division between Scotland and England.

In the earliest chart by Jacobus de Giroldis,[1] dated 1422, the inlets of the Solway Firth and the Humber estuary are merely indicated; in his second chart, of 1426, they are prolonged inland in the form of two rivers, which, although nearly approaching one another, do not actually meet. But in the later work of this cartographer, as exemplified in two charts dated 1443 and 1446, and in four anonymous and undated examples, which are certainly by the same hand, together with their prototype, a chart by G. Pasqualini as early as 1408, the mountain-and-river type of frontier is adopted. In this series the rivers are reduced to thin lines with a conventional wavy course, and the central mountain to a small, pointed, leaf-shaped object, which might easily be mistaken for a lake. In all these the eastern river still represents the Humber (Pl. II., fig. 4).

Type III. Catalan.

The charts due to the Catalan school of marine cartographers, their prototypes and derivatives, provide without doubt the most valuable material for the study of the boundary between Scotland and England. For in the eight known examples of this type, dating from the fourteenth century, and in the long series of the fifteenth- and sixteenth-century specimens of Majorcan or Italian origin, which, so far as the British Islands are concerned, are based upon Catalan originals, all types of frontier are to be found. For our present purpose, the main interest of these charts lies in the possibility of tracing in them the rectification of an originally defective representation, which was not achieved until the early years of the fifteenth century; and of following the subsequent degradation of this corrected arrangement to a mere symbol in the standardisation of the British Islands, which took place in the work of half a century later.

Some of the earliest descriptions of Scotland correctly describe the English boundary as a mountainous region, from which flow two rivers.

[1] For the Giroldis charts see M. C. Andrews, "Rathlin Island in the Portolan Charts," *Journal of the Royal Society of Antiquaries of Ireland*, 6th series, vol. xv. part i. (June 1925), p. 33, note.

In the writings of Æneas Sylvius Piccolomini, for example, which, however, only date from the early years of the fifteenth century, Scotland is described as being "*separated from England by a mountain,*" while in another place it is said that "*a river, which descends from a lofty mountain, forms the boundary of the two countries.*"[1] This natural frontier is faithfully represented in the early work of the Catalan school. A lofty mountain is placed in the centre of the borderland, from which flow two rivers, one discharging into the western sea, the other into the eastern. The details of this arrangement are, however, peculiar. In the chart by Angellinus de Dalorto of 1325 or 1330, a single mountain is crowned by a castle, which is named "*Castro novo*" (Newcastle), while in that of Angelino Dulcert of 1339[2] two peaks appear, on each of which stands a castle, one named "*Castro novo,*" the other "*Castro berluhic,*" which is probably a corrupt reading for Cair-Luilid, Caer-Luel (Carlisle), rather than, as has been supposed, for Berwick, already entered in duplicate further to the north on the east coast (Pl. II., fig. 2).[3] The western river, which flows into the Irish Sea just south of *Donfres* (Dumfries), although unnamed, evidently represents Liddel Water or the river Esk and the Solway Firth; and from the inscription, *hic dividet schocia,* there can be no doubt of its function. But the names given to the castles would suggest that the eastern river is intended for the Tyne rather than for the Tweed. It might be thought that the cartographer had been influenced by some earlier version of such a description as occurs in the *History* of Polidore Vergil, who, when speaking of Scotland, says: "*. . . but after the destruction of Pictland it did extende even to the ryver Twede, yea, sumtyme unto Tine, the uncerteyne chaunce of battayle shewing like mutabilities in that pointe as it dothe in all other things.*"[4] When, however, it is observed that in both

[1] I quote from the translation in Professor Hume Brown's *Early Travellers in Scotland,* pp. 25 and 28.

[2] Dulcert's chart is dated from Majorca, but although that of Dalorto was probably made by an Italian, perhaps by a citizen of Genoa, it may also be regarded as a prototype of the Catalan model. Charles de la Roncière, "L'Atlas Catalan de Charles V.," *Bibliothèque de l'École des Chartes,* tome lxiv. liv. 5-6, pp. 481-89, Sept.-Dec. 1903.

[3] The Pizigano chart of 1367, although made in Venice, follows the early Catalan arrangement; one mountain only is shown with its castle, named *castro berliqic* (?), followed by two illegible words. The anonymous fourteenth-century chart in the British Museum (Add. MS. 25691) has two mountains, apparently without castles. The inscriptions in this place are nearly illegible, but *ca . . . nov* may be distinguished on the right, and a name, which may be *castro berluhic,* on the left. The map of Great Britain in the *Isolario* of Henricus Martellus Germanus (Brit. Mus. Add. MS. 15760), although a century and a half later than the Dulcert chart (*ca.* 1489), follows it with considerable fidelity; the eastern castle is named *castrū nouum* and the western *castrū uerluhic.* In the Leiden codex of Martellus (Cod. Voss. Lat., f°. 23) of the same date the readings are *castrū nouū* and *castrū uerluhic.*

[4] Polydore Vergil's *English History,* from an early translation edited by Sir Henry Ellis, K.H., for the Camden Society, 1846, p. 5.

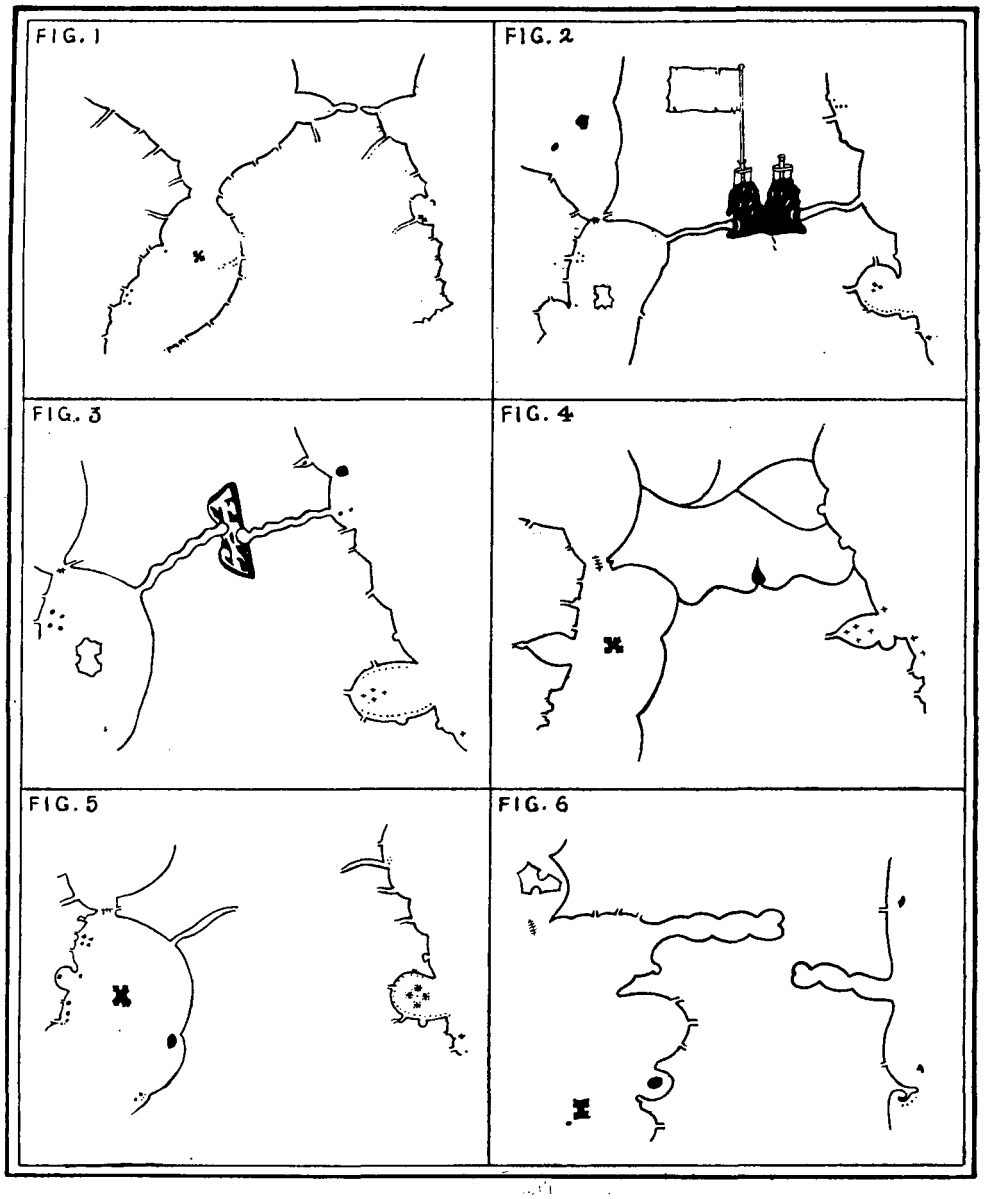

PLATE II.—EARLY FORMS OF SCOTTISH-ENGLISH BOUNDARY IN THE PORTOLAN CHARTS.

Fig. 1. *ca.* 1320 [Petrus Vesconte], ROMA, Biblioteca Vaticana, Cod. Vat. Lat. 2972.
Fig. 2. 1339 Angelino Dulcert, PARIS, Bibliothèque Nationale, Ge. B. 696.
Fig. 3. XV. Anonymous, NAPOLI, Biblioteca Nazionale.
Fig. 4. 1446 Jachobus de Giroldis, FIRENZE, Società Colombaria.
Fig. 5. 1435 Batista Becharius, PARMA, Biblioteca Palatina, Cart. Naut. No. 1613.
Fig. 6. *ca.* 1489 Anonymous, LONDON, British Museum, Egerton MS. 73 (29).

these charts *Vllo* (Hull) appears close to the mouth of this river, which in the 1339 example is actually named *Vnbra*, there can be no doubt that the River Humber is intended. That the mapmaker might have had in mind the time when England extended only so far as the ancient kingdom of Northumberland is possible; but to attribute any such detailed knowledge of English history to the cartographers of Majorca would be a bold assumption. It is more reasonable to assign the arrangement of this part of their charts to a confusion of thought, due to an ignorance of these northern regions, and to a misunderstanding of the reports they had received. When once established, this error was copied for a long period. The exact date of its correction cannot, of course, be determined with accuracy, but the work of Meca de Villadestes in 1413 (Pl. I., fig. 1), while retaining the old type of boundary, indicates a more northern river, probably the Forth, as the eastern boundary; while the majority of later chartmakers, who followed Catalan models, fixed upon the Tyne as the frontier river. Work of Venetian origin, however, continued to employ the Humber as a boundary for more than thirty years.

It should be remarked that in the Villadestes chart, and some others, the central mountain is placed at right angles, instead of parallel, to the direction of the two rivers, both of which are provided with large circular sources (Pl. II., fig. 3).

In four Catalan charts of the later fourteenth century, and in several examples of the first half of the fifteenth, no division is indicated between Scotland and England; there is neither mountain nor river, nor are there any gulfs or inlets from the sea, which would even suggest a break in continuity. The earliest of these charts is the well-known anonymous Catalan atlas of 1375, which is closely followed by the Soleri chart of 1385, by the undated example by the same author, and, later, by the work of Cholla de Briaticho, dated 1430, and by some anonymous examples.

With the early years of the fifteenth century certain minor alterations were made in the delineation of the British Islands, in charts which, although emanating from various sources, so far as these islands are concerned still followed the Catalan type. The principal examples are by Battista Becharius of Genoa, 1435; by Gabriel de Vallsecha of Majorca, 1439; by Petrus Roselli, also of Majorca, in two examples dated 1456 and 1466; and by Bartolomeus de Pareto of Genoa, in a chart dated 1455. These alterations may be described as a standardisation of form, which was employed with little further change for about a century and a half. With the general change we are not here concerned, but with it a variation of Scottish-English frontier was introduced. The central mountain of the earlier type disappears entirely, and an incomplete division only is indicated by two arms of the sea, or sometimes by

two rivers, representing the Solway Firth and River Tyne, with a greater or less extent of plain territory between them (Pl. II., fig. 5; Pl. III., fig. 1).

The popularity of this standardised type of the British Islands may probably be attributed to the great output of beautifully executed charts and atlases by Gratiosus Benincasa of Ancona. No less than sixteen examples of the work of this industrious craftsman, dating from 1461 to 1482, are preserved in various continental libraries, while our national collection in the British Museum contains six more. The charts of Gratiosus Benincasa were copied by his son Andreas (1476-90), by Conte Hectomani Freducci of Ancona (1497-1539),[1] by Giorgio Callapoda, also called Sideri, of Candia, and by many other mapmakers until the close of the sixteenth century.

The particular interest of the Benincasa chart for the present inquiry lies in the introduction of yet another type of Scottish-English frontier, which was destined to exercise a great influence upon the work of the next century (Pl. I., fig. 2, and Pl. III., fig. 3). This form, which was based upon an earlier chart by Becharius dated 1426, is in reality not new, but merely a conventionalised rendering of the original mountain-river boundary of the early Catalan school. The rivers are of disproportionately great width, and are provided with large circular sources, both of which characteristics are not uncommon in mediæval land maps; the central mountain is reduced in size till it hardly exceeds that of the river sources, between which it is so tightly squeezed as to lose all resemblance to its prototype, and to become a mere ornamental form. It is easy to see how later copyists, who were unacquainted with the original intention, were misled by the highly symbolic treatment of Benincasa. Some of the forms which this copying took, and the errors it introduced, are shown on Pl. IV., figs. 3, 4, and 5. The stages by which these errors eventually developed into a complete separation of Scotland from England will be examined when reviewing the work of the sixteenth century. But before passing to a consideration of these, one other general type of Great Britain must be mentioned. As, however, it is of no great interest for the research we are engaged upon, it need not be dwelt upon to any great length.

Type IV. Late Fifteenth Century.

The only other type of the British Islands to be found in charts of the fifteenth century cannot with certainty be assigned to any

[1] For the Freducci charts see E. L. Stevenson, *Portolan Atlas*, Conte De Ottomanno Freducci, MCCCCCXXX7, facsimile, New York (Hispanic Society), 1915.

school, but is probably of Catalan origin—the earliest-known example (of 1462) being signed by Petrus Roselli, and the second (of 1487) by Nicholas Marc . . ., both of Majorca. Three other examples of this type to be found in the Egerton MS. No. 73 (British Museum) have been dated approximately 1489. One of these has been assigned tentatively to Roselli, but the other two are supposed to be Venetian. The Scottish-English boundary in three of these charts is indicated by two arms of the sea which do not meet, but no central mountain is shown (Pl. II., fig. 6); in two other cases, including the earliest, complete insularity is adopted. Although differing in the type of boundary, all five charts of this group agree in identifying the eastern frontier with the Tweed.

In addition to these two charts only six others, of earlier date than the sixteenth century, indicate a complete separation of Scotland from England. The anonymous Medicean chart of Genoese origin, which has been thought to be of as early a date at 1351,[1] identifies the eastern end of the dividing canal with the River Humber. A planisphere by Albertin de Virga which, although the date is not entirely legible, may be assigned to the year 1411 or 1415, follows the last-mentioned chart in its representation of Scotland, which is completely insular. As, however, the scale is small and place-names are lacking, the point at which the dividing arm enters the North Sea cannot be determined with accuracy. Two collections of Venetian charts dating from the fourteenth century, and known from their former owners as the "Pinelli" atlas and the atlas of "Nicholas de Combitis," and a chart of Catalan type by Zuan da Napoli, of *circa* 1489, indicate the River Tyne.

The great circular world-map of Fra Mauro (1459) detaches Scotland from England in a peculiar and unique manner. A wide arm of the sea, entering at the Solway Firth, presently divides into two distinct channels, which pursue different and widely separated courses until they again unite shortly before the estuary of the Humber is reached.

Two charts by Andrea Bianco of Venice, dated respectively 1436 and 1448, may perhaps be considered as using an intermediate form of frontier, for while not distinctly separating Scotland from England, the eastern and western estuaries, which here represent the River Tweed and Solway Firth, are joined by a narrow but continuous river (Pl. III., fig. 2). An anonymous chart of Catalan type in the Biblioteca Estense (Chart No. 13) also shows a continuous dividing river, the eastern end of which is, however, intended for the River Tyne.

[1] The early date of this chart is questioned by Franz R. von Wieser in *Die Weltkarte des Albertin de Virga*, Innsbrück, 1912.

The Sixteenth Century.

In the last years of the fifteenth century a few marine cartographers had extended the scope of their charts by including in them the results of Portuguese discovery along the coast of Africa; America and the Indian Ocean were not represented till the sixteenth century. Notwithstanding the fact that many nautical charts of this century were progressively expanded by the inclusion of the rapidly discovered new lands, thus becoming true world-maps, yet a large number of cartographers were content to restrict their labours to the traditional limits of their predecessors. Copies of the old charts and atlases are indeed of common occurrence long after the time when far better material was available in printed maps, which however did not influence them to any great degree. But although much of the sixteenth-century work was based upon older models in so far as the well-established coasts of the Mediterranean basin were concerned, yet in the outlying regions changes were from time to time introduced. Such changes are particularly noticeable in the case of the British Islands. It is evident that navigators were no longer satisfied with the representation of these islands, which, it has just been seen, had been standardised more than a century earlier. It was the business of the cartographers to meet this demand, and they met it by many alterations in form, of which nine distinct types were introduced in less than one hundred years. But in six cases out of these nine, the revision of the Scottish coasts does not appear to have been the result of any extension of geographical knowledge, for although they exhibit a considerable diversity of outline, no real improvement is discernible. Indeed, it might almost be supposed that some at least of these changes had been made by the craftsmen, with the commercial object of introducing into their charts some new and distinctive feature which would appeal to their customers. The lack of any improved geographical knowledge is strongly confirmed by the fact that in five of these six new forms the very restricted series of place-names of a century earlier were retained with no alteration and with but few additions. The material point for the present inquiry is, that it is precisely in the charts which conform to one or other of these five types, using the old place-names, that Scotland is generally represented as a separate island; whereas in the other four, which by their extended and modernised nomenclature indicate a more intimate knowledge of the country, the insular form is seldom to be found. It will not be necessary in this place to examine the numerous sixteenth-century charts (of which over three hundred

include the British Islands)[1] in as much detail as those of the two former centuries; but particular attention must be paid to the first two new types. In one can be traced the last stages by which the original mountain-river boundary degenerated into the completely insular form; in the other some faint indication of a new and improved knowledge of Scotland, associated with a return to a more rational frontier delineation, may be found.

Type VI. Olives-Martines.

The first new sixteenth-century type of the map of Scotland, whose principal characteristic is a large four-lobed central lake with five islands, connected by a broad river to the North Sea, was widely employed. No less than sixty-three charts which adopted it have been examined. It appears to have originated in the early years of the century, as there exist two examples signed by Salvat de Pilestrina of Majorca, both of which are dated 1511. Unfortunately, however, neither of these early examples give any indication of the original form of the borderlands, for in both this region is completely covered by a large and elaborate wind-rose. The type in its full form is best exemplified by the work of the elder members of the map-making family of Olives of Majorca,[2] by that of Matheus Prunes, also of Majorca,[3] and by the later and very beautifully executed charts by Joan Martines of Messina.[4] The charts of these cartographers, together with all those which adopt this form, excepting twelve examples which return to the original type of mountainous frontier, separate Scotland completely from England by a broad arm of the sea. If, however, this sea passage is examined more carefully, it will be found in some cases to present certain suggestive peculiarities. In eight charts by Matheus Prunes, from 1553 to 1599, and in twelve other signed or anonymous examples, it is found not to be of uniform width. A distinct enlargement of the central part, which might be taken for a lake, is clearly indicated (Pl. I., fig. 3). This enlargement can, however, hardly represent a lake, of which no hint is given in any early

[1] For general lists of sixteenth-century charts, see G. Uzielli e P. Amat di S. Filippo, *Studi Biografici e Bibliografici sulla Storia della Geografia in Italia*, Edizione Seconda, Roma, 1882, vol. ii.; and Appendice, Roma, 1884; A. E. Nordenskiöld, *Periplus*, pp. 63*b*-69*a*.

[2] For the Olives charts, see Antonio Blázquez, "Mapas Antiguos adquiridos por la Sociedad Bilbaína y un mappa de Juan Oliva de 1591," *Boletin de la Real Sociedad Geográfica*, Madrid, tomo lx., segundo trimestre, 1918, Appendices, pp. 212-16.

[3] For the Prunes charts, see K. Kretschmer, "Handschriftliche Karten der Pariser National-Bibliothek," *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, 1911, No. 6, pp. 470-71.

[4] For the Martines charts, see E. L. Stevenson, *Portolan Atlas*; Joan Martines en Messina, Añy 1582, facsimile, New York (Hispanic Society), 1915.

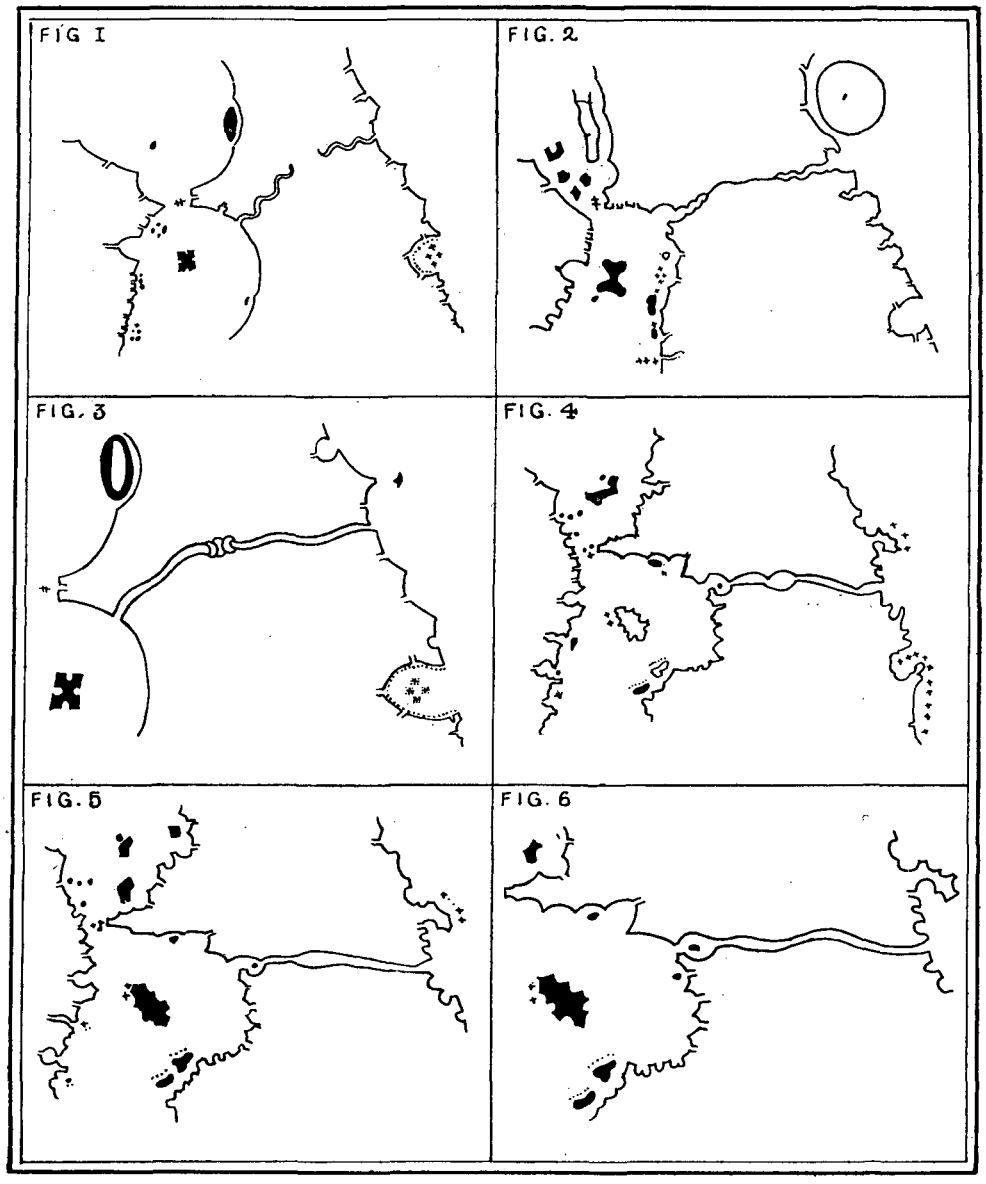

PLATE III.—DEVELOPMENT OF THE INSULAR FORM IN THE PORTOLAN CHARTS.

Fig. 1. 1439 Gabriel de Vallsecha, BARCELONA, Biblioteca de Catalunya.
Fig. 2. 1448 Andrea Bianco, MILANO, Biblioteca Ambrosiana, F. 260 inf.
Fig. 3. 1467 Gratiosus Benincasa, LONDON, British Museum, Add. MS. 11,547.
Fig. 4. 1550 Jaume Olives, WASHINGTON, Library of Congress.
Fig. 5. 1557 ,, ,, PAVIA, Biblioteca Universitaria, scaf. I. a. sin.
Fig. 6. 1563 ,, ,, NEW YORK, Hispanic Society, Chart 16.

chart nor in any written description. It seems, therefore, much more reasonable to suppose that it is merely a degraded form of the well-known symbolic design employed by Benincasa, copied inaccurately by a craftsman who failed to understand that this symbol really represented a central mountain and two river sources. The suggestion here made that the complete insularity of Scotland in many sixteenth-century Portolan charts is to be traced to the uninstructed or negligent copying of fifteenth-century examples which *did not* represent this separation, rather than to the imitation of the rare examples of earlier date which *did* adopt it, or to any definite geographical ideas, may be further supported by evidence drawn from the same group. In the work of three cartographers a transition from the central-lake type to an uninterrupted sea passage of uniform width may be traced when their later work is compared with that of earlier date. While in the earliest known chart by Jaume Olives, dated 1550, the central lake is quite distinctly represented, in his charts of 1557 and 1559 it has almost disappeared (Pl. III., figs. 4 and 5). The passage, however, is not perfectly parallel, but shows traces of the earlier form in a slight central widening, which would easily escape notice unless the fully-developed lake form had been previously observed. In two charts, both dated 1563, and in two undated examples by the same author, the final stage of a perfectly parallel canal has been reached (Pl. III., fig. 6). Bartolomeo Olives also employed these three stages; but in his case the transition is not so strictly chronological, for while his charts of 1538 and 1559 show a well-developed central lake, in that of 1532, together with two of 1561 and 1584, and two undated examples, only a slight central widening is to be observed. One chart only by this craftsman represents a parallel passage; the original date has been altered, but from internal evidence it has been suggested by Dr E. L. Stevenson that this may perhaps be near 1581. The parallel form of the division between Scotland and England would suggest that this chart was not executed until after 1584.

No signed work of Joan Martines indicates a central lake, but it is to be found in two anonymous charts (Bodl. and Vat.) which are probably due to him, and which may therefore be assigned to the earlier stage of his activity. A distinct central widening of the dividing canal may be observed in his charts of 1550-56 and 1568, while traces of this still appear in those of 1579 (Brit. Mus.), 1582, and perhaps also in that of 1586 (Vat.), the drawing of which is, however, so irregular as to preclude any certainty. In the signed charts of 1578, 1579 (Admiralty), 1582, 1583, and 1586 (Torino), and also in an anonymous undated example (Vat. Urb.), probably by the same author, the sea passage is

perfectly parallel (Pl. I., fig. 4). Martines, however, was not consistent in his work, for his charts of 1567, 1578 (Brit. Mus.), 1582 (Paris), and 1591 introduce a mountain range, without any complete separation of the two kingdoms.

As might be expected from the variety of transitional frontier forms employed by the earlier cartographers who adopted this type of Scotland, the charts of later date exhibit a like diversity, according to the model from which they were copied. The only known chart by Domingo, a son of Jaume Olives, made in Naples in the year 1568, and two of the earlier examples of the work of Jacobus Scottus of Genoa, dated 1589 and 1592, indicate a mountainous frontier. In 1593 Scottus adopts the parallel form of sea passage, and so does his ellow-citizen, Carlo da Corte, in 1592. The fully-developed lake form appears in one chart of 1593 by Vincentius Demetrius Voltius of Ragusa, in one of 1629 by J. F. Mon, and in one as late as 1651 by Pietro Giovanni Prunes of Majorca, who copied the work of his ancestor Matheus. (See Appendix III.)

The degradation of the frontier delineation having now been traced from its original natural physical form of river and mountain, through a version of that symmetrical symbolic type so dear to the mediæval mind, by a further stage of misunderstanding to an unnatural, arbitrary, and incorrect insular form, the remaining work of the sixteenth century may be briefly examined. In it we shall find that although the majority of nautical mapmakers followed the established but erroneous insular representation of Scotland, yet in their later charts three cartographers, who appear to have attained to a better general knowledge of this country, correct their earlier mistake, and cease to separate it from England.

Type VII. Maiollo.

The first of these was Vesconte de Maiollo,[1] a citizen of Genoa, in whose long period of activity (1511–49) some indication of an attempt to improve the map of Scotland may be discerned, which, faint as it may be, is still a forerunner of more enlightened geographical views. Scotland, in his earliest known chart of 1511, differed but slightly in form from that adopted in the Pilestrina charts of the same date, and a similar, but even less extended, series of place-names was employed. In his chart of 1512 the absurd central four-lobed lake was eliminated, and a more reasonable representation of the Firth of Tay substituted,

[1] M. D'Avezac, "Atlas Hydrographique de 1511 du Génois Vesconte de Maggiolo," extrait de *Annales des Voyages* (Juillet, 1870), Paris, 1871.

but no change was made in the nomenclature. The southern boundary of Scotland in both these charts consists of two wide estuaries, joined by a narrow but continuous river, with no central mountain, and although not fully insular in form, yet indicates a certain conformity with this convention. Both these charts were executed at Naples; but when in 1519 Vesconte, on obtaining an official appointment in Genoa, removed to his native city, it is evident that he obtained access to an extended knowledge of Scotland. Although no further change of form was made in his chart of this date, the list of place-names was much augmented. It is not necessary in this place to examine in detail these new names; it will be sufficient to note that, amounting to forty-six against the fourteen of his former maps, they are distributed as thickly along the northern and western coasts as on the eastern. The large central mountain of earlier date is re-introduced, but Scotland is of completely insular form. In seven of his subsequent charts, dating from 1520 to 1549, this error is rectified; the central mountain is retained, but east and west of it estuaries or very wide river mouths only are indicated, without any complete separation of the two kingdoms. It must, however, be recorded with regret that although Vesconte's son Jacobus and his grandson Baldasaro, who carried on their ancestor's work for nearly one hundred years (till 1605), retained the form of Scotland laid down in 1519 in all its details, and even slightly extended the original copious series of place-names, yet they fell away from his later accuracy by returning to the unbroken river boundary and semi-insular representation of his earlier work.

A remarkable example of the confusion which existed in the minds of some sixteenth-century chartmakers is to be found in the work of Aloysius Cesanis of Idria, who in 1574 copied the Maiollo chart of 1511. Not satisfied with completely separating Scotland from England by an arm of the sea running erroneously from Scarborough (or perhaps the Tyne) to the Solway Firth, he introduces to the south of this a second complete dividing channel from the Wash to the Mersey.

A brief notice of the four remaining types of the map of Scotland, to be found in charts of earlier date than the middle of the sixteenth century, will be sufficient for the purpose of this paper. Although differing in form from one another and from the earlier types, none of these show any improvement but rather a deterioration. Three of them use a very restricted series of place-names, which does not differ materially from the standard fifteenth-century list; in the fourth, except in one example, no names are to be found, and all employ in general the insular form.

Type VIII. Early Sixteenth Century.

The first, which is represented by a small group of seven charts, is of early origin, its first appearance being in the anonymous world-map of about 1502, formerly belonging to the late Dr E. L. Hamy, and known from a former owner as the "King" chart. Only one example of this group, made by Baptista Genovese in 1514 at Venice, is signed and dated, a copy of twenty years later being probably the work of the Portuguese cartographer, Gaspard Viegas.

Type IX. Later Portuguese.

A very defective form of Scotland is to be found in the chart of 1528 by Pero Fernandez, and in three other anonymous examples of Portuguese origin. In these charts the spurious central lake of the boundary river is well developed, and is further provided with an island, which possibly indicates a still earlier stage of the debasement of the Benincasa form than those already mentioned (Pl. IV., figs. 1 and 2).

Type V. Early Spanish-Portuguese World-Charts.

In a number of Spanish and Portuguese world-charts from the early years of the century a crude representation of the British Islands appears, which differs materially from all the former types. In these examples, which are usually of small scale and have very few or no place-names, the two kingdoms are generally represented as separate islands. The type was used later on a larger scale by John Rotz of Dieppe in 1542, by other members of the Dieppoise school of cartography, in some early charts by Diego Homen (1557-58), and in the work of Antonio Millo, Admiral of Candia, who, however, does not wholly detach Scotland from England.

Type X. Agnese (Early).

A very poor form of Scotland is presented in the numerous charts which were issued from the Venetian studio of Baptista Agnese of Genoa between the years 1536 and 1545.[1] The canal which separates Scotland from England in examples of earlier date (1536), while parallel, assumes a characteristically undulatory form (Pl. IV., fig. 6), which is,

[1] For the Agnese charts, see K. Kretschmer, "Die Atlanten des Battista Agnese," *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, Band xxi. No. 5, 1896, pp. 362–68, and Justin Winsor, "Baptista Agnese and American Cartography in the Sixteenth Century," *Proceedings of the Massachusetts Historical Society*, Feb., Mar., April, May, 1897, pp. 372–85.

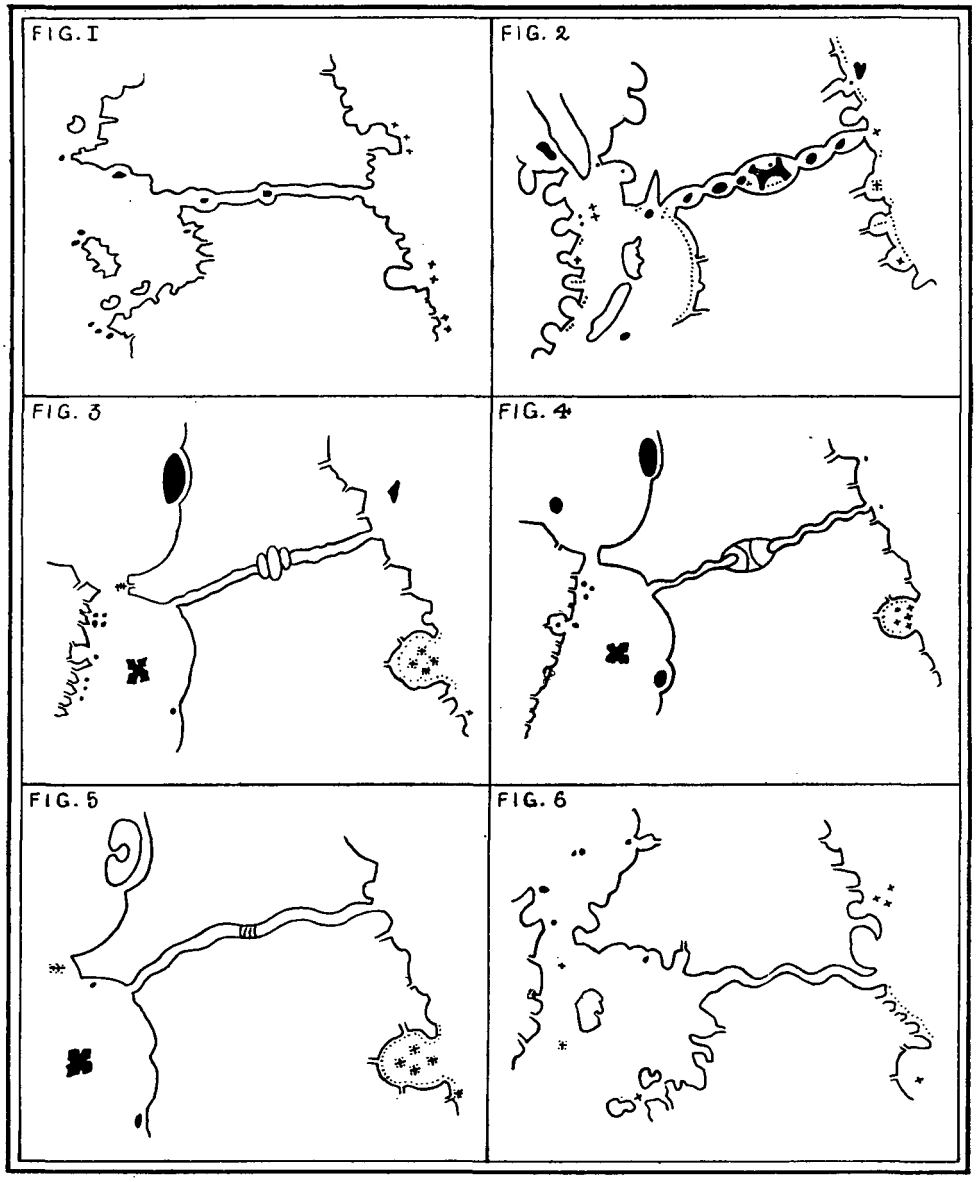

PLATE IV.—DEBASED FORMS OF MOUNTAIN-RIVER FRONTIER IN THE PORTOLAN CHARTS.

Fig. 1. XVI. Anonymous, LONDON, British Museum, Egerton MS. 767.
Fig. 2. ,, ,, PARIS, Bibliothèque Nationale, Ge. B. 1119.
Fig. 3. ,, ,, Greek, LUCCA, Biblioteca Governativa, Cod. 1898.
Fig. 4. 1520 Giovanni Xenodochio, VENEZIA, Museo Civico, Rac. Correr Port. 3.
Fig. 5. 1582/4 Antonius Millo, ROMA, Biblioteca Vittorio Emanuele, scaf. 12, sala 68, No. 1.
Fig. 6. 1536 Baptista Agnese, VENEZIA, Museo Civico, Rac. Correr Port. 31.

however, to a large extent smoothed out in those of later execution (1542-45). These and other variations suggest some development from an earlier to a later model, but only six examples have been found which do not adopt the full insular form. As these are all undated, it is however, most unfortunately, impossible to determine whether this variety is the original type adopted by Agnese, or whether it is an improvement of later date. It should be noticed that most of this Venetian work, whether signed or unsigned, has been preserved in the form of elaborately executed and extensively decorated atlases, often having the armorial bearings of the owner illuminated on the first page, which indicates that they were designed rather for the libraries of the great than for the use of practical mariners.

The last three types of Great Britain which have to be noticed all originated after the middle of the sixteenth century, and all show a greatly improved form of Scotland. In the first two this improved form is associated with a modernised and extended list of place-names, and a final disuse of any trace of a division between this country and England.

Type XI. Agnese (Late).

The later work of Baptista Agnese is indeed a remarkable instance of reform, in a period which has generally been considered as one of decadence in marine cartography, and by a mapmaker who has been regarded rather as an expert craftsman than as a skilled geographer. For in his charts from 1553 onwards, both the proportion and form of Scotland approach much more nearly to reality than is the case in any other type of Portolan chart. Associated with this improved form, in some examples we find a modernised nomenclature, and in no case are the northern and southern members of Great Britain separated from one another. So radical an improvement by such a cartographer inevitably raises the question as to whether it is original, or whether it may be traced to the influence of a more modern type of local map, such as had already been issued at Rome, in copperplate, by George Lilly a few years earlier, in 1546. That Agnese was acquainted with Lilly's work we know, for in one of his atlases he gives a very accurate hand-drawn copy of it in addition to his own charts. The connection is, however, by no means certain.

Type XII. Homen.

The Portuguese cartographer Diego Homen,[1] although indicating the possession of a considerably greater knowledge of northern and western

[1] For the Homen charts, see V. Hantzsch und L. Schmidt, *Kartographische Denkmäler König. Öffent. Bibl. zu Dresden*, Leipzig, 1903; and G. Caraci, *Cimelî cartografici sconosciuti esistenti a Firenze, I-Una carta nautica di Diego Homen* (1563), La Bibliofilía, Anno xxv. Dispensa 8A-9A, Nov.-Dec. 1923, pp. 237-38.

Scotland than is to be found in earlier work, was not nearly so successful, either in his details or in his general proportions, as was Agnese; with whom, however, he agrees in joining Scotland to England. The series of exceedingly fine charts by this author, from 1557 to 1576, are of great interest, and mark an advance in the cartography of the British Islands, which was apparently appreciated at an early date, as copies are to be found in copperplate prints engraved in 1569 and 1572 by Paolo Furlani of Venice, one of which was published by Antonio Lafreri of Rome.[1]

Type XIII. Oliva-Cavallini.

The last form of Scotland to be used by the makers of manuscript nautical charts provides a final and very clear confirmation of the fact already frequently insisted upon, that the insular form of Scotland was only used where older examples were copied, and disappears in those charts which indicate, by the place-names recorded, any real knowledge of these northern coasts. It is in some respects similar to the seventeenth-century printed charts of the Dutch school, as exemplified in the printed work of Arnold Colom and Pieter Goos. This type of Scotland was largely used by the younger members of the Oliva family, even so late as the last quarter of the seventeenth century. The earliest examples are those by Joannes Oliva of Messina, dating from the last decade of the sixteenth century, which, together with later charts by Vincentius Demetrius Voltius of Ragusa,[2] by Francesco, Brasito, and Salvatore Oliva, and the still later work of Placidus Calioro et Oliva, although employing a new form, reproduce faithfully the place-names of the Olives-Martines type (No. VI.) of a century earlier. In these charts the insularity of Scotland is a common feature; but when, in 1622, a much fuller series of place-names was introduced into the same form by Joannes Oliva, which was adopted by Giovanni Battista Cavallini of Livorno in 1650, the boundary between Scotland and England is represented by two estuaries and a narrow connecting river only, without any indication of that complete separation which has been supposed to be characteristic of the Portolan Charts.

[1] British Museum, Map Depart. C. 7. e. 1 (5) and C. 7. e. 2 (1).

[2] For the Voltius charts, see K. Kretschmer, *Handschriftliche Karten der Pariser National-Bibliothek*, pp. 473-4.

APPENDIX I.

A List of Fourteenth and Fifteenth Century Charts Classified according to the Type of Scottish-English Boundary Employed.

The references are to :—

Konrad Kretschmer, *Die italienischen Portolane des Mittelalters*, Berlin, 1909, ii. 3 ; *Verzeichnis der mittelalterlichen Seekarten*, pp. 106–148.

G. Uzielli e P. Amat di S. Filippo, *Studi Biografici e Bibliografici sulla Storia della Geografia in Italia*, Edizione Seconda, Roma, 1882 ; vol. ii. and Appendice, Roma, 1884.

(A. E. Nordenskiöld, *Periplus*, Stockholm, 1897, viii. *Portolanos*. 5. *List of portolanos*, pp. 56–69, gives most of these charts, but adds nothing of the fourteenth and fifteenth centuries.)

References to the Type of Scotland :—

I. Early Genoese. (*a*) Earlier form. (*b*) Later form.
II. Early Venetian.
III. Catalan. (*a*) Prototype. (*b*) Early form. (*c*) Revised form. (*d*) Standardised form.
IV. Late Fifteenth Century.

			Type of Scotland.	Kretschmer.	Uzielli.
	A.—Two Arms of the Sea or Rivers not Meeting.				
	(1) *Representing the Firths of Clyde and Forth.*				
1	1318 Petrus Vesconte	Wien, K. K. Hofbibliothek, Cod. No. 594	I. *a*	7	14
2	1318 ,, ,,	Venezia, Museo Civico	I. *a*	6	13
3	1320 ,, ,,	Roma, Biblioteca Vaticana, Cod. Pal. Lat. No. 1362.	I. *a*	8	...
4	1321 Perrinus Vesconte	Zürich, Zentralbibliothek, No. R. P. 4	I. *a*	10	...
5	1327 ,, ,,	Firenze, Biblioteca Laurenziana, Cart. Naut. 248.	I. *b*	11	16

6	*ca.* 1320	[Petrus Vesconte]	ROMA, Biblioteca Vaticana, Cod. Vat. Lat. No. 2972.	I. *a*	9 (*a*)	...
7	*ca.* 1320	[,, ,,]	LONDON, British Museum, Add. MS. 27376	I. *b*	9 (*c*)	...
		(2) *Representing the Solway Firth and River Humber.*				
1	XIV.	Anonymous	FIRENZE, Archivio del Principi Corsini	...	...	...
2	1422	Jachobus de Giroldis	PARIS, Bibliothèque Nationale, Ge. C. 5088	II.	25	31
3	1426	,, ,,	VENEZIA, R. Biblioteca di San Marco, Cl. vi. Cod. 212.	II.	26	32
		(3) *Representing the Solway Firth and River Tyne.*				
1	1435	Batista Becharius	PARMA, Biblioteca Palatina, Cart. Naut. 1613.	III. *c*	32	35
2	1439	Gabriel de Vallsecha	BARCELONA, Biblioteca de Catalunya	III. *c*	36	...
3	1455	Bartolomeus de Pareto	ROMA, Biblioteca Vittorio Emanuele Sala 63	III. *c*	48	47
4	1456	Petrus Roselli	CHICAGO, Newberry Library, Ayer Collect. No. 1.	III. *c*	...	...
5	1464	,, ,,	NÜRNBERG, Germanisches Nationalmuseum, La. 4017.	III. *c*	44	127
6	1466	,, ,,	FIRENZE, Archivio del Principe Corsini	III. *c*	45	...
7	1468	,, ,,	NEW YORK, Hispanic Society, No. 2	III. *c*	...	...
8	1480	Albino de Canepa	ROMA, Reale Società Geografia	III. *c*	...	...
9	1482	Jac. Bertran	FIRENZE, Archivio di Stato, Cart. Naut. 7	III. *d*	72	398
10	XV.	Anonymous	MODENA, Biblioteca Estense, No. 11	III. *c*	...	...
11	XV.	,,	ROMA, Biblioteca Vallicelliana, Invent. No. 104.	III. *c*	...	401
12	XV.	,,	MODENA, Biblioteca Estense	III. *c*	50	123
		(4) *Representing the Solway Firth and River Tweed.*				
1	1487	Nicholas Marc . . .	FIRENZE, Archivio di Stato, Cart. Naut. 6	IV.	...	248/397
2	*ca.* 1489	Anonymous	LONDON, British Museum, Egerton MS. 73 (29).	IV.	...	96

APPENDIX I.—*continued.*

			Type of Scotland.	Kretschmer.	Uzielli.
3	*ca.* 1489 Anonymous	LONDON, British Museum, Egerton MS. 73 (36).	IV.	...	103
4	XV. ,,	MILANO, Biblioteca Ambrosiana, F. 160 *inf.* (2).	II.	41	117
5	XV. ,,	OXFORD, Bodleian Library, MS. Douce 390	II.	...	...
	B.—CENTRAL MOUNTAIN AND TWO RIVERS.				
	(1) *Representing the Solway Firth and River Humber.*				
1	1330 Angellinus de Dalorto	FIRENZE, Archivio del Principi Corsini	III. *a*	12	...
2	1339 Angelino Dulcert	PARIS, Bibliothèque Nationale, Ge. B. 696	III. *a*	13	...
3	1367 Franciscus Pizigano	PARMA, Biblioteca Palatina, Cart. Naut. 1612.	III. *a*	15	18
4	XIV. Anonymous	LONDON, British Museum, Add. MS. 25691	III. *a*	...	...
5	1408 G. Pasqualini	WIEN, K. K. Hofbibliothek, Cod. 410	II.	...	26/405
6	1443 Jachobus de Giroldis	MILANO, Biblioteca Ambrosiana, S.P. II. 3	II.	27	38
7	1446 ,, ,,	FIRENZE, Società Colombaria	II.	29	39
8	*ca.* 1489 Henricus Martellus Germanus	LONDON, British Museum, Add. MS. 15760	III. *b*	...	...
9	1489 ,, ,,	LEIDEN, Universiteitsbibliotheek, Cod. Voss. Lat., fo. 23.	III. *b*	...	...
10	XV. Anonymous	NAPOLI, Biblioteca Nazionale	III. *b*	46	{ 25.27 393
11	XV. [Jachobus de Giroldis]	MILANO, Biblioteca Ambrosiana, S.P. II. 8	II.	28	...
12	XV. [,, ,,]	NEW YORK, Hispanic Society, No. 1	II.	...	...
13	XV. [,, ,,]	CHICAGO, Newberry Library, Ayer Collect. No. 2.	II.	...	...
14	XV. [,, ,,]	ROMA, Biblioteca Vaticana, Cod. Rossiano 676.	II.	...	...
15	XV. Christ. Esenius (Buondelmonte)	FIRENZE, Biblioteca Laurenziana (Periplus, Pl. xxxiii. (1)).	III. *b*	...	...
16	XV. ,, ,,	FIRENZE, Biblioteca Laurenziana (Periplus, Pl. xxxiii. (2)).	III. *b*	...	...

	(2) *Representing the Solway Firth and River Tyne.*					
1	1426	Batista Becharius	MÜNCHEN, Bayerisches Nationalmuseum	III. *c*	31	33
2	1461	Gratiosus Benincasa	FIRENZE, Archivio di Stato, Cart. Naut. 4	III. *d*	52	51
3	1461	,, ,,	FIRENZE, Archivio di Stato, Cart. Naut. 5	III. *d*	...	...
4	1463	,, ,,	LONDON, British Museum, Add. MS. 18454	III. *d*	53	53
5	1466	,, ,,	PARIS, Bibliothèque Nationale, Ge. DD. 2779.	III. *d*	55	55
6	1467	,, ,,	PARIS, Bibliothèque Nationale, Ge. DD. 1988.	III. *d*	56	56
7	1467	,, ,,	LONDON, British Museum, Add. MS. 11547	III. *d*	57	120
8	1467	,, ,,	PARIS, Bibliothèque Nationale Annex à Nogent-sur-Marne.	III. *d*	...	...
9	1468	,, ,,	PALERMO, Biblioteca del Principe di Trabia, 1905/242.	III. *d*	58	57
10	1468	,, ,,	LONDON, British Museum, Add. MS. 6390	III. *d*	59	121
11	1469	,, ,,	MILANO, Biblioteca Ambrosiana, S.P. II. 6	III. *d*	61	59
12	1469	,, ,,	LONDON, British Museum, Add. MS. 31315	III. *d*	62	...
13	1470	,, ,,	LONDON, British Museum, Add. MS. 31318A	III. *d*	63	...
14	1471	,, ,,	ROMA, Biblioteca Vaticana, Cod. Vat. Lat. 9016.	III. *d*	64	61
15	1473	,, ,,	LONDON, British Museum, Egerton MS. 2855	III. *d*	...	...
16	1473	,, ,,	BOLOGNA, Biblioteca Universitaria, Cod. 280	III. *d*	66	64
17	1476	Andreas Benincasa	GENÈVE, Bibliothèque Publique, MS. Lat. 81	III. *d*	70	65
18	1480	Gratiosus Benincasa	WIEN, K. K. Hofbibliothek, Cod. 355	III. *d*	68	67
19	1482	,, ,,	BOLOGNA, Biblioteca Universitaria, Rot. 3	III. *d*	69	471
20	1490	Andreas Benincasa	ANCONA, Museo Nazionale Archeologico	III. *d*	71	105
21	1497	Conte Hectomani Freducci	WOLFENBÜTTEL, Herzöglichebibliothek, Cod. 99, Aug. 2°.	III. *d*	74	107
22	XV.	Gratiosus Benincasa	FIRENZE, Archivio di Stato, Exhib. Gal. 2	III. *d*	...	...
23	XV.	Anonymous	FIRENZE, Biblioteca Nazionale, No. 16	III. *c*	22	392
24	XV.	,,	ROMA, Biblioteca Vaticana, Cod. Borgiana V.	III. *d*	...	...
25	XV.	,,	PARMA, Biblioteca Palatina, Cart. Naut. 1621.	III. *d*	...	109
26	XV.	,,	VENEZIA, R. Biblioteca di San Marco, Cl. iv. Cod. 9.	...	35	42
27	XV.	,,	VENEZIA, Museo Civico, Racc. Correr Port. No. 38.	...	...	? 259

APPENDIX I.—*continued.*

			Type of Scotland.	Kretschmer.	Uzielli.
		(3) *Representing the Solway Firth and River Forth.*			
1	1413 Meca de Villadestes	PARIS, Bibliothèque Nationale, Ge. AA. 566	III. *b*	23	...
		C.—NO BOUNDARY.			
1	1373 Franciscus Pizigano	MILANO, Biblioteca Ambrosiana, S.P. II. 2	II.	16	19
2	1375 Anonymous Atlas of Charles V.	PARIS, Bibliothèque Nationale, MS. Espagnols 30.	III. *b*	17	...
3	1385 Guillelmus Soleri	FIRENZE, Archivio di Stato, Cart. Naut. 3	III. *b*	18	391
4	XIV. ,, ,,	PARIS, Bibliothèque Nationale, Ge. B. 1131	III. *b*	19	...
5	XIV. Anonymous	FIRENZE, Biblioteca Nazionale, Cart. Naut. 22.	III. *b*	...	136
6	XIV. (?) ,, Arabic	MILANO, Biblioteca Ambrosiana, S.P. II. 1	...	...	390
7	1417 or 1457 Anonymous	FIRENZE, Biblioteca Nazionale, Cart. Naut. No. 1.	III. *b*	40	27
8	1421 Franciscus de Cesanis	VENEZIA, Museo Civico, Racc. Correr Port. No. 7.	II.	24	30
9	1430 Chola de Briaticho	SIENA, Biblioteca Comunale, Cart. Naut. S.V. 2.	...	30	34
10	1448 Giovanni Leardo	VICENZA, Museo Civico	...	...	44
11	1452 ,, ,,	NEW YORK, American Geograpical Society	...	...	46
12	*ca.* 1473 Anonymous	PARIS, Bibliothèque Nationale, MS. Itl. 1710	III. *c*	...	...
13	*ca.* 1489 [Nicolò Fiorin]	LONDON, British Museum, Egerton MS. 73 (14).	II.	...	82
14	XV. Anonymous	VENEZIA, R. Biblioteca di San Marco, Cl. iv. Cod. 493.	II.	...	114
15	XV. ,,	ROVIGO, Accademia dei Concordi, Cod. 41	II.	...	132 or 133

		D. INSULAR.			
		(1) *Solway Firth and River Humber.*			
1	1351 (?) Anonymous	FIRENZE, Biblioteca Laurenziana Gad. Reliq. 9.	...	14	17
2	1411/15 Albertin de Virga	WIEN, Samlung Figdor	...	...	...
3	1459 Fra Mauro	VENEZIA, R. Biblioteca di San Marco (Museo).	...	51	50
		(2) *Solway Firth and River Tyne.*			
1	*ca.* 1384 Anonymous "Pinelli"	LONDON, British Museum, Add. MS. 19510	II.	21	20
2	XIV. ,, "Combitis"	VENEZIA, R. Biblioteca di san Marco, Cl. vi., Cod. 213.	II.	20	22
3	*ca.* 1489 Zuan da Napoli	LONDON, British Museum, Egerton MS. 73 (6).	III. *d*	...	71
		(3) *Solway Firth and River Tweed.*			
1	1462 Petrus Roselli	PARIS, Bibliothèque Nationale, Ge. C. 13611	IV.	43	52
2	*ca.* 1489 [Petrus Roselli]	LONDON, British Museum, Egerton MS. 73 (4)	IV.	...	70
		E. SEMI-INSULAR.			
		(1) *Solway Firth and River Tyne.*			
1	XV. Anonymous	MODENA, Biblioteca Estense No. 13	III. *c*	...	...
		(2) *Solway Firth and River Tweed.*			
1	1436 Andrea Bianco	VENEZIA, R. Biblioteca di San Marco, Cl. z. Cod. 76.	...	33	37
2	1448 ,,	MILANO, Biblioteca Ambrosiana, F. 260 *inf.* (1).	II.	34	43

APPENDIX I.—*continued.*

			Type of Scotland.	Kretschmer.	Uzielli.	Probable Type of Boundary.
		Damaged and Illegible.				
1	XIV. Johanes [da Carignano]	FIRENZE, Archivio di Stato, Cart. Naut. No. 2.	...	3	9	A. 4
2	1447. Petrus Roselli	VOLTERRA, Museo Guarnacci	III. *c*	42	...	A. 3
3	1497. Jehuda Ben Zara	ROMA, Biblioteca Vaticana, Cod. Borgiana VII.	III. *d*	...	399	A. 3
4	XV. Conte Hectomani Freducci	WEIMAR, Grossherzöglichebibliothek	III. *d*	75	150	B. 2
5	XV. [,, ,, ,,]	LUCCA, Biblioteca Governativa, Cod. 2720.	III. *d*	...	448	B. 2
6	XV. Anonymous	LONDON, British Museum, Egerton MS. 2712 F.	III. *d*	...	...	B. 2

TABLE showing the Number of Charts using each Form of Boundary in the various Types of Scotland.

TYPES OF BOUNDARY.		TYPES OF SCOTLAND.											DATE.		TOTAL.
		I. Genoese.		II. Venetian.	III. Catalan.				IV. Late Fifteenth Century.	Not Classified.	TOTAL.		Fourteenth Century.	Fifteenth Century.	
		(a) Earlier.	(b) Later.		(a) Prototype.	(b) Early.	(c) Revised.	(d) Standardised.							
A. Two arms of the sea—	(1) Clyde and Forth	5	2	...	...	...	...	...	...	...	7		7	...	7
	(2) Solway and Humber	...	...	2	...	...	...	...	...	1	3		1	2	3
	(3) Solway and Tyne	...	...	...	...	...	11	1	...	...	12		...	12	12
	(4) Solway and Tweed	...	...	2	...	...	...	...	3	...	5		...	5	5
												27			
B. Central mountain and two rivers—	(1) Solway and Humber	...	...	7	4	5	...	...	...	...	16		4	12	16
	(2) Solway and Tyne	...	...	...	...	...	2	23	...	2	27		...	27	27
	(3) Solway and Forth	...	...	...	...	1	...	...	...	...	1		...	1	1
												44			
C. No boundary		...	...	5	...	5	1	...	...	4	15		6	9	15
D. Insular—	(1) Solway and Humber	...	...	...	...	...	...	...	...	3	3		1	2	3
	(2) Solway and Tyne	...	...	2	...	...	...	1	...	...	3		2	1	3
	(3) Solway and Tweed	...	...	...	...	...	...	...	2	...	2		...	2	2
												8			
E. Semi-Insular—	(1) Solway and Tyne	...	...	...	...	...	1	...	...	...	1		...	1	1
	(2) Solway and Tweed	...	...	1	...	...	...	...	...	1	2		...	2	2
												3			
		5	2	19	4	11	15	25	5	11	97		21	76	97
Damaged and Illegible		...	...	...	...	...	1	4	...	1	6		1	5	6
		5	2	19	4	11	16	29	5	12	103		22	81	103
THE EASTERN RIVER															
The River Forth		5	2	...	...	1	...	...	...	...	8		7	1	8
,, ,, Tweed		...	...	3	...	...	...	...	5	1	9		...	9	9
,, ,, Tyne		...	...	2	...	...	14	25	...	2	43		2	41	43
,, ,, Humber		...	...	9	4	5	...	...	...	4	22		6	16	22
No boundary		...	...	5	...	5	1	...	...	4	15		6	9	15
		5	2	19	4	11	15	25	5	11	97		21	76	97

APPENDIX II.

LIST OF CHARTS OF THE FIFTEENTH CENTURY RECORDED BY UZIELLI AND KRETSCHMER, BUT NOT EXAMINED.

				Kretschmer.	Uzielli.
1	1458.	Anonymous Venetian	PARIS, Bibliothèque Walckenaer	...	48
2	1465.	Gratiosus Benincasa	VICENZA, Museo Civico	54	54
3	1469.	,, ,,	PARIS, Montelay Collection	60	58
4	1470.	,, ,,	VENEZIA, Biblioteca dei Chierici Regolari	...	60
5	1471.	,, ,,	MURANO, Biblioteca di San Michele	65	62
6	1472.	Anonymous	GENOVA, Biblioteca Universitaria	...	63
7	1480 (?)	Jehu da Ben Zara	ROMA, Archivio dell Collegio di Propaganda	...	395
8	1489.	Albinus de Canepa	MILANO, Bibl. ed Arch. Sola-Busca-Serbelloni	...	68
9	XV.	Anonymous	PERUGIA, Biblioteca Comunale	...	122
10	XV.	,,	VERONA, Conte F. Miniscalchi Erizzo.	...	125
11	XV.	,,	VENTIMIGLIA LIGURE [Biblioteca Apionana]	...	128
12	XV.	,,	VENEZIA, Maresi Bazolle	...	473
13	XV. (?)	Pietro Rosso	FORLÌ, Conte Giuliano Merenda	...	474
14	XV.	Anonymous	FIRENZE, Biblioteca Nazionale, Cod. Magl. Cl. xix. p. 7	...	500
15	XV.	,,	VENEZIA, Biblioteca Marciana	...	514
16	XV.	,,	GAP, Archives Départementals des Hautes-Alps, E. 470	...	...

(1) Fourteenth- and Fifteenth-Century Charts recorded by Kretschmer which do not contain Scotland :—
Nos. 1, 2, 4, 5, 9 (*b*), (*d*), (*e*), (*f*), (*g*), (*h*), (*i*), (*k*), (*l*), 37, 38, 39, 67, 73.

(2) Charts described by Kretschmer as of the Fifteenth Century, which are really of the Sixteenth Century :—

Nos. 47, 49.

(3) Fourteenth- and Fifteenth-Century Mappae Mundi and Charts recorded by Uzielli which do not contain Scotland :—

Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 29, 36, 49, 63, 66, 69, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 97, 98, 99, 100, 101, 102, 104, 106, 111, 113, 115, 116, 118, 119, 126, 131, 132 or 133, 341, 394, 396, 402, 469, 470, 472, 504.

(4) Charts which are twice recorded by Uzielli under different numbers :—
Nos. 25, 27 and 393 ; 45 and 404 ; 129 and 475 ; 130 and 135 ; 133 and 134 ; 248 and 397 ; 390 and 405.

(5) Charts described by Uzielli as of the Fourteenth or Fifteenth Century, which are really of the Sixteenth Century :—

Nos. 24, 40, 41, 45, 108, 111, 112, 124, 130, 400, 515.

APPENDIX III.

LIST OF CHARTS OF THE OLIVES-MARTINES TYPE (No. VI.) CLASSIFIED ACCORDING TO THE TYPE OF SCOTTISH-ENGLISH BOUNDARY EMPLOYED.

				Uzielli.
			(1) *Central Mountain.*	
1	1567	Joan Martines	LONDON, British Museum, Add. MS. 15714	200/203
2	1568	Domingo Olives	HELSINGFORS, Nordenskiöld Collection	...
3	1578	Joan Martiñes	LONDON, British Museum, Harl. MS. 3450	485
4	1582	,, ,,	PARIS, Bibliothèque de l'Arsenal MS. 8323	221
5	1589	Jacobus Scottus	VENEZIA, Biblioteca di San Marco, Cl. iv. Cod. 8	233
6	1591	Joan Martines	BERLIN, Preussische Statsbibliothek, MS. Hamilton 430	...
7	1592	Jacobus Scottus	VERONA, Biblioteca Capitolare	488
8	1592	,, ,,	VERONA, Biblioteca Capitolare	488
9	XVI.	Anonymous	OXFORD, Bodleian Library, Douce MS. 391	...
10	XVI.	,,	ROMA, Biblioteca Vallicelliana, Invent. 105	112
11	XVI.	,,	ROMA, Biblioteca Vaticana, Cod. Borgiana IV.	?403
12	XVI.	,,	LONDON, British Museum, Add. MS. 9814	...
			(2) *Central Lake.*	
1	1538	Bartolomeo Olives	VENEZIA, R. Inst. Supr. di Commercio, No. 400	517
2	1550	Jaume Olives	WASHINGTON, Library of Congress	...
3	1553	Matheus Prunes	SIENA, Biblioteca Comunale, Cart. Naut. S. V. 3	...
4	1559	,, ,,	WASHINGTON, Library of Congress	...
5	1559	Bartolomeo Olives	OXFORD, Bodleian Library, MS. Canonici Itl. 143	421
6	1561	Matheus Prunes	FIRENZE, Archivio del Principe Corsini	...
7	1578	,, ,,	VENEZIA, Museo Civico, Correr, Port. 39	...
8	1586	,, ,,	PARIS, Bibliothèque Nationale, Ge. AA. 570	...
9	1592	R. di B. de Ferrerios and Matt. Prunes	FIRENZE, Archivio di Stato	444
10	1593	Vincentius Demetrius Voltius	HELSINGFORS, Nordenskiöld Collection	236
11	1599	Matheus Prunes	SIENA, Biblioteca Comunale, Cart. Naut. S. V. 4	...
12	XVI.	Anonymous	MÜNCHEN, Kgl. Hofbibliothek, Cod. icon. 140	...
13	XVI.	,,	MANTOVA, Biblioteca Comunale, MS. I. 1, 15	?40
14	XVI.	,,	LONDON, British Museum, Add. MS. 10134	...
15	XVI.	[Matheus Prunes]	MILANO, Biblioteca Ambrosiana, S. P. II. 5	400
16	XVI.	Anonymous	LONDON, British Museum, Egerton MS. 767	...
17	1629	J. F. Mon	LONDON, British Museum, Add. MS. 31319	...
18	1651	Pietro Giovanni Prunes	FIRENZE, Museo Civico, Correr, Port. No. 32	...

APPENDIX III.—*continued.*

			Uzielli.
		(3) *Slight Central Widening.*	
1	1532 Bartolomeo Olives	PISA, Biblioteca Universitaria, Cod. 11602	414
2	1557 Jaume Olives	PAVIA, Biblioteca Universitaria, Scaf. I. a. *sin*	417
3	1559 ,, ,,	LONDON, British Museum, Add. MS. 21029	...
4	1561 Bartolomeo Olives	NAPOLI, R. Archivio di Stato Museo, MS. No. LXV.	428
5	[1562] [,, ,,]	ROMA, Biblioteca Vaticana, Cod. Urb. Lat. 283	...
6	1568 Joan Martines	FIRENZE, Biblioteca Laurenziana, Ser. Acq. e don. 183	204
7	1582 ,, ,,	LONDON, British Museum, Add. Sloane MS. 5019	...
8	1584 Bartolomeo Olives	PARIS, Bibliothèque Nationale, Ge. B. 1133	224
9	1586 Joan Martines	ROMA, Biblioteca Vaticana, Cod. Borgiana X.	227
10	XVI. Bartolomeo Olives	MILANO, Dott. P. F. Veltroni	...
11	XVI. [Joan Martines]	OXFORD, Bodleian Library, Rawl. MS. B. 256	...
12	XVI. [,, ,,]	ROMA, Biblioteca Vaticana, Cod. Vat. Lat. 8920	...
13	XVI. Anonymous	LONDON, British Museum, Egerton MS. 2860	...
14	XVI. ,,	FIRENZE, Biblioteca Nationale, Cl. xiii. Cod. IV.	...
15	XVI. ,,	VENEZIA, Museo Civico, Correr, Port. 15	256
		(4) *Parallel.*	
1	1550/6 Joan Martines	CORTONA, Accademia Etrusca	...
2	1563 Jaume Olives	NEW YORK, Hispanic Society, No. 16	...
3	1563 ,, ,,	MILANO, Biblioteca Ambrosiana, S. P. II. 4	45/404
4	1578 Joan Martines	LONDON, British Museum, Harl. MS. 3450	485
5	1579 ,, ,,	LONDON, Admiralty Library, Va. 3 (1)	...
6	1579 ,, ,,	LONDON, British Museum, Add. MS. 22018	...
7	*ca.* 1581 Bartolomeo Olives	NEW YORK, Hispanic Society, No. 12	...
8	1582 Joan Martines	NEW YORK, Hispanic Society, No. 18	...
9	1583 ,, ,,	CHICAGO, Newberry Library, Ayer Collect. 11	...
10	1586 ,, ,,	TORINO, Biblioteca Reale, vol. 165	225
11	1592 Carlo da Corte	CHICAGO, Newberry Library, Ayer Collect. 13	234
12	1593 Jacobus Scottus	BOLOGNA, Biblioteca dell' Archiginnasio	235
13	XVI. ,, ,,	WASHINGTON, Library of Congress	...
14	XVI. [Joan Martines]	ROMA, Biblioteca Vaticana, Cod. Urb. Lat. 1710	...
15	XVI. [Jaume Olives?]	LONDON, British Museum, Add. MS. 9947	...
16	XVI. [,, ,, ?]	NEW YORK, Hispanic Society, No. 32	...
17	XVI. Anonymous	SIENA, Biblioteca Comunale, Cart. Naut. S. V. 7	281
		Damaged and Uncertain.	
	1560(?) Matheus Prunes	BADIA DI CAVA, Biblioteca Nazionale, 40	41