

are excluded, 56 editions of Ptolemy's geography have hitherto been published, one of them photolithographically and fifty-five by book-print. Many of these editions, however, are not complete; sometimes the maps, sometimes more or less of the text is wanting. Others again are only title-editions. Yet by a careful comparison it will be found that many a supposed title-edition is an actual reprint of a former edition, rigorously following the original, page for page, line for line. In consequence of the cheapness of manual labor during the 15th and 16th centuries the reprint of a ready prepared text, even of such a voluminous work as Pto-

lemy's geography, might not have been connected with very heavy expenses, or difficulties. It was more costly and difficult to prepare new plates or blocks for the printing of the maps. For this reason the copper-plates and wood-cuts were often used for repeated editions, as may be perceived by the accompanying table. With regard to this it must be borne in mind that the old maps are not generally signed, and that it is often difficult to decide whether a name given on the title-page, or in the preface, in connection with the maps, belongs to the editor, to the drawer of the maps, or to the engraver.

#### Copper-prints and wood-cuts in the editions of Ptolemy's geography.

1. Copper-print by SCHWEINHEIM-BUCKINCK: N:o 4 1478; N:o 7 1490; N:o 8 1507; N:o 9 1508.
  2. Wood-cut by JOHANNES DE ARMSHEIM: N:o 5 1482; N:o 6 1486.
  3. Wood-cut, first published in an edition by AESCHLER and ÜBELIN: N:o 11 1513; N:o 13 1520.<sup>1</sup>
  4. Wood-cuts of the preceding maps, reduced into a smaller size by WALDSEEMÜLLER: N:o 14 1522; N:o 15 1525;<sup>2</sup> N:o 19 1535; N:o 23 1541.
  5. Wood-cut from SEBASTIAN MÜNSTER: N:o 22 1540; N:o 24 1541; N:o 25 1542; N:o 26 1545;<sup>3</sup> N:o 29 1552.<sup>3</sup>
  6. Copper-print first published in an edition by RUSCELLI and MOLETIUS: N:o 30 1561; N:o 31 1562; N:o 32 1564; N:o 33 1564 bis; N:o 34 1574.<sup>4</sup>
  7. Copper-print by MERCATOR: N:o 35 1578; N:o 36 1584; N:o 42 1602; N:o 43 1605; N:o 46 1618; N:o 48 1624; N:o 49 1698; N:o 50 1704; N:o 51 1730.
  8. Copper-print by HIERONYMUS PORRO: N:o 37 1596; N:o 39 1598; N:o 47 1621.
  9. Copper-print in an edition by ROSACCIO: N:o 40 1598; N:o 41 1599.
  10. Copper-print by PETRUS KESCHERT; exact copies of the previous, executed in Germany: N:o 38 1597; N:o 44 1608; N:o 45 1617.<sup>4</sup>
- Maps only printed once: N:o 1 Maps engraved in copper for the edition of MANFREDUS and PETRUS BONUS 1472 (?); N:o 3 Maps engraved in copper for the edition of BERLINGHIERI 1478 (?); N:o 11 Wood-cut by BERNARDUS SYLVANUS 1511; N:o 28 Maps engraved in copper by GASTALDI 1548; N:o 55 Chromo-lithographe from the Athos-manuscript 1867. Without maps, or with a few only, are the editions N:o 2 1475; N:o 12 1514; N:o 16 1532; N:o 17 1533; N:o 18 1533; N:o 20 1537; N:o 21 1540; N:o 27 1546; N:o 52 1828; N:o 53 1838; N:o 54 1843—1845; N:o 56 1883.

<sup>1</sup> Exception: Tabula nova Eremitarum. <sup>2</sup> Exception: Tab. V. Asiae. <sup>3</sup> Exception: Some new maps of European countries. The same blocks as those employed in these editions of Ptolemy, have afterwards been used for Münster's Cosmography and for other works, printed in Germany during the latter half of the 16th century. <sup>4</sup> Exception: Some maps from other plates.

## II.

### Pseudo-editions of Ptolemy. Ptolemy's errors and merits.

The catalogue of editions of Ptolemy's geography given above is, as far as I know, *complete*. It contains a few editions never noticed before, and among them one of the oldest and, in a cartographical point of view, most important. But on the other hand I have excluded twenty six works, erroneously enumerated among editions of Ptolemy's geography, viz:

1. *Cracovia 1512*, and
2. *Cracovia 1519*, two different editions of the *Introductio in Ptolomaei cosmographiam* etc. by IOANNES DE STOBNICZA.

I shall further return to this work and to the remarkable map (N. T. XXXIV) in the edition of 1512. It need here only be observed, that the introduction of Stobnicza certainly contains some geographical statements from Ptolemy, but not one single page directly translated from him, nor any Ptolemaic maps. It is mainly composed of extracts from the works of AENEAS SYLVIVS, ISIDORUS, OROSIUS and ANSELMUS.

3. *Lovanii 1597*; 4. *Louvain 1597* (English edition);
5. *Lovanii 1598*; 6. *Duaci 1603*; 7. *Douay 1605*; 8. *Dovay 1607*; 9. *Dovay 1611*. Different editions of a very important

and, as may be conceived by the numerous editions, highly appreciated work by CORNELIUS WYTFLEET, of which the latin title is: *Descriptionis Ptolemaicae Augmentum*. Here, it is true, Ptolemy's name is on the title-page. But the work, does not contain one line of Ptolemy. It describes a part of the globe entirely unknown to the ancients, and this in a manner completely different from the style of the Alexandrian geographer.

Moreover, the following 'editions' will have to be excluded, their insertion in the catalogue evidently being due to a confounding of other works of Ptolemy with his geography, to errors of printing, or to other mistakes. I must especially point out that the contribution of Santarem to Ptolemy's bibliography seems to be so hastily and uncritically written that the statements in his short, but often cited paper, are not deserving of the slightest regard, when not confirmed by more reliable references.

10. *Bologna 1480* (THOMASSY, *Les papes géographes et la cartographie du Vatican*, in *Nouvelles Ann. des Voyages*, T. 32, 1852, p. 57; T. 33, 1853, p. 151; T. 34, 1853, p. 7). Probably identical with the edition Bononiae MCCCCLXII,



for the misprinted date of which Thomassy has adopted 1480 instead of 1472.

11. *Florence 1481*. This edition is cited by Thomassy (*Novv. Ann. des Voyages*, T. 32, p. 75). Probably Berlinghieri's *Sette giornate* is here meant, in which case this work has already been enumerated by Thomassy among the editions of Ptolemy.

12. *Cl. Ptolomaei Geographiae libri VIII. 1500*. »Noted by Butsch, but thought to be apocryphal» (WINSOR). I have in vain searched for this edition in other catalogues, and suppose that the date is due to an error in writing 1500 instead of 1490.

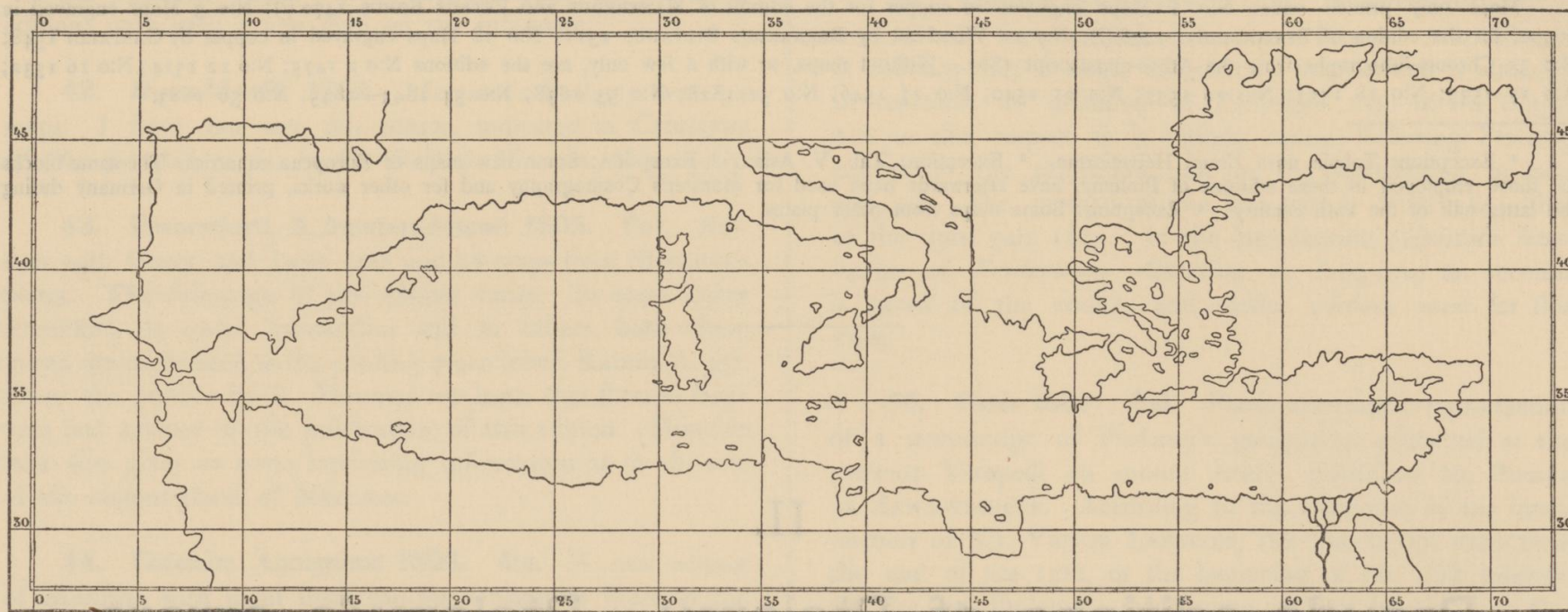
13. *Nuremberg 1524*. Cited by Santarem (*Bulletin de la Soci t  de G ographie*, S r. II, T. 8, 1837, p. 175). The date depends no doubt on an error in writing 1524 instead of 1514.

14. *Paris 1527*; 15. *Venice 1528*. These two editions are also cited by Santarem, but are not found either in the *Catalogue of the printed maps in the British Museum*, or in any other of the many Catalogues I have consulted. Evidently Santarem's citation of these editions depends on errors in writing, or printing.

*Basileae, ex officina Henricpetrina, 1571*, most of the maps of M nster's Ptolemy are inserted. They are numbered in connexion with the other text and provided on the first page with the usual Ptolemaic legends, borrowed from the Book VIII. The supervision of the printing, however, has been done so carelessly, that the map of the world and three maps of Asia have been omitted, whereas the map of Greece and the 4th, 5th and 9th maps of Asia have been introduced twice. In the book there also appear small wood-cut maps of Euboea, Creta, Lesbos, Rhodes, Cyprus and Cephalonia. The work can not be enumerated among editions of Ptolemy.

22. *Venice 1575*; 23. *Basel 1582*. Again two editions cited by Santarem, but otherwise unknown.

24. *Bononia 1608* (LELEWEL, II, p. 209). Evidently the edition: »Anno 1608. In celeberrima Agrippinensium Colonia excudebat Petrus Keschedt». The error of stating Bononiae as the printing place has arisen from the sentence »Mathematicarum in Almo Bononiensi Gymnasio publico professore» being added to the name of Maginus, on the title-page.



15. The Mediterranean and Black seas according to Ptolemy Tab. II, III, V-X Europe, I-III Africa, I-IV Asia.

16. *Basel 1538, fol.* according to Santarem. Here a confusion no doubt exists with »*Claudii Ptolomaei magna constructionis libri XIII. Theonis Alexandrini in eosdem commentar. libri XI*», which was published 1538 at Basel by SIMON GRYNÆUS.

17. *Venetis 1543*. As shown by D'AVEZAC, the citation of this edition depends on a printing-error (the year 1543 in stead of 1548) in ZURLA: *Di Marco Polo et degli altri viaggiatori Veneziani... con Appendice sulle antiche mappe idrogeografiche lavorate in Venezia*. Venezia 1818, T. II, p. 368.

18. *Basileae 1555*. The citation of this edition depends on a printing-error in FREDERIK MULLERS, *Catalogue of books etc. relating to America*, Amsterdam 1877, N:o 2626. Muller refers to HARRISSE, *Additions*, N:o 155. But there is only spoken of the edition of 1545.

19. (Place of printing not stated) 1559. Again one of Santarem's »*Ptol m e sans cartes*», not mentioned by any other of the bibliographers of Ptolemy.

20. *Venice 1568*. Cited only by Santarem.

21. *Basileae 1571*. In *Strabonis rerum geographicarum libri septemdecim a Guilielmo Xylandro... recogniti...*

25. *Trajecti ad Rhenum 1695*. Cited by MURPHY; probably identical with the edition: *Franequeret et Trajecti ad Rhenum 1698*.

26. *Parisiis 1715*. Among editions of Ptolemy Lelewel cites (p. 209) BERNARD. DE MONTFAUCON'S *Bibliotheca Coisliniana olim Segueriana*, Parisiis 1715, fol. This magnificent work does not contain any essential part of Ptolemy's geography, but, p. 611-768, an extensive comparison between the text of a Greek codex of Ptolemy (*Codex Coislinianus*) and the edition Lugduni Batavorum 1618.

In the critical catalogue, which I have given here, the number of the different editions of Ptolemy's geography is much reduced, 26 spurious editions being excluded. But there yet remain 56 authentic editions, most of them provided with maps. Thirty-three were issued before 1570, 26 of which contain about 700 old Ptolemaic maps and about 400 »*tabul  nov *». By comparing this number with the small number of maps printed before 1570 without any connection with Ptolemy's geography, we get an idea of



the great influence that the Alexandrian geographer, after fourteen hundred years, still exercised not only upon the history of geography, but upon the whole history of civilisation. Under such circumstances it would be of no small interest to have a reliable answer to the questions: how did the first printed maps of Ptolemy agree with the manuscripts? to what extent can these latter claim to be faithful reproductions of Ptolemy's own maps, and what was the main source of Ptolemy's extensive geographical knowledge?

The already very extensive literature on Ptolemy's geography does not, so far as I know, contain any answer to the first question, founded on a careful collation between the printed maps and the manuscript, and I had myself only the opportunity, during short visits to libraries, of examining a few of the many codices of Ptolemy's geography still extant. I have, however, been able fully to convince myself:

1st. That the original maps of Ptolemy are faithfully reproduced in Berlinghieri's *Septe Giornate della Geographia*,

the maps here reproduced with the fac-simile of the Athos codex, convince himself that no essential change has been introduced into Ptolemy's maps through these errors. To judge from the reproduction, published in Paris 1867, and from the introduction by M. Victor Langlois, the Athos manuscript itself is not very well preserved. It is sadly worn, and some of the 27 original maps have now disappeared. In many places the maps are so injured by moisture and age, that the outlines of the countries and the names are often in such a state that they cannot be deciphered. But in this manuscript, of the 12th or 13th century, one finds exactly the same maps, with the same territorial limits, the rivers following the same courses, the same mountains-ranges, and the same legends, the same division into climates etc., as in the maps of 1478 or 1490. If, for instance, the *Tabula V Europæ* in the edition of 1478 is compared with the corresponding map in the manuscript of Athos, it will be found that both these maps embrace exactly the same parts of the earth, and that exactly the same parts in the north,



16. The Mediterranean and Black seas according to a portolano by Dulcert 1339.

Firenze c. 1478. But this reproduction is full of gross typographical errors, and the copper-engravings have serious technical defects.

2d. That the manuscript-maps, redrawn on a kind of conical projection, are very faithfully reproduced in the edition of Bologna c. 1472. Here the technical execution of the maps, perhaps the first ones printed from copper-plate, is also very defective.

3d. That the manuscript maps of Nicolaus Germanus carefully reproduce the original Greek maps without any other modification than that of Ptolemy's equidistant cylindrical projection being changed into a projection with rectilinear, converging meridians.

4th. That the maps printed on copper by Schweinheim-Buckinck, Romæ 1478, 1490, 1507 and 1508, here reproduced in facsimile (T. I—XXVII), are faithful and unaltered copies of the original maps of Nicolaus Germanus.

It was inevitable that many errors, through negligence and caprice of the copyists, should have slipped in during the repeated transcriptions, but any one may, by comparing

east and south, in both these maps, have been left blank, without any territorial detail. Here are, within the frame of the map, portions of countries, of which complete maps are given on other sheets. On these territories are written: *Italia pars*, *Magna Germanie pars*, *Iazigum Metanastarum pars*, *Dacia pars* etc. which names correspond to *Ἰταλῖ... μέρος*; *μεγάλης γερμανίας μέρος*; *ιαζυγῶν μεταναστων μέρος*, and *δανίας μέρος*, in the Athos codex. The same is the case with the other legends on both maps. In both the Danube forms the northern border to the finished part of the maps, and this river makes, in both, the same bends, receives from the south the same tributaries, which again have exactly the same courses, and rise from the same mountains etc. If the manuscript had been drawn with more care and artistic skill and was not damaged, I have no doubt that name after name, river after river, and town after town, with very few exceptions, would be found on the maps of the old manuscript and on the corresponding printed maps; and although, so to speak, several generations of copyists separate these two atlases, yet even the direction



in which the names are written (for instance from right to left, or from above downwards) indicates an affinity between the two atlases, which incontestably proves that both are not only copies, or copies of copies from the same original, but also present a faithful, though more or less roughly drawn reproduction of the prototype.

No older manuscript than that from Vatopedi seems to be known. The fact that these maps exhibit no trace of christian influence, makes it all the more improbable that they should have been much altered or modified between A. D. 200 and 1200. All this seems to prove that the 27 maps, given here in fac-simile, furnish us with a very faithful copy of the atlas composed in the middle of the second century after Christ.<sup>1</sup> When the maps were engraved on copper, however, some changes as to the manner of drawing were introduced, mainly with the view of reproducing in black that which had been rendered by colours on the old manuscripts. These changes are of less importance in the oldest editions, printed in Florence and Bologna. Here the engraver has not been able to emancipate himself from the style of drawing, employed for the manuscript-maps.

With regard to the sources of Ptolemy's atlas Dr. N. H. BREHMER in a detailed, but perhaps not sufficiently critical work (*Entdeckungen im Alterthum*, Weimar 1822) has put forward the opinion, that the maps were not of Greek or Roman, but of Tyrian origin, and that their principal sources were the experiences gained during sea and land voyages from the Phenician towns. Professor A. H. L. HEEREN, on the other hand, has in *Commentatio de fontibus Geographicorum Ptolemaei tabularumque iis annexarum* etc., Gottingæ 1827, made an attempt to prove that the atlases of Marinus and of Ptolemy rest, not upon old Tyrian sources, but upon contemporary Greek and Roman writings and itineraries. But the arguments of Heeren are not convincing, and I do not hesitate to adopt the opinion of Brehmer with regard to this question, which is of such great importance to the history of geography. An atlas so exten-

sive and comparatively so correct as that of Ptolemy cannot have been the work of a few years by some few geographers. Experience, collected during centuries, has evidently been necessary for its production. We have no evidence, that such collections of maps as those of Ptolemy, or such works, as are now termed atlases, existed in ancient Rome or Greece. On the contrary all the passages regarding maps in Pliny, Strabo and other old authors, only speak of isolated drawings of the earth, of which not a single one is still extant. It is in no wise proved, that they had any resemblance to maps in a Ptolemaic or modern sense. Many of the numerous names in Ptolemy suggest a Phenician origin; even according to Heeren, the *oikumenæ* of Ptolemy extend to the north, south, east and west far beyond the limits of the military expeditions of the Romans and Greeks, and on the very maps we may often trace the pathway of the caravan, by which the knowledge of the distant countries arrived on the Mediterranean coast. As the *tabula novæ* added to Ptolemy's geography in the 15th century are founded on sea-charts or portolanos, originally drawn for practical use and attaining a rare perfection by being improved generation after generation; so the maps of Ptolemy are, as is expressly pointed out in his own text, in the first place founded on the Tyrian charts of Marinus, and these again have, as proved by Ptolemy's criticism of the works of Marinus, only been the last, the most complete and correct of the Phenician »portolanos» during Ptolemy's time. This does not exclude the belief that Ptolemy, in compiling his work, added some corrections founded on observations by Hipparchus, Erathosthenes, Posidonius, Strabo, Pliny etc., or inserted some new observations collected directly from European, Asiatic or African military commanders, mariners or merchant adventurers. But these corrections and additions were probably not very extensive, and the main part of the work, which after the discovery of the art of printing formed the prototype of all modern atlases, is thus, as Brehmer has supposed, most likely to be of a Tyrian or Phenician origin.

#### Errors and peculiarities in Ptolemy's geography.

High as Ptolemy's atlas stands above all other similar works either of ancient times or of the middle ages, yet a glance at his maps is sufficient to show that his geographical ideas and his notions of the distribution of continents and seas were often, not only very incomplete, but also quite erroneous. This is easy to explain and is excusable, for an atlas is only capable of representing the geographical knowledge of the age, when the work was composed. But in consequence of the well deserved reputation of the author and the unlimited faith in antiquity still prevailing in the 15th and 16th centuries, these errors and defects long exercised a retarding influence on the development of cartography, and induced learned cartographers to adhere for a long time to antiquated representations of countries, of which new and more correct maps had already been long published by illiterate mariners and travellers.

The most conspicuous of these errors are the following:

Ptolemy gave, in his maps, too great a longitudinal extension to the Mediterranean sea, and generally to the whole

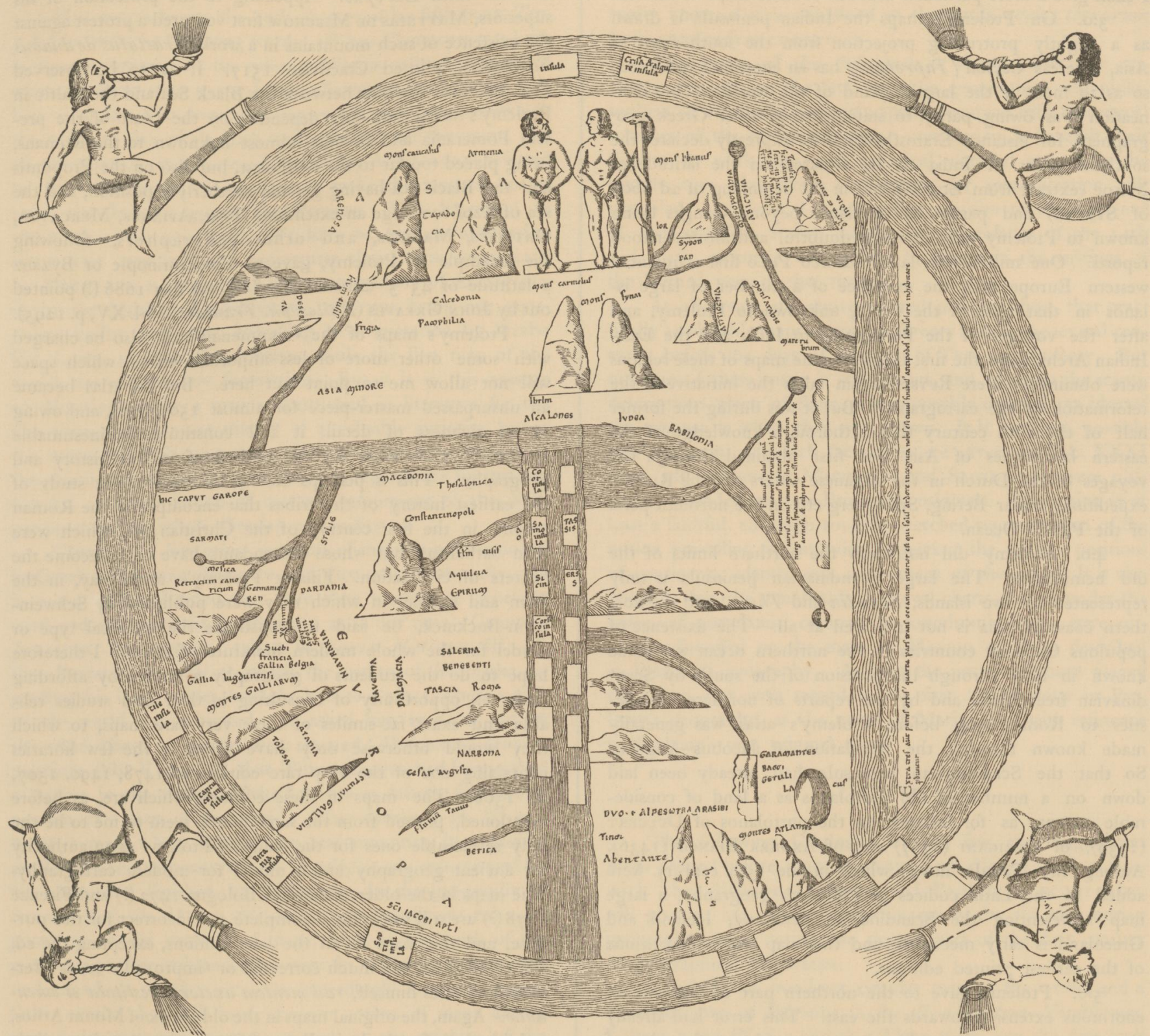
world known to the ancients. This error partly arose from his adopting a length of only 500 stadia for the degree of latitude instead of 700, in consequence of which all astronomically measured distances became too short. This error principally affected the distances from north to south; for it was then only possible to determine longitudes astronomically under exceptional circumstances. There must necessarily have been great uncertainty in the determinations of longitudes, before chronometers were invented. The error, as regards the length of the Mediterranean, was early discovered by mariners, as is shown by the more correct dimensions given to the Mediterranean and Black Seas on some portolanos of the 14th century. But in maps drawn by learned scholars, and even by learned mariners, the old error was adhered to far into the 17th century. This has led some geographers to censure Ptolemy and those who revived the study of his geography in the 15th and 16th century, unjustly. The injustice of this censure may be deduced from a comparison of the maps in the Roma-edition of 1478 with maps of

<sup>1</sup> MANNERT shows (cit. work I. p. 180) that the very order of the names in Ptolemy's text (Book II—VII) renders extensive interpolations improbable and difficult.



Scandinavia or of America from the first part of the 16th century. Such a comparison will show that Ptolemy's atlas, notwithstanding its deficiencies, occupied the first place among cartographical works, even far into the 16th century, at least, if the Portolanos are excepted. To the quite exceptional position in the history of cartography held by these I shall return further on. When making this comparison it should be remembered, that it was certainly possible to construct good charts of regions so well known and so many thousand times

2:0. Ptolemy made an unexplored continent, *Terra Incognita*, connect southern Africa with eastern Asia, thus forming an inland-sea of the Indian Ocean. It is probable that this theory regarding the extension of the Indian Ocean originally arose from accounts of continents and islands far in the South, among the inhabitants of the Eastern and Western Indian peninsulas, but certainly also from a tendency of the older geographers to apply the contours of known localities to unknown lands and seas. With the rejection of all reports



17. Map of the world from the 12th (?) century from a manuscript in the library of Turin. (From JOMARD).

traversed by mariners, as the Mediterranean and Black Seas, without a network of latitudes and longitudes, founded only upon guessed distances, and probably with Ptolemy's map as the point of departure. But if the same principles had been followed at the mapping of other parts of the globe, the mariners of the age of the great geographical discoveries would, during their passages to new countries and seas, for a long time have had to be guided, not by maps of Ptolemy's model, but by fancy maps in the Arabian style, or by representations of the earth resembling the map from the 12th (?) century, of which a facsimile is given fig. 17, or the maps in the *Rudimentum Novitiorum* N. fig. 2 & 3.

of the circumnavigation of Africa, the Indian Ocean was thus supposed to be an inland-sea like the Mediterranean, Black and Caspian Seas. It is here to be remembered that formerly there was a difference made between *Oceanus* and *Mare*. The Atlantic Ocean was generally not enumerated among the seas of the globe.

After the voyage round the southern point of Africa by BARTHOLOMEUS DIAS and especially after the return of VASCO DA GAMA 1499 from his first voyage to India, the error of this theory regarding the distribution of land in the Old hemisphere was obvious. Maps of the world of the old type, however, were printed not merely as representations of the geographical con-



ception of antiquity, but also as real maps, far into the 16th century, f. i. in the *Margarita Philosophica* by REISCH, 1503 (N. T. XXXI), in *Cosmographia Pii papæ* etc. Parthisis 1509. The first printed maps giving to Africa a tolerably exact extension to the south are the map of RUYSC in Ptolemy, Romæ 1508, a map on the title-page of the *Itinerarium Portugallensium*, Mediolani 1508 (N. fig. 37), one in the *Globus mundi*, Argentinae 1509 (N. fig. 22), and the new maps of Africa in Ptolemy, Argentinae 1513 (N. fig. 8 & 9). I shall give a more particular account of these maps further on.

3.0. On Ptolemy's maps the Indian peninsula is drawn as a slightly protruding projection from the south coast of Asia, whereas Ceylon (*Taprobane*) has an enormous extension, so as to make it the largest island of the world. This delineation was owing partly to statements of older Greek geographers, for instance Eratosthenes, who expressly declares the southern point of India to be situated on the latitude of Meroe (extract from Eratosthenes in the beginning of 2d book of STRABO) and partly to the lands beyond Ganges being known to Ptolemy only through doubtful and misunderstood reports. One millennium later, MARCO POLO first acquainted western Europe with the existence of a number of large islands in that part of the world, unknown to Ptolemy, and after the voyages of the Portuguese to India and the East-Indian Archipelago the first tolerably true maps of these regions were obtained. Here RUYSC again takes the initiative in the reformation of the cartography. But it was during the former half of the 18th century that a thorough knowledge of the eastern boundaries of Asia was first obtained through the voyages of the Dutch in the Japanese waters and the Russian expeditions under Bering, Spangberg etc. in the northern parts of the Pacific Ocean.

4.0. Ptolemy did not know the northern limits of the old hemisphere. The large Scandinavian peninsula is only represented by two islands, *Scandia* and *Thule*,<sup>1</sup> and the northern coast of Asia is not indicated at all. The existence of populous Christian countries in the northern ocean was made known in Italy through the invasion of the south by Scandinavian freebooters, and by the reports of northern ecclesiastics to Rome, long before Ptolemy's atlas was generally made known through the translation of Jacobus Angelus. So that the Scandinavian peninsula had already been laid down on a number of old portolanos as a land of considerable extent, as for instance on the portolanos of DULCERT (1339), of PIZZIGANI (1367) and of ANDREA BIANCO (1436). Among the *Tabulae novæ*, which in the 15th century were added to the Latin codices of Ptolemy's geography, a large map representing the Scandinavian peninsula, Iceland and Greenland is early met with, and this map was added to one of the earliest printed editions.

5.0. Ptolemy gave to the northern part of Scotland an enormous extension towards the east. This error had already been corrected on the earliest known portolanos, f. i. that of DULCERT of 1339, but on printed maps the error of Ptolemy

was long adhered to, a reform being first introduced on the maps of RUYSC 1508 and of BERNARDUS SYLVANUS 1511.

6.0. Ptolemy reduced the distance between the Baltic and the sea of Azof to one third of its actual length. So far as I have been able to ascertain, this error was first corrected on the small *Carta marina nova*, in MATTIOLO-GASTALDI's Ptolemy of 1548 (N. T. XLV). How defective Ptolemy's knowledge was of the interior of Russia in Europe may also be conceived from his letting mountain ranges cross the *Sarmatia Europæ*. Appealing to the protection of his superiors, MATTHIAS DE MIECHOW first ventured a protest against the existence of such mountains in a work, *Tractatus de duabus Sarmatiis*, printed Cracoviae 1517. It is to be observed that the short distance between the Black Sea and the Baltic in Ptolemy's maps not only depended on the coast of the present Pomerania and Livonia, almost unknown to the Romans, being placed too far to the south-east, but also on the Propontis and the Black Sea having got too northerly a position, and the sea of Azof too large an extension. That »APIANUS, MERCATOR, ORTELIUS, MAGINUS, and other geographers,» following the example of Ptolemy, gave to Constantinople or Byzanz a latitude of 43° 5' instead of 41° 6', was first 1686 (!) pointed out by JOHN GREAVES (*Philosoph. Transact.*, Vol. XV, p. 1295).

Ptolemy's maps of the »oikumenæ» may also be charged with some other more or less important errors, which space will not allow me to point out here. But his atlas became an unsurpassed master-piece for almost 1500 years, and owing to its richness of detail, it still constitutes an inestimable source of knowledge for the student of ancient history and geography. This is perhaps chiefly the case in the study of the earliest history of the tribes that encompassed the Roman empire in the first century of the Christian era, which were then barbarous, but whose descendants have since become the bearers of civilization. Finally Ptolemy's maps may, in the form and manner in which they were published by Schweinheim-Buckinck, be said to constitute the technical type or model for the whole modern literature of atlases. I therefore hope to do the students of geography a service by affording them an opportunity of consulting in their own studies reliable and exact fac-similes of these very rare maps, to which they would otherwise only have access in the few libraries containing one of the very rare editions of 1478, 1490, 1507, or 1508. The maps in these editions, which are, as before mentioned, printed from the same plates, seem to me to be the only serviceable ones for the study of Ptolemy as an authority for ancient geography and a model for modern cartography. The maps in the older editions of Bologna 1472 (?) and Firenze 1478 (?) are still too rude, incomplete and incorrect for this purpose, and the maps in all the later editions, excepting the ed. Paris 1867, are too much corrected or »improved,» or, as Mercator expresses himself, »ad mentem auctoris restituta et emendata.» Again, the original maps in the old codex of Mount Athos, published in fac-simile in Paris 1867, are drawn with too little artistic skill and are too worn to supply the want here indicated.

<sup>1</sup> Various opinions exist about the country designated by the ancients with the name of *Thule*, and it is possible that different lands or islands were at different times known by that name. But what *Ptolemy* or rather the mariners in Ptolemy's time meant by it, seems to me to be clearly deduced from his map of the world and his *Prima Europæ tabula*. *Thule* here corresponds to the south-western part of Norway, where the name *Telemarken* still reminds us of its ancient appellation.