

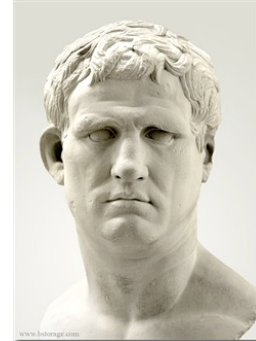
TITLE: *Orbis Terrarum*

DATE: A.D. 20

AUTHOR: *Marcus Vipsanius Agrippa*

DESCRIPTION: The profound difference between the Roman and the Greek mind is illustrated with peculiar clarity in their maps. The Romans were indifferent to mathematical geography, with its system of latitudes and longitudes, its astronomical measurements, and its problem of projections. What they wanted was a practical map to be used for military and administrative purposes. Disregarding the elaborate projections of the Greeks, they reverted to the old disk map of the Ionian geographers as being better adapted to their purposes. Within this round frame the Roman cartographers placed the *Orbis Terrarum*, the circuit of the world.

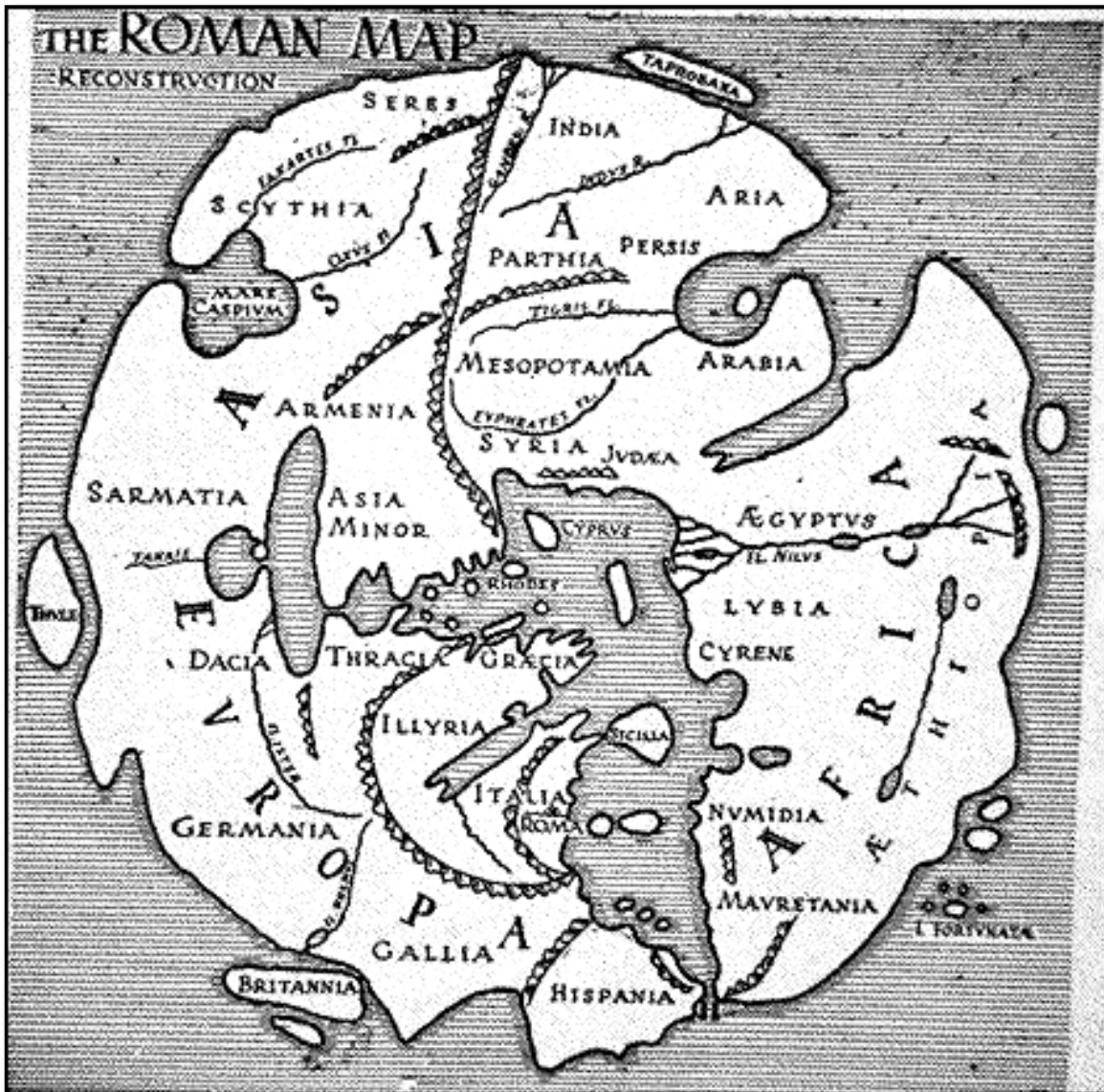
There are only scanty records of Roman maps of the Republic. The earliest of which we hear, the *Sardinia* map of 174 B.C., clearly had a strong pictorial element. But there is some evidence that, as we should expect from a land-based and, at that time, well advanced agricultural people, subsequent mapping development before Julius Caesar was dominated by land survey; the earliest recorded Roman survey map is as early as 167-164 B.C. If land survey did play such an important part, then these plans, being based on centuriation requirements and therefore square or rectangular, may have influenced the shape of smaller-scale maps. This shape was also one that suited the Roman habit of placing a large map on a wall of a temple or colonnade.



Varro (116-27 B.C.) in his *De re rustica*, published in 37 B.C., introduces the speakers meeting at the temple of *Mother Earth* [Tellus] as they look at *Italiam pictam* [Italy painted]. The context shows that he must be talking about a map, since he makes the philosopher among his group start with Eratosthenes' division of the world into North and South. This leads him on to the advantages of the northern half from the point of view of agriculture. The speakers compare Italy with Asia Minor, a country on similar latitudes where Greeks had experience of farming. After this they discuss in more detail the regions of Italy. As a visual aid to this discussion, the temple map will have been envisaged as particularly helpful. But whether it was only intended to be imagined by readers or was actually illustrated in the book is not clear. The same applies to possible cartographic illustration of Varro's *Antiquitates rerum humanarum et divinarum*, of which Books VII-XIII dealt with Italy. But at least we know that he was keen on illustration, since his *Hebdomades vel de imaginibus*, a biographical work in fifteen books, was illustrated with as many as seven hundred portraits. Since we are told that this work was widely circulated, some scholars have wondered whether Varro used some mechanical means of duplicating his miniatures; but educated slaves were plentiful, and we should almost certainly have heard about any such device if it had existed.

Although copies of Agrippa's map were taken to all of the great cities of the Roman Empire, not a single copy has survived. The reconstructions shown here are based upon data in the medieval world maps that were, in turn, derived from Roman originals, plus textual descriptions by classical geographers such as Strabo, Pomponius Mela and Pliny. The original was made at the command of Agrippa's father-in-law, the Emperor Augustus (27 B.C. - A.D. 14), and completed in A.D. 20. The map was presumably developed from the Roman road itineraries, and may have been circular in

shape, thus differing from the Roman *Peutinger Table* (#120). Note that most scholars, however, believe that due to its placement on the column in a portico or *stoa* open to the public, the *Porticus Vipsani*, it was probably rectangular, not circular. Shown here are three continents in more or less symmetrical arrangements with Asia in the east at the top of the map (hence the term orientation). The emphasis upon Rome is reflected in the stubby form of Italy, which made it possible to show the Italian provinces on an enlarged scale. Moreover, about four-fifths of the area of the map is devoted to the Roman Empire alone. India, *Seres* [China], and *Scythia* and *Sarmatia* [Russia] are reduced to small outlying regions on the periphery, thus taking on some features similar to the egocentric maps of the Chinese.



A "reconstruction" of the *Orbis Terrarum*, from Raisz

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The only reported Roman world map before Agrippa's was the one that Julius Caesar commissioned but never lived to see completed. We are told by late Roman and medieval sources that he employed four Greeks, who started work on the map in 44 B.C. These were no doubt freedmen, of whom there were large numbers in Rome, including many skilled artisans. The four regions of the world are not self-explanatory, but what Caesar seems to have meant is as follows: the East (by the cartographer Nicodemus), included everything to the east of Asia Minor; the West (by Didymus), included Europe except Greece, Macedonia and Thrace; the North (by Theodotus), included Greece, Macedonia, Thrace and Asia Minor; and the South (by Polyclitus), included all of Africa. If Romans were planning this, they would place the northern section much further west, whereas the cartographers were Greeks, and they followed a tradition which originated in Rhodes or Alexandria.

We may speculate whether this map was flat and circular, even though such a shape might have been considered 'unscientific' and poorly adapted to the shape of the known world. That is the form of the *Hereford* world map (*Book IIB*, #226), which seriously distorts the relative positions and sizes of areas of the world in a way we should not imagine Julius Caesar and his technicians would have. A late Roman geographical manual gives totals of geographical features in this lost map with recording names, but even the totals, on examination, turn out to be unreliable.

Agrippa's map was compiled to further Roman imperial expansion. M. Vipsanius Agrippa (64/63-12 B.C.) was one of the earliest supporters of the young Octavian in his fight to establish himself as Julius Caesar's heir. He first became prominent as governor of Gaul, where he improved the road system and put down a rebellion in Aquitania. He pacified the area near Cologne (later founded as a Roman colony) by settling the Ubii at their request on the west bank of the Rhine. In 37 B.C. he was a consul and built Octavian a fleet which enabled him the following year to defeat Sextus Pompeius in Sicily; Agrippa as admiral of this fleet used a new type of grapnel devised by him. His greatest victory was in 31 B.C. when off Actium, near Preveza in western Greece, Octavian and he defeated Anthony and Cleopatra. He was one of the main helpers of Octavian when in 27 B.C. the latter was invested with special powers and the title Augustus. In 23 B.C. Augustus, as he was ill, handed his signet-ring to Agrippa, thus indicating him as acting emperor. The same year Agrippa was given charge of all the eastern parts of the Empire, with headquarters at Mitylene. In 21 B.C. he returned to Rome and married Augustus' daughter Julia. After he had put down the Cantabri of northern Spain in 19 B.C., he returned to Rome more permanently and was given additional favors. From 17/16 to 13 B.C. he was pacifying the eastern provinces, and in 12 B.C. went to Pannonia, but died shortly after his return.

Augustus had a practical interest in sponsoring the new map of the inhabited world entrusted to Agrippa. On the re-establishment of peace after the civil wars, he was determined on the one hand to found new colonies to provide land for discharged veterans, on the other hand to build up a new image of Rome as the benevolent head of a vast empire. Mapping enabled him to carry out these objectives and to perfect a task begun by Julius Caesar. It became, among other things, a useful tool in the propaganda of imperial Rome. Agrippa was an obvious choice as composer of such a map, being a naval man who had traveled widely and had an interest in the technical side. He must have had plans drawn, and may even have devised and used large-scale maps to help him with the conversion of Lake Averna and the Lacus Lucrinus into naval ports.

Incomplete at Agrippa's death in 12 B.C., Augustus himself completed the world map. It was erected in Rome on the wall of a portico named after Agrippa, which extended along the east side of the *Via Lata* [modern *Via del Corso*]. This portico, of which fragments have been found near *Via del Tritone*, was usually called *Porticus Vipsania*, but may have been the same as the one that Martial calls *Porticus Europæ*, probably from a painting of *Europa* on its walls. The building of this colonnade was undertaken by Agrippa's sister Vipsania Polla. The date at which the building was started is not known, but it was still incomplete in 7 B.C. Whether the map was painted or engraved on the wall we do not know. The theory that it was circular is in conflict with a shape that would suit a colonnade wall. Some scholars believe that the map is even likely to have been rectangular, probably with North rather than South at the top.

The chief ancient writer who refers to Agrippa's map is the elder Pliny, who frequently quotes Agrippa by name; though whether in most cases his source is the map or the commentary is hard to say. Pliny's most specific reference to the map is where he records that the length of *Bætica*, the southern Spanish province, given as 475 Roman miles and its width as 258 Roman miles, whereas the width could still be correct, depending on how it was calculated. Pliny continues: "*Who would believe that Agrippa, a very careful man who took great pains over his work, should, when he was going to set up the map to be looked at by the people of Rome, have made this mistake, and how could Augustus have accepted it? For it was Augustus who, when Agrippa's sister had begun building the portico, carried through the scheme from the intention and notes [commentarii] of M. Agrippa.*"

In point of fact Augustus may have delegated the detailed checking to one of his freedmen, such as his librarian C. Iulius Hyginus. Certain phases in Pliny lead one to suppose that they came from a commentary, not a map. Thus Agrippa is said to have written that the whole coast of the Caspian from the Casus River consists of very high cliffs, which prevent landing for 425 miles. If the commentary had not been continuous, but had merely served as supplementary notes where required, there is a possibility that by Pliny's time, some eighty years later, it might have gone out of circulation. Two late geographical writings, the *Divisio orbis* and the *Dimensuratio provinciarum* (commonly abbreviated to *Divisio* and *Dimensuratio*) may be thought to come from Agrippa, because they show similarities with Pliny's figures. There are, however, cases, e.g. the combined measurements of *Macedonia*, *Thrace* and the *Hellespont*, that agree with Pliny on areas where he does not name Agrippa but may nevertheless in fact have been using him.



We may treat as secondary sources Orosius, *Historiae adversum paganos*, and the Irish geographical writer Dicuil (AD 825). Orosius seems to have read, and followed fairly closely both Agrippa and Pliny, as well as early writers from Eratosthenes onwards. Dicuil tells us that he followed Pliny except where he had reason to believe that Pliny was wrong.

It is also claimed that Strabo (#115) obtained his figures for Italy, Corsica, Sardinia and Sicily from Agrippa. His source was clearly one commissioned by Romans, not Greeks, as his figures for those areas are in miles, not *stades*. But Strabo never names this source, referring only to *the chorographer*. Such a word certainly ties up with *Divisio I*: "*The world is divided up into three parts, named Europe, Asia, Libya or Africa. Augustus was the first to show it [the world] by chorography.*" Evidently there is a slight difference of

meaning between this and Ptolemy's definition, by which *chorography* refers to regional mapping.

Although the term *chorographia* literally means "regional topography", it seems to include fairly detailed cartography of the known world. The Agrippa map probably did not, in the absence of any mention, use any system of latitude and longitude. It no doubt inherited a system of regional shapes from Eratosthenes (#112). It is, as one might expect, more accurate in well-known than less-known parts, and more accurate for land than for sea areas. From the quotations given by Dilke, there would appear to be a general tendency by Agrippa to underestimate land distances in Gaul, Germany and in the Far East, and to overestimate sea distances. If West Africa is any guide, in areas where distances were not well established, they were probably entered only very selectively. What purpose was served by giving a width for the long strip from the Black Sea to the Baltic Sea is not clear.

For a more complete assessment of what Agrippa wrote or ordered to be put on his map, we may again turn to passages where Pliny quotes him specifically as reference. These include both land and sea measurements, though the most common are lengths and breadths of provinces or groups of provinces. In this context, length normally means the greater of the two measurements. The fact that for continental measurements it also usually means west-east or north-west/south-east is largely coincidental. Although the words used are *longitudo* and *latitudo*, they have no connection with longitudinal and latitudinal degree divisions. O.A.W. Dilke provides a detailed discussion of Agrippa's measurements using quotes from the elder Pliny's *Natural History*.

It is a pity that Pliny, who seems to be chiefly interested in measurements, gives us so little other information about Agrippa's map. For a general description, however, of what is meant by chorography we may turn to Strabo ii.5.17 (as mentioned above, Strabo nowhere names Agrippa as his source):

It is the sea above all which shapes and defines the land, fashioning gulfs, oceans and straits, and likewise isthmuses, peninsulas and promontories. But rivers and mountains too help with this. It is through such features that continents, nations, favorable sites of cities, and other refinements have been conceived, features of which a regional [chorographic] map is full; one also finds a quantity of islands scattered over the seas and along the coasts.

Clearly Agrippa's map had many of the above features, but whether it also contained main roads is uncertain. But on the credit side, Agrippa's map, sponsored by Augustus, was obviously an improvement on that of Julius Caesar on which it is likely to have been based. The fact that such an insignificant and distant place as *Charax* was named on the map shows the detail that it embodied. Moreover it seems to have been the first Latin map to be accompanied by notes or commentary. Romans going to colonies, particularly outside Italy, could obtain information about the location or characteristics of a particular place. Also the full extent of the Roman Empire could be seen at a glance.

Certain medieval maps, including the *Hereford* and *Ebstorf* world maps (see monographs #224 and #226 in Book IIB) are now believed to have been derived from the *Orbis Terraum* of Agrippa, and point to the existence of a series of maps, now lost, that carried the traditions of Roman cartography into Christian Europe. The small *T-O maps* (see Book IIA, #205) so popular in later Roman times may, themselves, have been derived from reductions of the Agrippa map (these were the ubiquitous type of diagrammatic

map of the world inserted in many geographical treatises of the later Roman/early Medieval period).

The following is an excerpt from an article by J.J. Tierney. The map of Agrippa was not the first map to be set up in a public place in ancient Rome. Livy tells us (XLI, 28, 8) that the consul Ti Sempronius Gracchus in the year 174 B.C. set up a map of Sardinia in the temple of Mater Matuta in memory of his campaign in the island. Varro, in the following century, tells us of a map of Italy that was painted on the wall of the temple of Tellus. We do not know the occasion of this dedication, but since it was meant to celebrate a victory it may be intended for the geographical instruction of the Roman public. The map of Agrippa, however, was set up, not in a sacred place, but in a portico or *stoa* open to the public, the *Porticus Vipsania*. It was not a map of a part of the Empire, not even a map of the Empire as a whole, but rather a map of the whole known world, of which the Roman Empire was merely one part.

We know, therefore, that when Agrippa died in 12 B.C. he had not as yet begun this particular one of his many buildings. His sister, Vipsania Polla, began the work, and we know from Dio Cassius that it was still unfinished in the year 7 B.C. It was completed by Augustus at a later date, probably within the following few years. We know that the *campus Agrippae* was in the *campus Markus* on the east side of the Via Flaminia and that it was bordered towards the street on the west by the *Porticus Vipsania*. Remains of the portico are stated to have been found opposite the Piazza Colonna on the Corso at about the position of the column of Marcus Aurelius and further north. They are said to allow the conclusion that it had the same dimensions and construction as the adjacent *porticus saeptorum*, whose dimensions were 1,500 ft. in length by 200 ft in breadth. The *Porticus Vipsania* was, therefore, an enormous colonnade and it follows that the map with which we are concerned was only one decorative item among the many that adorned it. The largest imaginable dimensions of such a map would be a rectangle of say 30 ft. by 60 ft. and even this would only cover one-third of one of the short walls of the portico (*note that the only known "reconstructions" of Agrippa's map use a circular design*).

The physical appearance and construction of the map have long been matters of dispute. The general history of ancient cartography and our knowledge of Roman buildings in the Augustan period would appear to be our surest guides. There can be no reasonable doubt that the map was a rectangular one with the east-west measurements running horizontally and the north-south measurements running vertically. In regard to the materials of construction I think we have to choose between the painted type of wall-map mentioned by Varro and the construction of marble slabs that is used in the *forma urbis Romae* of two centuries later, of which considerable parts are extant. In view of the widespread use of marble facings that characterizes the age of Augustus, the marble slab method appears more probable. Inscriptions might either be painted or engraved and painted, on this marble surface.

The Greek geographer Strabo was in Rome in 7 B.C., or shortly afterwards, and he several times mentions "the chorographer," "the chorography" and "the chorographic map". It is now the common view of scholars that these passages refer to Agrippa and to his map. Though Strabo does not mention Agrippa's name here he is probably merely being tactful with regard to the Emperor who, presumably, took a large part in the completion of the portico with its map.

A serious point of disagreement among scholars has been whether the *commentarii* of Agrippa mentioned by Pliny were published at the time of construction of

the portico. The German philologist and historian Detlev Detlefsen always clung steadfastly the view that there was no such publication and that the inscriptions on the map itself provided all the geographical information that was available to later times under the name of Agrippa. One must grant Detlefsen that in Pliny's main reference there is talk only of a map and the *commentarii* are merely the basis of the map. Detlefsen, as against the view of Partsch, effectively quoted the passage of the younger Pliny, on the 160 volumes of his uncle's *commentarii*, which he describes as *electorum... commentarios, opisthographos quidem et minutissime scriptos*, annotated excerpts, written on the back in a minute hand. Riese and Partsch had argued that certain references to Agrippa in Pliny, in particular the reference to the inaccessibility of part of the coast of the Caspian Sea and also that to the Punic origins of the coastal towns of *Baetica* refer more naturally to a published work than to the map in the *Porticus Vipsania*. The volumes of commentary referred to by the younger Pliny were not published, but were clearly digested to the point where little further work was needed to prepare them for publication, and the same situation may well be accepted for the *commentarii* of Agrippa.

Another element in this problem that demands some explanation is the origin of the two later works the *Demensuratio provinciarum* and the *Divisio orbis terrarum* which are both derived from Agrippa, probably through a common source. Detlefsen had explained their origin by assuming the production of smaller hand-copies of Agrippa's map, their smallness then making a written text desirable. Partsch on the contrary, had assumed an original publication, contemporary with the original map, of a *Tabellenwerk*, that is, a series of tabulated lists. It is, of course, possible to imagine that tabulated lists were put up as an adjunct to the map at the short ends, but the references to Spain and the Caspian seem somewhat out of place even here, and the balance of probability on this problem seems to lie, although rather precariously in favor of a contemporary, or nearly contemporary, publication of at least a selection of Agrippa's material comprising something more than mere lists of names and figures.

Apart from the information supplied by Pliny, our chief evidence for the reconstruction of the map is provided by the two works already mentioned, the *Demensuratio provinciarum* and the *Divisio orbis terrarum*. The *Demensuratio* was first published in Milan in A.D. 1475, and, according to Paul Schnabel (*Text und Karten des Ptolemäus*, 1938) the thirteen manuscripts of the 15th and 16th centuries and a further manuscript of the 13th century all derive from the ninth-century codex in the library of Merton College, Oxford. The other work, the *Divisio orbis terrarum* was first edited by Schweder in A.D. 1876 from a Vatican manuscript of the 13th century. The text, however, had long previously been known from its reproduction in the first five chapters of the *De Mensura Orbis Terrae*, published by the Irish scholar Dicuil in A.D. 825. Dicuil worked and wrote probably at the Frankish palace at Aix-la-Chapelle in the time of Charlemagne and Louis the Pious.

Dicuil, in his preface, promises to give the measurement of the provinces made by the envoys of the Emperor Theodosius, and at the end of chapter five he quotes twelve verses of these envoys in which they describe their procedure. The lines themselves, however, show that Dicuil largely misconceived the situation. What they show is rather that on the orders of Theodosius two members of his household composed a map of the world, one written and the other a painting. They completed the work in a few months. We do not know the size of this map that has perished, or whether its descent from the map of Agrippa was through a series of hand-copies as Detlefsen supposed. But it did quite clearly derive from that map, whether in the map-

form or in a written form, with its list of seas, mountains, rivers, harbors, gulfs and cities. The twelve lines were inscribed on this map and also on an obviously contemporary written version thereof, and it is this written version that has been preserved for us both by Dicuil and in the various manuscripts of the *Divisio orbis terrarum*, whereas the map has perished. The date of the making of the map was probably the fifteenth consulate of Theodosius II, that is, A.D. 435, not the fifteenth year of his reign, as understood by Dicuil.

According to Tierney, Detlefsen regarded these two works as derived from small-scale copies of Agrippa's map. Small discrepancies were to be explained by differences in the copies of the map used by each. The classical scholar Alfred Klotz, however, in his articles on the map has shown that a number of correspondences between the two works as against Pliny point rather to a common source from which both works are derived. Detlefsen's view that both works were the transformation of actual maps into a written record had the advantage that the differences in the order of the material in the two works was of little consequence, the map giving merely the visual impact, and the writer "being free to begin his description at whatever point on the map he preferred". In actual fact Pliny and the *Divisio* both begin their description from the straits of Gibraltar, moving east, while the *Demensuratio*, on the contrary, begins with India moves west. On Klotz's view that both works derive from a common written source this major divergence becomes a problem to be explained, but Klotz can offer no explanation. Klotz, however, believed that he could determine the original succession of countries and groups of countries as treated in the published work of Agrippa by criteria. One of these was the direction shown in the order of naming several particular countries where several are included in the same section, or the direction shown in the list of the boundaries of the section. Thus he says that the order Cevennes-Jura for the northern boundary of Narbonese Gaul shows motion from west to east, and again the list Macedonia, Hellespont, left side it the Black Sea shows the same movement. The second criterion is that the use (the alleged use) of the term *longitudo* for a north-south direction or for any direction other than the canonical one of east-west, shows us the direction of Agrippa's order in treating of the geography. Tierney does not believe that either of these criteria can show us the order of treatment in the original publication, presuming, that is, that there was an original publication. We are prone to forget that all ancient geographers were necessarily map-minded, and even when the map was not before their physical eye, it was before their mental eye. The order of countries within a section would, I think, very much depend on the momentary motions or aberrations of that mental eye.

Tierney believes however, that the west to east movement supposed by Klotz is, in fact, correct, but not for his reasons. The west to east movement in geographical description seems to have been normal in the geographers from the time of the sixth-century Massaliot *periplus* [the Latinization of the Greek word *περίπλους* (*periplous*, contracted from *periploos*), literally "a sailing-around"] of which part is preserved in the *Ora Maritima* of Festus Rufus Avienus, right down to the map of Ptolemy. Greek cartography, like Greek writing, ran from left to right and perhaps the former practice was promoted by the fact that the western boundary of Europe was well known, at least from the time of Pytheas (ca. fourth century B.C.), whereas the eastern boundary of Asia was always unknown and fluctuating.

Our idea of the detail of the map of Agrippa must be based on a study of the references in Strabo, Pliny, the *Divisio* and the *Demensuratio*. Strabo used Agrippa only

for Italy and the neighboring islands, so that our chief evidence comes from the other three sources. Occasionally there is confirmation from the chapter on geography in Orosius.

There are twenty-four sections in the *Divisio* and thirty in the *Demensuratio*, the difference being mainly due to the absence from the *Divisio* of the sections on the islands of the Mediterranean and the Atlantic. Detlefsen believed that the island sections were later added to the *Demensuratio*, but according to Tierney there can be little doubt that he is wrong in this and that Klotz is right in thinking that these sections have rather fallen out of the *Divisio*. The elements provided in each section are rather monotonously the same. First come the boundaries of the province given in the constant order east, west, north, south. Following on this and connected there with come the longitude and latitude, in that order, expressed in Roman miles with Roman numerals. The boundaries are marked by the natural features, usually the mountains, rivers, deserts and oceans, only occasionally by towns or other features. The *Demensuratio* on one occasion gives the fauna and flora of Eastern India, which it calls the land of pepper, elephants, snakes, sphinxes and parrots.

These sections are largely identical with passages in Pliny's geographical books (Books III to VI), and show that many passages in Pliny are taken from Agrippa beyond those where he is actually named. There are also numerous discrepancies. The numerals are much more corrupt than those in Pliny, and there is usually a presumption, therefore, that Pliny's figures preserve a better version of Agrippa.

The consensus of the views of modern scholars on Agrippa's map, is that it represents a conscientious attempt to give a credible version of the geography of the known world. It relies on the general scheme of the Greek maps that had been current since the time of Eratosthenes and Hipparchus, and attempts to rectify them, particularly in Western Europe, with recent information derived from the Roman itineraries and route-books.

But this consensus is not quite complete and therefore I now turn to consider the view of Agrippa's map put forward by Professor Paul Schnabel in his article in *Philologus* of 1935. We have to thank Professor Schnabel for providing in the same article a new critical text of both the *Demensuratio* and the *Divisio*. Schnabel, while expressing appreciation of the earlier work of Alfred Klotz, yet criticizes Klotz severely on two grounds. Firstly, Klotz has not discussed the possible use of Agrippa in Ptolemy's *Geography*, and secondly, and much more fundamentally, he has not recognized the scientific importance of the world-map of Agrippa as a link between Eratosthenes and Hipparchus on the one hand and Marinus and Ptolemy on the other, but has merely repeated traditional views dating from the end of the 19th century. These views stated that Agrippa's work was constructed on the basis of Roman itinerary measurements and took no note of the scientific results of the astronomical geography of the Greeks.

Schnabel does not himself take up the general question of the use of Agrippa by Marinus and Ptolemy. He sets out, at first, to prove that Agrippa's map possessed a network of lines of longitude and latitude.

Schnabel here refers to the last chapter of the geographical books of Pliny's *Natural History*, that is, Book VI, cap. 39, sections 211-219, where Pliny mentions evidently as a work of supererogation, "the subtle Greek invention" of parallels of latitude, showing the areas of equal shadows and the relationship of day and night Pliny then gives seven parallels, running at intervals between Alexandria and the mouth of the Dnieper, with longest days running from fourteen to fifteen hours. For the sixth of

these parallels he gives a slight correction due to the Publius Nigidius Figulus (ca. 98-45 B.C., a scholar of the Late Roman Republic). Pliny then adds "from later students" five more parallels, three of them, those of the Don, of Britain, and of Thule, running north of the original seven, and two, those of Meroe and Syene, running south of them. Of these parallels Schnabel tries to establish that at least two are due to Agrippa, to wit, the first of the new parallels passing through the Don, and the seventh of the old parallels passing through the mouth of the Dnieper. He argues that the Dnieper was used as a line of demarcation between Sarmatia to the east and Dacia to the west only on the map of Agrippa, and neither earlier nor later, and that therefore the parallel from the Don through the Dnieper must derive from that map. This argument, however, is unsound for a number of reasons, of which the most obvious in this context is that whereas the Dnieper is given by our sources as the west boundary of Sarmatia, it is never given as the east boundary of Dacia. For this east boundary our three sources unanimously give instead the deserts of Sarmatia.

Schnabel continues with the negative argument that the Don parallel cannot belong to the school of Hipparchus. Hipparchus had made the Don parallel the seventeen-hour parallel, corresponding to 54° N latitude, whereas Pliny here puts it at sixteen hours or 48° 30' N latitude, which is nearly correct. Therefore, Schnabel argues, the incorrect latitude of Hipparchus was corrected by Agrippa who had experience of the Black Sea in his later years. It follows further, says Schnabel, that Pliny's seventh parallel, that of fifteen hours, belongs equally to Agrippa. Here again Pliny's figure is nearly correct while that of Hipparchus is 2° too high. Both these arguments of Schnabel must however, also be rejected.

In the first place the heading of Pliny's chapter on the parallels, cap. 39, section 211, refers obviously to all that follows as far as the end of Book VI and shows that the complete passage is taken from Greek sources. His proximate source, moreover, he names in section 217, according to his usual custom, as Nigidius Figulus. Detlefsen pointed this out in 1909, and Kroll (after Honigmann) throws further light on the subject in his article on Nigidius in *R. E.* XVII, 200-212 (1936). Pliny's seven *klimata* are a piece of astrological geography and derive through Nigidius from Serapion of Antioch, who was probably a pupil of Hipparchus, or if not was a student of his work. Nigidius was a notorious student of the occult and his astrological geography was contained in a work apparently entitled *de terris*. This work seems to have included his commentary on the *sphaera Graecanica* describing the Greek constellations and his *sphaera barbarica* on the non-Greek constellations. Nigidius' "barbaric sphere" was derived from the like-named work of Asclepiades of Myrlea. The detailed extension of the Greek parallels into the Roman west is apparently due to Nigidius.

We may speculate as to whether Pliny's phrase regarding the "careful later students," does not refer to Nigidius himself. This appears improbable. The parallels of Meroe and Thule were both equally useless in astrological geography although they may well have been mentioned by Nigidius, as they are by Strabo simply by way of clearing the decks. Pliny's final phrase about these scholars adding half an hour to all parallels denotes rather the astronomer than the astrologer. What is new in Pliny's parallels may be referred to the Greek astronomers of the age of Hipparchus or the two or three generations after him. Many of these men's names are known, but very little more is known of most of them. But there is no vestige of probability or proof that Agrippa made new gnomonic readings to correct Hipparchus. As Detlefsen put it:

"Agrippa could have learned about parallels from a Roman writer (that is Nigidius) but there is no evidence of it."

Schnabel next moves on to a more ambitious argument, making the assumption that Ptolemy has used some of Agrippa's reckonings to establish points in his geography. Schnabel takes Ptolemy's position (Geog. H, 10, 1.) for the mouth of the river Varus (the frontier of Gaul and Italy), that is, 27° 30' E longitude and 43° N latitude, and again his position for Nesakton (Geog. III, 1, 7) on the river Arsia, that is, 36° 15' east longitude and 44° 55' N latitude. By subtraction we get the difference in longitude between the two places as 8° 45' and the difference in latitude as 1° 55'. Using Ptolemy's reduction factor at 43° N latitude which is forty-three sixtieths we find that with Ptolemy's degree of 500 *stadia* the difference in longitude between the two places in question is 3,135 and five-twelfths *stadia* and the difference in latitude is 958 and one-third *stadia*. Schnabel now treats the spherical triangle involved as a plane right-angled triangle, and using the theorem of Pythagoras, he finds that the hypotenuse, that is, the distance between the Varus and the Arsia is 3,291 *stadia* or 411 *Roman miles*. But Pliny (III, 43) gives this distance as 410 miles and the *Divisio* gives it as 420. From the coincidence of the figures Schnabel strongly argues that Ptolemy must have taken over the figure of 411 miles from Agrippa. He further ventures to state that this distance was a direct line on Agrippa's map. Agrippa, he thinks, took the itinerary figure for the distance from the Varus to the Arsia, which is given as 745 miles by Pliny (III, 132) and reduced it to a straight line of 411 miles by astronomical and mathematical measurement. This proves, therefore, that Agrippa's map was not a purely itinerary map, but that Agrippa reduced the itinerary measurements in the way described. It is unfortunate, however, that nearly all Agrippa's figures come down to us in a non-reduced form that makes it impossible to reproduce his map.

It is sad to think that this elegant piece of reasoning must be thrown overboard, but Tierney believes it must be rejected on at least three different counts. In the first place, Schnabel has apparently overlooked Ptolemy's method of establishing the longitude and latitude of particular geographical points. This method Ptolemy has described quite clearly and unambiguously in the fourth chapter of Book I of his *Geography*. The bases of his map are (1) the few points established astronomically by Hipparchus and their extension on the lines of the parallels; (2) points lying on the same meridian gained by direct sailing north or south in the Mediterranean; (3) the inferior and miscellaneous information derived from sea voyages and land journeys. This third class was to be manipulated as intelligently as possible so as to fit in with the basic evidence of the first two classes. It was this third kind of evidence which gave Ptolemy his positions for the Varus and the Arsia. He never knew of this figure of 411 miles that Schnabel supposes him to take from Agrippa.

In the second place Schnabel's statement that Agrippa reduced the itinerary figure of 745 miles to a straight line of 411 cannot be accepted. Pliny gives this itinerary as running at the base of the Alps, from the Varus through Turin, Como, Brescia, Verona and other towns on to Trieste, Pola and the Arsia. It is difficult to see how Schnabel imagined that this line could be reduced to a straight line of 411 miles. How could the angles be measured with the slightest degree of accuracy? What Klotz says in his commentary is far more acceptable. He thinks the 411 miles represents the itinerary measurement from the Varus to Rimini through Dertona, and that the Arsia has got attached to it by a slight confusion in Pliny's mind in thinking of the boundaries between

the *mare superum* and the *mare inferum*, with which, in fact, he equates the Varus-Arsia measurement.

Thirdly, it may fairly be objected that the very method by which Schnabel obtains the figure of 411 miles is faulty. For the reduction, of longitude he uses, as I have said, the factor of forty-three sixtieths derived from Ptolemy's fifth map of Europe (Book VIII, cap. 7), which refers to *Raetia, Vindelicia, Noricum*, etc. It would be fairer to use the reduction factor from Ptolemy's third map of Europe, referring to Gaul (Book VIII, cap. 4). This factor of forty sixtieths or two-thirds gives a distance of approximately 384 miles from Varus to Arsia and the striking coincidence on which Schnabel has built this elaborate theory simply vanishes.

Tierney passes over Schnabel's reasons for thinking that Agrippa established lines of meridian in Spain and in the eastern Mediterranean, all of which Tierney finds quite unconvincing. Tierney turns to his last main argument in which he tries to prove Agrippa to be the author of a new value of the degree at 80 *Roman miles* or 640 *stadia*, Pliny (V, 59) gives the distance of the island of Elephantine from Syene as sixteen miles and its distance from Alexandria as 585 miles. Therefore Syene to Alexandria would be 569 miles. Hipparchus however, reckoned the distance from Syene to Alexandria as seven and one-seventh degrees of latitude. Now if we divide 569 *Roman miles* by seven and one-seventh we get 80 *Roman miles*. Therefore, argues Schnabel, Agrippa made a new reckoning of the degree at 80 *Roman miles* or 640 *stadia*.

I don't think I need to insist on the large *non sequitur* involved in this reasoning. If we accepted it we might as well accept that everyone in antiquity who either sailed or traveled in a north-south direction in the eastern Mediterranean was also engaged in establishing a new degree value. If it were true why didn't Marinus accept the new value? This degree value would have been a good deal more accurate than either of the two values accepted in antiquity, i.e., those of 700 and 500 *stadia*.

Schnabel's attempt to present us with a scientific Agrippa and indeed to reconstruct a scientific Roman geography may be regarded a complete failure, and the older view of Detlefsen and Klotz must be regarded as correct. On the general question of Roman proficiency in geographical studies some light is thrown by a passage of Strabo (Book III, C 166) who says: "The Roman writers imitate the Greeks but they do not go very far. What they have to say they translate from the Greeks but of themselves they provide very little impulse to learning, so that where the Greeks have left gaps the Romans provide little to fill the deficiency, especially since most of the well-known writers are Greek." On a comparison of this passage with Strabo's usual sycophantic admiration of things Roman we can rate it as very severe criticism.

From another well-known passage in Strabo (V, 3, 8, C, 235-236) that contains a *panegyric* [a public speech or published text in praise of someone or something] on the fine buildings of Augustan Rome, we know that he was well acquainted with the dedications of Marcus Agrippa that he specifically mentions. The phrase which he uses of Agrippa's aqueducts is exactly echoed in Pliny's phrase *tanta diligentia*. He was, therefore, well acquainted also with the map of Agrippa to which, or to whose content he refers no less than seven times in his Books II, V and VI. The most important of these passages is the first (II, 5, 17, C 120) where he refers to the important role played by the sea and secondarily, and by rivers and mountains in the shaping of the earth. "The sea is the cause of gulfs, oceans, sounds, isthmuses, peninsulas and promontories. Such features as these brought into existence the continents, the tribes, the fine natural sites of cities and the other decorative features of which our chorographic map is chock full." The

map of Agrippa displayed, therefore, all the natural features just mentioned and, in addition, the names of tribes and of famous cities.

Strabo shows the contemporary Roman view of the purely practical purposes of geography and of cartography by everywhere insisting on restricting to a minimum the astronomical and mathematical element in geographical study. For him geography must be "generally useful, . . . alike for the statesman and for the general public." And again, his idea of what is sufficient to define a country runs as follows: "A country is well defined when you can bound it by the rivers or the mountains or the sea, and also by a tribe or tribes, and by so great a size, and by shape where this is possible. But in every case instead of a geometrical definition a simple and rough definition is enough. For the size it is enough if you give the greatest length and breadth . . . and for the shape if you liken it to one of the geometrical figures (Sicily, for example, to a triangle), or to one of the other well-known shapes (for instance, Iberia to an ox-hide, or the Peloponnese to the leaf of a plane-tree)" (II, 1, 30, C 83). The two main passages from Strabo's second book may reasonably be regarded as a transcript of contemporary geographical practice and since between them they give an exact description of the methods followed in the ancient remains of the map of Agrippa, Tierney thinks that they may rightly be regarded as a strong proof that the views held on this map by Detlefsen and Klotz are generally correct.

This would mean then that Agrippa's map was based on the general scheme of the Greek maps which had been current for upwards of 200 years, since the time of Eratosthenes and Hipparchus, and that it presumably attempted to complete and rectify this scheme by using recent Roman route-books and the reports of soldiers, merchants and travelers. Before entering into the details of Agrippa's map it will be useful to examine briefly these two traditions, the Greek and the Roman, in order to grasp more clearly the problem which confronted Agrippa or whoever else might wish to construct a world map in the age of Augustus.

World maps had been familiar to the Greeks since the fifth century B.C. We are told that it was Democritus who first abandoned the older circular map and made a rectangular one whose east-west axis, the longitude, was half as long again as the north-south axis, the latitude. This continued to be the unvarying tradition of the Greek geographers. Presumably the material used was normally papyrus, although more durable materials were also possible, for example the famous bronze plaque of Aristagoras of which Herodotus (V 49) tells us, on which was engraved "the whole circuit of the earth, and every sea and all rivers."

By 400 B.C. the Pythagorean doctrine of the spherical nature of the earth was accepted by educated people, and also that of the five zones, whether it came from the same source or from Parmenides. In the fourth century the study of spherical geometry was pushed forward rapidly by Eudoxus in the Academy, and again by Callippus. Yet we may be sure that maps still continued to be made as rectangles on a plane surface, although the relation of the spherical to the plane surface must have begun to appear as a problem. Earth globes and celestial globes seem to have been rarely constructed. The *gnomon* [from Greek γνώμων, *gnōmōn*, literally "one that knows or examines", is the part of a sundial that casts the shadow] was already known and provided much food for thought on the problem of latitude.

Towards the end of the fourth century two important events greatly enlarged the scope of geography. The campaigns of Alexander and the new Greek settlements pushed the Greek horizon far to the east while in the west the intrepid Pytheas of

Massalia circumnavigated Britain and sailed along the European coast from Gibraltar at least as far as the Elbe, publishing his investigations in a work which included gnomonic observations at certain points, and remarks on the fauna and flora of these distant areas. This new knowledge was then exploited geographically by Eratosthenes of Cyrene (#112) in the latter half of the third century. His calculation of the length of the earth's circumference and of the degree length of 700 *stadia* was a notable event in the advance of geography. He also established a fundamental parallel of latitude, following the example of Dicæarchus. This parallel ran from Cape St. Vincent to Mount Taurus and further east. At right angles to this he established a meridian running from Meroe northwards to the mouth of the Dnieper, and passing through Alexandria, Rhodes and Byzantium. The establishment of these two lines provided the theoretical basis for a grid of lines of parallels and meridians respectively, points being fixed by longitude and latitude as by the coordinates in a graph.

The map of Eratosthenes was, therefore, much superior to anything that had preceded it. He reckoned the length of the *oikumene* as 78,000 *stadia* and its breadth as 38,000. His delineation of the Near East, of Egypt, the Black Sea and the Mediterranean was reasonably correct, and this was also true of his sketch of the Atlantic coast of Europe and the Brettanic islands in which area he followed Pytheas. I need not say that the map had very grave defects. The north, the far east, and Africa south of the Arabian gulf, were practically unknown, and even in the Mediterranean and the land-areas surrounding it, major defects were due to the great uncertainties of measurement, whether by land or by sea. The faults, however, are not those of Eratosthenes himself. Gnomonic readings were often inaccurate, measurement of time was still very vague, and a degree length one-sixth too large did not help.

About a century later the famous astronomer Hipparchus subjected the geography of Eratosthenes to rather stringent criticisms. He made devastating attacks on the eastern sections of the map, as being seriously incorrect, both on mathematical and on astronomical grounds. Hipparchus further indicated the theoretic requirements for establishing the exact location of points on the earth's surface. For latitude he described the celestial phenomena for each individual degree of the ninety degrees running north from the Equator to the North Pole, giving for each the length of the longest day and the stars visible. For longitude he indicated the value of observing lunar and solar eclipses. However, Hipparchus advanced the science of geography rather in theory than in practice. He used the circle of 360 degrees, giving up the *hexecontads* [a 60-sided polygon] of Eratosthenes. Yet he did not try to get a more exact value for the degree, although this was the point where theory could most easily have affected practice.

The next geographer whose views are well known to us is Strabo (#115), who was writing at the time of the construction of Agrippa's map or some years later. Some of his views on geography have already been quoted. Despite his criticism of earlier geographers such as Pytheas, Eratosthenes and Hipparchus, it has long been recognized that he does not advance their work except in providing some details in regard to the map of Europe, while his general map of Europe has more faults than that of Eratosthenes. He tells us that the lack of gnomonic readings in the east, of which Hipparchus complained, was equally true of the west (IL 1, C 71). Strabo's aversion to the mathematical and astronomical side of geography has already been described and considered as typical of the age that he lived.

If, then, progress was no longer being made or to be expected from Greek geographers using various astronomical instruments, was anything to be expected from

the other tradition, the Roman roads and their itineraries? Sad to relate, the gradually accumulating mass of details concerning roads and areas did not add up to any great increase in geographical knowledge. Without the stiffening of astronomical observation the Roman road systems were like a number of fingers probing blindly in the dark. A passage of Ptolemy already quoted indicated that even in the second century A.D. these highly-articulated road-nets were still regarded by geographers as a set of loose lines to be manipulated at will between the fixed points, to achieve at best a more or less probable position. Only a combination of the practical measurements with astronomical observation could have affected a real progress and our evidence shows only too clearly that this happy union did not take place.

We must then approach the map of Agrippa on a purely factual basis realizing that it provides us merely a list of boundaries followed by a length and breadth, for the areas within the Empire and beyond it. Our three main authorities, Pliny, the *Divisio* and the *Demensuratio*, have suffered a great deal in the transmission of these latter figures, the longitude and latitude, so-called. The variation in the figures is aggravated by the fact that our later authorities do not entirely understand the Roman method of expressing large numbers as used by Agrippa and Pliny. When one considers the variants within the MSS groups it follows that one may have a dozen or more variants for a single number. Much toil has been expended by scholars such as Partsch, Detlefsen and Klotz in attempting to divine which, if any, of these figures belong to Agrippa. Some light has been thrown on the subject by comparison with later Roman itineraries for the particular areas. But since we normally do not know by what route Agrippa's measurements were taken, this light may prove to be a will-o-the-wisp. Moreover, although the Roman roads may often have rationalized the native roads by new road-construction or by bridging, yet in general they continued to be town-to-town roads, and if the itineraries ever correctly represented the longitude and latitude of a province it would be by pure chance. The measurements of Agrippa should, therefore, be reduced but it is not easy to say by what factor. In somewhat similar circumstances Ptolemy reduced the figures of Marinus in Asia and Africa by about one-half.

A more subtle source of misinterpretation is the following. Klotz has argued that Agrippa did not use the word *longitudo* in the technical sense of the east-west measurement, nor the word *latitudo* in the technical sense of the north-south measurement, but rather in the more general sense of length and breadth. This is, however, a serious error on the part of Klotz and to accept it would be a very retrograde step in our appreciation of the map. The corresponding Greek words had, of course, originally meant length and breadth with no particular sense of direction. They became technical terms for longitude and latitude with a strict directional sense in the fifth century B.C. and so they continued to be used in all Greek geographical writers down to Ptolemy and for centuries after him. Aristotle, Strabo and Pliny all insist on the technical directional sense, as there was the possibility of ignorant people misunderstanding them. But, you may object, this technical sense is only suitable for describing rectangles and not all countries fall into that convenient form. This is true indeed, and here we have to consider a few ancient misconceptions about the shapes and positions of particular countries.

Italy, for instance, was thought to lie E.S.E. rather than S.E. Therefore the word longitude could reasonably be used of its full length, and the measurements at right angles to this, that is, the latitudes, varied so much that Agrippa thought it necessary to give at least two, one in northern Italy and the second from Rome to the river Aternus.

In Spain again the Pyrenees were always regarded as running north and south, parallel to the Rhine, while the east coast as far as the straits and Cadiz was regarded as running more or less in a straight line to the west. The north coast, however, was usually thought to run from Lisbon (Cabo da Roca) to the Pyrenees, the northwest capes, Nerium and Ortegá, being ignored. The result of this misconception was that the figures for longitude and latitude were simply interchanged. The same thing occurred in the British islands that were regarded as running from northeast to southwest. Here again *longitudo* is the long axis and *latitudo* the short axis, not because of a misuse of these technical terms, but simply because their general position was misconceived.

Fundamentally, therefore, Agrippa's figures allow us to construct a series of boxes or rectangle with which to deck out the shores of the Mediterranean and the eastern world and whose dimensions should be reduced by an uncertain amount. To evaluate the map we must take a glance at each of these boxes in turn, and the most convenient order would appear to be that of the Greek geographers and of Agrippa himself, if we can trust the order of the *Divisio* that has *Europa*, *Asia*, *Lybia*, that is, Europe, Asia, and Africa.

Spain consists of three boxes, the square of Lusitania and the rectangle of the *Hispania citerior* [Roman province] east of it being placed over the rectangle of *Bætica*. The internal line of division ran south from the estuary at *Næca* between the *Astures* and the *Cantabri*, down to *Oretania* and on to New Carthage. Since the Pyrenees are supposed to run north and south the longitude of *Hispania citerior* is really the latitude, as was noted before.

In *Gaul* [France] a large rectangle lies over a small one, that is *Gallia Comata* over the province of *Narbonensis*. Off the coast of *Gallia Comata* lies an enormous Britain, 800 by 300 miles, and north of it an equally exaggerated *Hibernia* [Ireland]. Over the Rhine lies a small Germany, only half the size of *Gaul*, and southeast of it an *Illyricum* and *Pannonia* of about the same size as Germany. Italy lies more E.S.E. than S.E., that is, nearer the Dalmatian coast, and is over 1,000 miles long and 420 miles across from the head of the Adriatic to Nice. *Dacia*, Northern Greece, and Southern Greece are three rectangles of diminishing longitude. 1,200, 720 and 410 miles, respectively, running from the unknown north down to the Aegean, but all having approximately the same latitude of just under 400 miles. Further east again *Sarmatia* [Russia], including the Black Sea to the south, measures 980 by 715 miles, Asia Minor 1,155 by 325, Armenia and the Caspian 480 by 280. Of these provinces *Dacia* [a branch of the Thracians north of the *Haemus* range; bounded in the south approximately by the Danube River, or at its greatest extent, by the *Haemus Mons* [the Balkan Mountains]; in the east it was bounded by the *Pontus Euxinus* [Black Sea] and the river Dniester] and *Sarmatia* have the saving phrase *qua cognoscitur, qua cognitum est* [which is known as ascertained] for their northern boundaries, while Armenia is bounded only by the *Scythian Ocean* [Black Sea?] to the north and the Chinese ocean to the east.

The islands of the Mediterranean are not forgotten, at least the major ones, just as Italy lies too far to the southeast, so do Corsica and Sardinia lie too far to the southwest. Corsica, in fact forms the eastern boundary of Sardinia and this explains why the long axis of both islands is described as the longitude. Cross measurements of the Mediterranean are given at three points, from the Italian coast by way of Corsica and Sardinia to Africa, from southern Greece through Sicily to the same place, and from Cape Malea in Greece to Crete and Cyrenaica. The north African coast has four sections,

Mauretania, Numidia, Cyrenaica and Lower Egypt. All of these equally peter off into the unknown south.

The eastern Mediterranean is faced by Syria whose longitude Pliny (V, 671) states as 470 miles between Cilicia and Arabia, and whose latitude is 175 miles from Seleucia Pieria on the coast to Zeugma on the Euphrates. Tierney believes that it is possible to remove the difficulties felt about Agrippa's Syria by both Detlefsen and Klotz. Pliny (VI, 207) gives Agrippa's figure for the longitude of the Mediterranean from *Gades* [Cadiz, Spain] to the gulf of Issus as 3,440 miles, and comments: "I rather think there is an error in the number." Pliny knew that Agrippa's figure from *Gades* to Alexandria was only 2,600 miles and the difference of 840 miles seemed to put the gulf of Issus too far east. Detlefsen accepts that Agrippa's figure is an error without being able to explain why, while for Klotz Syria is an obvious proof that Agrippa assigned no definite direction to his longitude. But the truth of the situation is fairly obvious. Agrippa regarded the Syrian coast running northeast from the boundary of Egypt, as running much more in an easterly direction than it actually does. Therefore the longitude was to him the east-west direction, and the latitude from Seleucia Pieria to Zeugma was the north-south direction. Any doubt on this matter is removed when we look at Pliny (VI, 126), where he gives the latitude from the same point, Seleucia Pieria, to the mouth of the Tigris. The distance is 175 miles from Seleucia to Zeugma, 724 miles from Zeugma to Seleucia and Tigris and 320 miles to the mouth of the Tigris, that is, 1,219 in all. This distance, he adds, is the latitude of the earth between the two seas, that is, the Mediterranean and the Persian Gulf.

We have now either reached or gone beyond the boundaries of the Roman Empire in the north, south and east, as it was in Agrippa's day. Only a few more boxes or rectangles are left to the east of the line, formed by Armenia, Syria and Egypt, but now they begin to grow portentously large. Mesopotamia measures a fairly modest 800 by 320 miles, but further east Media measures 1,320 by 840, Arabia to the south is 2,170 by 1,296 and, finally, India represents the Far East with 3,300 by 1,300. India alone, therefore, has a longitude as great as the whole Mediterranean, while its latitude is comparable to that of Europe and Africa combined.

What, now, should we think of the aim of Agrippa in preparing this map? I would follow Detlefsen and Klotz in denying him any scientific aims. He must have taken over the map of Eratosthenes as revised by people such as Polybius, Posidonius and Artemidorus, and made it the basis of his own. His chief pride would seem to have been in his measurements, and indeed it is only for the exactness of these that Pliny praises him when he refers to *Bætica* in Book III, 17. Detlefsen held that the map was not drawn to scale and that the measurements were merely inscribed upon it. This is probably correct, but an attempt may have been made to draw roughly to scale. Partial distances were given from station to station along the Italian coast, but Detlefsen thinks that the summation of the coastal measurements appeared elsewhere on the map. It is probable that Italy and the neighboring islands were given in greater detail than other areas.

Detlefsen pointed out the immense disproportion between Agrippa's sections. Spain has three sections and *Gaul* two, while in the east of Europe *Dacia* and *Sarmatia* run off to the unknown northern ocean, and further east again the sections are quite enormous. Agrippa could have had no forerunner in this, says Detlefsen. No Greek would have created such unnatural shapes. Detlefsen sought to find a reason for this in Agrippa's patriotic Roman pride. His map represents, says Detlefsen, a moment of

historical development, a point in the process of crystallization of the lands of the Mediterranean into the Roman Empire. Where this process is complete we have ready-made provinces, where it is still in progress we find the raw materials of provinces-to-be, which are still parts of large and scarcely known areas, and finally, where Roman armies have never set foot we find enormous, amorphous masses lumped together as geographical units. Of the first class, the ordered provinces, we have eight in Europe, three in Africa, and three in Asia. Of the second class, where the Romans had recent military campaign we have three in Europe, that is, Germany, Dacia and Sarmatia, one in Africa, Mauretania, and one in Asia, Armenia. Lastly, completely outside the Empire stand India, Media, Mesopotamia and Arabia.

The most important achievement of the map, to Agrippa's mind, consisted in its measurements, and it is possible that he spent very considerable pains in getting these exactly, although we cannot take the account given by Honorius (ca. 384-423 A.D.) of the activities of Augustus in this respect as being factually correct. Pliny understood these measurements as being the prime value of the map and that is why he copies them so exhaustively. They are also the chief element remaining to us in the *Divisio* and the *Demensuratio*. Unfortunately, in nearly all cases we know neither the beginning nor the end of the routes measured, nor do we know, with any exactness, the direction of the route. The measurements must have been done on real roads but they are valueless to us. It is notable, as Detlefsen points out, that Strabo must have recognized this lack of scientific value. He gives us from Agrippa, a few lines along the coasts of Italy and Sicily but not a single one of his reckonings for the provinces.

The exact correspondence between Pliny, the *Divisio* and the *Demensuratio*, in giving many of the boundaries of the sections, shows, according to Detlefsen, that these boundaries also were inscribed upon the map. Natural features such as the mountains and rivers that divided provinces were shown also, but in what exact way is not clear. Sometimes simple dividing lines were used, such as that used in central Spain, or wherever natural features of division were not present.

Klotz, in his final review of Agrippa's methods of work, has made some illuminating points that supplement Detlefsen. He points out that just as Eratosthenes had divided the inhabited earth into his famous "seals", so also Agrippa divided the earth into groups of countries without reference to their political or geographical conditions. Thus Agrippa's India corresponds generally to the first "seal" of Eratosthenes, and Agrippa's Arabia, Ethiopia and Upper Egypt corresponds to the fourth "seal". Again the horizontal spine of Mount Taurus plays an important role in both as a line of division between the northern and southern areas, Agrippa, however, follows the Eratosthenic method of division only in a general way and not in detail. Eratosthenes determined the sides of his "seals," that were irregular quadrilaterals, by the points of the compass. Agrippa defines the boundaries of his groups of countries in the same way, by the points of the compass, but as regards size he supplies only the length and breadth, thus agreeing with Strabo, already quoted.

Within the Empire he chiefly used the itineraries without the overt use of an astronomical backing, although astronomical data, of course, already formed the basis of the Greek maps that were the real foundation of his. Any attempt to draw the map of Agrippa from the figures that have survived without some astronomical backing is entirely hopeless. Even with an astronomical basis they only provide us with a set of rectangles mostly scattered at haphazard about the Mediterranean.

Agrippa sometimes used sailing measurements but preferred land measurements. Wherever itineraries did not exist he made use of the estimated distances of the Greek geographers, and outside the Empire he had to rely on them altogether. At the boundaries to the north, east and south he had to content himself with *qua cognitum est*. One wonders was this phrase inscribed on the map. It is clear that he gave the itinerary stages in Italy and Sicily in addition to the coastal sailing measurements. It is a question whether these itinerary measurements were given, in detail on the map for all the western provinces, not to mention the eastern ones. It appears from passages in Pliny that Varro had already used the Roman itineraries in his geographical books and Agrippa was only following his example. Since so little of the materials of the ancient geographers has been preserved it is mostly a matter of chance whether we know or do not know whether Agrippa agreed or not with the measurements of a particular earlier geographer. Klotz has shown that he used Eratosthenes very often, but that on occasion he disagreed with him, and that Artemidorus apparently he did not use at all.

LOCATION: (*this map only exists as reconstruction*)

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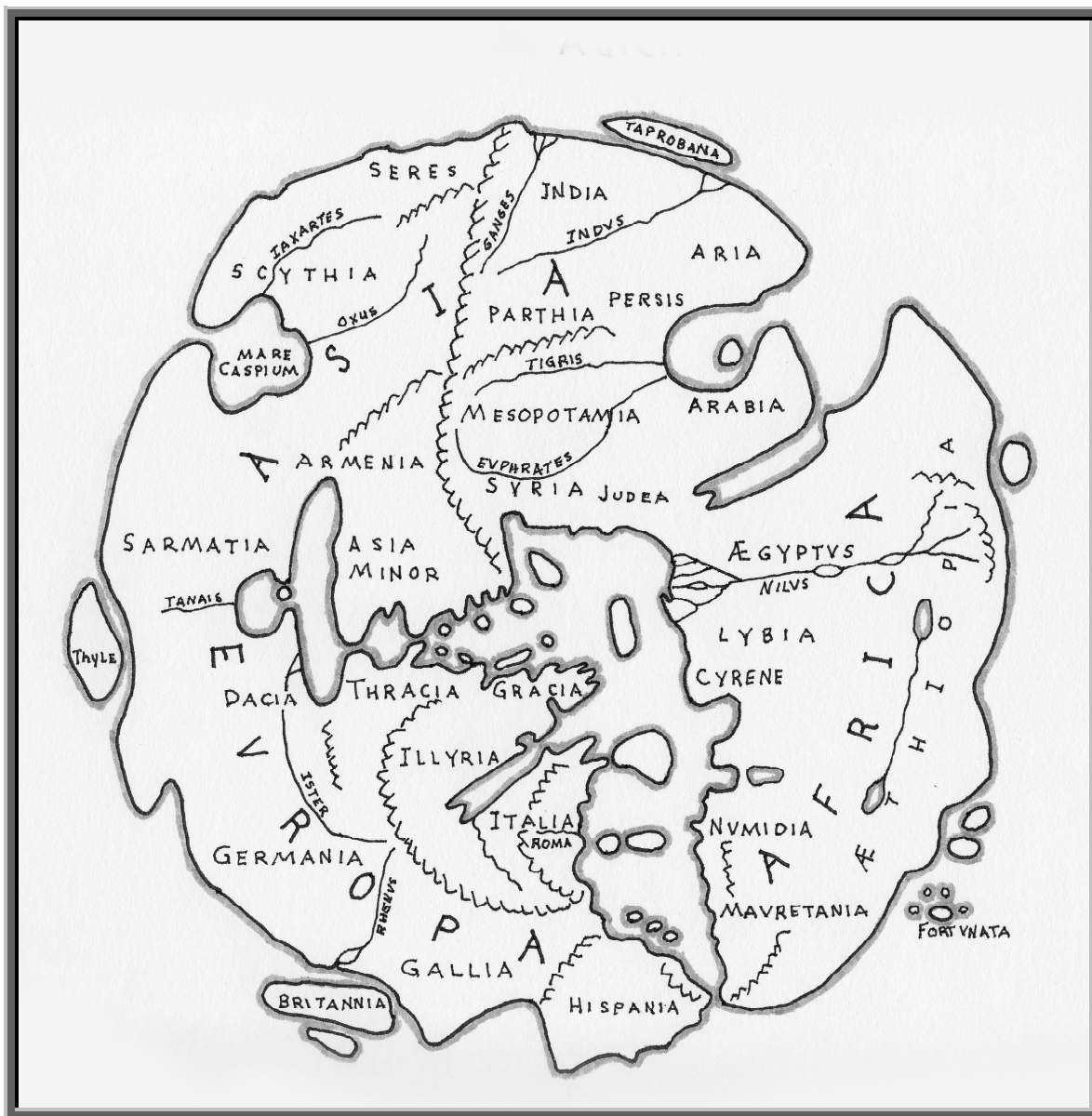
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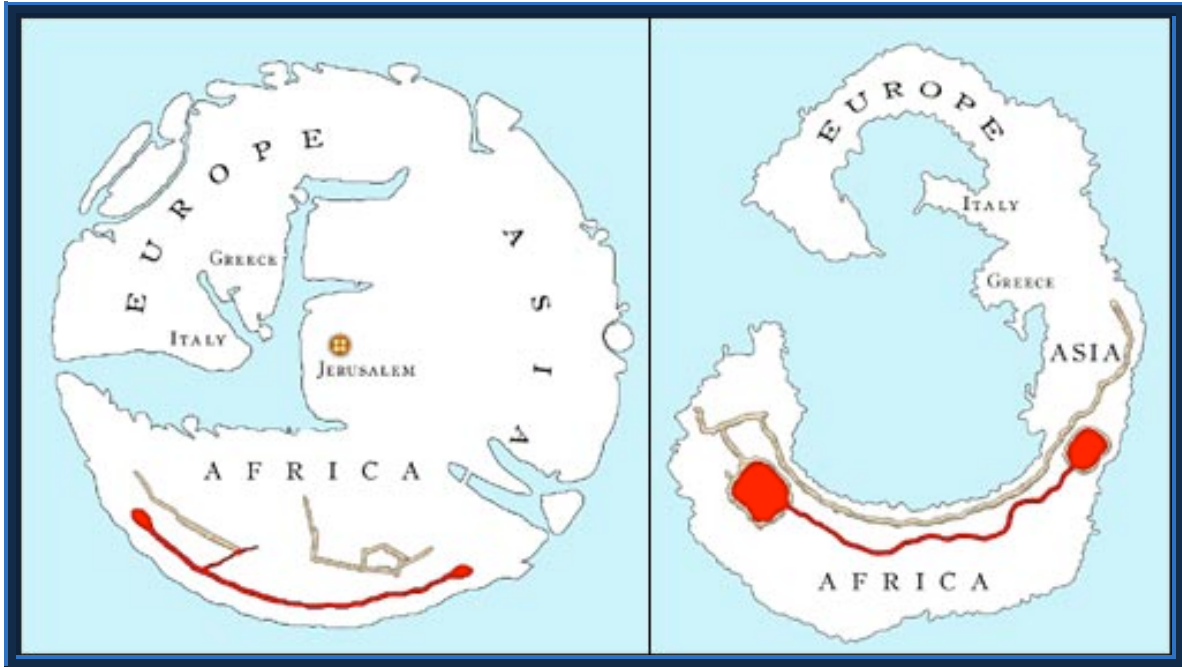
*illustrated



A "reconstruction" of Agrippa's Map.

Note that most scholars, however, believe that due to its placement on the column in a portico or stoa open to the public, the Porticus Vipsani, it was probably rectangular, not circular.





According to a theory put forth by Doug Fisher (*AtlantisMaps.com*) concerning the depiction of Antarctic on Schöner's 1515 globe (see Book IV, #328): In the image above, a stripped down rendering of the *Hereford mappamundi* (Book IIB, #226) – one of the many medieval maps believed to have been based on the Roman world map known as Agrippa's *Orbis Terrarum* – sits alongside a stripped down rendering of Schöner's southern landform. Highlighted in red on both maps is a highly unique prominent water feature. This water feature is significant not only in the fact that it is completely landlocked, unlike most waterways that empty into a surrounding sea, but also notably both waterways are 1) truncated at each end by circular lakes 2) are similarly arced away from the center of their C-shaped surrounding, and 3) span the portion of their C-shape lying opposite the Greek and Italian peninsulas, the portion of the map that coincides with Africa. It is quite certain that the waterway made its way onto the *mappaemundi* via Agrippa's *Orbis Terrarum* as this landlocked waterway represents the Roman belief that the Nile River originated in the mountains of Mauritania and ran laterally across the continent dividing the African continent in two with Libya to the north and Ethiopia to the south. Interestingly enough, the feature currently is unique to medieval *mappaemundi*...and Schöner's southern landform.



According to Fisher seeing that this is a Roman world map sharing many similarities with the *mappaemundi*, it is logical to assume that Schöner's southern landmass is a copy of Agrippa's *Orbis Terrarum*, the Roman world map upon which the *mappaemundi* were based. Proceeding in our evaluation with this in mind we can gain insights into how the *mappaemundi* arrived at their final design.

Within the context of the early 16th century, it seems apparent that Schöner found himself caught up in the perfect cartographic storm. Just two years prior we have a

recorded account of a cartographer referencing ancient maps and scaling their geographic features into new maps and globes to depict recent finds, e.g., Piri Reis 1513 world map (*Book IV*, #322). First century Roman maps like Agrippa's *Orbis Terrarum*, which had existed throughout Europe, disappeared during the medieval period, but at least one copy was discovered in Germany just a few years prior to the arrival of Schöner's 1515 globe, the *Peutinger Table* (#120), and therefore it is not unreasonable to believe that Schöner might have had access to an unfinished copy of Agrippa's map. And finally, based on Schöner's design Agrippa's map was built around a concentric grid that resembled a polar projection which he as a globe maker would have readily recognized.

All these parts were in place when an errant 1508 report of a strait at the tip of South America with a large southern continent lying beneath inspired Schöner to unwittingly preserve the only copy of Agrippa's *Orbis Terrarum* on the bottom of his 1515 world globe.

When medieval Christians began creating the *mappaemundi* they borrowed heavily from Agrippa's map as well as Greek designs. Fisher believes that the central zones on Agrippa's map had to be eliminated when the Christians decided to adopt and adapt from Greek maps the concept of cartographic centrality by distorting the map to position the holy city of Jerusalem at the map's center. When Agrippa's *Orbis Terrarum* was originally created and put up for display on the wall of a portico, extensive commentary was likely consolidated within the center circular zone (2), but extending Jerusalem and Asia Minor into the map's center displaced much of the central text and necessitated the text's redistribution about the *mappamundi's* new design, relocating comments within the region to which each pertained, which is why we find the *mappae mundi* littered with commentary.

This design adjustment may also explain the *Expositio mappemundi* (EMM), manuscripts which are a collection of the data items appearing on the *mappaemundi*. Some believe that these manuscripts were instruction sets used to construct a *mappa mundi* based on the fact that the text is spatially specific. But it may actually be that the EMM were based on the original text found on Agrippa's map with the locative terms such as "above," "opposite," and "to the south of" being necessary for a consolidated text set apart from the map, while the *mappaemundi's* placement of these data items directly onto the map logically allowed the removal of the spatial references.

It was reverse engineered from the *mappaemundi*, but plays it relatively safe in its assumptions. It orients the map with east towards the top like the *mappaemundi*. The *mappaemundi* maintained this orientation because medieval Christians held *Eden*, which they believed resided in the east, in high esteem. Ancient Roman maps like the *Peutinger Table*, however, oriented the map with north to the top similar to the reconstruction based on Schöner's design.

Another curious adjustment concerns the lateral African waterway. The reconstruction acknowledges that the waterway originated on Agrippa's map as it is common to most *mappaemundi*, but it assumes that the Roman original was far less imposing, whereas Schöner's design suggests that the *mappaemundi* are far more accurate in their depiction of the waterway spanning most of the continent. The reconstruction also omits completely the lateral mountain range above the waterway, which seems like a rather large oversight as both the *Peutinger Table* and Ptolemy's map, two ancient Roman maps, incorporated a trans-African range as does Schöner's design.

The new found design also provides for the first time insights into the inspiration for key design aspects on the *mappaemundi* such as the tribute to Jesus at the top of the map, the transition from a separate commentary requiring locative terminology to commentary overlain onto the *mappaemundi* no longer requiring spatial references, and the distribution of images from a consolidated arced matrix lying above Africa on Schöner's design to areas throughout the *mappaemundi*. All three adjustments were based on their Roman counterparts, but reflect necessary adjustments as the makers of the *mappaemundi* opted for a Christocentric design.

In conclusion, Fisher believes that he has presented a solid logical case for the historic discovery of a long lost 2,000-year-old Roman world map at the bottom of the world, Schöner's world that is. His evaluation, however, is based on the fact that copies of Agrippa's *Orbis Terrarum* did indeed exist and were at one time distributed throughout Europe becoming the model for the medieval *mappaemundi*. It also maintains a more realistic belief that ancient maps did not maintain the accuracy of modern maps, but retained a basic design and set of elements common to nearly all ancient maps. But should some doubts still linger, he offers one last review two earlier images comparing the landmass to other C-shaped maps, the Greek Hecataeus (#108) and medieval Hereford world maps, and ask that you consider the mathematical probability that Schöner would incorporate the precise elements of these maps in their precise order and placement without an ancient world map as his template. He believes such a notion is impossible and with the presentation of a sound argument for the circumstances contributing to Schöner's error, there remains little reason to doubt that because of his grand error we are able to gaze upon Agrippa's *Orbis Terrarum* for the first time in many centuries.