

15 · Cartography in the Byzantine Empire

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WITH ADDITIONAL MATERIAL SUPPLIED BY THE EDITORS

Of all the civilizations of the classical world, the Byzantine is probably the least known from the cartographic point of view. The Byzantine state was the richest, the most powerful, and the most civilized in Europe and the Middle East at that time.¹ Although the territorial boundaries of its empire fluctuated,² there was a continuity in political organization, in cultural influences, and in religion for over a thousand years from A.D. 330, when Constantinople was founded, to the fall of Trebizond in 1461, eight years after the collapse of the capital.

It is paradoxical, however, that a literate society, heir to Greek and Roman learning, should have left so few traces of an interest in mapping. At least some of the necessary conditions for the development of such an interest were present. In late Roman times the eastern empire, from its base in Constantinople, had access to the practical skills of the Roman land surveyors, including mapmaking. The cartographic needs of Byzantine emperors in connection with administration, military conquest and subjugation, propaganda, land management, and public works were apparently similar to those of Rome itself. Moreover, the revival of classical culture, consequent on the restoration of literary Greek, gave the educated classes a reading knowledge of classical Greek and Latin. Finally, it is known that astronomical and geographical texts, both containing maps, were in circulation even before the so-called Renaissance of the tenth century A.D. Certainly these were available during the later Byzantine Empire when Maximus Planudes (ca. 1260–1310) was able to initiate a successful search for the manuscripts of Ptolemy's *Geography*.³

At the same time, there were other factors that weakened this continuity of classical learning. These included the decline of the Byzantine Empire in the seventh and eighth centuries; the religious movement known as iconoclasm, which may have resulted in the destruction of some images relevant to cartography; the capture of Constantinople by the Crusaders in 1204; and the removal of other manuscripts to western Europe by refugee scholars. Thus the transmission of original Greek and Latin manuscripts through the centuries was far from being a simple process. Literary and artistic cur-

rents that mingled in maritime and commercial centers such as Alexandria, Antioch, Ephesus, and Thessalonica—and above all in Constantinople itself—were complex. They were not only the contacts with the heartland of the old classical world but also links with the Islamic and other societies to the east.⁴ Byzantine cities became entrepôts through which astronomical and geographical learning (including a knowledge of maps) was handed on in many directions.

Notwithstanding their complexity, some of these conditions should have been favorable to the survival of classical cartographic knowledge. It is disappointing, therefore, that so few maps have come down to us from the whole of the Byzantine millennium. Moreover, it is quite clear that these few are representative neither of the theoretical cartography developed by the Greeks nor of the applied mapping practiced by the Romans. In addition, there are fewer literary allusions to maps from the Byzantine period than from the Roman period, so that once again our expectations cannot be matched by actual evidence.⁵

ROMAN INFLUENCES: THE THEodosian MAP AND THE RAVENNA COSMOGRAPHY

Despite the gaps in our knowledge, there are no grounds for believing in a hiatus, in the fifth and sixth centuries, between mapping in the late Roman Empire and map-

1. Robert Browning, *The Byzantine Empire* (New York: Charles Scribner's Sons, 1980), 7. Not until the western empire was overthrown in A.D. 476 can one consider Byzantium to have been acting entirely on its own.

2. At its greatest extent Byzantium not only retained the eastern provinces of the Roman Empire but also, as under Justinian (emperor 527–565), took over Italy, North Africa, and parts of Spain.

3. For the Greek and Latin manuscripts containing celestial maps of the ninth and tenth centuries, see volume 3 of the *History* and Paul Lemerle, *Le premier humanisme byzantin* (Paris: Presses Universitaires de France, 1971).

4. For Arab links with Byzantium see volume 2 of the present *History*.

5. In view of the large extant literature from the Byzantine period, including much of a philosophical and technological nature, we may hope that a detailed search for cartographic material (which has not hitherto been undertaken) would yield further references to the existence or use of maps.

ping as it would develop in the eastern empire. On the contrary, there was a conscious preservation of all things Roman. The Byzantines called themselves not Byzantines but *Romaioi* (Romans),⁶ and they liked to see themselves as heirs of the Roman Empire. In cartography there were deliberate imitations of some of the maps of the earlier era, especially where these were perceived as fulfilling imperial purposes, such as the glorification of the greatness of Byzantium at a date when it was still possible to believe in the reconstitution of the Roman Empire as a whole.⁷

The map of the Byzantine Empire that was issued on the orders of Theodosius II (emperor of the East from A.D. 408 to 450) can be interpreted in this light. The map itself has not survived, but we know about it from the poem that was attached.⁸ Although Greek was the common language of the eastern empire, this poem is in Latin hexameters, Latin being at the time the official language of both parts of the empire. In the original text, the date mentioned is the fifteenth *fascies* of Theodosius. This does not mean, as the Irish geographer Dicuil (fl. A.D. 814–25) thought, the fifteenth year of Theodosius's reign⁹ but refers to his fifteenth consulship, A.D. 435. The poem may thus be rendered:

This famous work—including all the world,
Seas, mountains, rivers, harbors, straits and towns,
Uncharted areas—so that all might know,
Our famous, noble, pious Theodosius
Most venerably ordered when the year
Was opened by his fifteenth consulship.
We servants of the emperor (as one wrote,
The other painted), following the work
Of ancient mappers, in not many months
Revised and bettered theirs, within short space
Embracing all the world. Your wisdom, sire,
It was that taught us to achieve this task.¹⁰

Dicuil took these lines to indicate that two members of the imperial staff were instructed to travel around the empire. A more appropriate interpretation would be that the instructions were to edit and update a map and, perhaps, a commentary. The latter would have been almost certainly derived from Agrippa, always recognized during Byzantine times as the official source, rather than the works of Marinus or of Ptolemy. The use of Latin would point to it, as do the measurements in Roman miles. The map itself was still extant when Dicuil was writing in the early ninth century. Dicuil also noted that the map's authors calculated the length of Syria, from the borders of Asia Minor to Arabia and Lower Egypt, as 470 Roman miles.¹¹

It is possible that Theodosius's map was exceptional and that other manuscripts that are linked with his name were not necessarily accompanied by maps even when they dealt with subjects where maps would have been appropriate. This was certainly the case with the anon-

ymous treatise *Urbs Constantinopolitana nova Roma*, dedicated to Theodosius II.¹² Nor is the more detailed description of Constantinople by one Marcellinus—which lists the fourteen districts of the city and its most important buildings—linked to any large-scale plan comparable to the *Forma Urbis Romae*.¹³ Moreover, even in matters where the emperor dealt with the legal organization and codification of lands within the empire, cadastral surveys and mapping do not seem to have been undertaken, and certainly not in the manner recommended in the *Corpus Agrimensorum*. There is a written survey of property law, said to have been instituted by Theodosius II and to have dealt not only with a resurvey of the Nile valley but also with conditions in other provinces of the Roman Empire,¹⁴ but again the surviving part of the text makes no mention of maps.

To extrapolate from such scraps of evidence, it is possible to suggest that while the Byzantine emperors retained maps for propaganda and (as will be seen) religious purposes, the many practical uses for mapping so characteristic of the western empire steadily declined. Such an interpretation is borne out by the periploi, books of sailing directions, which continued to lack accom-

6. Browning, *Byzantine Empire*, 8 (note 1).

7. A representation of an orb or globe in an imperial context is associated with the colossal statue of an emperor erected in Barletta and found in the sea off the town. Symbolizing Byzantine power in the West, it is two and a half to three times life size, with an orb in the emperor's hand, but there are no markings on the orb. It has traditionally been considered to be a likeness of Heraclius (emperor 610–41); but according to an alternative theory it is of Valentinian I (emperor 364–75). See *Enciclopedia italiana di scienze, lettere ed arti*, originally 36 vols. ([Rome]: Istituto Giovanni Treccani, 1929–39), 6:197, col. 2 and photo 196.

8. Emil Baehrens, ed., *Poetae Latini minores*, 5 vols. (Leipzig: Teubner, 1879–83; reprinted New York: Garland, 1979), 5:84; Wanda Wolska-Conus, “Deux contributions à l'histoire de la géographie: I. La diagnose Ptoléméenne; II. La ‘Carte de Théodose II,’” in *Travaux et mémoires*, Centre de Recherche d'Histoire et Civilisation Byzantines, 5 (Paris: Editions E. de Baccard, 1973), 259–79.

9. Dicuil *De mensura orbis terrae* (On the measurement of the earth) 5.4; see *Liber de mensura orbis terrae*, ed. and trans. James J. Tierney, *Scriptores Latini Hiberniae*, no. 6 (Dublin: Dublin Institute for Advanced Studies, 1967); Tierney discusses Dicuil's errors of interpretation in his introduction, pp. 23–24.

10. Dicuil *De mensura* 5.4 (note 9), translation by O. A. W. Dilke.

11. Dicuil *De mensura* 2.4 (note 9).

12. In *Geographi Latini minores*, ed. Alexander Riese (Heilbronn, 1878; reprinted Hildesheim: Georg Olms, 1964), 133–39.

13. Marcellinus's cosmography was recommended by Cassiodorus *Institutiones divinarum et saecularium litterarum* 1.25.1; see *Institutiones*, ed. R. A. B. Mynors (Oxford: Clarendon Press, 1937), or, for an English translation, *An Introduction to Divine and Human Readings*, ed. and trans. Leslie Webber Jones (New York: Columbia University Press, 1946).

14. Text “Imperator Theodosius et Valentinianus,” in *Die Schriften der römischen Feldmesser*, ed. Friedrich Blume et al., 2 vols. (Berlin: Georg Reimer, 1848–52; reprinted Hildesheim: G. Olms, 1967), 1:273–74.

panying maps as earlier in the Roman period. The term “portolan” or “portulan” has been somewhat misleadingly used for these by some modern scholars, but though eight periploi are known, none that are extant have maps.¹⁵ An anonymous periplus of the Black Sea—again without maps—has also survived, and it is preceded by a summary measurement of the whole *oikoumene*.¹⁶

In the case of Byzantine land itineraries, too, there is no known graphic version, no *itinerarium pictum* comparable to the Peutinger map of the Roman period. The principal geographical listing of places to have survived is known as the Ravenna cosmography.¹⁷ While this is clearly indebted to the earlier Roman models, the work perpetuates the written rather than the graphic form of such documents for travelers or other interested readers. It takes its name from what was the center of Byzantine power in Italy from A.D. 540 to 751. It is a list, in Latin, of some five thousand geographical names arranged in approximate topographical order, gathered from maps of most of the known world, the compiler proceeding roughly from west to east. It was not an official document of the Byzantine bureaucracy but was worked up by an unknown cleric (referred to now as the Ravenna cosmographer) for a fellow cleric called Odo, perhaps soon after the year 700. He gave his sources as Castorius (frequently quoted), Christian historians such as Orosius (fl. A.D. 414–17) and Jordanes (sixth century A.D.), and various Gothic writers, but he seems to have varied his method of compilation from region to region.¹⁸

Rather unsystematically, the Ravenna cosmographer apparently set out to list all the main places (*civitates*) of each area, together with some rivers and islands. There is no sign of methodical selection, so if the text contains a reference to an unknown place near a known place, there is only a fair chance that the unknown locality was in fact close by, whereas mention of an unknown place between two known ones can fairly safely be taken as an indication of its true position. The cosmographer noted: “We could, with the help of Christ, have written up the harbors and promontories of the whole world and the mileages between individual towns,”¹⁹ a comment that suggests one of his sources might have been similar to the Peutinger map. This has thus led some modern writers to attempt to see Castorius (thought to have lived in the fourth century A.D.), as the maker of the Peutinger map.²⁰ However, it seems unlikely that the Ravenna cosmographer would have been so erratic in his ordering of place-names had his principal source contained roads as the Peutinger map does. It has also been claimed that a very corrupt form of Ptolemy’s *Geography* was used for some parts of Asia and for the islands. One may suggest, though, that what looks like a corruption of Ptolemy’s text may

have been a slightly less corrupt version of Marinus, on the assumption that Marinus’s map was in fact available at Ravenna. Such questions are difficult to resolve, especially in view of the cosmographer’s lack of method. This has often resulted either in omission of important places or in duplication of names, implying that the author was inexpert at reading map names in Greek. Sometimes he would give a contemporary regional name (e.g., Burgandia) in association with that of an ancient tribe (e.g., Allobroges).

However the sources of the Ravenna cosmography are interpreted, it is clear that a selection of Greek and Roman maps was available for consultation in Italy at this time in Byzantine history.²¹ This listing, then, provides important evidence for the continuing use of maps, albeit in a very nontechnical way, even though the earlier impetus to produce new maps—or to revise older maps as new sources of information became available—no longer appears to have been given priority among scholars in early eighth-century Ravenna.

15. Armand Delatte, ed., *Les portulans grecs* (Liège: Bibliothèque de la Faculté de Philosophie et Lettres de l’Université de Liège, 1947); G. L. Huxley, “A Porphyrogenitan Portulan,” *Greek, Roman and Byzantine Studies* 17 (1976): 295–300. See also pp. 237 and 383.

16. *De Ambitu Ponti Euxini*, in *Geographi Graeci minores*, 2 vols. and tabulae, ed. Karl Müller, (Paris: Firmin-Didot, 1855–56), 1:424–26. This defines the stade differently from the measurements that had been recognized in the western empire. On the matter of the modern value of the stade, see chap. 9 above, “The Growth of an Empirical Cartography in Hellenistic Greece,” note 3.

17. Moritz Pinder and G. Parthey, eds., *Ravennatis anonymi Cosmographia et Guidonis Geographica* (Berlin: Fridericus Nicolaus, 1860; reprinted Aalen: Otto Zeller Verlagsbuchhandlung, 1962). The chief manuscripts are Urbinas Latinus 961 (Rome, Biblioteca Apostolica Vaticana), fourteenth century; MS. Lat. 4794 (Paris, Bibliothèque Nationale), thirteenth century; and Basiliensis F. V. 6 (Basel, Basel University Library), fourteenth to fifteenth century.

18. Louis Dillemann, “La carte routière de la *Cosmographie de Ravenne*,” *Bonner Jahrbücher* 175 (1975): 165–70; Ute Schillinger-Häfele, “Beobachtungen zum Quellenproblem der *Kosmographie* von Ravenna,” *Bonner Jahrbücher* 163 (1963): 238–51.

19. Translation by O. A. W. Dilke, *Ravenna cosmography* 1.18.10–15; see Pinder and Parthey, *Ravennatis anonymi Cosmographia*, 39 (note 17).

20. Konrad Miller, *Itineraria Romana* (Stuttgart: Strecker und Schröder, 1916), xxvii–xxix; J. Schnetz, *Untersuchungen über die Quellen der Kosmographie des anonymen Geographen von Ravenna*, Sitzungsberichte der Akademie der Wissenschaften, Philosophisch-historische Abteilung 6 (Munich: Verlag der Bayerischen Akademie der Wissenschaften, 1942).

21. For example, in Britain an otherwise unrecorded map of the Severan period seems to have been used. See Louis Dillemann, “Observations on Chapter V, 31, Britannia, in the Ravenna Cosmography,” *Archaeologia* (1979): 61–73; A. L. F. Rivet and Colin Smith, *The Place-Names of Roman Britain* (Princeton: Princeton University Press, 1979), 185–215.

RELIGIOUS CARTOGRAPHY: COSMAS INDICOPLEUSTES AND THE MAP MOSAICS

Christianity clearly distinguishes the Byzantine Empire from the preceding Roman Empire. This was to become both the state religion and that of the majority of its citizens. By the sixth century, Christian modes of thought and Christian imagery permeated the political, intellectual, and artistic life of the society and indeed gave it many of its characteristic qualities. The prominence of the church throughout the Byzantine world similarly imparted a religious tone to much of the cartography of the period. It is no accident that the principal surviving maps—those of Cosmas Indicopleustes and the mosaic maps at Nicopolis and Madaba—as much as the later *mappaemundi* of western Europe, reflected the superimposition of these new ideas on a classical foundation. The Nicopolis mosaic and some of the maps of Cosmas Indicopleustes are intelligible only in a religious context. Cosmas had traveled widely around the Red Sea and in adjacent areas, but he was much more interested in theology than in geography or cartography. The Madaba map also reveals its religious function: it was laid out in a church, and it gives great importance to Jerusalem, together with biblical quotations.

COSMAS INDICOPLEUSTES

During the sixth century, traditional teaching still flourished in the Byzantine world, but signs of decline were already appearing. On the one hand there was, at the end of the fifth century, the copying of Strabo's *Geography*; remains of this copy have been preserved in a palimpsest. Later, in southern Italy, the Christian Cassiodorus (ca. A.D. 487–583) advised young monks to learn geography and cosmography through Dionysius's map and Ptolemy's *Geography*.²² In Alexandria, still functioning as the greatest intellectual center of the late Roman world, another Christian, Johannes Philoponus (ca. A.D. 490–570), commented on Aristotle's works and taught, like him, that the earth was spherical and lay in the center of the celestial sphere.

There were some, however, who considered Aristotelian and Hellenistic teaching about the universe to be in contradiction with the Scriptures. A polemic developed in which Cosmas (called Indicopleustes meaning, literally, "Indian sea traveler"; fl. A.D. 540), took an active part. Cosmas, a merchant in Alexandria, was a self-taught man; he had traveled much, though he probably did not go as far as India, as his nickname suggests. In Persia he had attended the lectures of Patrikios, a Christian teacher, and had been converted to Nestorian Christianity. Coming back to Alexandria, wishing to propagate what he considered the true Christian teaching, he composed a *Geography*, an *Astronomy* (both

now lost), and a *Christian Topography* in twelve books, of which three manuscripts have been preserved.²³

Cosmas thought that the earth was flat and that the cosmos was shaped like a huge rectangular vaulted box. He sharply attacked "people from outside" (that is to say, infidels) who believed the world to be spherical and mocked their representations of the sky and earth. The *Christian Topography* is illustrated throughout with diagrams and paintings that are part of his demonstration of these beliefs. The manuscripts that have come down to us are thought to be fairly faithful to the original, so that we can take their illustrations as similar to the ones actually drawn by Cosmas himself; in general, however, his importance to the history of cosmography has been greatly exaggerated.²⁴

In the *Christian Topography* the cosmos is represented schematically as a rectangular box, vaulted along its length. It is divided into two parts, an upper and a lower, by the firmament, which serves as a screen separating the two. The lower part represents the visible world, in which men and the angels live. The upper part represents the invisible world, the realm of God. Two diagrams illustrate this conception: on one only the narrow end of the box is drawn, with its semicircular top; on the other, the whole box is shown, in oblique perspective (fig. 15.1).

Another of the text's pictures presents Cosmas's concept of a flat earth. It is a map of the inhabited world drawn as a rectangle surrounded by an ocean with a rectangular frame (fig. 15.2). Four gulfs of the ocean break the regular outline of the inhabited world: the Caspian on the northern side; the Arabian (Red Sea) and Persian gulfs on the southern side; and the Mediterranean (called the Romaic Gulf) on the western side, the only major sea to be shown.²⁵ Beyond the narrow Asian

22. Cassiodorus *Institutiones* 1.25.2 (note 13).

23. Cosmas Indicopleustes *Topographie chrétienne*, ed. Wanda Wolska-Conus, in *Sources Chrésiennes*, nos. 141 (1968), 159 (1970), and 197 (1973); Wanda Wolska, *La Topographie chrétienne de Cosmas Indicopleustes: Théologie et science au VI^e siècle*, Bibliothèque Byzantine, Etudes 3 (Paris: Presses Universitaires de France, 1962). Cosmas's text is preserved in the Vat. Gr. 699, Rome, Biblioteca Apostolica Vaticana (ninth century), copied in Constantinople; the Sinaïticus Gr. 1186, Mount Sinai, Monastery of Saint Catherine (eleventh century), written in Cappadocia; and Plut. 9.28, Florence, Biblioteca Medicea Laurenziana (eleventh century), copied on Mount Athos.

24. See below, p. 348.

25. As in Eratosthenes' and Strabo's geographies, the Caspian is represented as a gulf of the ocean. Herodotus before them and Ptolemy afterward thought the Caspian was an enclosed sea. The same kind of representation of a rectangular earth, surrounded by the ocean and partly divided by a deeply penetrating gulf, was still used by twelfth-century illuminators. It illustrated the creation of the cosmos, Gen. 1:1–24, in Octateuch manuscripts (Seragliensis 8, fol. 32v, and Smyrnaeus A1, fol. 7v, both in the Sultan's Library, Istanbul). But the



FIG. 15.1. THE UNIVERSE OF COSMAS INDICOPLEUSTES. The arched vault of heaven is represented above a flat, rectangular earth, where the sun is shown both rising and setting around the great mountain in the north. The firmament is at the meeting of the vault and the lower region.

Size of the original: 10.2 × 13 cm. By permission of the Biblioteca Medicea Laurenziana, Florence (Plut. 9.28, fol. 95v).

side of the rectangular world, and beyond the ocean, a small rectangle is drawn figuring paradise, blooming with flowers and trees. Four rivers flow from paradise into the inhabited world, passing under the ocean. One of them, the Gihon (Nile), flows into the Romaic Gulf; the others, the Tigris, the Euphrates, and the Pishon (Indus), flow into the Persian Gulf. Surrounding the rectangular ocean is “the earth beyond the ocean.” In the upper part of this, men lived before the Flood. Taken as a whole, this particular map of Cosmas’s is a strange mixture of classical and Hellenistic knowledge (the four gulfs of the ocean, the length double the breadth, the rectangular frame) and of biblical teaching (paradise and its four rivers, the four corners of the earth, the earth beyond the ocean). Cosmas attributes such a map to the

historian Ephorus (ca. 405–330 B.C.), and he may in fact be adapting Ephorus’s work.

In other illustrations, Cosmas presents his own concepts of the world, wishing to prove their validity. One diagram shows four large men standing at right angles

drawing of the inhabited world (inhabited only by animals, since it illustrates the creation on the sixth day), is far less accurate, with only one gulf on the ocean. Wolska, *Topographie chrétienne de Cosmas*, 137–38 (note 23), thinks that both kinds of illustrations, in Cosmas and in the Octateuch, are derived from an early prototype. Cynthia Hahn, “The Creation of the Cosmos: Genesis Illustration in the Octateuch,” *Cahiers Archéologiques* 28 (1979): 29–40, advances the opinion that “the geographical configuration of the Octateuch miniature was derived from the *Topography*” (p. 35), the illustrator adding animals and foliage to the map structure of the *Topography* miniature. This would explain the degradation in the drawing of the map itself.

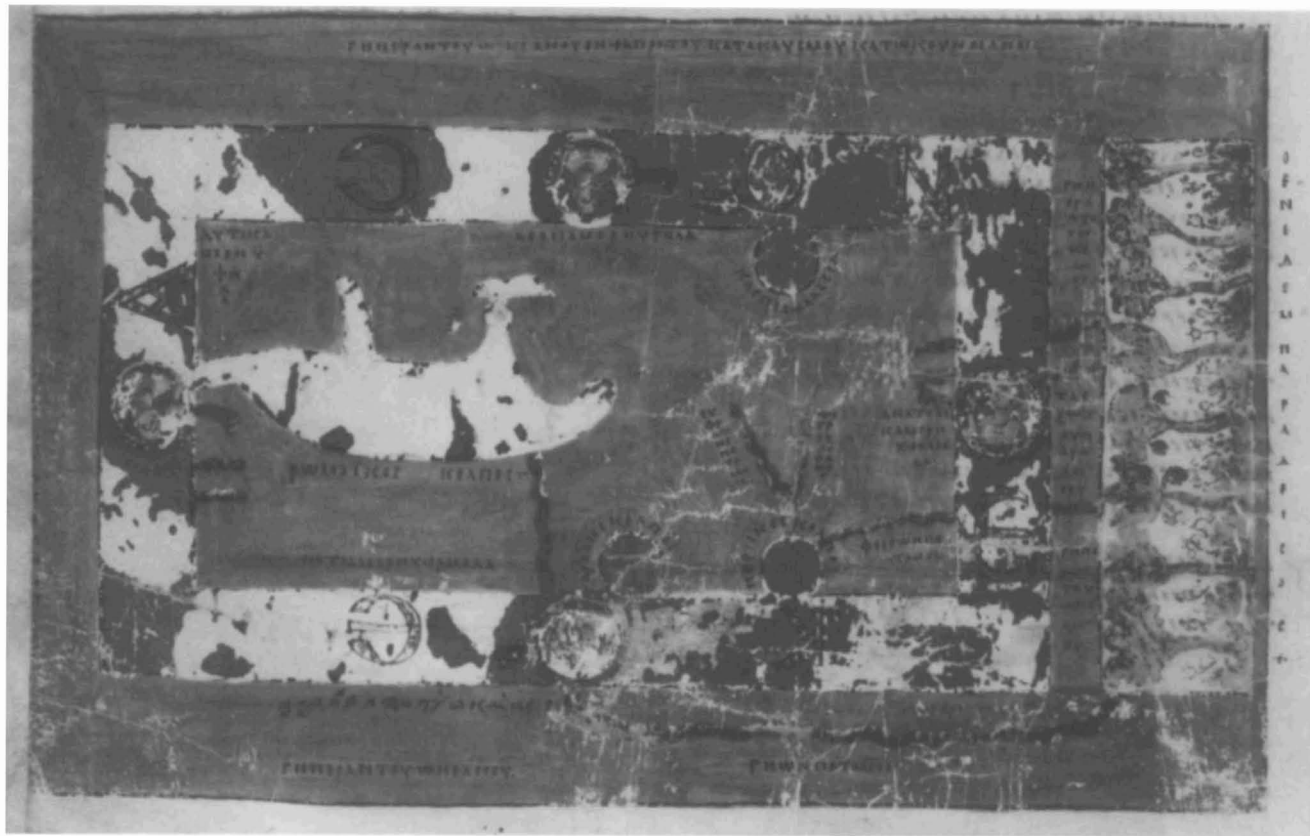


FIG. 15.2. THE WORLD ACCORDING TO COSMAS INDICOPLEUSTES. In a mixture of Hellenistic and biblical geography, Cosmas envisaged a rectangular inhabited world surrounded by an ocean. To the east, beyond the ocean, is paradise. Beyond the ocean at the top (south) is the uninhabited world.

Size of the original: 23.3 × 31.5 cm. Photograph from the Biblioteca Apostolica Vaticana, Rome (Vat. Gr. 699, fol. 40v).

to each other on a small round earth; this was enough, in Cosmas's eyes, to demonstrate the stupidity of those who judged the existence of the Antipodes possible, even probable. In another diagram, the orbits of the planets were drawn as circles with the earth as the central one; on the upper circle, the twelve zodiacal signs are represented in a rough diagram.

For Cosmas, the drawing was part of the teaching. But his drawing was of necessity sketchy; the mind is left to transpose the diagram into the complex reality. It seems as though Cosmas never thought of the transposition: a flat map meant a flat earth; biblical teaching should be taken literally. Despite the assumed importance of Cosmas's teaching by modern writers of historical texts, however, the work appears to have had little influence on medieval thought. The spherical world of the Greeks (and the Romans, for that matter) was never forgotten.²⁶

THE MAP MOSAICS AT NICOPOLIS AND MADABA

Byzantine art was predominantly religious, and just as maps furnished the theme of many Christian wall paintings in western Europe, so too in the Byzantine Empire they were incorporated into mosaics. Together with frescoes, mosaics were the most magnificent expression of Byzantine art, and this is clearly reflected in the cartography of the period.²⁷ Besides the primary examples of Nicopolis and Madaba, a number of zodiac mosaics are known from other locations. The function of the larger of these maps—as with the *mappaemundi*—was no doubt to instruct the faithful by presenting the allegories of biblical lore.

26. See chapter 18 in this volume, "Medieval *Mappaemundi*," pp. 286–370.

27. On Byzantine mosaics see Otto Demus, *Byzantine Mosaic Decoration: Aspects of Monumental Art in Byzantium* (London: Routledge and Kegan Paul, 1948).



FIG. 15.3. THE NICOPOLIS MOSAIC. From room X, Basilica α (basilica of Saint Demetrius), Nicopolis, Greece, sixth century A.D.

Size of the original: 2.35 \times 3.01 m. Photograph courtesy of Marie Spiro, University of Maryland, College Park.

An unusual early Byzantine mosaic may be seen in situ in the remains of the Byzantine church at Nicopolis, near Preveza in Epirus (fig. 15.3).²⁸ Nicopolis (“victory city”), which has the largest and most extensive Roman remains in Greece, was founded to commemorate the victory of Augustus over Antony and Cleopatra at the battle of Actium in 31 B.C. The mosaic at Nicopolis was evidently set up by an Archbishop Dometios (there were two of that name, both of whom seem to have flourished in the sixth century). The Greek verses incorporated in the mosaic may be rendered:

Here you can see the boundless ocean run
 Carrying in its midst the earth, wherein
 All that can breathe and creep is here portrayed
 Using the skillful images of art.
 Noble archpriest Dometios founded this.²⁹

The mosaic itself is rectangular (and thus reminiscent of Cosmas’s concept of the world) and has around its sides an ocean with fish swimming in it. In the middle, in a rectangular centerpiece somewhat similar to that of the Mount Nebo mosaic,³⁰ are trees and birds. To say that without the inscription one would have thought it represented paradise is perhaps to prejudice the interpretation: the mosaic could represent the earth as it is, but it could also represent the earth before the creation

of man, when it was paradise.³¹ In either case, biblical and pagan Greek concepts are mingled in this mosaic, the outer edges reflecting either the Homeric or subsequent representations of the ocean that surrounds the earth.³²

The Madaba map—probably the best known example of Byzantine cartography—is a mosaic of Palestine and Lower Egypt with legends in Greek. The remaining parts are well preserved. It was rediscovered in 1884 in the old church at Madaba, Jordan (plate 7).³³ In 1896 Father

28. Ernst Kitzinger, “Studies on Late Antiquity and Early Byzantine Floor Mosaics. I. Mosaics at Nikopolis,” *Dumbarton Oaks Papers* 6 (1951): 81–122, figs. 18–19.

29. Translation by O. A. W. Dilke; see Kitzinger, “Nikopolis,” fig. 18 (note 28).

30. Sylvester J. Saller, *The Memorial of Moses on Mount Nebo*, 3 vols., Publications of the Studium Biblicum Franciscanum, no. 1 (Jerusalem: Franciscan Press, 1941–50), vol. 1, 230 ff., and vol. 2, pls. 103.1, 106, 107.

31. Kitzinger, “Nikopolis,” 100 (note 28).

32. This concept was sometimes given expression in art. Thus it is thought by R. Hinks, *Myth and Allegory in Ancient Art* (London: Warburg Institute, 1939), 30 and pl. 1b, that a bronze disk in the British Museum represents Oceanus embracing the three continents.

33. Herbert Donner and Heinz Cüppers, *Die Mosaikkarte von Madaba*, Abhandlungen des Deutschen Palästinavereins (Wiesbaden: O.

Kleopas Koikylides, librarian to the Greek Orthodox patriarch, found that work on the new church was causing damage to the mosaic, which was then preserved, and he and others made drawings of it. In 1965 it was restored by Heinrich Brandt and handed over to the Greek Orthodox patriarch.

The mosaic is datable to between A.D. 542 and 565 (the year of Justinian's death). The main surviving fragment measures about 10.5 by 5 meters, but originally the entire mosaic could have accommodated a map as large as 24 by 6 meters. The mosaic squares that have been preserved from the map are in five or six shades of green and blue and four shades of red, with others of black, white, brown, violet, yellow, and gray. The map, thought to have shown the area from Byblos and Damascus to Mount Sinai and Thebes in Egypt, would have required over two million mosaic squares.

The Madaba map was clearly intended to instruct the faithful. It faced the part of the church that the laity would frequent, though they would have been looking at it through a screen. The portion that has been preserved extends from Aenon in the Jordan valley to the Canopic branch of the Nile. The scale varies from about 1:15,000 for central Judaea to about 1:1,600 for Jerusalem, which was given a prominent position and an exaggerated size. The map seems to have had a fairly straight Mediterranean coast so that, whereas it has east at the top in Palestine, in Egypt it has southeast or south at the top. Place-names are numerous considering the coarse nature of the medium. They are mostly based on the *Onomasticon* of Eusebius of Caesarea (ca. A.D. 260–340), but partly also, no doubt, on a road map, since road stations are given four and nine miles out of Jerusalem. In Egypt some villages are called by the names of Greek or Roman owners, such as “the [village] of Nicias.”³⁴ Cartographic signs for towns or churches are somewhat similar to those in the Peutinger map.

Evidently the compiler was eager to fill all empty spaces either with pictures of boats or trees or with historical explanations. Some of these explanations come from the Old Testament, some from the New: examples are “Floor of Atath, now Bethagla”;³⁵ “Salt Lake or Pitch Lake or Dead Sea”; “Selo, where the ark once was”;³⁶ “Ephron or Ephraia, where the Lord went”;³⁷ “Ailamon, where the moon stood still one day in the time of Joshua son of Nun”;³⁸ “Rama: a voice was heard in Rama”;³⁹ “the church of Saint Philip where they say the eunuch Candaces was baptized”;⁴⁰ “borders of Egypt and Palestine”; “Zabulon shall dwell by the sea and its border shall be unto Sidon”;⁴¹ and “Sareptha, the long village where a child was brought back to life that day.”⁴²

Parts of the map reproduce architectural details. The church of Saint Zacharias near Bethzachar is promi-

nently outlined. It has a porch with sloping roof, surmounted by a facade with three windows. A semicircular court with columns, presumably at the rear, is shown in oblique perspective as if it were above the porch and facade. Jerusalem is portrayed in great detail as an oval walled city with its principal gateway in the north (plate 8). The central street is shown with its east colonnade the right way up but its west colonnade upside down. The western area is viewed from outside and the eastern area from inside. In the center foreground is the Church of the Holy Sepulcher. Like the west colonnade, it is shown upside down, with a staircase at the top and a dome at the base. Numerous other buildings of Byzantine Jerusalem have been identified from the mosaic. The latest to be so recognized, at the south end of the east colonnade, is thought to be the New Church (Nea) of the Theotokos, consecrated in 542. To the north of Jerusalem is the Damascus Gate. Its Arabic name, Bābil ‘amūd, commemorated a Byzantine column in the nearby square. This column, on which the statue of an emperor had been replaced by a cross, is depicted on the mosaic. Another city that is shown in some detail, though the mosaic is only partly preserved, is Gaza, with what looks like a Greek theater in the background.

The coloring in mountainous areas includes red, pink, green, and dark brown, with dark brown surrounds in roughly parallel curves. It is possible that some sort of form lines were intended, an effect that looked most realistic in a fragment of the mosaic now thought to be lost. A drawing of this fragment made in 1897 shows Agbaron (Akhbara), with a village to the left between two mountains, one of which has form lines or terracing.⁴³

Harassowitz, 1977); Michael Avi-Yonah, *The Madaba Mosaic Map* (Jerusalem: Israel Exploration Society, 1954); R. T. O’Callaghan, “Madaba (Carte de),” in *Dictionnaire de la Bible: Supplement*, ed. L. Pirot and A. Robert (Paris: Letouzey et Ané, 1928–), vol. 5 (1957), 627–704.

34. This is the correct form, not Nicius as given in Avi-Yonah, *Madaba Mosaic* 76, no. 133 (note 33).

35. Accad in Gen. 10:10.

36. Shiloh in Josh. 18:1.

37. John 11:54: “Accordingly Jesus no longer went about publicly in Judaea, but left that region for the country bordering on the desert, and came to a town called Ephraim.”

38. Avi-Yonah, *Madaba Mosaic* (note 33), points out that Aijalon, in Josh. 10:12, was actually at Yalu, three kilometers from Nicopolis in Palestine, as indicated by Jerome’s translation of the *Onomasticon*; but the mapmaker follows Eusebius.

39. Ramah in Jer. 31:15.

40. Not so, he was a eunuch of Candace (Kandake), queen of Ethiopia: Acts 8:26–27.

41. Gen. 49:13: “Zebulun dwells by the seashore.”

42. Elijah’s miracle at Zarethan, now Sarafand, 1 Kings 7:8 ff.

43. Avi-Yonah, *Madaba Mosaic*, 76, fragment A (note 33).

The third type of mosaic map dating from the Byzantine period depicted the zodiac, perpetuating a subject already noted as popular during the Roman Empire (p. 248).⁴⁴ In the period after the Hammath mosaic, for example, there developed a Byzantine tradition of mosaics with Hebrew inscriptions in the interiors of synagogues (exteriors were not allowed to be decorated). At Beth-Alpha, Hefzibah, a well-preserved mosaic from the early sixth century A.D. portrays the sacrifice of Isaac and also the signs of the zodiac (fig. 15.4).⁴⁵ These are set out counterclockwise in a circle around the chariot of the sun. In the corners are personifications of the four seasons: spring (top left), summer, fall, and winter (counterclockwise). The artistic style is vigorous but naive. The sun-god (a Greco-Roman concept) appears as a head with *corona radiata*; the head and front legs of each of his four horses are shown, but not the rest of their bodies. Around him are a crescent moon and twenty-three stars, irregularly spaced. Or again, the same Byzantine style is manifest in the representation of the signs of the zodiac: Virgo, for example, is shown seated frontally, but her feet are turned sideways.

At Susiya, near Hebron, there was originally a similar zodiac mosaic alongside a picture showing Daniel in the lions' den. But since mosaics were disapproved of by the Jews as graven images, they were both removed. In other mosaics of the Byzantine period from the Holy Land, the zodiac is represented only by the names of its signs rather than by their graphic representations.

THE GREEK REVIVAL AND PTOLEMY'S GEOGRAPHY

Byzantine cartography is not easy to classify. Such maps as are known from the earlier part of the period—as is clear from the mixture of Greek, Roman, and Christian ideas in Cosmas and the Madaba map—may be regarded as a synthesis of all three traditions. Later, however, there developed a strand of cartographic representation in which Greek influence eventually came to predominate. While the Byzantines did not for most of their long history call themselves Hellenes, the dominant language and the dominant culture of the empire were always Greek.⁴⁶ By the ninth century, however, the conscious reactivation of Hellenic traditions—by restoring, for instance, the use of Atticizing literary Greek, virtually forgotten during the seventh and eighth centuries—was more actively taken up by scholars in the ruling class. In the tenth century and later, when this fashion had become an even greater preoccupation of literary and linguistic scholarship, many Greek texts were recovered and transcribed into new books, themselves an important factor in the revival of this aspect of classical culture.⁴⁷

The short-term significance of this renaissance of Hellenic traditions by Byzantine scholars for mapping is not easy to assess. Though we may assume that Greek astronomical and geographical works were being recopied by the Byzantine scribes, or in some cases digested into encyclopedias,⁴⁸ there is little evidence that these activities quickly gave rise to a renewed interest in map-making per se. If anything, before Planudes' search for Ptolemy, to be described below, there seems to have been a continuing decline of practical knowledge about map-making. Apart from the scrap of information (even if it can be accepted as of Byzantine origin), about Agathodaimon's drawing a world map according to Ptolemy's instructions, also discussed below (pp. 271–72), the few Byzantine writers of geographical texts known to us exhibit scant interest in compiling maps. This was evidently the case with the ninth-century scholar Epiphanius of Jerusalem. Epiphanius wrote a guide to Syria, Jerusalem, and the holy places that has survived.⁴⁹ It is true also of Eustathius of Constantinople (died ca. 1194), who had already written a large number of scholarly works when he became metropolitan of Thessalonica in 1174–75.⁵⁰ These works include a commentary on the description of the world by Dionysius Periegetes. In this, quotations from works of earlier geographers, some no longer extant, are given together with citations from the complete *Ethnika* of Stephanus. Eustathius attempted to reconcile the two differing accounts of the Caspian. He agreed that one could indeed walk around it but suggested that perhaps it discharged into the northern ocean by means of an underground stream. India he

44. Michael Avi-Yonah, *Ancient Mosaics* (London: Cassell, 1975); Michael Avi-Yonah and Meyer Schapiro, eds., *Israel Ancient Mosaics*, UNESCO World Art Series, no. 14 (Greenwich, Conn.: New York Graphic Society, 1960). For signs of the zodiac in Hebrew manuscripts see Bezalel Narkiss, *Hebrew Illuminated Manuscripts* (Jerusalem: Encyclopaedia Judaica, 1969), 32–33.

45. Avi-Yonah, *Ancient Mosaics*, 56–59 (note 44); Avi-Yonah and Schapiro, *Israel Ancient Mosaics*, 7, 14, 25, pls. XI, XII (note 44); Eleazar L. Sukenik, *The Ancient Synagogue of Beth Alpha* (Jerusalem: University Press, 1932).

46. Browning, *Byzantine Empire*, 8 (note 1).

47. See L. D. Reynolds and N. G. Wilson, *Scribes and Scholars: A Guide to the Transmission of Greek and Latin Literature*, 2d ed. (Oxford: Clarendon Press, 1974), esp. 50–53. On the development of Byzantine scholarship, see John Edwin Sandys, *A Short History of Classical Scholarship from the Sixth Century B.C. to the Present Day* (Cambridge: Cambridge University Press, 1915), 92–110.

48. Fritz Saxl, "Illustrated Mediaeval Encyclopaedias. 1. The Classical Heritage; 2. The Christian Transformation," in his *Lectures*, 2 vols. (London: Warburg Institute, 1957), 1:228–54 (lectures delivered at the Warburg Institute, University of London, February 1939).

49. Herbert Hunger, *Die hochsprachliche profane Literatur der Byzantiner* (Munich: Beck, 1978–), 1:517, n. 47.

50. Eustathius *Commentary* (on Dionysius's *Periegesis*), in Müller, *Geographi Graeci minores*, 2:201–407, esp. 401 on the shape of India (note 16).



FIG. 15.4. THE BETH-ALPHA MOSAIC. An example of a tradition of Byzantine mosaics depicting the Zodiac and seasons with Hebrew inscriptions. From Michael Avi-Yonah and Meyer Schapiro, eds., *Israel*

Ancient Mosaics, UNESCO World Art Series, no. 14 (Greenwich, Conn.: New York Graphic Society, 1960), 7. Copyright UNESCO 1960; reproduced by permission of UNESCO.

described as having the shape of a rhombus, which he illustrated as in figure 15.5. In fact, this is merely a variation on the rhombus of Dionysius, where the Indus River is in the west rather than the southwest and the other places are adjusted accordingly. But no diagram exists of Dionysius's scheme, and however much or little Eustathius may have consulted maps, his coastline, albeit schematic, is more correct than Ptolemy's.

THE GREEK MANUSCRIPTS OF PTOLEMY'S *GEOGRAPHY*

Given such antecedents, the subsequent recognition by Byzantine scholars of the importance of the manuscripts of Ptolemy's *Geography* is both remarkable and of great significance in the development of mapping. No Greek manuscript of Ptolemy's *Geography* earlier than the thir-

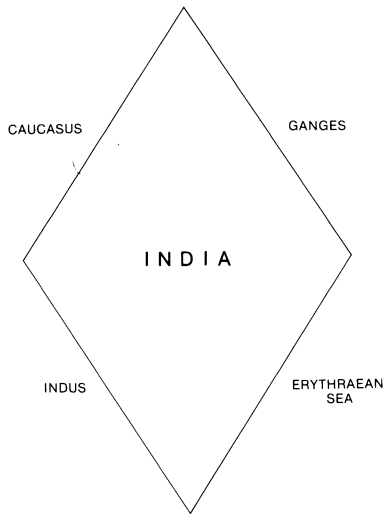


FIG. 15.5. INDIA ACCORDING TO EUSTATHIUS OF BYZANTIUM. The representation of India as a rhombus owes much to the ideas of Dionysius and, perhaps, Eratosthenes (see fig. 9.6).

teenth century has been preserved (appendix 15.1).⁵¹ In that century Maximus Planudes (ca. 1260–1310) was reviving scientific studies, collecting many precious manuscripts for the library in his monastery at Chora. Planudes was an active scholar:⁵² he revised Aratus’s poem to relate it to Ptolemy’s *Almagest*; he restored an old copy of Strabo’s *Geography* (the ninth-century MS. Gr. 1397, Paris, Bibliothèque Nationale) that had been gnawed by rats; and he acquired another copy of Strabo (the thirteenth-century MS. Gr. 1393, Paris, Bibliothèque Nationale) and gathered extracts from it. These are preserved in the manuscript completed before his death known as Plut. 69.30, Florence, Biblioteca Medicea Laurenziana.

In the summer of 1295—he tells us in a letter—Planudes was in search of a copy of Ptolemy’s *Geography*, a work long neglected. Certainly it was not until long after the Arabs had been working on Ptolemy’s text that Byzantine scholars gave serious attention to it. That it was the sight of Arab maps from Ptolemy that stimulated Planudes’ interest can only be speculation.⁵³ It seems unlikely that Planudes’ thorough examination of Greek mathematics and science—including his work on various Greek texts and his advocacy of the introduction of Arabic numerals, as well as his resurrection of Ptolemy—was undertaken in isolation and without at least a small circle of contemporary scholars interested in such studies.⁵⁴ What is perhaps most remarkable, anticipating the teaching of Manuel Chrysoloras and the Italian scholars in the fifteenth century, is Planudes’ identification of the *Geography* as a key text in geographical science.

In any event, Planudes seems to have found a copy of the *Geography* rapidly. This may be surmised from the

fact that a Greek copy (Vat. Gr. 177, Rome, Biblioteca Apostolica Vaticana), dated to the end of the thirteenth century includes a note that points to Planudes, in Chora monastery, as its former owner. “Heroic verses” added to the manuscript describe Planudes’ efforts to find this work and his disappointment at encountering a copy in which the maps were lacking.⁵⁵ This particular copy has no maps, although the intended number is indicated in the text: there should have been twenty-six. So Planudes had maps drawn to accompany the text, and both text and maps were admired by the emperor Andronicos II Palaeologus (1282–1328), who had a copy made for himself by Athanasius (formerly patriarch in Alexandria, then retired in Constantinople, 1293–1308).

This in itself is a pointer to the level of cartographic understanding in thirteenth-century Constantinople. Planudes was not alone in being able to have a set of maps drawn to order. Evidently there were draftsmen in Constantinople sufficiently skilled to follow Ptolemy’s instructions for mapmaking, possessed of a technical understanding of the relevant map projections, able to translate coordinates into map images, and able to employ cartographic signs in the fashion of the maps in the Greek manuscripts (described below).

A precious thirteenth- or fourteenth-century manuscript, the Vat. Gr. 191, in the Biblioteca Apostolica Vaticana, Rome, is generally held to be evidence for scholarly activity in Constantinople during Andronicos’s reign. It contains various astronomical, astrological, and geographical texts. Among these are the collection

51. The reception of Ptolemy’s manuscripts in western Europe, their impact on cartography, and the development of celestial maps from his materials will be dealt with in volume 3 of the *History*. Maps were also sometimes drawn to accompany the copies of the *Geography* transmitted to the Arab world. We know, for example, through the Arab historian al-Masūdi, who lived in the tenth century, that at least one copy of Ptolemy’s *Geography* existed and was richly illustrated with colored maps showing towns, rivers, seas, and mountains: see Marcel Destombes, ed., *Mappemondes A.D. 1200–1500: Catalogue préparé par la Commission des Cartes Anciennes de l’Union Géographique Internationale* (Amsterdam: N. Israel, 1964); and al-Masūdi, *Les prairies d’or*, 9 vols., trans. C. Barbier de Meynard and Pavet de Courteille, Société Asiatique Collection d’Ouvrages Orientaux (Paris: Imprimerie Impériale, 1861–1917), 1:76–77.

52. On Planudes’ activity see Carl Wendel, “Planudes, Maximos,” in *Paulys Realencyclopädie der classischen Altertumswissenschaft*, ed. August Pauly, Georg Wissowa, et al. (Stuttgart: J. B. Metzler, 1894–), 20.2 (1950): cols. 2202–53. See also note 54 below.

53. Armando Cortesão, *History of Portuguese Cartography*, 2 vols. (Coimbra: Junta de Investigações do Ultramar-Lisboa, 1969–71), 1:179–85.

54. “The reign of Andronicus II Palaeologus (1282–1328) has the paradoxical distinction of being the period in which the signs of incurable political and economical weakness in the empire became unmistakable and yet the level of cultural life rose to a height as great as had ever been seen.” N. G. Wilson, *Scholars of Byzantium* (London: Duckworth, 1983), 229–41, quotation on 229.

55. See MS. Gr. 43 (Milan, Biblioteca Ambrosiana).

known as the *Little Astronomy*, the *Commentary on Eudoxus's and Aratus's Phaenomena* by Hipparchus, and also Ptolemy's *Geography*. Once again the *Geography* lacks maps, but a note following the description of the last map reads: "There are twenty-seven maps instead of twenty-six in this copy, since the tenth map of Europe has been divided into two parts representing (1) Macedonia, (2) Epirus, Achaëa, the Peloponnese, Crete, and Euboea."⁵⁶ We may infer from this that the archetype of the Vat. Gr. 191 was accompanied by maps.

THE MANUSCRIPTS WITH TWENTY-SEVEN MAPS:
THE A RECENSION⁵⁷

From allusions described above, it is clear that by the late thirteenth and early fourteenth centuries in Constantinople there were circulating, and being actively copied, a number of versions of Ptolemy's *Geography*. Some were without maps.⁵⁸ But the three oldest surviving manuscripts with maps of Ptolemy's *Geography* also date from the end of the thirteenth century. These three are: the Urbinas Graecus 82 in the Biblioteca Apostolica Vaticana, Rome; the Seragliensis 57 in the Sultan's Library, Istanbul; and the Fragmentum Fabricianum Graecum 23 in the Universitetsbiblioteket, Copenhagen (of which only a bifolium remains). Paul Schnabel pointed out that these three manuscripts are similar in size, number of lines to a page, and arrangement of the maps.⁵⁹ Diller has added that of the two hands in the Seragliensis 57, one is identical to that of the Fragmentum Fabricianum Graecum 23 and the other to that of the Paris MS. Gr. 1393 (the copy of Strabo owned by Planudes).⁶⁰ Diller also noted that certain special features common to the three manuscripts are very clear in the Urbinas Graecus 82, less so in the Seragliensis 57, and rather vague in the Fragmentum Fabricianum Graecum 23. On this basis he concluded that the three manuscripts had been copied in that order, as if, moreover, by one (perhaps Planudes') impulse. Diller speculated, plausibly, that the Urbinas Graecus 82 was perhaps copied for the emperor and the Seragliensis 57 for Planudes' personal use. A supplementary argument in favor of Diller's hypothesis could be that the Urbinas Graecus 82 and the Seragliensis 57, in spite of their similarity, have at least one major difference. In the case of the Urbinas Graecus 82, the map of the inhabited world is drawn on Ptolemy's first projection with straight converging meridians; in the Seragliensis 57 it is drawn on his second projection, whose curved meridians were much more difficult to execute. This could be taken to imply that the former was drawn first and that Planudes had the more advanced projection executed for his personal use.

The Urbinas Graecus 82 is a beautiful copy of Ptolemy's text. It is large (570 × 415 mm), written in two

columns (fifty-seven lines to a page), and has frequent marginal notes, many of which refer to Strabo. At the end of book 7, the comprehensive map of the inhabited world is drawn on two pages (fols. 60v–61r); this is followed (from book 8, fols. 3–28) by the twenty-six regional maps. In the first projection, the inhabited world is surrounded by winds, drawn as human faces blowing a kind of horn, and by the signs of the zodiac within red circles. The network of curved parallels and straight meridians is carefully drawn. Mountains are represented as colored straight features that, in the Asian part, indicate the limits between neighboring countries. Rivers are drawn as undulating blue lines; oceans are also colored blue (plate 9).

The regional maps in Urbinas Graecus 82 are drawn on Marinus's rectangular projection. Meridians and parallels form a red network. The meridians are drawn every five degrees (each degree is divided into halves in the external frame). Parallels are spaced at intervals of a quarter of an hour of maximum daylight (but degrees of latitude are numbered in the external frame). Names of towns are inscribed inside red vignettes, which are represented with or without towers according to the importance of the town. Outlines of coasts and courses of rivers are rather approximate and only schematically drawn. As in the other manuscripts of that type and as in Ptolemy's original specification, there are thus twenty-seven maps in all in the Urbinas Graecus 82: the world

56. Translation by O. A. W. Dilke from the Vat. Gr. 191 (Rome, Biblioteca Apostolica Vaticana). In fact, from book 5 to the end, coordinates are lacking for all towns and geographical places.

57. Ptolemy, *Claudii Ptolemaei Geographiae Codex Urbinas Graecus 82*, 2 vols. in 4, ed. Joseph Fischer, *Codices e Vaticanis Selecti Quam Simillime Expressi*, vol. 19 (Leiden: E. J. Brill; Leipzig: O. Harrassowitz, 1932), 1:208–415; Erich Polaschek, "Ptolemaios als Geograph," in *Realencyclopädie*, suppl. 10 (1965): cols. 680–833, esp. 734–53 (note 52); Leo Bagrow, "The Origin of Ptolemy's Geographia," *Geografiska Annaler* 27 (1945): 318–87.

58. In addition, the fourteenth-century Vat. Gr. 176 (Rome, Biblioteca Apostolica Vaticana) contains a *diorthosis* of Ptolemy's *Geography* made by Nicephoros Gregoras (ca. 1295–1360), who was an active scholar in Constantinople. In fact this revision concerns only book 1, the first chapter of book 2, and from book 7, chapter 5, to book 8, chapter 2, the only ones copied in this manuscript. Rodolphe J. Guilland, *Essai sur Nicéphore Grégoras* (Paris: P. Geuthner, 1926), 27b, argues that this revision was not carried out by Gregoras, but the manuscript note says it was. There is also a scholium written by the monk Isaac Argyros about the first system of projection proposed by Ptolemy. The manuscript ends with Ptolemy's *Harmonics*, which Nicephoros Gregoras had undertaken to revise, but death intervened.

59. Paul Schnabel, *Text und Karten des Ptolemäus*, Quellen und Forschungen zur Geschichte der Geographie und Völkerkunde 2 (Leipzig: K. F. Koehlers Antiquarium, 1938).

60. Aubrey Diller, "The Oldest Manuscripts of Ptolemaic Maps," *Transactions of the American Philological Association* 71 (1940): 62–67. See also Fischer, *Urbinas Graecus 82* (note 57).

map, ten maps for Europe, four for Libya (Africa), and twelve for Asia.⁶¹

THE MANUSCRIPTS WITH SIXTY-FIVE MAPS:
THE B RECENSION

A second group of the manuscripts of Ptolemy's *Geography*, known to Fischer as the "B Redaction," are distinguished by containing sixty-five maps, distributed throughout the text, instead of the twenty-seven maps of manuscripts of the A recension. The interest of the B manuscripts, in which the format and arrangement of the maps depart from Ptolemy's original scheme for an atlas, lies in the fact that they point to different stemmata for the descent of Ptolemy's cartographic ideas and raw materials from the fourth century A.D. into the Middle Ages. Indeed, so different are the A and B recensions that their divergences can hardly be accounted for by textual corruption. Leaving aside minor variations between the individual Greek manuscripts, some scholars have been led to ask whether Ptolemy might not at some point have modified his original instructions; whether the extant manuscripts result from additions made cumulatively or sporadically after his death; and most radically, whether Ptolemy may properly even be regarded as the sole author of these variant manuscripts surviving from the late Byzantine period.⁶² Such questions remain largely unresolved through lack of evidence. Yet there is no doubt that by the early fourteenth century, if not earlier, the separate stemmata epitomized in the A and B recensions were well established.

Of the manuscripts of the B recensions, the Plut. 28.49 in the Biblioteca Medicea Laurenziana, Florence, dating from the beginning of the fourteenth century, is the earliest. It is a parchment manuscript, smaller (340 × 260 mm) than the first three of the A recension.⁶³ It was carefully written in two columns, with forty-nine lines to a page. Maps are provided from book 2 to book 7. There are thirteen in book 2 and twelve in book 3, making twenty-five all together for Europe; eight in book 4, dealing with Africa; thirteen in book 5, fifteen in book 6, three in book 7 (making a total of thirty-one for Asia). Following these sixty-four regional maps, a comprehensive map of the inhabited world is drawn on Ptolemy's first projection, similar to the one in the Urbinas Graecus 82. Curiously at odds with actual numbers of maps included, the summary relates to four of the books of the *Geography* and refers to the traditional number of maps in the A recension (not the B recension).

The regional maps in the Plut. 28.49 are rectangular, of various sizes, and each is included in a graduated frame. Towns are indicated by vignettes, sometimes with a cross on top (for Iouernis and Rhaiba, for instance, in Ierne island—Ireland), and sometimes with one or sev-

eral towers (three for London). Marginal signs in the text (indicating tribes) are reproduced as part of the settlement sign on the relevant maps. Coasts are drawn as a single blue line; mountains are long brown rectangles. When the maps are out of their regular order (which happens a few times), the copyist has indicated where to find them. The map of the inhabited world (fols. 98v–99r) follows the last regional one, the map of Taprobane (Sri Lanka). The end of book 7 is lacking. Book 8 begins with the next folio, but apparently is in a different hand and less carefully copied.

This Florentine manuscript is the oldest of a series dating from the fourteenth and fifteenth centuries, which can display significant variations in their maps. One of this family, the Burney Gr. 111, now in the British Library, London, and dated to the end of the fourteenth century, has the same sixty-five maps.⁶⁴ But in the Biblioteca Ambrosiana's MS. Gr. 997, Milan (dated by Schnabel to the fourteenth century) the sixty-five usual maps are followed by four modern maps, one showing Europe, one Africa, and two Asia (northern and southern Asia). The Seragliensis 27 in the Sultan's Library, Istanbul (late fourteenth-early fifteenth centuries) is a copy of the MS. Gr. 997, except that two maps are lacking, the Peloponnese map and the map of the inhabited world. Yet another copy, the Urbinas Gr. 83 in

61. For example, the *Vatopedi* 655, preserved in Mount Athos and elsewhere, was copied from the Urbinas Graecus 82 at the beginning of the fourteenth century, in Constantinople. Ptolemy's *Geography* (with its maps, as in the Urbinas Graecus 82) is followed by the corpus of minor geographers, copied from the tenth-century Pal. 398, in the Universitätsbibliothek, Heidelberg, and by Strabo's *Geography*. See *Géographie de Ptolémée* (reproduction of the *Vatopedi* manuscript), ed. Victor Langlois (Paris: Firmin-Didot, 1867); Fischer, *Urbinas Graecus* 82, 1:234–43 (note 57); Aubrey Diller, "The *Vatopedi* Manuscript of Ptolemy and Strabo," *American Journal of Philology* 58 (1937): 174–84. The Ptolemy map of the inhabited world (from the *Vatopedi* manuscript), drawn on his first projection, is incorporated in a London manuscript, British Library Add. MS. 19391. A penciled note by Leo Bagrow in the British Library Catalogue states that leaves of this manuscript are also found in Leningrad: "Einige Blätter von diese[m] MS. auch in Petersburg im Museum d. Gesellschaft Lyubetelei Drevney Pismennosti i Pechati."

62. The line was most strongly argued by Bagrow, "Origin" (note 57).

63. The need to accommodate the maps to this smaller format may have been one reason for their fragmentation in the B recension.

64. Joseph Fischer, "Der Codex Burneyanus Graecus 111," in *75 Jahre Stella Matutina*, 3 vols., Festschrift (Feldkirch: Selbstverlag Stella Matutina, 1931), 1:151–59. In fact the Burney Gr. 111 contains sixty-six maps. These are listed in British Museum, *Catalogue of the Manuscript Maps, Charts, and Plans, and of the Topographical Drawings in the British Museum*, 3 vols. (London: Trustees of the British Museum, 1844–61), vol. 1, though some pages are given incorrectly. Burney Gr. 111 contains two maps of Taprobane Insula. The first forms the frontispiece, and it is obvious from differences not only of the paint itself but also of presentation (the sea, for example, is fully colored whereas on all other maps only the coastline is outlined in a brighter blue) that this is not one of the original series.

the Biblioteca Apostolica Vaticana, Rome (dated to the middle of the fifteenth century), has the sixty-four regional maps and the four modern ones, but the space left vacant for the map of the inhabited world has not been filled. Such variations taken all together, between manuscripts that have the same basic genealogy, serve to confirm the inconsistencies and errors inherent in the transmission process of a manuscript age. If such difficulties could emerge in the century or so after the compilation of the *Plut.* 28.49, then the scope for similar changes in the much longer period between the death of Ptolemy and late Byzantine times was potentially much greater.

THE AGATHODAIMON ENIGMA

The difficulty of reconstructing the precise path of Ptolemy's texts as transmitted through the early Middle Ages is further increased by the relatively few surviving fragments of evidence that point to the modification of the manuscripts in this period. In particular, there is tantalizingly little evidence that will illuminate the crucial process of the descent and modification of the maps—and their addition or otherwise to the texts—in this long period.⁶⁵ Thus the proper interpretation of what at first sight might seem to be a relatively minor scrap of evidence—the so-called Agathodaimon endorsement on some Ptolemy manuscripts—becomes an important part of our reconstruction.

The endorsement takes the form of a note appended to book 8 of the *Geography* in some manuscripts. It may be rendered: “Agathos Daimon” (or “I, Agathos Daimon”), “a technician [*mechanikos*] of Alexandria, drew [have drawn] the whole world from Ptolemy's *Geography*.”⁶⁶ This statement is found at the end of a number of copies of Ptolemy's *Geography*. It occurs, for instance, in the thirteenth-century Vat. Gr. 177 (which has no maps); in the thirteenth-century Urbinas Gr. 82 (which has twenty-seven maps); in the fifteenth-century Conv. Sopp. 626 [Abbatiae] 2380 in the Biblioteca Medicea Laurenziana, Florence (twenty-seven maps); and in the fifteenth-century MS. Gr. 1402 in the Bibliothèque Nationale, Paris (twenty-seven maps). In the fifteenth-century Paris manuscript, MS. Gr. 1401, for which Urbinas Graecus 82 was used as a model, a variant slips into the note: the wording is “has drawn” instead of “I have drawn.” The main manuscript of the B recension, *Plut.* 28.49, has the same note at the end of book 8 but uses another form of the verb, though also in the third-person singular. It is generally held that Agathos Daimon (“good spirit”) should be taken as a variant on Agathodaimon (the name of some real technician) and not as a humorous appellation.⁶⁷

That being the case, three questions may be asked: Are the maps that we now see in the surviving manu-

scripts copies of maps drawn previously by Agathodaimon? When did Agathodaimon live? Did he make all the regional maps or only the map of the inhabited world? The answer to the third question seems the most straightforward. It is that Agathodaimon, described in the note on the manuscripts as *mechanikos*, drew only the world map. It was only this map, drawn on a projection like Ptolemy's first, that required the geometric knowledge and drafting skill that may have been possessed by such a “technician,” albeit Agathodaimon may in fact have contented himself with drawing the network of parallels and meridians just according to Ptolemy's instructions.⁶⁸

The other two questions can be answered only by conjecture. As regards the second, Agathodaimon could have lived at any time between Ptolemy's lifetime and the thirteenth century. It was not uncommon for scribes of the postclassical period to continue copying out notes of this nature as if they were part of the original manuscript. Some guidance may be inferred from the fact that he was an Alexandrian and that Alexandria did not have Greek technicians after the sixth century. Thus it would be reasonable to speculate that Agathodaimon might have been alive in the fifth or sixth century.⁶⁹ If so, he could have been, perhaps, a contemporary of Cosmas Indicopleustes, author of a number of small maps of the inhabited world, and of Johannes Philoponus, a good graphic technician as well as a commentator on Aristotle's work. The suggestion of a fairly early date for Agathodaimon is reinforced by the fact that the note in question appears in manuscripts belonging to different families, indicating that it had been inserted into an early copy of the *Geography*, before the splitting

65. Erich Polaschek, “Ptolemy's *Geography* in a New Light,” *Imago Mundi* 14 (1959): 17–37, citing evidence from the Greek geographer Marcianus of Heraclea (ca. A.D. 400), who has already been noted as revising the eastern half of the map, suggests that “before the second half of the 4th century alterations were being made in the geographical work of Ptolemy” (p. 37).

66. Translation by O. A. W. Dilke. Two of several manuscripts containing Agathodaimon's note are the Paris MSS. Gr. 1401 and 1402 (see appendix 15.1).

67. Joseph Fischer, “Ptolemaeus und Agathodämon,” *Kaiserliche Akademie der Wissenschaften in Wien, Philosophisch-Historische Klasse*, 59 (1916): 3–25; Polaschek, “Ptolemaios” (note 57).

68. There is a striking example of the plotting of the network of parallels and meridians before the drawing of the map, in MS. Gr. 1402 (Paris, Bibliothèque Nationale): the network is complete, but not even half of the map is drawn. It is clear that the general map of the inhabited world required a particularly skillful draftsman; it was often executed after the regional maps and by a different specialist. Likewise, in the Urbinas Graecus 82 the map of the inhabited world is the only one lacking, though it was situated between two sets of existing maps.

69. Bagrow, “Origin,” 350 ff. (note 57), seems to ignore the fact that the whole of Greek scientific writing in Alexandria came to an end in the sixth century. For a more positive approach, see Polaschek, “Ptolemy's *Geography*,” 17–37 (note 65).

of the stemma, and one that had been provided with a comprehensive map by this Agathodaimon.

The first question, whether the maps that have come down to us were copied from Agathodaimon's world map (if it existed), raises different problems. It is doubtful, in fact, that such a direct link can be accepted, even were the existing world maps to be, as they probably are, very similar to that planned by Ptolemy and drawn by Agathodaimon or some other "technician." It can be argued that Ptolemy's intention was to provide anyone with a means of drawing a special map or, rather, two types of maps. He knew that one projection was easier to execute than the other and that mapmakers would choose the easier one. Planudes, who proved to be such an enthusiastic scholar and so interested in geography, seems exactly the kind of man to order the maps remade according to Ptolemy's various instructions. Hence the different mapping for the inhabited world in the Urbinas Graecus 82 and in the Seragliensis 57; hence too, perhaps, the different arrangement for the regional maps

in recension A and recension B. If such an interpretation is acceptable, and without prejudicing the suggestion that Ptolemy may also have made maps in his own day, it reinforces the conclusion that the Byzantine maps as a whole group are not so much the lineal descendants of some Ptolemaic prototype as the creation of scholars in a society also interested in maps, stimulated by the availability of Ptolemy's instructions for their manufacture.

By the thirteenth century, and by way of the Byzantine Empire, Ptolemy's *Geography* had thus rejoined the mainstream of cartographic history in Europe. A century later it was to be translated into Latin in Italy, where its importance was appreciated by scholars and where the many copies so characteristic of the Italian Renaissance would start to proliferate. The rediscovery of Ptolemy may be regarded as the seminal contribution of Byzantine scholarship to the long-term development of mapmaking.

APPENDIX 15.1 GREEK MANUSCRIPTS OF PTOLEMY'S *GEOGRAPHY*

Repository and Collection Number	Date	Description (number of leaves refers to whole manuscript)
Bologna, Ecclesiae S. Salvatoris 305 (present whereabouts unknown)	1528	(C) 33 × 23 cm, no maps
Chicago, Newberry Library, Ayer Collection, Ayer MS. 743	Fifteenth century	40 × 28 cm, 144 leaves
Copenhagen, Universitetsbiblioteket, Fragmentum Fabricianum Graecum 23	Thirteenth century	(F, C) Fragment with 3 maps, 56.5 × 42.5 cm
El Escorial, Real Biblioteca, Gr. Ω I.1	Sixteenth century	(M) 212 leaves
Florence, Biblioteca Medicea Laurenziana, Plut. 28.49	Fourteenth century	33.5 × 26.0 cm, 113 leaves, 64 maps and a world map; (C)
Florence, Biblioteca Medicea Laurenziana, Plut. 28.42	1445	34 × 27 cm, 64 maps 29 × 21 cm, 147 leaves
Florence, Biblioteca Medicea Laurenziana, Plut. 28.9	Fifteenth century	(C) 29 × 22 cm, 132 leaves, no maps
Florence, Biblioteca Medicea Laurenziana, Plut. 28.38	Fifteenth century	(M) 24 × 16 cm, 177 leaves
Florence, Biblioteca Medicea Laurenziana, Conv. Sopp. 626 (Abbatiae 2380)	Fifteenth century	(F) 59.5 × 44.0 cm, 104 leaves, 27 maps
Istanbul, Sultan's Library, Seragliensis 57	Thirteenth century	(F) Reference A10
Istanbul, Sultan's Library, Seragliensis 27	Late fourteenth/ early fifteenth century	(F) Reference B5; (C) 41 × 29 cm, 88 leaves, books 2.3–8
Leiden, Bibliotheek der Rijksuniversiteit, Voss. Gr. F. 1	Sixteenth century	54.5 × 42.5 cm, maps only
London, British Library, Burney Gr. 111	Late fourteenth/ early fifteenth century (F); fifteenth century (C)	43.1 × 30.4 cm, 115 leaves, 66 maps
London, British Library, Add. MS. 19391. Originally in Mount Athos, Vatopedi (see below)	Fifteenth century; fourteenth century (M)	(F) 34.5 × 25.5 cm, 8 leaves; (M) books 7–8, chap. 4

Repository and Collection Number	Date	Description (number of leaves refers to whole manuscript)
Milan, Biblioteca Ambrosiana, Codex D 527 inf.	Fourteenth or fifteenth century (F); thirteenth century (M)	(F) 40.3 × 28.5 cm, 101 leaves, 69 maps
Milan, Biblioteca Ambrosiana, Codex N 289	Fifteenth century (M); fifteenth and sixteenth centuries (C)	(M) 27 × 16 cm, books 1–7, chaps. 1 and 2
Mount Athos, Vatopedi 9 (655)	Fifteenth century (F); late thirteenth/early fourteenth century (C)	(F) Reference A2, 58 leaves, see London, British Library, Add. MS. 19391; some leaves also in Leningrad. Facsimile by V. Langlois, <i>Géographie de Ptolémée</i> (Paris, 1867). Probably a copy of Rome, Vatican, Urbinas Graecus 82
Oxford, Bodleian Library, 3376(46)-Qu. Catal. i(Greek), Cod. Seld. 41	Fourteenth century	(M) 274 leaves; 25 × 16 cm, books 1–8, chap. 28
Oxford, Bodleian Library, 3375(45)-Qu. Catal. i(Greek), Cod. Seld. 40	1482	176 leaves; (M) 29 × 18 cm
Oxford, Bodleian Library, Laud. 52	1568	(M) 32 × 21 cm, 83 leaves, books 1–7, chap. 5, and book 8, chaps. 1 and 2
Paris, Bibliothèque Nationale, MS. Gr. 2423	Thirteenth century	(M) 158 leaves; 25 × 16 cm, book 1, chaps. 7–24, book 2, chap. 6, beginning of book 3
Paris, Bibliothèque Nationale, MS. Gr. 2399	Thirteenth/fourteenth centuries	(M) 122 leaves; extracts from book 8
Paris, Bibliothèque Nationale, Gr. Suppl. 119	Fourteenth century	(M) 232 leaves; 20 × 14 cm
Paris, Bibliothèque Nationale, Coislin 337	Fourteenth/fifteenth centuries	(M) 278 leaves; 23 × 14 cm, books 1–8, chap. 28
Paris, Bibliothèque Nationale, MS. Gr. 1407	1438	(M) 215 leaves; 27 × 19 cm, parts of book 8
Paris, Bibliothèque Nationale, MS. Gr. 2027	1449	(M) 235 leaves; 20 × 14 cm, book 1, chap. 22 and part of chap. 23
Paris, Bibliothèque Nationale, MS. Gr. 1401	Fifteenth century	(F) 101 leaves; 58.8 × 43.7 cm, 27 maps
Paris, Bibliothèque Nationale, MS. Gr. 1402	Fifteenth century	(F) 72 leaves, 59.3 × 44.5 cm, 5 unfinished maps; (M) books 1–7 and chapters of book 8
Paris, Bibliothèque Nationale, MS. Gr. 1403	Fifteenth century	(M) 225 leaves; 28 × 19 cm, books 1–8, chap. 27
Paris, Bibliothèque Nationale, MS. Gr. 1404	Fifteenth century	175 leaves; 30 × 22 cm, books 1–7, chap. 5
Paris, Bibliothèque Nationale Coislin 173	Fifteenth century	311 leaves, books 1, 2, and 8
Paris, Bibliothèque Nationale, Gr. Suppl. 673	Fifteenth century	28 leaves; fragments of books 1 and 7
Paris, Bibliothèque Nationale, MS. Gr. 1411	Fifteenth or sixteenth century	(M) 585 leaves, 20 × 13 cm, copy of MS. Gr. 1407
Rome, Biblioteca Apostolica Vaticana, Vat. Gr. 191	Late twelfth or early thirteenth century	23.7 × 36.5 cm, 397 leaves
Rome, Biblioteca Apostolica Vaticana, Urbinas Graecus 82	Thirteenth century; ca. twelfth century (F); eleventh century (C)	(F) 57.5 × 41.8 cm, 111 leaves, 27 maps; facsimile by J. Fischer
Rome, Biblioteca Apostolica Vaticana, Vat. Gr. 177	Thirteenth century; fourteenth century (C)	24 × 16 cm, 240 leaves; (M) books 1–7, chap. 4, and parts of book 8
Rome, Biblioteca Apostolica Vaticana, Vat. Gr. 178	Fourteenth century	18.3 × 12.5 cm, 216 leaves; (M) books 1–7, chap. 4, and parts of book 8
Rome, Biblioteca Apostolica Vaticana, Vat. Gr. 176	Fourteenth century	27.0 × 17.3 cm, 193 leaves; (M) books 1–7, chap. 5, book 8, chaps. 1 and 2

APPENDIX 15.1—*continued*

Repository and Collection Number	Date	Description (number of leaves refers to whole manuscript)
Rome, Biblioteca Apostolica Vaticana, Vat. Gr. 193	Early fifteenth century	29.2 × 20.0 cm, 181 leaves; (M) (M) books 1–2.1, chap. 5, book 8, chaps. 1 and 2
Rome, Biblioteca Apostolica Vaticana, Pal. Gr. 388	Early fifteenth century	(M) 36 × 24 cm, 280 leaves
Rome, Biblioteca Apostolica Vaticana, Barberinianus 163	Fifteenth century	24.7 × 15.6 cm, 233 pages
Rome, Biblioteca Apostolica Vaticana, Barberinianus 128	Sixteenth century	(M) 19 × 15 cm
Rome, Biblioteca Apostolica Vaticana, Pal. Gr. 261	Fifteenth century	[Excerpta ex initio Ptolemaei Geographiae]
Rome, Biblioteca Apostolica Vaticana, Urbinas Graecus 83	Fifteenth century	42 × 29 cm, 118 leaves (C) 65 maps; (F) 69 maps; copy of Milan, Biblioteca Ambrosiana, Codex D 527 inf.
Rome, Biblioteca Apostolica Vaticana, Pal. Gr. 314	Late fifteenth century	28 × 19 cm, 224 leaves, books 1–8, chap. 29; no maps
Rome, Biblioteca Apostolica Vaticana, Christinae Reginae 82	Sixteenth century	(M) 22 × 22 cm, 166 leaves, no maps
Rome, San Gregorio Magno al Celio, 15 (present whereabouts unknown)	Fifteenth century	(M) 40 × 28 cm
Venice, Biblioteca Nazionale Marciana, Gr. 516	Fifteenth century (F); fourteenth century (C)	(F) 33 × 22 cm, 138 leaves, 24 maps; (C) 30 × 21 cm, 208 leaves, 22 maps and 2 half maps
Venice, Biblioteca Nazionale Marciana, Gr. 103	Fifteenth century	(M) 20 × 15 cm, book 3, chap. 14
Venice, Biblioteca Nazionale Marciana, Gr. 388	Fifteenth century	(F) 59.0 × 44.2 cm, 101 leaves, 27 maps
Vienna, Österreichische Nationalbibliothek, Vindobonensis historicus Graecus	1454	(F) 59.5 × 44.0 cm, 99 leaves, 27 maps

Based on Douglas W. Marshall, "A List of Manuscript Editions of Ptolemy's *Geographia*," *Bulletin of the Geography and Map Division, Special Libraries Association* 87 (1972): 17–38.

Additional sources:

(C) = Otto Cuntz, ed., *Die Geographie des Ptolemaeus: Galliae Germania, Raetia, Noricum, Pannoniae, Illyricum, Italia* (Berlin: Weidmann, 1923).

(F) = Joseph Fischer, ed., *Claudii Ptolemaei Geographiae Codex Urbinas Graecus* 82, 2 vols. in 4, Codices e Vaticanus Selecti Quam Simillime Expressi, vol. 19 (Leiden: E. J. Brill; Leipzig: O. Harrassowitz, 1932).

(M) = Karl Müller, "Rapports sur les manuscrits de la géographie de Ptolémée," *Archives des Missions Scientifiques et littéraires*, 2d ser., 4 (1867): 279–98.

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