
Fra Mauro

The Debate on the Map

One of the great monuments of the late Middle Ages reposes in splendor at the Biblioteca Marciana in Venice. Nearly six feet in diameter, painted on parchment glued to wood panels, it is the world map of Fra Mauro. The circular map is mounted in a heavy, square frame hanging in its own room and is usually covered by a curtain to protect it from the light. When the curtain is drawn aside, one sees a rich abundance of color and detail: ships sailing on seas rippled with blue and white, innumerable tiny castles mounted on hills, rivers winding throughout the land, irregularly shaped islands scattered in the sea. In addition to thousands of place-names, the map is covered with two hundred descriptive texts, sometimes mounted on scrolls that are pasted onto the surface. These not only give further geographical information but also present the debate about geography which was raging in fifteenth-century Europe (fig. 6.1).¹

The usual theory is that the original map was commissioned by the king of Portugal shortly before 1450. Last seen in the royal monastery of Alcobaça in the seventeenth century, it is now lost, perhaps a victim to the great earthquake of 1755. The map in Venice has been considered as a copy made for “questa illustrissima signoria,” the Republic of Venice, and completed in 1459. Recent discovery of relevant documents in Venetian archives suggests that these two events should be reversed, the first map being made for Venice about 1448–53, and a copy produced for Portugal between 1457 and 1459.² The map we have today is written in the Venetian dialect of Italian; we presume the Portuguese version was translated into Latin. The maps were produced at Fra Mauro’s monastery of San Michele di Murano, a house of the Camaldolensian order. Its establishment in Florence was Santa Maria degli Angeli, which the reader may remember was the site of almost daily gatherings of humanists in the mid-fifteenth century, often for the purpose of studying geography.³ We do not know

if Fra Mauro ever traveled to Florence, but he did spend some time at another monastery, San Michele al Leme in Istria in the northeast Adriatic, where he made a map of the monastic estates. This map survives in a seventeenth-century copy. In 1444 he was on a commission charged with changing the course of the Brenta River, which flowed into the Venetian lagoon. Both of these projects show a practical approach to the use of maps. Another map attributed to Fra Mauro is an extended sea chart, covering the world most familiar to Europeans, from the Caspian Sea in the east to the Atlantic islands in the west, and as far south as the northern part of the Persian Gulf and Red Sea. This map has a number of legends identical to those used on Fra Mauro's world map, and Almagià has proposed that it was a copy Fra Mauro made of a Portuguese chart supplied by the royal government and used as a source for his world map.⁴

Fra Mauro was dead by October 1459, when he was honored with a medalion bearing his profile and the inscription "Frater Maurus S. Michaelis Moramensis de Venetiis Ordinis Camaldulensis Chosmographus Incomparabilis."⁵ The idea of a cloistered monk becoming one of history's greatest cartographers recently caught the fancy of a novelist with more imagination than historical sense, who wrote a fantasy called *A Mapmaker's Dream: The Meditations of Fra Mauro, Cartographer to the Court of Venice*. He puts Fra Mauro in the sixteenth rather than the fifteenth century, thereby skewing almost everything important about the cartographer's work, but his image of the monk interviewing travelers and seafarers about the world outside (based on a fictional journal) has a certain appeal.⁶ In actuality, Fra Mauro had a well-traveled collaborator on his project, Andrea Bianco, who had sailed a good part of the Western world with the Venetian fleet and already had several important maps to his credit. (See the introduction.) The third collaborator, Francesco da Cherso, was apparently a painter.

A Traditional Mappamundi?

The map itself is circular, showing the three traditional continents surrounded by the ocean. Compared to the classic mappamundi, their shapes are more irregular, the coastlines are indented, and the seas have opened up, particularly in the southeastern part, to show an Indian Ocean open to navigation and filled with many islands. As we have already seen, the mappamundi form began to alter in the early fourteenth century, when Pietro Vesconte included elements from the marine charts and altered the outline of the world with an open Indian Ocean flowing into the thin band of ocean which formerly surrounded the inhabited world. Like Vesconte, Fra Mauro has incorporated the geographical

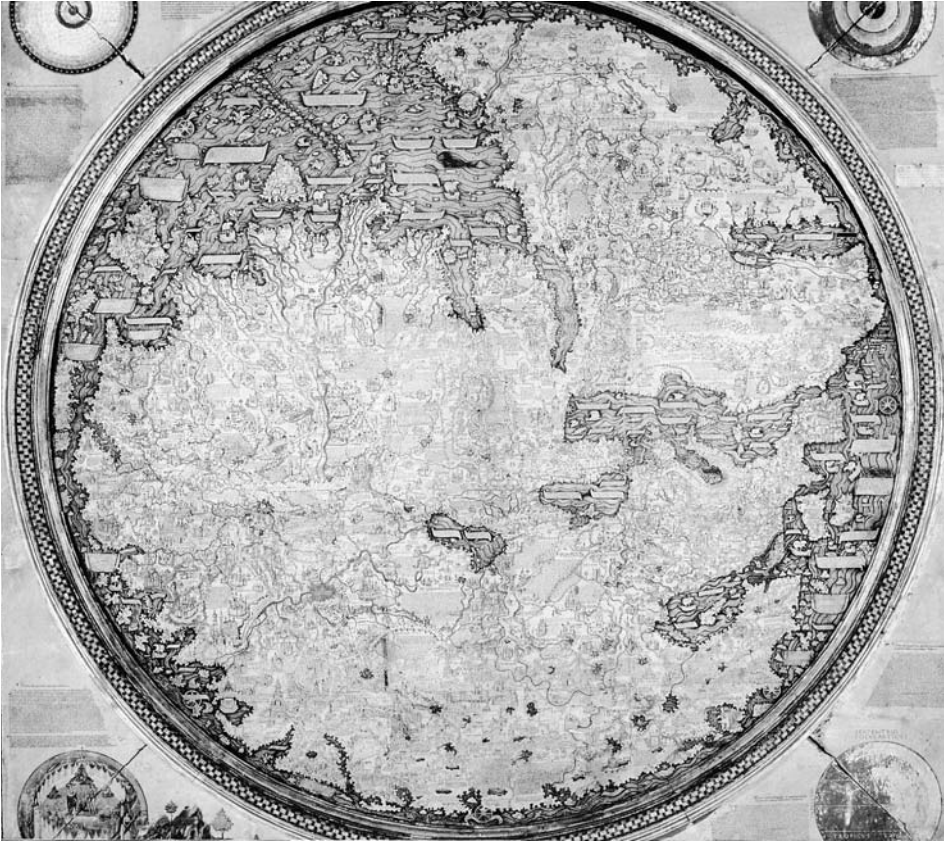


Figure 6.1. World map of Fra Mauro / Andrea Bianco, c. 1450 (Venice, Biblioteca Nazionale Marciana. 1.96×1.93 m / $6' 6'' \times 6' 5''$). The world map of Fra Mauro is oriented with south at the top and features an open Indian Ocean and a circumnavigable Africa. The Mediterranean, Black Sea, and Atlantic coasts are influenced by the marine chart. The Scandinavian peninsula is at the lower right, but there is no Greenland. Courtesy of the Biblioteca Nazionale Marciana.

forms of the sea chart in Europe, western Asia, and North Africa. There are no rhumb lines drawn on the map but around the perimeter are medallions for the eight winds of the sea charts (*griego*, *maistro*, *auster*, etc.). There is also a wind rose, unlabelled and half buried beneath the land, in the eastern Mediterranean. The pictures and legends evoke the encyclopedic tradition of the great world maps of the thirteenth century.

Outside the frame of the map in each corner is a circular diagram surrounded by a discussion of related cosmographical subjects, a characteristic of the *map-paemundi*, which liked to put the terrestrial realm into the larger context of

the whole universe. In the upper left-hand corner, there is a depiction of the spheres that surround the centrally placed earth, as well as the four elements (air, fire, water, earth). The text presents the views of various authorities on the total number of heavens beyond the obvious eight (sun, moon, five planets, stars) and tries to reconcile these with the system of the four spheres of the elements. It concludes that, beginning with the sphere of the moon, there are ten spheres, counting the empyrean, “chome apar qui ne la presente pictura” (as the picture here shows). Nearby are given the diameters of the planets and the distances from one sphere to another (e.g., 73 million miles from the surface of the earth to the eighth sphere, that of the fixed stars.) In the top right-hand corner is a diagram of the moon’s orbit around the earth, with an accompanying text describing the lunar influence on the tides. Another paragraph explains how, by the providence of God, part of the earth is raised above the water, so that air-breathing creatures can live on it. This was an important issue in the later Middle Ages as scientists struggled with the Aristotelian concept that the sphere of the earth was surrounded by the sphere of water. If so, how could any part of the earth be above water and thus habitable? Fra Mauro argues that dry land is lighter and more porous than the land beneath the sea and so can rise above it. This question was important for exploration and to reconcile new discoveries of land with cosmic theory. This section concludes with a discussion of the force of gravity, as the “natural appetite” of earthly things. In the lower right-hand corner is a depiction of the five zones of the earth. The texts above and to the side discuss the question of the habitability of the nontemperate zones and the relative quantities of the four elements in the sublunar realm, using the techniques of Euclidean geometry. To support these small dissertations, the author calls upon “natural reason.”

Finally, in the lower left is a little painting of Adam and Eve being instructed by God within the walled garden of Eden.⁷ The Garden of Eden, located in the east, had been a standard feature of the *mappaemundi*, but its location had become an increasing problem for fifteenth-century mapmakers, as further exploration had rendered the East less vague. On the Genoese map of 1457, the mapmaker noted that some had put paradise in Africa, following the theory that the climate around the equator was the most “equable” and therefore suitable for a garden of delights.⁸ On Fra Mauro’s map it has been displaced from the map proper to the northeast corner, outside the frame. At the gate stands the angel with the flaming sword, about to bar humanity from ever entering the garden again, and at his feet flow the four rivers. The text, “Del sito del paradiso terrestre,” tells us that paradise is not only a spiritual place but also, according to Saint Augustine’s authoritative views on the subject, a real physical place on

earth. It is in the east but remote from human habitation and knowledge. The four rivers that flow from it form the principal hydrography of the world, being the source of four of the greatest rivers of all. Fra Mauro's text is thoroughly orthodox, but it is contradicted, or at least challenged, by the picture he presents. Eden is in the east to be sure but outside the map entirely. The four rivers flow out into a small landscape nearby and disappear, with no apparent connection to the great rivers of the world. On the map itself the source of three of these rivers (the Ganges, Euphrates, and Tigris) is described as being in the mountain range that traverses Asia, while the source of the Nile is pondered in a number of different texts.⁹ What appears to be a border of water surrounds this vignette, so perhaps it is meant to be an island.

Alessandro Scafi argues that the placement of the Garden of Eden here is "thoroughly orthodox," a brilliant solution to the problem of separation and connection with the world, balancing "revealed truth" with observed reality.¹⁰ Angelo Cattaneo suggests that Fra Mauro shows the garden as part of the "cosmographic" space but not the "chorographic" space of the map, that is, the known and inhabited regions of the earth.¹¹ It is still hard to ignore its position outside the frame of the map. This placement, despite the conventional text, is a radical change, a precursor to the boxed Garden of Eden attached to Bible maps from the sixteenth century on. As the adventurous Europeans extended their knowledge of the world in the mid-fifteenth century, the idea of a place on earth not accessible to human travelers was less acceptable than it had been in the past.

Looking at the map itself, we find other traditional features such as Jerusalem, Gog and Magog, Noah's Ark, the pyramids, and the adventures of Alexander the Great. With many pictures, long legends, beautiful colors, and lavish use of gold paint, this map seems securely located in the world of the mappamundi. The texts themselves, however, destroy this sense of security. The centrality of Jerusalem, for example, a staple of the later mappaemundi, causes a problem for our Venetian cartographer. The great expanse of Asia has pushed the holy city slightly to the west, and Fra Mauro explains this in a bit of tortured prose: "Jerusalem is in the middle of the inhabited world according to the latitude of the inhabited world, although according to longitude it is too far west. But because the western part, Europe, is more heavily populated, it is still in the middle according to longitude, not considering the physical space of the earth but the number of its inhabitants."¹² The physical center of the circular map is east of Babylon in Persia and appears to have no symbolic significance. In the conflict between symbolic meaning and the accurate representation of space, the latter has won out.

Gog and Magog, those enclosed peoples in the northeast who will burst forth to assist the Antichrist at the end of days, are the subject of several texts. Fra Mauro puts together the various conflicting traditions about these folk, who were said to live in various places, one being the Caspian Mountains, or Iron Gate, east of the Black Sea. Fra Mauro thinks this cannot be true, for in his day the area was frequented by Western travelers and no trace of the mysterious enclosed people could be discovered. “In truth,” he says disgustingly, “this error is put forth by those who like to draw on the Holy Scripture to support their own sentiments.”¹⁵ Moving to northeast Asia, in the land of Tenduch, he echoes Marco Polo, who was informed that the correct names of these tribes was “Ung and Mongul,” and that they live “at the ends of the earth, between the northeast and north winds, and are surrounded by very rugged mountains.” As to whether they were shut up by Alexander the Great, Fra Mauro doubts that Alexander got that far and seems to think the enclosure was a more natural phenomenon, being that of “rugged mountains and the ocean sea.” After having read all this, however, the observer cannot fail to note a tidily locked gate at the southern end of the rock-walled enclosure.¹⁴ Here the picture is conventional, while the text is not (fig. 6.2).

As on the *mappaemundi*, the three continents of the known world are shown, their forms somewhat altered by the mapping of the sea charts, and Europe is distinctly reduced in size in relation to the other two. More surprising than these physical modifications are the comments the mapmaker posts about the divisions between the continents. “The River Don,” he says, “rises in Russia and not in the Rhiphaean Mountains, but at a great distance from them . . . And anyone who wishes to deny this should know that I have information from trustworthy persons who have seen this with their own eyes. One can in fact say that this river does not make a good boundary between Europe and Asia, first because it traverses a great part of Europe, second because of its form like a Roman V, third because its source is not in the place where the written sources have put it.”¹⁵ He thinks the river Edil or Volga, long confused with the Don, is a better candidate for the boundary, “because its course is more direct and has a better form and rises in the place which is the origin of that division.”¹⁶

As for the division between Asia and Africa, he writes, “Because I didn’t have space in Europe to give Ptolemy’s true opinion about the division of Africa from Asia, I say here that he seems to make two divisions. The first begins from the horn of Africa [la punta de Ethiopia] and goes along the coast of the Arabian gulf. Then he says, in order not to divide Egypt, he places it in Africa, and I agree.”¹⁷

His scattered comments on the topic are put in more compact form on the Borgia map in the Vatican:

About the division of the earth, that is to say, Asia, Africa and Europe, I have found among cosmographers and historians opinions more diverse than I can well say. As it is a rather interesting subject, I will review my opinions briefly here. The Ancients, among them Messala the orator, [Marcus Valerius Messalla Corvinus (64 BCE–13 CE); his works are lost] who wrote a genealogy of the family of Augustus, and Pomponius Mela and those who borrowed from him, affirm that the Nile separates Asia and Africa, and the Tanais, Europe and Asia. Among them Ptolemy affirms that Africa is separated from Asia by the mountain chains of Arabia, which are found beside Nubia and extend across Abyssinia as far as southern Ethiopia. Others express modern opinions, affirming that the delimitation of Africa by the Nile or by these mountains makes it too small, and say that Africa is best bounded by the Red Sea or by the Gulf of Arabia. Likewise, considering that the Edil (Volga), which flows into the Caspian Sea, flows more directly from the north than the Tanais, they judge that that river is a better boundary between Europe and Asia. This latter opinion seems more clear and convincing and requires much less tracing of imaginary lines than with those authors proposing the previous division.¹⁸

It is interesting that he should here refer to the division of the continents as the “tracing of imaginary lines.” He does not, however, do away with the concept of continents altogether but, by shifting the borders, makes them potentially unstable.

One dramatic change Fra Mauro makes to the mappamundi format is the orientation of his map to the south. Nearly all medieval world maps had been oriented to the east, with the garden of paradise at the top, even, in the case of the Hereford map, surmounted by Christ in glory. Fra Mauro has not only displaced Eden from its dominant position but has reoriented the map completely. This is generally thought to be the result of Arab influence, as many Arabic world maps were south oriented in the Middle Ages. Orientation seems not to have been such an important issue for Arabic culture, as we have found no real justification for southward orientation. For Europeans, however, it was important, and abandoning the east-on-top tradition with its important significations was a decisive and radical step.¹⁹

Another staple of the mappamundi is the engaging display of monsters, both beast and human, which exhibited the great variety of creation. On the Hereford mappamundi, they appear throughout Asia and Africa but are most concentrated on the southern rim of Africa. The Fra Mauro map is strangely devoid of animal or human figures, outside the Garden of Eden. One has to read the text to find references to a few imaginary creatures, such as the phoenix and the



Figure 6.2. Detail, northeast Asia. “Chataio” (Cathay) appears in the lower left above an elaborate monument labeled “the imperial sepulcher,” or tomb of the Grand Khan. At the bottom (center) is a gate enclosing a mountainous region where Gog and Magog were contained, “according to popular belief.” The Caspian Sea is to the right of center and a part of the Black Sea appears at the far right. Courtesy of the Biblioteca Nazionale Marciana.



dragon, as well as real but exotic ones, such as parrots, elephants, apes, and polar bears. Fra Mauro speculates in several places about the monsters traditionally described in maps and geographies and where they might be found:

Since there are many cosmographers and very learned men who write that in Africa, and especially in Mauritania, there are many monstrous men and animals, it is necessary to note my own opinion, not that I wish to contradict the authority of so many, but in order to say I have inquired with diligence into all the new information I could find in Africa for many years, beginning from Libya, Barbaria, and all of Mauritania from the river of Gold and from the seven mountains across from the country of the blacks outside the first climate and afterwards beginning from Binimagra, Maroch, Fessa, Siçilmensa and along the coast of the mountains and toward the west through Garamantia, Saramantia, Almaona, Benichileb, Cetoschamar and Dolcarmin and more toward the east through the kingdom of Goçam and toward the south and in Abassia and in their kingdoms, which are Barara, Saba, Hamara and further toward Nuba through the kingdom of Organa and the island of Meroe and through all these lands of Negroes, I have found not one person who could give me knowledge of what I have found written; wherefore not knowing any more that I can confirm, I leave to those who are curious to seek to understand such novelty.²⁰

He is not opposed to monsters on principle—just skeptical of rumors that are not substantiated by reliable reports. He refers to the secrets of nature, saying “the many things we know are but a small part of those which we do not know, and those which we know are little esteemed due to their familiarity, and those which are unfamiliar are not believed, and this happens because Nature exceeds the intellect.” He concludes that “therefore those who wish to understand must first believe.”²¹ Thus he uncritically records the existence of a seven-headed serpent in India, a dragon in Parthia with a miraculous healing stone embedded in its forehead, and an island in the Indian Ocean where metal objects are turned to gold.²² Sailors’ stories—the dark sea in the southeast from which no ship has ever returned, the fish in the northern ocean that can bite a boat in half—are also recounted.²³ But perhaps he has not included enough marvels. As for “those that desire miraculous things and other monstrosities, let them read Julius Solinus Polyhistor, Pomponius Mela, Saint Augustine, Albertus Magnus, Saint Thomas Aquinas in his book against curiosity. Also the ‘Metaure’ [Meteorology] of Aristotle and Pliny on the marvels of the world, and they will see that of a thousand things I have said scarcely one.”²⁴

Although Fra Mauro tries to work within the conventional format of the mappamundi, his words explode its certainties and leave questions to be re-

solved by future explorers and cartographers. The earth is reoriented to the south, paradise removed from the top of the map, and Jerusalem displaced from the center; the monster population is depleted, and the tripartite structure undermined. What remains of the traditional world picture? In the opinion of George Kish, "The world has not yet changed structurally, but a revolution (a de-centering) is already at work in the interior of the ancient structure."²⁵

Sources of the Map

Among Fra Mauro's sources we find the usual classical authors (Solinus, Macrobius, Martianus Capella), augmented by then recently recovered works by writers such as Pliny, Pomponius Mela, and, above all, Claudius Ptolemy. The Bible, with its rather puzzling observations on the structure and layout of the physical world, is helpfully interpreted by generations of scholastic philosophers from Augustine and Jerome to Isidore, Bede, Saint Thomas Aquinas, and Albertus Magnus, whose works are cited, particularly in the corner texts. Then there was the testimony of travelers, especially the seagoing Venetians and the Portuguese, who provided some of the material for the map. These folk Fra Mauro referred to with respect as "nautici," "homini degne di fede" (trustworthy men), or those who have "veduto ad occhio" (seen with their own eyes). Visual sources included traditional world maps and diagrams, nautical charts (a number of which were made in Venice), and the maps of Ptolemy's *Geography*. Andrea Bianco's solution had been to place these three map types side by side, but now, working with Fra Mauro, the daunting project was to incorporate them into a single image of the world.

Although Christ does not appear embracing the world, as he does on the Ebstorf map, the Christian religion is by no means banished from Fra Mauro's picture. The sites of the Old Testament, an elaborate shrine of the holy sepulcher in Jerusalem, and the places where the saints preached and/or were martyred can all be found, but there is a difference from how these sites had been represented in the past. First of all, the size of the holy land is greatly reduced, putting its small area in proportion with the scale of the rest of the world. Some medieval mapmakers had stretched the size of the holy land in order to accommodate all the places of interest, and Fra Mauro feels he has to apologize for omitting them: "Those who are knowledgeable would put here in Idumea, Palestine and Galilee things which I have not shown, such as the river Jordan, the sea of Tiberias, the Dead Sea and other places, because there was not enough room."²⁶ It is true that the place-names in "Palestina" are few and mostly modern, such as the cities along the coast, while we seek in vain for Bethlehem, Cana, Nazareth,

Hebron, and Mount Quarantana, where Jesus fasted. It is worth noting that the long explanatory inscription for Jerusalem takes up considerable space in the holy land where place-names could have been put. Beside the Red Sea, there is a brief notice of the crossing of the children of Israel, but, most unusual in a medieval map, the parted waters are not shown and the sea is not colored red. Noah's Ark is shown in Armenia, as a small house on a mountaintop, but the legend notes that these are the remains of the ark, according to "vulgar" opinion among the Armenians.²⁷ While religious sites continued to be important, they were firmly located in the past rather than the eternal present. A famous event happened here, but it was a long time ago. (In contrast, the *mappaemundi* gave a dizzying sense of all events occurring simultaneously: the waters of the Red Sea parting, Noah and his family peering out of the windows of the ark, the Tower of Babel still standing.) One exception is Fra Mauro's depiction of the city of Babylon, shown in all its glory, with a long legend telling of its enormous size and wealth. Citing Orosius, Fra Mauro observes that it is not only amazing that human power could build such a city but also that it could be (and was) destroyed. Inside the circle of the impressive walls we return to modern times with the inscription "Babilonia, or Baghdad." It is interesting that there is no Tower of Babel, a fixture on most medieval *mappaemundi*.

Secular history received the same treatment. Fifteenth-century Ptolemaic maps were burdened with the names of numerous tribes who long since had ceased to inhabit the designated part of the world—or indeed any part of the world—and medieval maps had frequently shown them, too. Fra Mauro's references are more current. Near the northern part of the border between Europe and Asia is a brief inscription: "From this [area of] Gothia came the Goths to Italy." A longer historical note near Scandinavia traces the course of the migration in greater, if somewhat fantastical, detail.²⁸ Ancient sources are quoted admiringly, but Fra Mauro has a particular problem with Ptolemy, who was cutting such a swath through the intellectual world of the mid-fifteenth century. The superiority of sea charts in many areas to Ptolemy's maps, the archaism of his nomenclature, and the impossibility of constructing a world map on a latitude/longitude structure without sufficient data were some of the problems Fra Mauro faced. "I do not wish to contradict Ptolemy by not following his cosmography," he writes, "for if I wished to respect as far as possible his meridians or parallels or degrees of the northern part of this sphere, I would have had to omit many provinces which Ptolemy never mentioned at the extremes of south and north latitude, said by him to be 'terra incognita,' because in his time they were not known."²⁹ In the far north, he says, "In his fourth map of Europe Ptolemy names this area 'Scandinaria' and says that it has 18 hours of daylight, which

is amazing to me in that all this part of Norway and Sweden was unknown to him.”⁵⁰ This comment, along with a dozen other critical remarks about Ptolemy, shows that Fra Mauro certainly had access to a Ptolemaic atlas and no doubt had studied it with some care.

The problem of ancient versus modern place-names was also an issue with more recent mapmakers. The old provinces of the Roman Empire had been retained on European maps for a millennium, long after those names had fallen out of everyday use. Fra Mauro announces, “In this work I have chosen by necessity to use modern and common names because truly if I had done otherwise few would have understood me except for some bookish type [qualche literato] who, even nowadays, cannot make himself use the names which are currently employed.”⁵¹ For example, in North Africa he writes that he is not going to use the three classical divisions of Mauritania (Cesarensis, Sitifensis, and Tingitana) because they are no longer in use today.⁵²

Voices of Experience

His most respected source was the skillful sailors (“i marinari esperti”), those who had seen with their own eyes.⁵³ Their testimony is repeatedly put up against antique authority, which comes off poorly. We know who some of his sources were, as he made good use of Marco Polo for place-names and legends in Cathay, and Nicolò de’ Conti for southeast Asia. Marco Polo’s adventures had been mapped in a mural at the doge’s palace, which was apparently still there in the 1450s. It was ordered to be repainted in 1459 and was destroyed by fire in 1483. (The map visible today was painted in the eighteenth century.) When Ramusio wrote his collection of “Navigations” in the sixteenth century, he averred that Fra Mauro used a map that Marco himself had made in Cathay and brought back with him, but no trace of such a map has ever been found.⁵⁴ The Catalan Atlas of 1375 was the first surviving map to make use of Marco Polo’s information from the East, and Fra Mauro does the same. He notes that this area was “terra incognita” to Ptolemy and repeats Marco Polo’s fulsome description of the wonders of the great city of Cansay (Quinsay)—that it is built upon a lake like Venice but is much larger. He goes off into a flurry of statistics, citing its twelve thousand bridges, its circumference of one hundred miles, and an estimate of its population (900,000) based on the number of hearths, and he concludes with a tribute to its great magnificence and order.⁵⁵ He lists cities and provinces, mentions the great size of the Yangtze (Quian) River, and refers to the trade goods to be found there, such as rhubarb, ginger, silk, and porcelain.

While he may not have had Marco Polo’s map, Fra Mauro does seem to have

had a Portuguese chart with the most up-to-date information on their voyages. He describes his source as a “new map” with “new names for rivers, gulfs, capes and ports, of which I have had a copy.”⁵⁶ The newest names appear on the west coast of Africa, where Cavo Rosso and Cavo Verde indicate that the mapmaker had information from the voyage of 1445. Venice itself was full of merchant travelers coming and going from exotic places, which is reflected on the map by many references to trade routes and trade goods—spices, silk, precious stones, gold, and silver. The business of making nautical charts flourished in Venice as well. The most unusual bit of information on Fra Mauro’s map probably involves the Catalan ship which, in his own day, went off course in the far north and lost its cargo.⁵⁷

Fra Mauro’s connections with the intellectual center of Florence may have provided him with more information. For example, he mentions the conquests of the king of Ethiopia in central Africa in 1430, which may have come to him from those who interviewed the Ethiopian delegation at the Council of Florence.⁵⁸ In East Africa is a legend explaining that, in mapping this area “virtually unknown to the ancients,” he had consulted with monks native to the region, who “with their own hands had drawn all these provinces and cities and rivers and mountains with their names” (fig. 6.3).⁵⁹ He makes one other reference to these informants. “The Abassians [Abyssinians] say that they have more territory above the source of the Nile than below, that is, toward us. And they say that they have rivers greater than the Nile, which among us has such a reputation for its great size.” He goes on to say that the Nile is increased by the many rivers that flow into it and the rains that fall at the time of their winter, that is, May and June.⁴⁰

On the complex and vexed question of the configuration of the Indian Ocean, the cartographer marshaled the forces on all sides. “Some authorities,” he notes, “write that the Indian Ocean is closed like a lake and that the Ocean does not enter it, but Solinus says that the Indian Ocean is navigable from the southern part to the southwest, and I affirm that some ships have gone out and come back by that route. Pliny also confirms this when he says that in his day two ships went out from the Arabian Sea, according to the account which they left, and, loaded up with spices, finally disembarked in Spain and at Gibraltar. This is also confirmed by Facio [Fazio degli Uberti, author of the geographic poem, *Il Dittamondo*] and by those who have experienced this journey, men of great prudence, in agreement with those authorities.”⁴¹ It is not clear exactly who these “men of great prudence” were, but he seems to be referring to contemporaries, specifically “those whom the king of Portugal sent with his caravels to seek out and see with their own eyes. These are said to have gone more than 2000 miles southwest beyond the strait of Gibraltar.”⁴²

Even more intriguing is his reference to a “ship of India,” which he calls a *çoncho*, or junk. This vessel had sailed around Africa from east to west in the year 1420, traveling for forty days “beyond the cape of Soffala and the Verde islands to the southwest and west, and by the judgment of their astrologers [astronomers] which guided them they went about 2000 miles.”⁴⁵ Returning to the “Cape of Diab,” the southern tip of Africa, they went ashore and found the giant egg of an even larger bird, one capable of easily lifting an elephant. Gavin Menzies is convinced that the “ship of India” was one of the great Chinese fleet of 1421 and that the tale of its misadventure was brought back to Venice by Nicolò de’ Conti, who had encountered the fleet when it passed through India. Conti, like Marco Polo, does describe the huge junks with five or more masts, solid construction, and great carrying capacity but does not say anything about the fleet.⁴⁴ This would be an interesting speculation if he went no farther, but unfortunately Menzies identifies the bird as an ostrich, when it is clearly the Rukh of the ancient sailors’ tale. Fra Mauro even refers to it as a “chrocho,” and says it was “most rapid in its flight.” Menzies has the fleet going on to the Cape Verde Islands (“the green islands”), America, and the Straits of Magellan, and discovering Australia and Antarctica before returning home.⁴⁵ It seems possible that one of the ships may have gone astray, as Fra Mauro reports, or that it could have been any of the many traffickers in the Indian Ocean who ran into unpleasant weather. That Fra Mauro shows the tip of Africa, albeit divided from the rest of the continent by a thin band of water, and insists that it is circumnavigible, raises irresistible speculation. How did he know this? Or was it a lucky guess?

Other Maps as Sources

Fra Mauro makes sparing references to other maps, but he must have seen a number of them in Venice, in addition to the maps of his collaborator Andrea Bianco. Fortunately, we have preserved in the Vatican the chart that may have been a copy of the source map Fra Mauro says the Portuguese supplied.⁴⁶ He apparently had access to the maps of Ptolemy, as Bianco had when he produced his atlas in 1436. The very form and ambition of the Mauro/Bianco map, however, links it to the monumental maps that had had their heyday several centuries earlier. The impulse to make such maps had not vanished. In the mid-fifteenth century, Giovanni Leardo, working in Venice, made several mappaemundi of the traditional type: east at the top, Jerusalem at the center, the inaccessible frigid and torrid zones plainly marked. Other world maps Fra Mauro might have seen were those of Paolino Minorita, Marino Sanudo, and Pietro Vesconte.

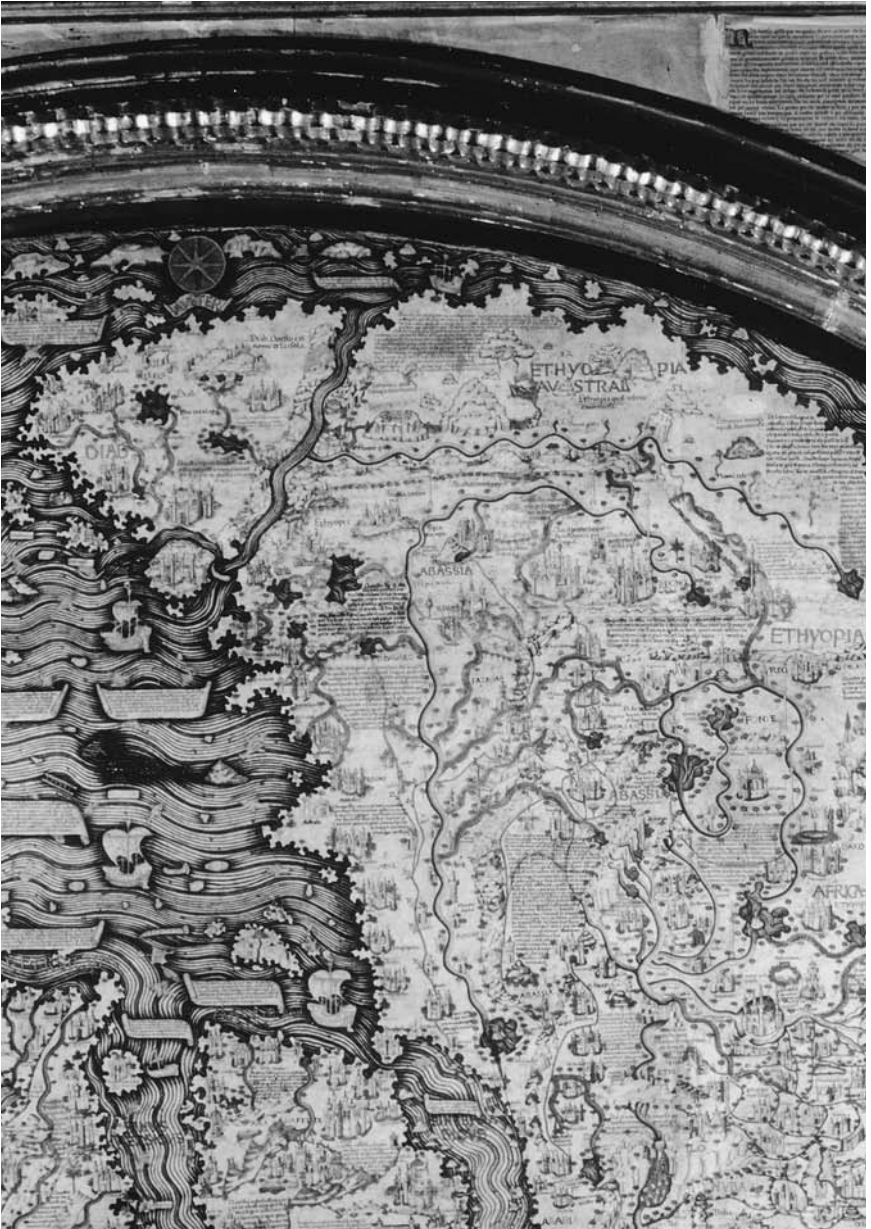
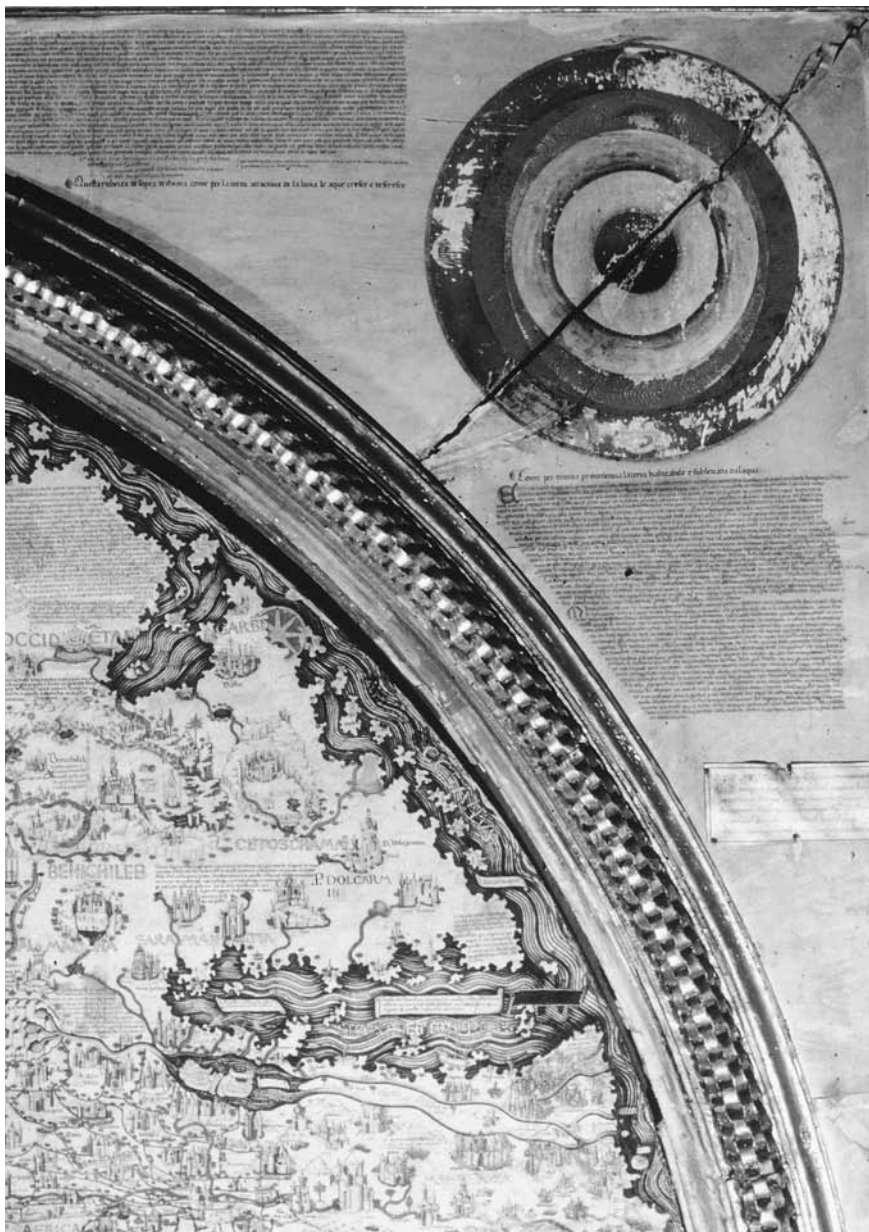


Figure 6.3. Detail, southern Africa. Fra Mauro's depiction of Africa shows it to be circumnavigable. On the west coast is a gulf similar to the later discovered Gulf of Guinea, while the southern tip of the continent is divided from the whole by a narrow river. The Red Sea may be seen at the lower left. (Remember south is at the top.) Courtesy of the Biblioteca Nazionale Marciana.



Sanudo made sure that numerous copies of his maps survived and, according to his will, had put several of them into monasteries in Venice. The world map in this group was one of the very first to incorporate the geographical forms and structure of the sea charts.

Another possible source of inspiration was the Catalan school of cartography. Like Fra Mauro, the Catalans melded the sea chart with a complex depiction of the world as a whole, embellished with extensive details on land and colorful images. One of the most ambitious productions of this school, the Catalan world map of Modena, is dated to about 1450 and was made for the Este family of Ferrara. Fra Mauro might have seen this map or one like it (fig. 7.8). The Modena map, unlike the Catalan Atlas of 1375, was circular like Fra Mauro's and the ocean was painted in a similar rippled pattern of blue and white. While the shape of South Africa on the Modena map is quite different, it is divided by a canal as it is on the Venetian map.

Image of Africa

The configuration of Africa on the Fra Mauro map is not completely out of line with that of other mid-fifteenth century maps, which show some kind of extension to the south and east. Ptolemy, of course, had joined Asia and Africa by means of a long southern shore to the Indian Ocean. Fra Mauro's image startles because it seems so close to the modern image, just curved around to the east to accommodate the circular frame. The indentation on the west coast looks remarkably like the Gulf of Guinea, which is puzzling because the Portuguese had not yet gotten that far. Labeled Sinus Ethiopicus, it is more likely that it is the eastward-bearing gulf described in the *Libro de Conoscimiento* and sought by the Portuguese as the body of water which would bring them within a few days' journey of the fabled kingdom of Prester John.⁴⁷ It was also believed to be the entrance to the River of Gold and is so marked on the map.⁴⁸ Near this point is a notice: "I have heard many times from many people that here there is a column with a pointing hand and an inscription saying that one should go no further. I wish the Portuguese who sail this sea would say if what I have heard is true, because I do not dare to affirm it."⁴⁹ This mysterious column and notice ("ne plus ultra") had once been located at the Straits of Gibraltar but now seemed to be moving rapidly southward down the coast.

The southern portion of the African continent, the Cape of Diab, is shown separated from the rest by a narrow river. It has been speculated that this is the island of Madagascar, knowledge of which may have come from Arab sources. The legend here informs us that the passage separating Diab from Abassia (Ab-

yssinia) is bordered on both sides by very high mountains and huge trees, and so is dark and dangerous for ships.⁵⁰ On the east coast of Africa we find several names of Arabic origin: Xengibar (Zanzibar), Soffala, Chelue (Kilwa), and Maabase (Mombasa).⁵¹

Africa also contains a number of features that date back many centuries. The name Ethiopia appears at least seven times, reminding us that this was almost a synonym for southern Africa (see fig. 6.3). In the far south was the powerful and wealthy kingdom of Benichileb, where the inhabitants had the faces of dogs but had never been conquered, not even by the Romans.⁵² Somewhere in central Africa dwelt Prester John, with 120 kingdoms under his dominion, speaking sixty different languages. He is further identified as the “King of Abassia,” ruling an almost infinite number of people. He goes into battle with a force of a million men, some of whom fight naked while others wear armor made of crocodile skins.⁵³ It is interesting that there is no reference to his famous piety and virtue.

Like other mapmakers, Fra Mauro is concerned with the course of the Nile and provides a number of inscriptions speculating particularly on its source and course. From the Ethiopians he may have gotten a description of its originating in a huge mountain, out of which the river emerges to form three lakes and then to flow northward to lower Egypt. This configuration also appears on Arabic maps and in Ptolemy’s *Geography*. Still, he cannot let go of the idea that the great river also flows into West Africa because, he says, the same animals are found in both places.⁵⁴ After giving various information in different legends, which are not quite consistent, Fra Mauro exclaims, “I believe that many marvel at where I have placed the source of the Nile, but surely if they be moved by reason and desire to understand, they will see how much I have done and with more diligence than I can say here, and that I have been motivated to prove this by the clearest evidence I had.”⁵⁵

On the West African coast appears a series of names marking the points attained by the Portuguese voyages, as far as Cape Rosso, just south of the River Gambia at 12° 20” north, reached by Dinis Dias in 1445. Already the sailors had begun to note the position of the polestar low on the horizon. Fra Mauro puts this information at Cape Verde and remarks that the same is true in the same latitudes of India near the Cape of Chomari (Cape Comorin). Here “one loses the north star or the arctic pole, and this is affirmed by all.”⁵⁶ The Venetian Alvise Cadamosto, sailing in African waters in a Portuguese ship in the mid-1450s, sighted the southern cross and drew an outline of this constellation in his notebook. Fra Mauro’s map is dated too early to include information from Cadamosto, who was traveling in Africa in 1455–56, returning to Venice only

in the early 1460s. There is one peculiar reference in Africa, however, which is identical with his report. It is a story of silent barter, of salt for gold in Africa, and includes the strange and unlikely custom of the natives “with the big lips” carrying salt in their lips, which “keeps them from putrefying.” While the tale of silent barter is an ancient one, dating back at least to Herodotus, and has been said to occur in many parts of the world, this odd detail is unique to Cadamosto—and Fra Mauro.⁵⁷

The Canary Islands, some of which were settled by Castile beginning in the 1420s, are named on the map with the comment that some have thought them to be the Fortunate Islands. Madeira, “rediscovered” by the Portuguese in 1425 and subsequently settled, although the Azores, discovered in 1427, are not. The discovery dates of these Atlantic islands are unclear, and it is puzzling that they appear on sea charts during the fourteenth century and in the *Libro de Conoscimiento*, before their discovery was otherwise recorded.⁵⁸

Although his collaborator and many of his informants were sailors, Fra Mauro gives us relatively little information about navigational techniques. He is more likely to speak about divergence from common Mediterranean sailing practices than to tell us about something that was perhaps so commonly known that it did not seem worth mentioning. In the Baltic Sea (“an area completely unknown to Ptolemy”), he observes that they navigate “without chart or compass but only with lead and line.”⁵⁹ In the Indian Ocean, they also navigate without a compass, “but they carry an astrologer [astronomer] on board who perches up above with the astrolabe in his hand gives orders how to sail.”⁶⁰ One deduces that the audience for the map would already be familiar with compass-and-chart sailing in mid-fifteenth-century Europe.

Indian Ocean

The Indian Ocean on the Mauro/Bianco map not only is open to navigation east and west but also is crowded with an array of islands more clearly identified than those in the Catalan Atlas of 1375. Taprobana was the one island that had dominated older maps, and conventional geographical accounts, as well as Ptolemy’s atlas, had made it too large. Marco Polo speculated that it had shrunk in recent times due to the rising of the sea.⁶¹ But which of these depicted islands is the real Taprobana? Fra Mauro writes, “Note that Ptolemy, meaning to describe Taprobana, only described Saylam [Ceylon].”⁶² Instead, Fra Mauro identifies the large island of Sumatra, farther east, as the true Taprobana. This confusion was to persist for several hundred years, understandable in view of the multitude of islands in this sea. The map takes Marco Polo’s figure of 12,700, and

adds that “in this sea are many islands of which one cannot make special note because there is no space, but all are inhabited and very fertile in diverse and precious spices and other novelties and are most rich in gold and silver.”⁶⁵ Japan (Ciampangu) appears for the first time on any European map, even though Marco Polo had alerted the west to its existence 150 years before. We also find two Javas, major (possibly Borneo) and minor (Java); the island of Colombo (apparently an error for Quilon on the southwestern coast of India); Bandan, which was the source of cloves; and Sondai, where nutmeg grows. The polyglot nature of the Indian Ocean meant that most places had multiple names in various languages with transliterations and translations. Today it is still impossible to identify absolutely some of the islands and cities shown. Fra Mauro’s sources on this area were probably Arabic, though perhaps filtered through Venetian merchants.⁶⁴

One of these merchants was Nicolò de’ Conti, who had spent decades rambling about southeast Asia and among the islands. His account of his travels was incorporated into Poggio Bracciolini’s book on the vagaries of fortune. It is difficult to be specific about Fra Mauro’s use of Conti, as many of Conti’s observations were similar to those made by others, and inconsistencies of nomenclature and spelling make identification chancy. Conti’s travels in the Indian Ocean follow Marco Polo’s, and many of Conti’s remarks follow those of his great predecessor. He did, however, travel further inland, up the Ganges River (he says for fifteen days) and to the great kingdom of Vijayanagar in central India (“300 miles from the sea”). Both he and Fra Mauro called this kingdom Bisenegal, and Conti comments on its great wealth and size and goes into detail about its elaborate religious ceremonies. Here one finds one of several of his descriptions of the custom of sati, the burning of a living wife on the funeral pyre of her husband.⁶⁵ Details that Fra Mauro may have taken from him include the description of the city walls built into the surrounding mountains and the estimate of the king’s fighting force at 900,000 men.⁶⁶ Conti also gives specific information about the spices to be found on the islands of Sondai (Sunda) and Batavia (Banda), nutmeg and cloves, respectively, not to mention beautifully colored parrots who can talk exactly like human beings. Fra Mauro repeats the information about the spices and the parrots on the map.⁶⁷ We may assume that Fra Mauro thought Conti a reliable source because he soberly reports the presence in India of “a seven-headed serpent seven feet long,” which Conti had described.⁶⁸ Conti’s glowing account of the abundant resources and numerous people of India finds an echo on the map, where the mapmaker waxes eloquent about the “cities, castles, innumerable variety of people, conditions, customs, very powerful kings, great number of elephants” as well as “precious fruits, woods, grasses and roots,” pre-

ciuous stones, and “so many other things that I cannot possibly list them all.”⁶⁹

The Indian Ocean was a good place for marvels—not only rare spices, precious stones, aromatic woods, exotic fruits, and other things one could not find at home but also people with peculiar customs. The islands of men and women, long a part of Arabic folklore, had been mentioned by Marco Polo. These sexually segregated islands were located conveniently near to one another so that the men could pay periodic visits in order to replenish the race. The Catalan Atlas, seeing the obvious connections with the old stories of the Amazons, put the queen of the Amazons on one of these islands. Fra Mauro calls the islands Nebila and Mangla and puts them in the far southeast. Of course, most of these people were “idolaters,” and some were cannibals and giants. If one went too far, one might sail into the “dense sea” near the “dark islands,” from which no sailor had ever returned. Ibn Baṭṭūṭah, the Moroccan traveler, had told of being becalmed in that frightening sea for thirty-seven days before being miraculously saved.⁷⁰

The Portuguese recipients of the original map must have studied this area carefully and, undaunted by the hazards, determined to go after the pearls, spices, scented aloe, brightly colored parrots, and gold reputed to be found there.

The Far North

At the other end of the world, in the far north (also “unknown to Ptolemy”) Fra Mauro drew a rather large Scandinavian peninsula and mapped out the ports along the Baltic Sea and the Gulf of Finland.⁷¹ The Baltic is here called the Sinus Germanicus. It lacks the northward extension of the Gulf of Bothnia, making the Scandinavian peninsula much thicker than it is in reality. This depiction probably reflects the greater familiarity sailors would have had with the southern shore and its many rich trading cities. Fra Mauro says the Scandinavians used to be the terror of Europe, but now they are weak and do not have the reputation that they once had.⁷² The Laplanders, called Permiani, live farthest north. They live by trapping and selling furs, and in the winter they retreat into Russia and live underground.⁷³ Greenland is not shown; it is interesting that Fra Mauro does not seem to know the Clavus map of the north. Variants of Iceland appear three times, once on the Danish peninsula (Islandia, shown as an island), once at the far west of the Scandinavian peninsula (Islant), and once (Ixilandia) on an island in the northwest Atlantic. The Hyperborean mountains and the Rhiphaean mountains, both of fabled antiquity, are shown as well. In this area the mapmaker has tried to combine the traditional picture of the far north with

rather spotty contemporary information. A good part of the northern section of the map is taken up with more general texts on the making of the map and the general configuration of the world.

On the Mauro/Bianco map the conflict between visual representation and textual description is persistent, reflecting the unsettled state of world geography in the fifteenth century. New discoveries of distant lands as well as ancient manuscripts and maps had thrown the eternal verities into confusion. Sometimes the text on the map is thoroughly conventional, as in the case of paradise, while the picture is not. Elsewhere the placement is orthodox and the text more radical. One curious example is the connection between Scotland and England on the island of Great Britain. Sea charts had shown the Firths of Forth and Clyde as a channel separating the two nations. Fra Mauro's Britain is presented as a continuous landmass, but in the nearby text he says that Scotland is in fact "separated by mountains and water" from the southern part of the island.⁷⁴ This example seems to indicate that the legends were composed after the map was painted, a circumstance that would explain why many of the legends contradict not only the images but sometimes each other. Some of the legends are pasted on bits of paper, inspiring us to imagine that, after the map was supposed to be finished, the mapmaker kept feverishly composing new texts and sticking them onto the surface, as new information came to Venice or he had second thoughts. Although Cattaneo thinks this map was mostly made in the early 1450s, it was still at the monastery, and the date of 1460 on the back suggests that it was declared finished only after the death of the "incomparable cartographer."

The long inscriptions on the map allowed the mapmaker to struggle with some of the cosmological issues paramount in his day. Was the earth habitable throughout? Was there more land on the other side of the globe, or was there only a vast expanse of sea? And what was the proportion of land versus water on the earth? Recent discoveries, bolstered by the miscalculation of the width of the three known continents, reinforced the idea that land might be dominant. However, the Bible said that the land covered six-sevenths of the globe: "On the third day you [God] commanded the waters to be gathered together in a seventh part of the earth; six parts you dried up and kept so that some of them might be planted and cultivated and be of service before you" (Esdras 6:42). Was there an encircling band of ocean at the equator, which was uncrossable due to the great heat? Increasing exploration to the south seemed to demonstrate that there was no such band, nor was the heat intolerable. Again and again, the mapmakers turned to the oral testimony of eyewitnesses to confirm their information.

Ancient authorities, however, were not cast aside lightly, and in fact many

conclusions were held in abeyance with the idea that they might still be upheld. A small example is Fra Mauro's reference to the gold-digging ants, denizens of many geographies and world maps since Herodotus's day. Maybe there was some larger animal who looked like an ant, he wrote.⁷⁵ The river Don did not flow from the Rhiphaean mountains, but these legendary mountains, which marked the farthest north, were still shown. The Permiani were savage and their climate harsh, unlike that of the storied Hyperboreans, but perhaps someday the Hyperboreans would be found near the mountains which bore their name.

The Mauro/Bianco map strains at the seams. The growing expanse of the Atlantic Ocean and the newly discovered islands would not fit onto a circular world map without greatly shrinking other features. Africa here curves around to the east, but further explorations would reveal its southward thrust, and on the 1490 map of Henricus Martellus Germanus, the Cape of Good Hope broke through the map's frame. Throughout their map, Mauro and Bianco express confidence that new discoveries will be made which will clarify some remaining uncertainties. The world was not a static image, established some time in the classical past, but a dynamic one, changing before one's very eyes.

In the general caption of his great map, Fra Mauro writes:

This work, made for the contemplation of this most illustrious signoria [of Venice], has not achieved all that it should, for truly it is not possible for the human intellect without divine assistance to verify everything on this cosmographia or mappamundi, the information on which is more like a taste than the complete satisfaction of one's desire. Thus some will complain because I have not followed Claudius Ptolemy, neither in his form nor in his measures by longitude and by latitude. I have not wished to go to extremes to justify what he cannot justify himself, for in Book II, chapter one, he says that he can speak correctly about those parts of the world which are continually frequented, but of those places which are not so often visited, he does not think it is possible to speak correctly. Understanding that it was not possible for him to verify everything in his cosmography, it being a long and difficult task and life being brief and experience often faulty, so he concedes that with time such a work could be better produced or that one could have more definite information than he has here. Furthermore I say that in my time I have tried to validate written sources with experience, researching for many years and profiting from the experience of trustworthy persons who have seen with their own eyes all I have faithfully put forth here.⁷⁶