

The Book of Curiosities: A Newly Discovered Series of Islamic Maps

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ABSTRACT: A newly discovered Arabic treatise was acquired by the Bodleian Library, Oxford, in June 2002. The manuscript, compiled in the late eleventh century and copied in the early thirteenth century, contains several maps of considerable importance to the history of cartography. Of particular interest is a unique rectangular world map, incorporating a graphic scale, which may reflect a map known to have been made for the caliph al-Ma'mūn (reg. 813–833), but now lost, or a projection proposed by Marinus of Tyre and discussed by Ptolemy. A second world map, circular in form, is of the type usually misattributed to al-Idrisī (fl. 1154). The maps of the Mediterranean Sea and of Sicily, Cyprus, Tinnīs, and al-Mahdiyya appear to be original to our treatise. The manuscript is the subject of a forthcoming major research programme, based at the Bodleian Library and The Oriental Institute, University of Oxford, and the present essay presents only our preliminary findings.

KEYWORDS: Arabic maps, Islamic cartography, map construction, Egypt, Sicily, Tinnīs, al-Mahdiyya, Ptolemy, al-Ma'mūn, al-Idrisī.

In June 2002, the Department of Oriental Collections of the Bodleian Library, Oxford, acquired an Arabic manuscript of considerable importance to the history of medieval cartography.¹ This newly discovered manuscript contains a remarkable series of early maps and astronomical diagrams, most of which are unparalleled in any Greek, Latin or Arabic material known to be preserved today. The title of the volume, *Kitāb Gharā'ib al-funūn wa-mulāḥ al-'uyūn*—a rhyming title typical of Arab authors—is difficult to render fully in English and can be interpreted in various ways. The work was first known by the rather loose

rendering *The Book of Strange Arts and Visual Delights*. Calling it *The Sciences' Strange Sights and the Eyes' Delights* might reflect some of the internal rhythms of the original, but the literal translation that we now prefer is *The Book of Curiosities of the Sciences and Marvels for the Eyes*. For convenience it can be referred to simply as *The Book of Curiosities*.

Author and Date of the Treatise

The volume contains a single Arabic treatise formed of two books (*maqālāt*): the first, on celestial matters, is composed of ten chapters (*fuṣūl*), and the second, on terrestrial matters, is divided

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into twenty-five chapters. The volume consists of forty-eight folios (ninety-six pages), each measuring 32.4 × 24.5 cm (12.7 × 9.6 ins). Pages without illustrations have thirty lines of text per page. The treatise begins with a dedication to an unnamed patron and an abbreviated table of contents, but the manuscript is incomplete: the copyist has omitted the eighth and ninth chapters of the second book, and the manuscript has lost part of the penultimate chapter and all of the last one.²

The author of *The Book of Curiosities* is not named and has not been identified, although he refers to another composition of his titled *al-Muḥīṭ* ('The Comprehensive'). We can, however, tease out several facts about him. In the course of the text, he gives several dates, the latest being equivalent to AD 1012–13, while the most recent event to which he refers appears to be the advance of the Normans on western Sicily, which took place from 1068 to 1071. Indeed, the author of *The Book of Curiosities* was particularly well-informed about Sicily and was also well-acquainted with the other two corners of the great commercial triangle of the ninth- to eleventh-century Mediterranean: Egypt and Ifrīqiya (modern Tunisia). Of these three regions, he was perhaps most interested in, and most knowledgeable about, Egypt. Because he devotes four whole pages to a brief history and map of the city of Tinnīs in the Nile Delta, it is tempting to speculate that he might have come from Tinnīs and that he would therefore have been involved with the trade in cloth for which Tinnīs was then famous.

Our author also recognized the legitimate authority of the Fāṭimid imāms who came to power in Ifrīqiya in 909 and ruled at Cairo from 973 until their dynasty was brought to an end by Ṣalāḥ al-Dīn (Saladin) in 1171. Whereas the 'Abbāsīd caliphs of Baghdad were recognized as the rightful leaders of the Muslim community by the Sunnī majority, the Fāṭimid imāms—who claimed to be the biological descendants of the Prophet Muḥammad through his daughter Fāṭima—were recognized as legitimate by a faithful minority of Ismā'īlī Muslims. Our author not only opens his work with an explicit acknowledgement of the Fāṭimids but also, further on, gives a brief but highly doctrinaire history of the rise of the dynasty, from the accession of the first imām, al-Mahdī, to the defeat of Abū Yazid (*al-dajjāl*, the Antichrist) by his son, al-Qā'im. Moreover, in his representation of al-Mahdīya, the Ifrīqiyan capital

founded by al-Mahdī, he labels his palaces with a pious Fāṭimid formula even though those palaces had long been abandoned by the imāms after they moved east in 969 to found their new capital on the banks of the Nile.

On the basis of internal evidence, then, we can suggest that the treatise was composed at the end of the eleventh century, probably in Egypt. Physical evidence, however, suggests that the copy we have today is more recent and that it was made some hundred and fifty to two hundred years later. Although the copy is undated and unsigned, the paper, inks and pigments appear consistent with Egyptian-Syrian products made from the early thirteenth through the fourteenth century. The script suggests an early thirteenth century date.³

Physical Description

The lightly glossed, biscuit-brown paper is sturdy, rather soft and relatively opaque.⁴ The paper has thick horizontal laid lines, slightly curved, and there are rib shadows, but no chain lines or watermarks are visible.⁵ Paper of such construction was produced in Egypt and Greater Syria in the thirteenth and fourteenth centuries (greater precision is not possible).⁶ The paper has some damp-staining, foxing and wormholes, and there is considerable soiling and grime near the edges of the pages, which have been trimmed from their original size with the loss of some text and marginalia. Numerous repairs have been made to the paper at various times.⁷ At the end of the volume, in the gutter, are narrow remnants of two folios that have been cut from the volume; there are a few traces of Arabic writing on both strips.⁸ At present, as acquired by the Bodleian, the volume is contained in an Ottoman binding of, possibly, eighteenth or nineteenth century date; the binding is too small for the manuscript and in extremely poor condition. The first folio of the manuscript has staining which indicates that an earlier binding included an envelope flap lacking in the present binding. Before conservation of the paper and full scanning of the text, the volume will be disbound and the present binding removed.

The text is written in a medium-large Naskh script in dense black ink. Headings are in warm-red ink. The illustrations are labelled in a similar but much smaller hand.⁹ Both hands are closer in many of their characteristics to those of copyists

known to have worked in Greater Syria at the end of the twelfth century or early thirteenth century than to the hands of securely dated and located products of the fourteenth century. The text area has been frame-ruled. The copyist displays a disconcerting carelessness, if not ignorance, in his transcription of many words, especially non-Arabic place-names, and diacritical dots are frequently omitted, making the interpretation of certain words difficult. Some illustrations, such as those depicting comets or small islands, have traces of gold or silver sprinklings. Some areas in the maps may have been over-painted or coated in a shiny lacquer-like material that is now cracked and crazed. Some grey-blue areas representing water are in fact tarnished silver, while some areas now red-brown appear to be oxidized lead reds.

Combining the evidence of the paper and pigments with that of the script, we are led to narrow down the date of the manuscript to the first half of the thirteenth century. We have, of course, vigorously tested the authenticity of this manuscript but have found no reason at this point to doubt that it is a genuine early thirteenth-century copy of a treatise composed in the late eleventh century. There remain, inevitably, certain inconsistencies and puzzles, some of which will be addressed below.

The Contents

The treatise is in large part a compilation from various sources, with the author perhaps introducing his own material in the sections on the Mediterranean. It is evident he had access to some textual sources and maps that are not otherwise preserved. He also cites by name at least twenty-two authorities whose works he employed: Two of these sources remain unidentified, three are Greek (Ptolemy, Hippocrates, and Hermes [Trismegistus]), and one is a 'letter to Alexander the Great' attributed to Aristotle. The remaining figures date from the ninth, tenth and eleventh centuries. As research progresses, we are able to identify an increasing number of the unnamed Arabic sources, all of which date from these three centuries.

As is typical of many medieval compositions, the treatise begins with a description of the heavens and their influence upon events on earth, before moving to a discussion of the nature of the earth itself and the creatures upon it. The first book, on the heavens, contains a number of

unique illustrations and rare texts, including an illustrated discourse on comets and several pages depicting the 'lunar mansions'—star-groups near the ecliptic whose risings and settings were traditionally used to predict rain and other meteorological events—with neighbouring prominent stars. The author's interest here is primarily astrological and divinatory, and no mathematical astronomy is presented.

The second book, on the earth, is of greater interest to historians of cartography. The titles of the twenty-two preserved chapters are listed in Figure 1, in the order in which they appear in the manuscript.¹⁰

At the end of the first book, the announcement of Book II to follow is accompanied by a statement that the first two chapters are dependent upon the *Geography* of Ptolemy (2nd cent. AD).¹¹ In fact, Book II contains so many references to Ptolemy's *Geography* that the extent to which the compiler (or his sources) had access to and relied directly on Ptolemy is something which will need to be examined carefully.¹² In general, though, our author's interest is descriptive and historical rather than mathematical.

The first chapter of Book II provides an account of the project of the caliph al-Ma'mūn (reg. 813–833) to re-measure the distance on the surface of the earth corresponding to one degree of celestial meridian.¹³ Al-Ma'mūn probably wanted to rationalize the value of the Arabic *mīl* in relation to the Greek *stadion*. He involved several scholars, including 'Alī ibn 'Isā al-Aṣṭurlābī, Aḥmad ibn al-Bukhturī al-Dhārī¹⁴ and Khālīd ibn 'Abd al-Malik al-Marwarrūdhī, all of whom are named by our author.¹⁵ Hitherto, our knowledge of al-Ma'mūn's project has been largely dependent on an account originally given by Ḥabash al-Ḥāsib (fl. 840) and partially repeated by al-Bīrūnī (d. c.1050), neither of whom is mentioned by our author. The account given in the present manuscript is in certain respects fuller than in any other recorded source; it is not drawn from al-Bīrūnī and derives only in part from Ḥabash,¹⁶ a portion of whose account is repeated verbatim, with additional material from sources as yet not identified. Ḥabash states at the end of the relevant paragraph that he learned the facts he gives from hearing al-Marwarrūdhī report the events to the *qāḍī* Yahyā ibn Aḥmad (or Akṭam ?), who then ordered the facts to be recorded; no similar statement occurs in our manuscript, but elsewhere in the volume our

1. 'On the surface of the earth (*misāḥat al-arḍ*) and its division into seven climes according to what Ptolemy and others have said'.
2. 'On the depiction of the earth (*ṣūrat al-arḍ*)'.
Double-page rectangular map of the inhabited world, fols. 23^b–24^a (Plate 1).
3. 'On the knowledge of the seven climes and their characteristics, and what lies beyond the equator to the north [and to the south]'.
A half-page diagram of five inlets on the southern Anatolian coast, fol. 38^a.
4. 'On the nomenclature of the Arabian Peninsula'.
5. 'On the populated areas at the edges of the inhabited world' (*amṣār al-āfāq*).
Half-page illustration of a tree (or 'inhabited scroll'), the fruits of which have the form of heads of horned animals, fol. 26^b.
Full-page illustration of a *wāqwāq*-tree, said to grow on islands near the eastern or southern edges of the inhabited world, bearing fruits of human form, fol. 27^a.
Double-page circular world map, fols. 27^b–28^a (Plate 3).
6. 'On the depiction of the seas and their islands and havens'.
7. 'On the cities and forts along the shore [of the Indian Ocean]'.
Double-page map of Indian Ocean, fols. 29^b–30^a (Fig. 6).
8. [title and chapter omitted by copyist]
9. [title and chapter omitted by copyist]
10. 'On the Western Sea, that is the Syrian Sea'.
Double-page map of the Mediterranean, fols. 30^b–31^a (Plate 2).
11. 'On the Caspian Sea (*baḥr khazrān*)'.
A map of the Caspian, fol. 31^b.
12. 'On the description of the largest of the islands in these seas, with a view to brevity'.
A double-page map of Sicily, fol. 32^b–33^a (Plate 6).
13. 'On the "island" of al-Mahdiyya (*jazīrat al-mahdiyya*)'.
A map of al-Mahdiyya, fol. 34^a (Plate 7).
14. 'On the island of Tinnīs'.
A map of Tinnīs, fol. 35^b–36^a (Fig. 4).
15. 'On the islands of the infidels (*fī jazā'ir al-kafara*)'.
A map of Cyprus and its anchorages, fol. 36^b (Fig. 5).
16. 'On the depictions of inlets which are bays, particularly the bays of Byzantium (*hilād al-rūm*)'.
A half-page diagram of five inlets on the southern Anatolian coast, fol. 38^a.
17. 'On the description of the lakes (*fī wasf al-buḥayrāt*)'.
An illustration of the 'Great Marsh (*baṭīḥa*)', the alleged source of the Nile, fol. 40^a.
Double-page illustration of thirteen lakes, fols. 40^b–41^a.
18. 'On the rivers, their courses (*fī al-anhār wa-ashkālīhā*), and the cities associated with them'.
A map of the source and course of the Nile, fol. 48^a, bound out of sequence (Plate 4).
A map of the source and course of the Euphrates, fol. 48^b, bound out of sequence.
A map of the course of the Tigris, fol. 42^a (Plate 5).
A map of the course of the Indus, fol. 42^b.
A map of the course of the Oxus, fol. 43^a.
19. 'On the description of the rivers (*fī wasf al-anhār*)'.
20. 'On marvellous aquatic creatures amongst the fishes and the monsters of the sea (*fī 'ajā'ib nabāt al-mā' min al-sumūk wa-al-wuḥūsh al-baḥrīya*)'.
21. 'On deformed, quasi-human creatures (*fī al-khalq al-insāniyat al-mushawwaha*)'.
22. 'On wondrous waters (*fī 'ajā'ib al-mā'*)'.
23. 'On curious plants (*fī gharā'ib al-nabāt*)'.
24. 'On curious creatures (*fī gharā'ib al-wuḥūsh*)'.
25. [missing]

Fig. 1. Chapter titles and illustrations in Book II of *The Book of Curiosities* (Bodleian Library, MS Arab. c. 90). Plate and figure numbers refer to the present article.

author does name al-Marwarrūdhi as one of the sources employed for the treatise as a whole.¹⁷

Another achievement of scholars working for al-Ma'mūn was the production of a large map of the world, unfortunately no longer extant. The actual form of *al-ṣūra al-ma'mūniya* ('the map of al-Ma'mūn') has been the subject of considerable speculation.¹⁸ Its possible relationship to the rectangular world map, which in the present manuscript follows immediately upon the account of al-Ma'mūn's mensuration, is a matter that requires careful consideration. Our author's juxtaposition of these two elements clearly implies that he thought the text and the map to be related, or wished his readers to think so.

The Rectangular Map of the World—Description

The rectangular map of the inhabited world (Plate 1) is unlike any other recorded ancient or medieval map. At the top of the map, which is labelled South, there is a carefully executed graphic scale. The 'Mountain of the Moon' (*jabal al-qamar*)—considered by medieval Arabic writers to be the source of the Nile—is represented at the centre of the scale by a semicircular mountain from which ten streams diverge, five on either side, pouring into two circular pools which in turn feed into one lake before emerging as the River Nile. In the lower right part of the map the European land mass is represented, with the right half dominated by an extremely large Iberian peninsula. Italy and Greece are indicated on the left, and Constantinople is marked at the left extremity of the European continent.¹⁹ No islands are found in the Mediterranean Sea on this map, but a separate map of the Mediterranean (Plate 2) details a huge number of islands, including Sicily and Cyprus, which are also shown individually on separate maps.

In the upper left of the rectangular map of the world, the Indian Ocean is shown together with Arabia (the larger of the two peninsulas) and Persia/India (subsumed into one, smaller, peninsula). The red line down the middle of the smaller peninsula indicates the Indus River, which is depicted rising from a surprisingly modest mountain and ending near the coast at a place labelled al-Manṣūra, a city at the head of the river's delta, which was apparently in ruins by the fourteenth century.²⁰ To the east of the Indian peninsula, another river flows into the ocean, and the curved

coastline to the left of this river is China. The two highly stylized and complicated river systems between and below the two peninsulas represent the Euphrates and the Tigris.

In the lower left of the map, we find the gate constructed by Alexander the Great to enclose Gog and Magog.²¹ From this barrier, a river flows inland toward the Caspian Sea. Near the margin on the left, a brown land mass has an inscription, encircled in red, which reads: 'Island of the Jewel, and its mountains encircle it like scales', a reference to what was considered the easternmost limit of the inhabitable world (usually interpreted as Formosa or, possibly, Indonesia).

Several lines composed of red dots indicate routes or itineraries, as identified by the adjacent writing. These interesting features may be an echo of some Late Antique convention, but they also, as will be seen below, reflect our author's declared preference for toponymy over physical geography. A scattering of unlabelled red dots, along the coasts and elsewhere, presumably reflects either the ignorance and negligence of our copyist or the corruption of his source. The highly stylized presentation of all the material, together with the labelling of the itineraries, suggests that the purpose of the map may have been to provide a visual mnemonic rather than a model of physical reality, a hypothesis which seems to be confirmed by our author's comments on his philosophy of map making (see below).²²

Finally, it may be noted that the rectangular world map does not, in fact, represent the whole of the world thought at the time to be inhabited. Following Ptolemy, most Arabic geographers defined the inhabited world as extending 180 degrees from west to east, with a northern limit of about 63° N and a southern limit of either the equator or about 16° S. Indeed, our author makes explicit reference to Ptolemy's belief that the inhabited world extended over half the earth's circumference, from the islands in the Atlantic Ocean (the 'Green Sea', *al-baḥr al-akhḍar*) to China. Most Arab geographers divided the inhabited area north of the Equator into seven zones, or climes, according to hours of maximum daylight, and although the clime boundaries are not indicated on the map, it is evident that only the first to the fourth climes are illustrated in their entirety. The semicircular 'Mountain of the Moon' lies on the equator, and the boundary between the third and fourth

climes should come approximately halfway up the map. Furthermore, almost no land south of the equator is shown at the top of the map, and only about a third of the fifth clime and none of the sixth and seventh climes (which included the land of Gog and Magog as well as much of northern Europe), are depicted at the bottom, that is, to the north.

The Rectangular World Map—Interpretation

As in the case of the other maps in the volume, it is evident that the copyist responsible for the rectangular map of the world was copying from an earlier manuscript that he did not fully understand or that was already corrupt. On occasion, the positioning of features is bizarre, and errors were created that any well-educated person would have known to be incorrect. For example, Tabaristān—a well-known region on the southern shore of the Caspian Sea (shown here as a medium-sized circle in the Asian land mass, below centre)—is misplaced on the Black Sea (bottom, left of centre), where Tarābzunda (Trabzon) should be.

Many of the labels on the rectangular world map have yet to be identified, and the majority of the red place signs are unlabelled, leaving us with many problems and puzzles, including the absence of major cities such as Cairo, Alexandria, and Jerusalem. One example will serve, however, as a warning against drawing premature conclusions from over-hasty readings of the labels. The position of the large red bicuspid marker on the east coast of the Arabian peninsula might seem to correspond approximately to modern Kuwait, a place-name not attested before the early eighteenth century.²³ The marker is labelled with a word which an inattentive reader might mistake for *Kuwayt*. In fact, the label lacks its diacritical points and actually reads *Ghuwayth* (or *Uwayth*), a village that Yāqūt (d. 1229) described in his geographical dictionary as located ‘after al-Ṭā’if when coming from the Yemen’.²⁴ On our map, *Ghuwayth* is indeed associated with al-Ṭā’if, but is placed too far to the north-east, a reflection of the sketchy and haphazard manner in which the whole Arabian peninsula is represented.

For none of the maps in the volume was an attempt made to represent coastlines accurately. On the contrary, the main aim seems to have been to map areas of sea rather than the land. In the sixth chapter of Book II, which is entitled ‘On the

depiction of the seas and their islands and havens’, the author acknowledges that his drawings are not realistic, stating bluntly that ‘these sea maps are not by way of being accurate’, and gives two reasons.²⁵ First, he says that it is well known that land can turn to sea and sea to land, giving as examples Alexandria (sea changing to land) and Tinnis (land to sea), implying that there is no need to bother to trace the coasts in detail since they will inevitably change with time. Second, he argues that even were it possible to produce an accurate map of a sea in the manner described by Ptolemy and based on precise instrumental measurement, the irregularity of the coastline would not leave room for the dots and labels that indicate the coastal cities to be placed accurately: ‘the cartographer (*muhandis*) would not be able to position [lit. ‘to build’] a city in its location amidst the sharp or obtuse angles [of the coast] because of the limits of the space that would correspond to a vast area in the real world. That is why we have drawn this map in this way, in order that each [sea] could be depicted together with the land.’²⁶

Despite the apparent preoccupation with generalities, however, the map of the world has been provided with a scale bar. Exactly why a scale was needed, and what its function might have been in the production of the map awaits further research. What can be said in the interim is that its presence on the map suggests that a graticule of some sort may have been employed in the map’s prototype. If that were the case, then it is likely that our map is at several removes from the original, which would explain how so many errors and misunderstandings came to be introduced over time. It is obvious that the copyist of the manuscript discussed here did not understand the purpose of the scale. Only the cells on the right-hand folio are numbered, with *abjad* letter-numerals which increase cumulatively in units of 5 degrees.²⁷ The numbering begins on the right, and 135° is the last visible number before the scale is overpainted with the ‘Mountain of the Moon’. Had the numbering continued as presented here, with 5 degrees to a single large division and each subdivision equaling 1 degree, the last number reached by the left-hand margin of the folio, *i.e.* in the gutter of the manuscript, would have been 180°. The numbering should continue across the gutter onto the facing folio, but the scale here remains unnumbered, presumably because the copyist realized his error—namely that he should have been counting

two large divisions as equal to 5 degrees and each of the smaller divisions as equal to $\frac{1}{2}$ degree and simply stopped. In other words, the scale should show 180 degrees across the open bi-folio. Even so, and even were the scale represented on the map to have been correctly numbered, it is clear from errors in the coordinates of many places that these have not been plotted on to the map, merely interpolated.

At the same time, allowing for the errors introduced by successive uncomprehending copyists, the possibility that the original map could well have had places plotted onto it according to a 180-degree graphic scale has to be taken seriously. Correctly numbered, the scale at the top of the rectangular world map in *The Book of Curiosities* would be strikingly suggestive of the method of map making proposed by Suhrāb, a late tenth-century geographer, in his treatise *Fi 'ajā'ib al-aqālim al-sab'a* ('The Wonders of the Seven Climes').²⁸ Suhrāb gave instructions for making a rectangular world map with a lateral scale of 180 degrees at the top and at the bottom of the map, and a vertical scale—divided into 110 degrees (90 degrees to the north, and 20 degrees to the south of the equator)—down each side. Once the seven climes were marked on the map, the towns were to be plotted from their coordinates with the aid of a pair of weighted strings extended between the horizontal and vertical scales. The result of such a procedure would have been an orthogonal projection of parallel equidistant lines, exactly the projection proposed by Marinus of Tyre (fl. AD 100) and described by Ptolemy in some detail (albeit rather critically) in the *Geography*. The encyclopaedist al-Mas'ūdī (d. 956)—an authority frequently cited by the author of *The Book of Curiosities*—stated that the map made for the caliph al-Ma'mūn was rectilinear, and it has been proposed that Suhrāb's method was used for al-Ma'mūn's map.²⁹ No manuscripts are known to survive, however, of Suhrāb's proposed map.

Moreover, the author of *The Book of Curiosities* does not cite Suhrāb as one of his sources, and were his map to have been based on such a procedure, the map must have been greatly distorted over time in order to attain the state in which it is found today. However, the fact that the map is the only rectangular world map to be preserved from antiquity or from the medieval world, and the fact it carries a scale (as misunderstood as it was) at the

top, requires that full account be taken of the possibility that it might in some way reflect the early ninth-century map made for Ma'mūn, or even the much earlier projection of Marinus of Tyre, as described by Ptolemy. The argument may well be strengthened when other potentially relevant maps are considered. One of these might be the now-lost world map prepared in 964 on silk for the Fātimid caliph al-Mu'izz (reg. 953–975), given the Fātimid sympathies betrayed by the compiler of *The Book of Curiosities*.³⁰ Other maps which may have played some role in the story of the rectangular map of the world in *The Book of Curiosities* include a world map prepared in the early fourteenth century by Ibn Faḍl Allāh al-'Umārī (d. 1349) for his encyclopaedia: a circular world map with a superfluous graticule preserved in an autographed copy of al-'Umārī's encyclopaedia dating from 1340; and finally a rather crude rectilinear map in a relatively modern manuscript copy of the same work.³¹ All such avenues of comparison and interpretation have yet, however, to be explored.

The Circular World Map

The second map in *The Book of Curiosities* is another world map (Plate 3). In this instance, however, it is a circular world map of a type well known from other sources. The circular inhabited world is surrounded by the dark ring of the 'Encompassing Sea'. South is again at the top, with the African land mass extending eastward so that it covers virtually all the southern hemisphere. Seven concentric arcs are placed on the map to indicate the seven climes, the uppermost representing the equator. The 'Mountain of the Moon' forming the source of the Nile River is placed well south of the equator. The Indian Ocean is land-locked except for a narrow opening due east, and in that ocean there is the large circular island of Sarandīb (Ceylon) and the narrow and elongated island labelled *jazīrat al-qumr*, representing either Java or the entire Malay Archipelago. The Mediterranean Sea, in the lower right quadrant, contains a large circular representation of Sicily and, to the left, smaller elliptical forms of Crete and Cyprus.

Virtually identical versions of this circular map are to be found, for example, in six copies of the treatise *Nuzhat al-mushitāq fī ikhtirāq al-āfāq* ('Entertainment for He Who Longs to Travel the

World') by al-Idrisi (fl.1154), who composed his geographical compendium for Roger II, the Norman king of Sicily.³² Although al-Idrisi also made for Roger II a world map engraved on silver (now lost), the circular world map that occurs in some copies of his treatise does not appear to be an integral part of the text, for it is placed at the front of the treatise and no further reference is made to it. The circular world map represents a different approach to cartography from that underlying the maps forming the locus of al-Idrisi's treatise, which are 70 regional maps (ten sectional maps to each of the seven climes).

The circular world map in *The Book of Curiosities*, on the other hand, is an integral part of the fifth chapter of Book II, relating to the surrounding text. Its occurrence here raises questions about the origin of the one in al-Idrisi's treatise (Fig. 2). Were our conjecture that *The Book of Curiosities* was compiled in the late eleventh century to prove correct, and were the circular map in *The Book of Curiosities* to have been part of the original compilation, the occurrence of the map in *The Book of Curiosities* would demonstrate that this circular world map was in fact designed well before al-Idrisi's day. Were that the case, then al-Idrisi himself or some later copyist merely inserted it into his treatise. At the very least, the existence of the map in *The Book of Curiosities* indicates that it

circulated separately, apart from al-Idrisi's treatise.³³ Moreover, if our copy of *The Book of Curiosities* really is a product of the early thirteenth century, it is possible that the circular world map it contains is the earliest recorded copy of this particular type of world map.³⁴ Whatever its relative age, the circular world map in *The Book of Curiosities* is more detailed and has more labels than any other recorded map of similar design.

The Five River Maps

The eighteenth chapter of Book II contains five maps of individual river courses: the Nile, the Euphrates, the Tigris, the Indus, and the Oxus. Of these five maps, only one—that of the Nile River—is paralleled in any other recorded manuscripts. At the time *The Book of Curiosities* was compiled, knowledge of the source and tributaries of most of these rivers was highly speculative and remained so for several centuries thereafter. The maps are highly stylized diagrams in which (with the exception of the map of the Nile), the cardinal directions play only a minor role. The courses of the rivers were constrained by the size of the folio, with the designer making a sufficient number of equal-sized bends and curves to allow for labelled features and yet to fit comfortably on the page. The source of each river is indicated by a roughly hemispherical form labelled 'mountain' (or in the case of the Nile, 'mountain of the moon' *jabal al-qamar*). Each river empties into a larger body of water, a sea indicated by a blue-green rectangle or, in the case of the Oxus, a blue-green circle. Tributaries and branches are indicated by blue-grey bands identical in size to that of the river itself. Red dots of uniform size indicate settlements, many of which are labelled.

The map of the Nile River, as well as that of the Euphrates on the back of the same folio, has been severely damaged (Plate 4). It is evident, however, that over the map of the Nile there were horizontal lines indicating the first three climes, with the line labelled as the equator running between the circular lake from which the river proper flows and the two pools into which the ten streams from the Mountain of the Moon feed. Enough of the map of the Nile has been preserved to enable a comparison with other maps of the Nile river, and there is a striking similarity between the map of the Nile River in *The Book of Curiosities* and a map from a geographical treatise written by Abū Ja'far



Fig. 2. The world-map of al-Idrisi. Oxford, Bodleian Library, Dept. of Oriental Collections, MS Pococke 375, fols. 3^v 4^r. Copied by 'Alī ibn Ḥasan al-Ḥuff al-Qāsimī and completed on 13 Sha'hān 960 [25 July 1553]. 25 × 25 cm (10 × 10 ins). (Reproduced with permission from the Bodleian Library, Oxford.)

Muḥammad ibn Mūsā al-Khwārazmī (d. c.847), a mathematician, astronomer and geographer active during the caliphate of al-Ma'mūn.³⁵

Al-Khwārazmī is one of the sources specifically mentioned by the author of *The Book of Curiosities*, and he was also a major, although unnamed, source for the tables of coordinates accompanying Suhrāb's discourse on map making a hundred years later. Little is known with certainty of the life of Khwārazmī except that in 842 the caliph al-Wāthiq (reigned 842–847) sent him on an unspecified mission to the king of the Khazars, on the north-east shore of the Caspian Sea, although modern scholars have conjectured that he was among the group of scholars carrying out observations for the caliph al-Ma'mūn. Only fragments of Khwārazmī's geographical treatise *Ṣūrat al-ard* ('Depiction of the Earth') are preserved today, and these consist mostly of lists of coordinates of major towns, arranged according to the longest-day climate system, with separate lists for rivers and mountains.³⁶ These fragments do include, however, an illustration of the course of the Nile which is similar to that given in the present manuscript, with identical lines indicating the climes that the river crosses and with similar labels.³⁷

Therefore, it is reasonable to conjecture that the other maps of river courses in *The Book of Curiosities* (Tigris (Plate 5), Euphrates, Indus, and Oxus) may also have ultimately derived from Khwārazmī's treatise. Another of the four illustrations preserved in the fragments of al-Khwārazmī is a drawing of the 'Island of the Jewel' (*jazīrat al-jawhar*)—a non-Ptolemaic geographical feature that is also prominently illustrated and labelled on the rectangular world map—suggesting that al-Khwārazmī's influence may have extended well beyond the five maps of river courses.³⁸

The Map of Sicily

The anonymous author of *The Book of Curiosities* collected material from various sources dating mostly from the ninth or tenth centuries. It is possible that only the representations of Sicily, Cyprus, al-Mahdiyya, Tinnīs and the Mediterranean Sea are the author's own work. The originality of these maps is best seen in his map of Sicily (Plate 6), particularly when it is compared with al-Idrīsī's more familiar map of the island (Fig. 3). In al-Idrīsī's map, south is to the top, and the island is shown with its characteristic triangular shape in the midst of its archipelago, with the toe of



Fig. 3. The sectional map containing Sicily, from al-Idrīsī, *Nuḥḥat al-muṣṭāq fī ikhtirāq al-āfāq*, Oxford, Bodleian Library, Dept. of Oriental Collections, MS Pococke 375, fols. 187^b–188^a. Copied by 'Alī ibn Ḥasan al-Ḥūfī al-Qāsimī and completed on 13 Sha'ban 960 [25 July 1553]. 19.5 × 33 cm (7.5 × 13 ins). (Reproduced with permission from the Bodleian Library, Oxford.)

Calabria to its left and Sardinia to the right. The principal rivers and dominant relief are indicated in stylized but recognizable form. Mount Etna (*jabal al-nār*, 'The Mountain of Fire') is clearly shown in the north-east corner, a chain of mountains is illustrated just inland from the north coast, the Monti Palermitani are arranged around Palermo (*Balarim*) so as to suggest the Conca d'Oro, and the hills of the south and the interior are represented schematically, but accurately, in relation to the rivers of the island. Approximately the same twenty-five or so towns and cities—all on the coast, except for two or three in the interior—are marked on all maps of this type.³⁹ In short, al-Idrisi's map of Sicily is a realistic if highly stylized representation of the island, in which the main features of its physical and human geography are instantly identifiable.

The map of Sicily in *The Book of Curiosities* is completely different. North, not south, is at the top in a reversal of Arabic mapping convention that may be of some significance for the reconstruction of the history of this copy. The island is shown alone, without the surrounding archipelago or the Italian mainland. It is represented not in its usual triangular shape, but as a flattened sphere. No attempt has been made to reproduce coastal details, except for a v-shaped indentation for the port of Palermo. Relief is indicated by a series of isolated peaks around the coast. Inland, only the peaks of the Conca d'Oro are indicated. Only two rivers are shown. One flows north and empties into Palermo harbour, the other has ten sources and no mouth and seems to flow southwards. Labels giving the distance in Arabic miles between one mountain peak and the next have been erratically inserted around the coast, and the total falls far short of the figure of five hundred miles given in the text as the circumference of the island.

The representation of Palermo and its region dominates the map. Like the description of Palermo in the text, the map is based on the account given by the Iraqi traveller Ibn Ḥawqal, who visited Sicily in 972–973.⁴⁰ However, like the text, the map incorporates significant additions that seem to have come from the author himself. Three additions to the text help to date the composition of the treatise. The first concerns the 'Quarter of the Europeans' (*ḥārat al-ṣaqāliba*, lit. 'of the Slavs'),

which Ibn Ḥawqal specifically noted was unwall-
ed. The author of *The Book of Curiosities* states that the district had had a wall for forty years and labels it pointedly on the map as 'The Quarter of the Europeans with its wall' (*ḥārat al-ṣaqāliba ma'a al-sūr*). The second addition mentions a new quarter of Palermo built after the visit of Ibn Ḥawqal. In *The Book of Curiosities*, the city is described as

originally a rectangle, with a market from its east to its west, but it was subsequently built up and became circular. Fifty years ago, it acquired a new quarter called al-Ja'fariya, which has 10,000 houses.

The quarter of al-Ja'fariya was almost certainly built by, and named in honour of, the eighth Kalbid emir of Sicily, Ja'far ibn Yūsuf (reg. 998–1019), a famous builder. The third, and most significant, detail added by the author of *The Book of Curiosities* appears at the beginning of the chapter, which opens with the words:⁴¹

The island of Sicily is the largest of the Islamic islands, and the most famous on account of the enemy—may God cast them down!—having reached its western parts, and the continuing struggle of its imams and governors against them.

The reference to 'the enemy', surely a clear reference to the invasion of Sicily by the Normans, most likely refers to the short period between the invaders' victory at Misilmeri in 1068 (which destroyed organized Muslim resistance in western Sicily) and the beginning of the siege of Palermo in the summer of 1071. In which case the quarter of al-Ja'fariya must have been built fifty years earlier, towards the end of the reign of Ja'far ibn Yūsuf; while the wall around the *ḥārat al-ṣaqāliba* must have been built in *circa* 1030 under Ja'far ibn Yūsuf's brother Aḥmad al-Akḥal (1019–1036).

On the map, the Old City of Palermo (*qaṣr al-qadīm*) is represented as a circular enclosure in red, broken by eleven gates—one more than the ten listed by Ibn Ḥawqal.⁴² On either side of the harbour, which lies outside the walls, a tower, labelled 'Castle of the Chain' (*qaṣr al-silsila*), represents the pair of towers between which was stretched the chain that barred the entrance to the port. On the eastern side of the harbour, the arsenal (*al-ṣinā'a*) is shown. In the centre of the city, three or four labels disappear tantalizingly into the gutter of the manuscript and have not yet been read with certainty. Provisionally, though, we read: *Dār* ('the house of') *ibn al-Shaybānī*, *al-Daqqāqīn* ('the Flour-merchants'), *tajādid*[?] *ḥammām* ... ('restored [?] baths ...').

Outside the Old City two quarters are shown adjoining its walls: the Quarter of the Europeans and the Quarter of the Mosque of Ibn Saqlāb. Other quarters and suburbs are shown spreading over much of the island. Thus, the domed 'Ruler's Palace' (*qaṣr al-sulṭān*)—presumably a representation of the Fātimid palace-city of al-Khālīṣa—is shown halfway to Termini Imerese. The Palermitan spring of Bayḍā' lies far to the west, while that of al-Qādūs rises almost on the south coast, and al-Ghirbāl and the two suburban lakes (*al-fawwāra al-kabīra*, *al-fawwāra al-ṣaḡhīra*), rise far to the east. Several hitherto unattested quarters—including 'the Quarter of the Prayer-ground of Abū Hajar' (*ḥāra tusammā muṣallā Abū Hajar*),⁴³ the Quarter of the Church of the Joyful (*ḥārat kanīsa al-farūḥ*), and the Quarter of Divine Precept (*ḥārat al-farīḍa*)—are all shown far from the line of the walls but still within the zone of identifiably Palermitan place-names.

Beyond Palermo and its disconcertingly widespread suburbs, the map is confused and confusing. For example, Etna is shown, with its crown of fire, in the south-western corner of the island instead of the north-eastern. Next to it are not only its true neighbours, Syracuse and Taormina, but also Sciacca, Mazara and Trapani, three towns which rightly belong in the south-west of Sicily. One way of explaining the confusion is to assume that an earlier version of the map from which this copy ultimately derives was divided into at least four parts, and that these were at some point re-assembled in the wrong order, with the result that what should have been the north-eastern quadrant was misplaced in the south-west quarter. It may also be postulated that such an original would have been much larger than the present map, and that, while a copyist reduced the size of the island, he failed to adjust proportionately the size of Palermo, so that in this copy the capital and its region seems to spread over most of the island. We have already seen that a similar process of redrawing and resizing may account for many of the anomalies of the rectangular world map. Such confusion combines with negligence or ignorance in the transcription of what would have seemed to be outlandish Sicilian place-names so as to make many of the labels on the map difficult to read. Thus, although the place-names of the interior are located on what are clearly intended to be itineraries, most have so far defied identification.⁴⁴

The Map of al-Mahdiyya

The map of Sicily is followed in *The Book of Curiosities* by a chapter devoted to al-Mahdiyya, the capital city built by the Fātimid caliphs in 916–921 in what is now Tunisia. The peninsular city is depicted in bird's-eye view, as if seen from the south-west (Plate 7).⁴⁵ It is shown surrounded by stone walls, with the great gate known as 'the Dark Passage' (*al-saqifa al-kaḥla*) barring the isthmus. In the south-eastern corner of the map is the enclosed inner harbour, surrounded by port buildings. Two isolated and rather elaborate buildings are labelled 'the palaces of the [Fātimid] imams, may peace be upon them', a pious formula which indicates that the author of *The Book of Curiosities* recognized Fātimid authority. In the top left corner of the city is an accurate itinerary of the sea route from al-Mahdiyya to Palermo. The representation corresponds closely to the topography of al-Mahdiyya as it was in the eleventh century and, like the maritime itinerary, suggests that the author had first-hand experience of the town. The map is the only known representation of the city of al-Mahdiyya earlier than the European engravings published to celebrate its capture by the emperor Charles V in 1550.⁴⁶

The Map of Tinnīs

The last of the Muslim islands of the Mediterranean Sea discussed in *The Book of Curiosities* is Tinnīs, in the Nile delta. The disproportionate coverage accorded to Tinnīs—two full pages of text and a double-page map—raises the suspicion that the author may have had close personal connections with the city and may even have been a native or resident. Two sources are named in the text: the *Murāj al-dhahab* of al-Mas'ūdī (d. 956), and the *al-Muṣannaf fi waṣf tinnīs* ('The description of Tinnīs') by Muḥammad ibn Aḥmad ibn Sālim al-Muhtasib ('the Market Inspector'). The latter work appears to be identical to a work better known as the *Kitāb Anīs al-jalīs fi akhbār tinnīs* ('The Companion Guide to the History of Tinnīs'), by Muḥammad ibn Aḥmad ibn Bassām al-Muhtasib al-Tinnīsī,⁴⁷ to whom is also credited a manual on market supervision (*ḥisba*-manual) generally dated to the thirteenth century. The history of Tinnīs and the *ḥisba*-manual are in fact two completely independent texts, neither of which refers to the other.⁴⁸ Whatever the date of the *ḥisba*-manual, and we are aware of no compelling reason to date it to the thirteenth century, the

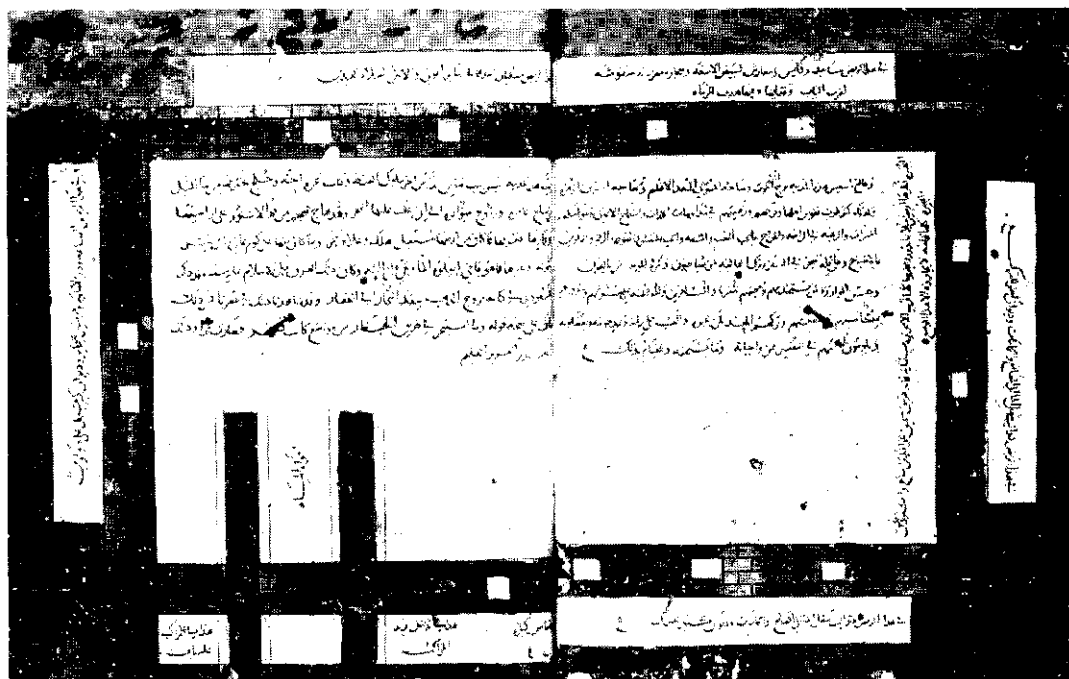


Fig. 4. A map of Tinnis. Oxford, Bodleian Library, Dept. of Oriental Collections, MS Arab.c.90, fol. 35^b–36^a, 32.4 × 49 cm (12.7 × 19 ins). Undated, 13th century (?). (Reproduced with permission from the Bodleian Library, Oxford.)

history of Tinnis refers to no event later than the persecution of the Christians of Tinnis and the destruction of their churches by the Fātimid caliph al-Ḥakim in 1012–1013. It was apparently written soon after that event, though, for it mentions none of the disasters that befell Tinnis during the Crusades, from the mid-twelfth century onwards, which culminated in the evacuation of the city in 1189–1190 and its total destruction in 1227.⁴⁰

The map of Tinnis (Fig. 4) shows the city with the Mediterranean (*al-baḥr al-rūmī*) at the top of the page (that is, to the north and north-east) and, on the other three sides, the deliaic lake (*al-buḥayra*) in which the island-city lies. Unlike the maps of Sicily and al-Mahdiyya, the map of Tinnis could be called an annotated diagram. Only two features are represented pictorially: the rectangular enclosure of its walls and, in the lower left corner, two channels labelled 'the inlets for the waters' (*afwāḥ al-miyān*), which relate to a phenomenon described in the text—the way, every year, the salt waters of the lake were driven out to sea by the sweet waters of the Nile in flood, when these channels were opened to allow the flood-water to refill the huge cisterns on which the city depended for its water supply. All other features on the map are indicated by labels alone, which

give far more detail than could easily have been represented pictorially: mosques, churches, installations for bleaching and cleaning textiles, and a target for archery (top right); two prayer grounds (*muṣallayān*), one for funerals, the other for the two great religious festivals (*al-ʿidayn*) (top left); waterwheels that carry water to the cisterns, the baths, and 'a great hall for fish' (*dīwān kabīr lil-samak*) (lower right); 'many huts' (lower centre); two harbours for ships, one with a gate (lower left). The label to the right of the map describes the waterwheels that carry water to the cisterns, baths, and another fish hall; that to the left lists the arsenal, the governor's palace (*dār al-imāra*), large courtyards for all sorts of merchandise, and a great hall incorporating other lesser halls. The large blocks of text in the middle of the city describe (on the right) the city's astrological associations and their effect upon the population, and (on the left) the inundation of Tinnis in pre-Islamic times.

The Map of Cyprus

The map of Cyprus is also little more than an annotated diagram, but unlike the three maps just discussed (Sicily, al-Mahdiyya, Tinnis), it does not relate to anything in the text, although it opens



Fig. 5. A map of Cyprus and its anchorages, Oxford, Bodleian Library, Dept. of Oriental Collections, MS Arab.c.90, fol. 36^v, c. 270 × 220 mm (10.6 × 8.6 ins). Undated, 13th century (?). (Reproduced with permission from the Bodleian Library, Oxford.)

the fifteenth chapter of Book II, entitled 'On the islands of the Infidels'. The diagram occupies almost the whole of the folio and is headed 'A map of the island of Cyprus and its anchorages' (Fig. 5). The island is represented by a square surrounded on all four sides by a strip of sea.³⁰ The square is subdivided internally by straight lines into thirty-six rectangular boxes, twenty-nine of which contain text. In the centre of the square, two exceptionally large boxes contain a brief description of the island and of its conquest by the Muslims in the seventh century. One of the smaller boxes contains a note of the sailing time (a day and a night with a favourable wind) from an unnamed harbour to Latakia in Syria. The remaining twenty-six boxes name the island's harbours and give brief details of their topography, including their churches, the number of ships that may be accommodated, and their position with respect to the named winds. Twenty-seven prominent dots—eighteen coloured red in the outer boxes, nine coloured yellow adjacent to the inner boxes—appear to have been intended to correspond to the named harbours. Some of the harbours were ancient sites whose names are here Arabicized, such as *Marsā Dhādas* (Dades), *Marsā*

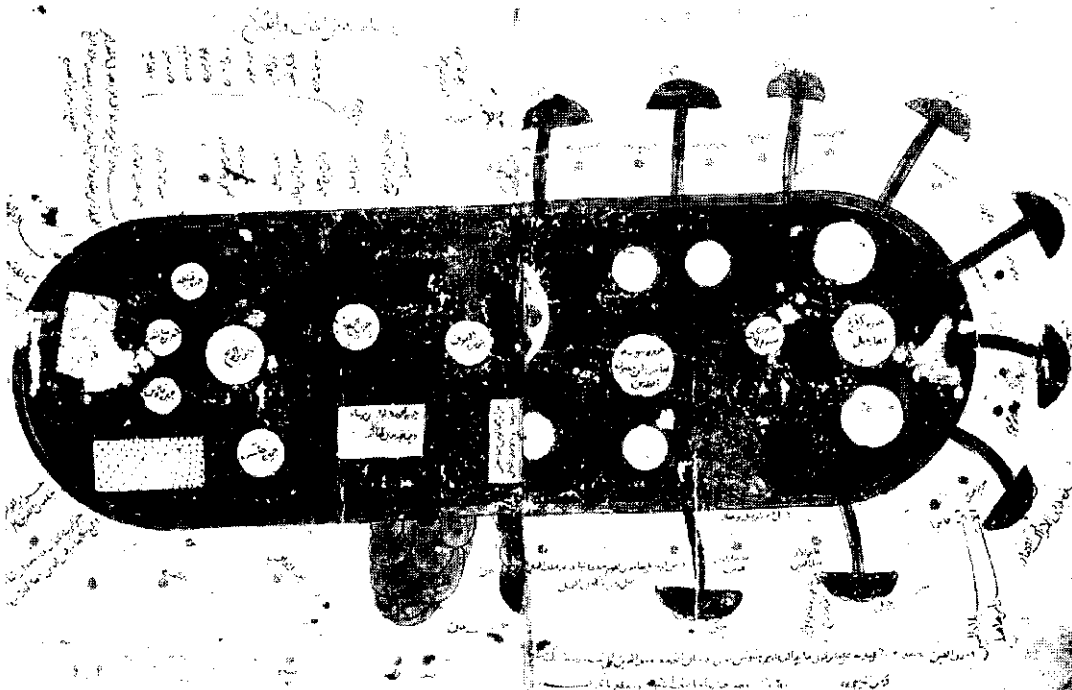


Fig. 6. The Indian Ocean shown as an enclosed oval sea (see note 38). As far as is known, only Ptolemy described it in this manner. Oxford, Bodleian Library, Dept. of Oriental Collections, MS Arab.c.90, fols. 29^b–30^a, c. 324 × 490 mm (12.7 × 19 ins). Undated, 13th century (?). (Reproduced with permission from the Bodleian Library, Oxford.)

Qīhiyun (Citium), *Ḥiṣn Qusṭanṭīya* (Constantia), *Marsā Karfāsiya* (Karpasia), and *Marsā Salamis* (Salamis). Other hitherto unknown Arabic place-names refer to as yet unidentified sites, such as *Marsā Ra's al-'Abbās* ('the harbour of the Cape of al-'Abbās') and *Marsā Nahr al-Malik* ('the Harbour of the River of the King', where the river name suggests the later medieval *Vasiliko potamos* 'Royal River'). Below the map, at the foot of the page, is a brief account of the principal exports from Cyprus, including caulking materials, *lādhan*,⁵¹ myrrh, soft wheat, iron sulphate, pitch, vitriol, and goods imported from Byzantium.

On Arab maps of the Mediterranean Sea, Cyprus is represented sketchily as little more than a circle, and the map in *The Book Of Curiosities* is thus the first detailed Arab map of the island to be recorded.⁵² The map presented here is a uniquely important source for the toponymy and topography of Cyprus between the Muslim conquest of 647 and the restoration of Byzantine rule by Nicephorus Phocas in 963. It contains a wealth of detail concerning the harbours of the island which, as far as we can judge at this preliminary stage of our research, does not seem to have been reported in any other known text, either Arabic, Greek or Latin.

Despite the originality of its maps of the Mediterranean, the second book of the *The Book of Curiosities* seems not to have had any influence on later cartographical developments. In contrast, the first book, which deals with matters relating to the heavens, appears to have had some later influence, at least on Arabic writings. A treatise by a fifteenth-century Egyptian scholar, 'Abd al-Ghānī ibn Ḥusām al-Dīn Ahmad ibn al-'Arabānī (d. 1450), for example, has an expanded but otherwise strikingly similar title: *Ḥarā'ib al-funūn wa-mulāḥ al-'uyūn wa-nuḡḡat al-ushshāq lil-tālib al-mushtāq* ('Curiosities of the Sciences, Marvels for the Eyes, and Pleasures of the Passions for the Seeker of Journeys'). Furthermore, al-'Arabānī's treatise also reproduces some paragraphs from the early part of the first book of *The Book of Curiosities*, including the paragraph in which eight authorities are named. In other respects, however, the rest of al-'Arabānī's material differs substantially. He mentions additional, different, authorities, such as Ibn Sīnā (Avicenna, d. 1037), and he includes no discussion of any aspect of terrestrial geography, still less any maps.⁵³

The interpretations presented in this essay embody the fruits of the first stage of research since the manuscript of *The Book of Curiosities* came to light late in 2000. They are only our preliminary findings. Our conclusions will be developed, and almost certainly amended, as we advance.⁵⁴ For the maps in particular, several hundreds of labels have yet to be definitively transcribed, interpreted and compared with other cartographical material. The discursive text in which the maps and diagrams are imbedded has still to be edited, translated, analysed and compared with other relevant material. Sufficient evidence has already emerged about the maps in this remarkable manuscript, however, to reveal their importance in the history of medieval cartography, particularly, perhaps, as regards mathematical map-making techniques.

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NOTES AND REFERENCES

1. The manuscript has been given the shelfmark MS Arab.c.90. The acquisition was made possible through generous donations from the National Art Collections Fund, the Heritage Lottery Fund, the Friends of the Bodleian Library, ARAMCO, All Souls College, Merton College, New College, St Cross College, St John's College, Wadham College, and Wolfson College, as well as a number of individual scholars. It was purchased from Sam Fogg Rare Books and Manuscripts, London, having been sold previously at auction in London (Christie's, *Islamic Art & Manuscripts*, lot 41) on 10 October 2000. The grant from the Heritage Lottery Fund, in addition to contributing to the purchase price, is supporting the conservation of the manuscript. We wish to thank Dr Nadia Jamil for making a preliminary survey of the whole manuscript and for the more detailed study of some of the passages used in this article, and Professor Geert Jan van Gelder for the felicitous rhyming translation of the title.

2. Little is known of the manuscript's provenance. Only three owners' notes or stamps occur on it, and they provide little information. On the title page there is an undated (Ottoman ?) stamp, impressed twice, reading: Sa'dī ibn 'Isā al-faqīr al-mutawakkil 'alā Allāh al-kabīr. On the same page are two undated signatures, one reading: *min kutub (ex libris) al-faqīr Muṣṭafā al-ma'rūf bi-* (known as) Katarmu-zade [?]; the other reads: *fī nawḡat (among the property of) al-faqīr Yahyā ibn Muḥammad al-Māhī.*

3. Neither chemical analysis of the inks and pigments nor analysis using proton-induced X-ray emission or Raman spectroscopy, has yet been undertaken. It is our intention to do so, for such analysis would rule out the presence of modern substances, but at present there is no body of data produced by testing comparable medieval Islamic material with which the results could be meaningfully compared. Examination with lenses and various forms of enhanced lighting has not revealed any features that are incompatible with the age here suggested.

4. The thickness of the paper varies between 0.17 and 0.20 mm, and the paper measures 3 on the Sharp Scale of Opacity. The latter is a recently devised method (named after its originator, Henrietta Sharp) by which the translucency of paper can be categorized in terms of the number of folios required before the outline of a dowel held behind the folio(s) is no longer visible when illuminated from underneath with a constant light of 60 watts at an approximate distance of 15 cm. The first folio appears to be formed of two sheets of paper pasted together. Examination with a fibre-optic light sheet revealed no internal writing or marks, and the extra-thick first leaf appears to have been original to the manuscript; such doubled leaves are known to occur in other early manuscripts.

5. The laid lines are 6–7 wires/cm, with the space between lines less than the width of one line. The paper would appear to have been made using a grass mould.

6. See Helen Loveday, *Islamic Paper: A Study of the Ancient Craft* (London, Don Baker Memorial Fund, 2001). The authors wish to thank Helen Loveday for discussing *The Book of Curiosities's* construction with them.

7. The title page is guarded, as are some of the other folios, and folio 48 has been bound out of order. There are no end papers.

8. These remnants have not been counted in the foliation. Their relationship to the other leaves will not become evident until the volume is disbound.

9. The normally undotted forms of letters have no minuscule letters beneath them, but carons occasionally occur over *dāl* and *rāʾ*. The letter *mīm* has a short tail, and there are a number of ligatures throughout; for example, the alif is often joined to a following letter such as the *khāʾ*, as in *ākhar*. Breaks occur in the strokes before certain letters, particularly *lām*, which seems to be a peculiarity of this particular copyist.

10. For the illustration of the *wāqwāq* tree (folio 27a) and localities where it grows, see F. Viré, 'Wākwāk' in *The Encyclopaedia of Islam*, 2nd edn., ed. C. E. Bosworth, E. van Donzel, Th. Bianquis, et al. [hereafter *EF*], 11 vols. (Leiden: E. J. Brill, 1960–2002), 11: 103–9. For a rather disappointing introduction to the iconography of 'inhabited' scrolls and the *wāqwāq* tree, see Eva Baer, *Sphinxes and Harpies in Medieval Islamic Art: An Iconographical Study* (The Israel Oriental Society, The Hebrew University of Jerusalem, Oriental Notes and Studies, 9; Jerusalem, Central Press, 1965), 66–68.

11. Folio 22, lines 25–27, where Ptolemy is called Bajalamīyūs al-Qalūdhī. The second part of the name arose from an early misunderstanding that Ptolemy was the son of the Roman emperor Claudius. See M. Plessner, 'Bajalamīyūs' in *EF* (note 10), 1: 1100–2.

12. There is no extant Arabic translation of Ptolemy's *Geography* (*Geographikē Hyphegesis*), and accounts of a translation having been made are confused. Yet, it was clearly known to early Arabic writers, who called it *Kitāb al-Jughrafiyā*. See F. Sezgin, *Mathematische Geographie und Kartographie im Islam und ihr Fortleben im Abendland. Historische Darstellung, Teil I und Kartenband* (Geschichte des arabischen Schrifttums, 10 and 12; Frankfurt am Main, Institut für Geschichte der Arabisch-Islamischen Wissenschaften an der Johann Wolfgang Goethe-Universität, 2000), 1: 43–57. See also E. Polaschek, 'Ptolemy's Geography in a new light', *Imago Mundi* 14 (1959): 17–37, and J. Lennart Berggren and Alexander Jones, *Ptolemy's Geography: An Annotated Translation of the Theoretical Chapters* (Princeton, Princeton University Press, 2000), 41–50. The *Almagest*,

an indisputably genuine treatise by Ptolemy, also had direct influence on Islamic geographical knowledge.

13. See R. P. Mercier, 'Geodesy', in *History of Cartography, Vol. II, Book 1: Cartography in the Traditional Islamic and South Asian Societies*, ed. J. B. Harley and David Woodward (Chicago, University of Chicago Press, 1992), 175–88, esp. 178–81.

14. Written as al-Dharrāʾ in this manuscript, fol. 22, line 25.

15. The caliph al-Ma'mūn also apparently sponsored astronomical observations made in 828 by Yahyā ibn Abī Maṣṣūr in the Shamāsiyah quarter of Baghdad and in 833 by Khālīd ibn 'Abd al-Malik al-Marwarrūdhī in the monastery of Dayr Murrān in Mount Qāsiyyūn near Damascus. See David A. King and Julio Samuś, 'Astronomical handbooks and tables from the Islamic world (750–1900): An interim report', *Sikhayl*, 2 (2001): 9–105, esp. 3–7.

16. Y. Tzvi Langermann, 'The book of bodies and distances of Ḥabash al-Hāsib', *Centaurus*, 28 (1985), 108–28. The unique manuscript is in the private collection of Rabbi Yosef Kafah of Israel, who acquired it in the Yemen.

17. Fol. 3^b, line 11.

18. See G. R. Tibbetts, 'The beginnings of a cartographic tradition' in Harley and Woodward, *The History of Cartography, Vol. II, Book 1* (note 13), 90–107, esp. 104–5. Abū al-Fidāʾ (d. 1331) also refers to a treatise titled *Rasm al-rabʿ al-ma'mūr* ('Drawing of the Inhabited Quarter') as a book that was attributed to Ptolemy and translated into Arabic for the caliph al-Ma'mūn and hence presumably available to early Islamic writers, though no longer extant. See Abū al-Fidāʾ, [*Taqwīm al-biddan*], *Géographie d'Abou'l-Fida: Traduite de l'arabe en français*, translated by J.-T. Reinaud and S. S. Guyard (2 vols., 3 pts., Paris, Imprimerie Nationale, 1848–1883; reprinted Frankfurt am Main, Institut für Geschichte der Arabisch-Islamischen Wissenschaften, 1985), sects. 22 and 74 (pt. 2, 27 and 97).

19. To the right of Constantinople—separated by a vertical brown band marking a masonry wall—is a five-line inscription referring to the peoples to the north-west of Constantinople, most of whom, despite their differences, are in allegiance to the King of Byzantium and 'wear the robe of Christianity'. Beneath that inscription, near the lower (northern) edge of the European continent is the label *al-Kūyāha*, or 'Kiev'.

20. For the problematic location of al-Manṣūra, see Y. Friedmann, 'Manṣūra' in *EF* (note 10), 6: 439–40.

21. It is labelled 'Barrier (*sadd*) which the Possessor of Two Horus (*Dhū al-Qarnayn*, the epithet for Alexander the Great) built'. For early accounts of this rampart, see A. R. Anderson, *Alexander's Gate, Gog and Magog, and the Inclosed Nations* (Monographs of the Medieval Academy of America, 5; Cambridge, Massachusetts, The Medieval Academy of America, 1932); and E. van Donzel and Claudia Ott, 'Yadūdī wa-māḍūdī', in *EF* (note 10), 11: 231–35.

22. In the representation of all cities by red dots of identical size, with equal distance between stops, this world map shares some characteristics with the maps produced by the so-called Balkhī school of the tenth century. In addition, some of the ways of representing rivers and mountains are similar. In all other respects, however, this world map, as well as the other maps in the volume, are utterly unlike any maps of the Balkhī school. It is of note also that the author does not refer to any members of the Balkhī school of geographers, though he does cite the

astrologer Ja'far ibn Muḥammad al-Balkhī, who is now generally referred to as Abū Ma'shar (d. 886). See E. Savage-Smith, 'Memory and maps', in *Culture and Memory in Medieval Islam: Essays in Honour of Wilferd Madelung*, ed. Farhad Dahiary and Josef Meri (London, I. B. Tauris, 2003), 109–27 and Figs. 1–4; and G. R. Tibbetts, 'The Balkhī School of geographers' in Harley and Woodward, *History of Cartography*, Vol. II, Book I (note 13), 108–36.

23. See R. M. Burrell, 'Kuwayt' in *EF* (note 10), 5: 572–76. The origin of the name Kuwayt is usually given as arising from *kūn* meaning 'fort', or from an indigenous word for 'a number of small wells'.

24. Yāqūt [*Kitāb Mu'jam al-buldān*], *Jacut's geographisches Wörterbuch*, ed. F. Wüstenfeld (6 vols., Leipzig: In commission bei F.A. Brockhaus, 1866–1870), 3: 827.

25. *Laysa hādhihi al-sayar al-bahriya 'alā shaklilhā fi al-haqīqa*, fol. 29^v, lines 5–6.

26. Fol. 29^v, lines 16–17: *lam yatamakkan muhandisūhū min biḥā' madina 'alā samītha fi ba'd 'iṣṭifā' aw shawābirihā li-dīq al-mawḍi' la-innaḥu fi al-arḍ al-baṣiṭa dhū sa'a 'aḡima fa-li-ḡil dhālika ja'atnā hādhihi al-sayra 'alā hādhih al-shakl li-yatahaqqaq kull ahad 'alā balad. For 'iṣṭifā' and shawābir meaning, respectively, acute and obtuse angles of the coast, see al-Idrīsī and Abu al-Tidā' apud R. P. A. Dozy, *Supplément aux dictionnaires arabes* (2 vols., Leiden, E. J. Brill, 1881), 2: 138b and 1: 720a.*

27. *Aḥḥad* letter-numerals are the letters of the Arabic alphabet given numerical values. They could be used in various combinations to represent any number from 1 to 1999. It is not a place-notational system, for their value does not depend on their position relative to one another. The name *ahḥad* comes from the first four letters in the sequence to which values 1, 2, 3 and 4 were assigned, and while the letter-numerals for 1 through 50 were the same throughout the Islamic lands, there were differences between Western areas and the Eastern provinces when assigning letters to the remaining values. In this manuscript, the Western pattern has been used.

28. *Das Kitāb 'aḡā'ib al-akālim as-sab'a*, ed. Hans von Mörk (Bibliothek arabischer Historiker und Geographen, 5; Leipzig, Harrassowitz, 1930), based on the unique copy in London, British Library, OIOC, MS Add. 23379. See also, Tibbetts, 'The beginnings' (note 18), 104–5; and David A. King, *World-Maps for Finding the Direction and Distance to Mecca: Innovation and Tradition in Islamic Science* (Islamic Philosophy, Theology and Science: Texts and Studies, 36; London, al-Furqān Islamic Heritage Foundation, and Leiden, Brill, 1999), 33 n. 61.

29. al-Mas'ūdī, *Kitāb al-Tanbih wa-al-islāf*, ed. M. J. de Goeje (Bibliotheca Geographorum Arabicorum, 8; Leiden, E. J. Brill, 1894), 44 (cf. 33). See E. S. Kennedy, 'Suhrāb and the world-map of Ma'mūn', in *From Ancient Omens to Statistical Mechanics: Essays on the Exact Sciences Presented to Asger Aaboe*, ed. J. L. Berggren and B. R. Goldstein (Acta Historica Scientiarum Naturalium et Medicinalium, 39; Copenhagen, University Library, 1987), 113–19. For other theories regarding the map made for al-Ma'mūn, see Sezgin, *Mathematische Geographie* (note 12), 1: 73–140.

30. See King, *World-Maps* (note 28), 35, who corrects the earlier erroneous attribution of the map to Ibn Yūnus (d. 1009) made by Tibbetts, 'The beginnings' (note 18), 96.

31. For illustrations of these two maps from Ibn Fadl Allāh al-'Umari's, *Masālik al-aḥsār fi mamālik al-aḥsār*, see King, *World-Maps* (note 28), 35–37, Fig. 1.7.5, and 93, Fig. 2.8.3. See also Sezgin, *Mathematische Geographie* (note 12), 1: 73–140, and Kartenband, 1a, who argues for the

circular map representing that made for the caliph al-Ma'mūn.

32. See S. Maqbul Ahmad, 'Cartography of al-Sharīf al-Idrīsī', in Harley and Woodward, *History of Cartography*, Vol. II, Book I (note 13), 156–74, and Sezgin, *Mathematische Geographie* (note 12), Kartenband, 4–6.

33. There is certainly evidence that the map had a separate circulation well after the time of al-Idrīsī, for three copies of the world history, *Kitāb al-'Ibar*, by Ibn Khaldūn (d. 1406) have such a map. See Ahmad, 'Cartography' (note 32), 170–71, and Sezgin, *Mathematische Geographie* (note 12), Kartenband, 9.

34. For a list of preserved copies, see Ahmad, 'Cartography' (note 32), 173–74. Note that Oxford, Bodleian Library, MS Greaves 42 is clearly not a sixteenth-century copy but, at the very least, a late fourteenth-century copy if not considerably earlier, while MS Pococke 375, listed as made in 1456, is in fact dated in the colophon as having been completed on 13 Sha'ban 960 [= 25 July 1553].

35. For al-Khwārazmī's life and writings, see J. Verneil, 'Khwārazmī', *EF* (note 10), 4: 1070–71. His name is often written as al-Khwārazmī, but since it derives from the province of Khwārazm, the spelling al-Khwārazmī is more precise and in general use today.

36. These are preserved in a unique manuscript now in Strasbourg. See, al-Khwārazmī, *Kitāb Ṣūrat al-arḍ*, ed. H. von Mörk (Bibliothek arabischer Historiker und Geographen, 3; Leipzig, Harrassowitz, 1926).

37. For the illustration of the River Nile in the Khwārazmī treatise, see Tibbetts, 'The beginnings' (note 18), plate 4, and Sezgin, *Mathematische Geographie* (note 12), Kartenband, 11.

38. For al-Khwārazmī's drawing, see Tibbetts, 'The beginnings' (note 18), 105, Fig. 4.8, and Sezgin, *Mathematische Geographie* (note 12), Kartenband, 1g. A map of what appears to be the Indian Ocean is also illustrated in al-Khwārazmī's *Ṣūrat al-arḍ*, but it is a much simpler diagram than the map preserved in the present manuscript (Fig. 6); see al-Khwārazmī, *Ṣūrat al-arḍ* (note 36) and Sezgin, *Mathematische Geographie* (note 12), Kartenband, 1i.

39. Three copies of this map are known: two—Paris, Bibliothèque Nationale de France, MS Arabe 2221, fol. 204, and Oxford, Bodleian Library, MS Pococke 375, fols. 187^v–188^r (see Fig. 3)—are reproduced in colour by Margherita Pinna, *Il Mediterraneo e la Sardegna nella cartografia musulmana (dal VIII al XVI secolo)* (2 vols., Nuoro, Regione Autonoma della Sardegna, Istituto Superiore Regionale Etnografico, 1996), 2: 52–53 and 62–63. (Pinna's text, however, cannot be consulted without considerable caution.) For a colour reproduction of the same map from the copy dated 1556 in the National Library, Sofia, Bulgaria (MS Or. 3168), see Angelo Cutaia, *L'itinerario arabo-normanno Sotera Agriante nel libro di Al Idrisi* (Villaggio Mosè, Siculgrlica, 2000), 108–9.

40. For Ibn Hawqal's account of Sicily, see J. H. Kramers, ed., *Opus geographorum auctore Ibn Hawqal* (*Kitāb Ṣūrat al-arḍ*) (Bibliotheca Geographorum Arabicorum, 2nd ed.; 2 vols. Leiden, E. J. Brill, 1938–1939), 1: 118–31; and as translated by J. H. Kramers and G. Wiet, *Ibn Hawqal: Configuration de la terre* (*Kitāb surat al-arḍ*) (Collection UNESCO d'oeuvres représentatives. Série arabe; 2 vols, Paris, G.-P. Maisonneuve et Larose, 1964), 1: 117–30.

41. Fol. 32^v, line 2: *jazirat Siqilliya fa-a'zam al-lazā'it al-islāmiya qadran wa-ajalluhā dhikran li-itīṣāl maghāribihā lil-'aduww jadālahu Allāh wa-ijṭihād a'immatihā wa-wulāihā fi dhālika 'alā al-dawām.*

42. The names of the gates are as follows: *Bāb al-Bahr*, *Bāb Sūq al-Dajāj*, *Bāb al-Hadid* (or *al-Jadīd*), *Bāb Sūdān*, *Bāb nabih wa-huwa al-Abnā'* (a very famous gate, that is *al-Abnā'*), a gate the name of which is hidden in the gutter, *Bāb Rūja*, *Bāb Ibn Qurhub*, *Bāb Shaghāt* (i.e. *Shantaghātha*—the Porta Sant'Agata), *Bāb al-Husayn*, and *Bāb 'Ayn Shifa'*. There are several anomalies in this list. For Arab Palermo, see Adalgisa De Simone, 'Palermo araba', in *Storia di Palermo II. Dal tardo-antico all'Islam*, ed. Rosario La Duca (Palermo, L'EPOS, 2000), 77–113.

43. It is tempting to see this as a reference to a member of the Banū al-Ḥajar, the family which, under Norman rule, became the hereditary rulers of the Muslim community of the island. See Jeremy Johns, *Arabic Administration in Norman Sicily: The Royal Diwān* (Cambridge Studies in Islamic Civilization; Cambridge, Cambridge University Press, 2002), 234–42.

44. Fuller accounts of the treatment of Sicily in our manuscript have been given by Jeremy Johns at two recent conferences and will, in due course, be published in their acts: 'Una nuova mappa della Sicilia musulmana e del nuovo su Palermo nell'XI secolo dal *Kitāb Ghara'ib al-funūn wa-mulāḥ al-'uyūn*', in *Culture and Contacts in the Mediterranean Area. The Islamic Rôle (Past and Present)*, 21st Congress of l'Union Européenne des Arabisants et Islamisants (UEAI), Palermo, 27–30 September 2002, organized by Antonino Pellitteri; and 'Una nuova fonte per la geografia e la storia della Sicilia nell'XI secolo: il *Kitāb Ghara'ib al-funūn wa-mulāḥ al-'uyūn*', in *La Sicile à l'époque islamique: questions de méthodes et nouvelles problématiques*, Rome, 25–26 October 2002, organized by Alessandra Molinari and Annliese Nef.

45. The Arabic word *jazīra* is used to designate both an island and a peninsula.

46. The sixteenth-century engravings show much the same topographical features as on the map in *The Book of Curiosities*. For the topography of medieval al-Mahdiyya, see Alexandre Lézine, *Mahdiyya. Recherches d'archéologie islamique* (Paris, Librairie C. Klincksieck for the Centre National de la Recherche Scientifique, 1965, séries Archéologie méditerranéenne).

47. Ed. Jamal al-Dīn al-Shayyāl, in *Majallat al-majma' al-'ilmī al-trāqī*, 14 (1975): 151–89; recently reprinted as a booklet: *Anīs al-ja'īs fī akhbār Tinnīs* (Cairo, Maktabat al-Thaqāfat al-Dīniya, 2000).

48. *Nihayat al-rutha fī ṭalāḥ al-hisha*, ed. Husām al-Dīn al-Samārrā'i (Baghdad, Maṭba'at al-Ma'ārif, 1968).

49. For Tinnīs, see Yaacov Lev, 'Tinnīs: an industrial medieval town', in Marianne Barrucand, ed., *L'Égypte fatimide: son art et son histoire. Actes du colloque organisé à Paris les 28, 29 et 30 mai 1998* (Paris, Presses de l'Université de Paris-Sorbonne, 1999), 83–96. On Ibn Bassām's history of Tinnīs, Lev comments: 'Nothing is known about the author, and it is impossible to establish the date of his text' (p. 90).

50. It is intriguing, but probably not significant, that the Hereford *mappa mundi* and other western medieval maps should represent Cyprus as almost square in shape.

51. A resin of *Cistus creticus* L., and related species, used as a dentifrice and in various ointments. See M. Levey, *The Medical Formulary or Aqrābādīn of al-Kindī* (Madison, University of Wisconsin Press, 1966), 329, no. 270.

52. See Andreas and Judith A. Stylianou, *The History of the Cartography of Cyprus* (Publications of the Cyprus Research Centre, 8; Nicosia, Zavallis Press Ltd, 1980), 3.

53. For the six known copies of al-Arabān's treatise, see Oxford, Bodleian Library, MS Bodl. Or. 68, fols. 109^b–144^b; C. Brockelmann, *Geschichte der arabischen Literatur* (2nd ed., 2 vols., Leiden, Brill, 1943–1949); *Supplement* (3 vols., Leiden, Brill, 1937–1942), 2: 128–29 (159) and Suppl., 2: 159–60; D. A. King, *Survey of the Scientific Manuscripts in the Egyptian National Library* (American Research Center in Egypt, Catalog 5; Winona Lake, Indiana, Eisenbrauns for the American Research Center in Egypt, 1986), 74, entry C65; and D. A. King, *A Catalogue of the Scientific Manuscripts in the Egyptian National Library. Part II: A Descriptive Catalogue of the Scientific Collections Arranged Chronologically According to Subject Matter (Arabic Persian Turkish)* (American Research Center in Egypt, Catalog 4; Cairo, General Egyptian Book Organization in collaboration with the American Research Center in Egypt, 1986), 748–50.

54. At the time of writing, a team of scholars is being assembled to carry out a major research programme into *The Book of Curiosities*, funded by the Heritage Lottery Fund, with a view to publishing the entire manuscript, with its maps, and all findings on a website devoted exclusively to *The Book of Curiosities*. Eventually, it is hoped, all will also be made available on a CD-Rom and as a book.



Plate 1. Rectangular map of the inhabited world. Oxford, Bodleian Library, Dept. of Oriental Collections, MS Arab.c.90, fols. 23^b-24^a, 32.4 x 49 cm. Undated, 13th century (?). South at the top, as indicated. Note the graphic scale along the top. (Reproduced with permission from the Bodleian Library, Oxford.) See page 11.

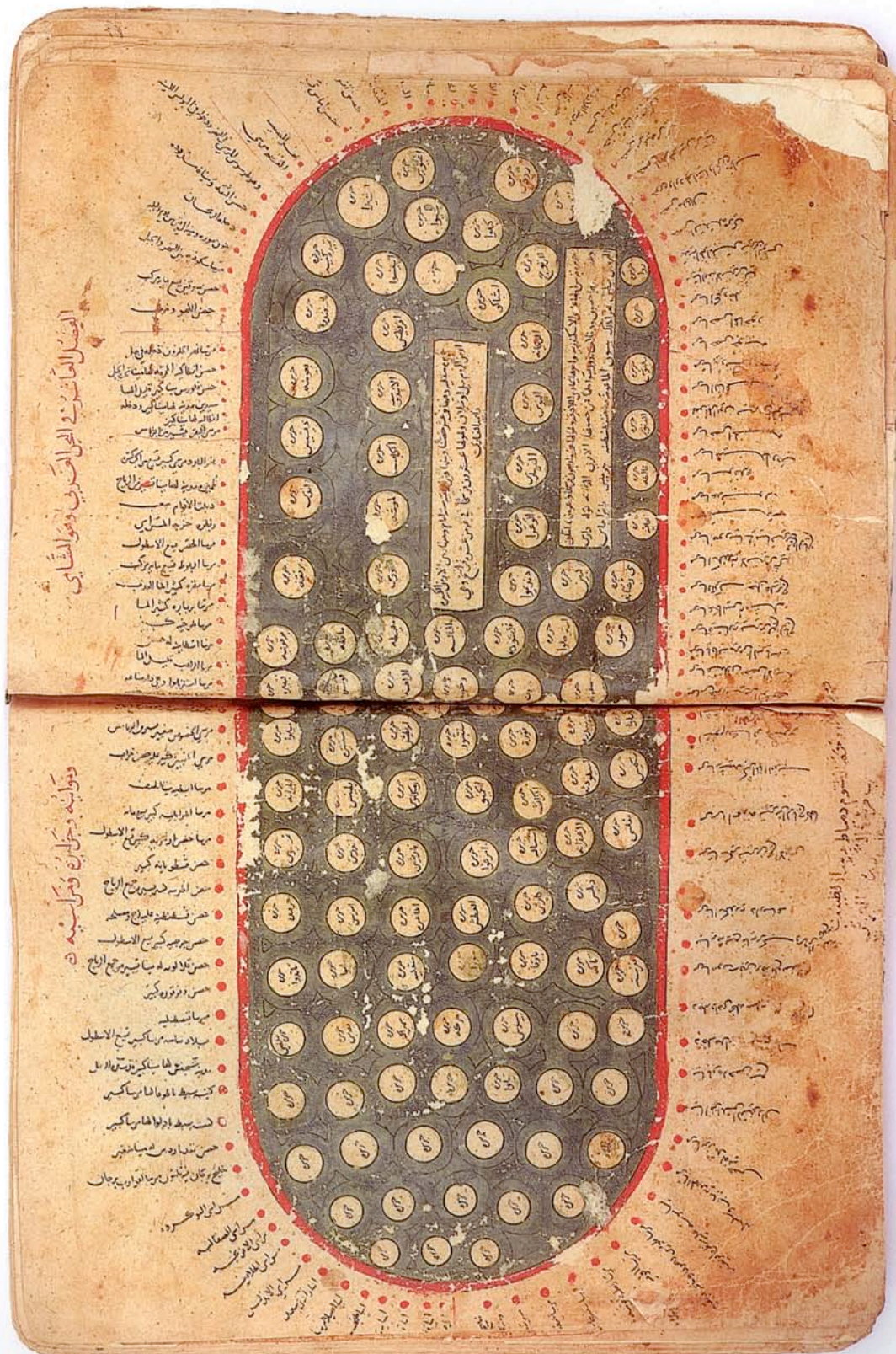


Plate 2. A map of the Mediterranean Sea, labelled 'The Western Sea, that is the Syrian Sea', Oxford, Bodleian Library, Dept. of Oriental Collections, MS Arab.c.90, fols. 30^b-31^a, 32.4 × 49 cm. Undated, 13th century (?). (Reproduced with permission from the Bodleian Library, Oxford.) See page 11.



Plate 3. Circular map of the inhabited world, of the 'Idrisi' type. Oxford, Bodleian Library, Dept. of Oriental Collections, MS Arab.c.90, fols. 27^v-28^r. 32.4 x 49 cm. Undated, 13th century (?). Cardinal points are labelled outside the circle. (Reproduced with permission from the Bodleian Library, Oxford.) See page 13.



Plate 4. The Nile River (detail). Oxford, Bodleian Library, Dept. of Oriental Collections, MS Arab.c.90, fol. 48^a [bound out of sequence and badly damaged]. 32.4 × 19 cm. Undated, 13th century (?). (Reproduced with permission from the Bodleian Library, Oxford.) See page 14.



Plate 5. The Tigris River. Oxford, Bodleian Library, Dept. of Oriental Collections, MS Arab.c.90, fol. 42^a. 30 × 21 cm. Undated, 13th century (?). (Reproduced with permission from the Bodleian Library, Oxford.) See page 15.

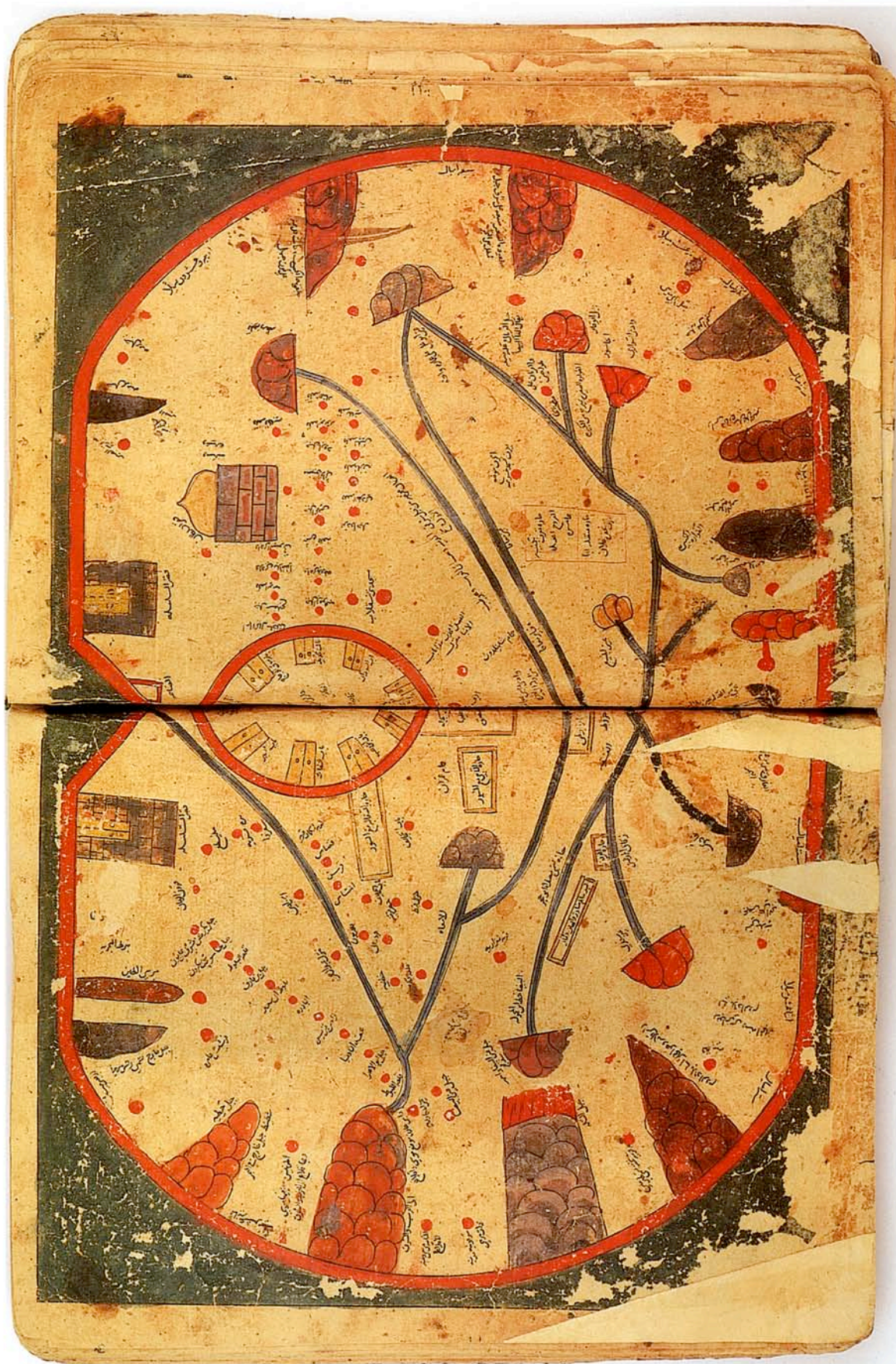


Plate 6. A map of Sicily. Oxford, Bodleian Library, Dept. of Oriental Collections, MS Arab. c.90, fols. 32^v-33^r, 32.4 × 49 cm. Undated, 13th century (?). (Reproduced with permission from the Bodleian Library, Oxford.) See page 15.

