

4 · Cartography in the Prehistoric Period in the Old World: Europe, the Middle East, and North Africa

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PREHISTORIC MAPS AND HISTORIANS OF CARTOGRAPHY

As was made clear in the Introduction to this section on prehistoric maps, historians of cartography have had little to say on prehistoric cartography in the Old World. Neither Richard Andree nor Wolfgang Dröber said anything at all.¹ In 1910 Bruno F. Adler discussed two decorated bone plaques that a German antiquarian, Fritz Rödiger, had suggested were maps, but he omitted both from his corpus.² In 1917 Leo Bagrow followed Adler in referring to Rödiger and in citing, for European prehistoric maps, the work of only three writers (Rödiger, Kurt Taubner, and Amtsgerichtsrath Westedt)³ among the 1,881 bibliographical items in his *Istoriya geograficheskoy karty: Ocherk i ukazatel' literatury* (The history of the geographical map: Review and survey of literature).⁴ Modern authors have scarcely improved on this: three topographical maps from the prehistoric period were published in the 1960s by Walter Blumer,⁵ though only two of these are included by P. D. A. Harvey,⁶ and one other has been described from the Middle East.⁷ Thus, when research for this chapter was started, the number of topographical maps from the prehistoric pe-

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1. Richard Andree, "Die Anfänge der Kartographie," *Globus: Illustrierte Zeitschrift für Länder* 31 (1877): 24–27, 37–43. Wolfgang Dröber, "Kartographie bei den Naturvölkern" (Diss., Erlangen University, 1903; reprinted Amsterdam: Meridian, 1964); summarized under the same title in *Deutsche Geographische Blätter* 27 (1904): 29–46. The Old World is here defined to include Europe (with Russia west of the Urals), the Middle East (to the Tigris), and North Africa (with the Sahara).

2. Fritz Rödiger, "Vorgeschichtliche Kartenzeichnungen in der Schweiz," *Zeitschrift für Ethnologie* 23 (1891): Verhandlungen 237–42. Adler misspelled Rödiger as Rödinger, an error perpetuated by Leo Bagrow in both *Die Geschichte der Kartographie* (Berlin: Safari-Verlag, 1951), 16, and *History of Cartography*, rev. and enl. R. A. Skelton, trans. D. L. Paisey (Cambridge: Harvard University Press; London: C. A. Watts, 1964), 26. In addition, Adler misspelled Taubner as Tauber: see Bruno F. Adler, "Karty pervobytnykh narodov" (Maps of primitive peoples), *Izvestiya Imperatorskogo Obshchestva Lyubitely Yestestvoznaniya, Antropologii i Etnografii: Trudy Geograficheskogo Otdeleniya* 119, no. 2 (1910): 218. See also the summary review by H. de Hutorowicz, "Maps of Primitive Peoples," *Bulletin of the American Geographical Society* 43, no. 9 (1911): 669–79. This omission meant that Adler had not one map example from Europe to set against the 115 gathered from the rest of the world; namely, 55 maps from Asia, 15 from America, 3 from Africa, 40 from Australia and Oceania, and 2 from the East Indies. The description of Adler's corpus comes from de Hutorowicz, "Maps," 669, and is also cited by Norman J. W. Thrower, *Maps and Man: An Examination of Cartography in Relation to Culture and Civilization* (Englewood Cliffs, N.J.: Prentice-Hall, 1972), 5 n. 7.

3. Rödiger, "Kartenzeichnungen," 237–42 (note 2). Kurt Taubner, "Zur Landkartenstein-Theorie," *Zeitschrift für Ethnologie* 23 (1891): Verhandlungen 251–57. Amtsgerichtsrath Westedt, "Steinkammer mit Näpfchenstein bei Bunsöh, Kirchspiel Albersdorf, Kreis Süderdithmarschen," *Zeitschrift für Ethnologie* 16 (1884): Verhandlungen 247–49.

4. Leo Bagrow, *Istoriya geograficheskoy karty: Ocherk i ukazatel' literatury* (The history of the geographical map: Review and survey of literature), *Vestnik arkheologii i istorii, izdavayemyy Arkheologicheskim Institutom* (Archaeological and historical review, published by the Archaeological Institute) (Petrograd, 1918). The relevant part of Bagrow's text was incorporated into his *Geschichte* (note 2), but very few of the original references reappear. Bagrow's *History of Cartography* (note 2), the revised and enlarged version of *Geschichte*, was translated and published in German as *Meister der Kartographie* (Berlin: Safari-Verlag, 1963). In all of these works, Bagrow discussed the Maikop vase: see note 90 below.

5. Map 43, map 45, and map 47 in appendix 4.1. Walter Blumer, "The Oldest Known Plan of an Inhabited Site Dating from the Bronze Age, about the Middle of the Second Millennium B.C.," *Imago Mundi* 18 (1964): 9–11 (Bedolina); idem, "Felsgravuren aus prähistorischer Zeit in einem oberitalienischen Alpental ältester bekannter Ortsplan, Mitte des zweiten Jahrtausends v. Chr.," *Die Alpen*, 1967, no. 2 (all three).

6. Seradina and Bedolina; P. D. A. Harvey, *The History of Topographical Maps: Symbols, Pictures and Surveys* (London: Thames and Hudson, 1980), figs. 20 and 21.

7. Map 54 in appendix 4.1. James Mellaart, "Excavations at Çatal Hüyük, 1963: Third Preliminary Report," *Anatolian Studies* 14 (1964): 39–119.

riod in the Old World referred to in recent histories of cartography totaled four.

After a reassessment of the evidence from the prehistoric period in the light of new criteria, over fifty maps or spatial representations from this period have been selected for consideration by historians of cartography and itemized in appendix 4.1—List of Prehistoric Maps. This list attempts to summarize what seem to be maps in the prehistoric source material. It is neither complete nor definitive and some items may prove controversial. It has been compiled with the caution such research demands and which has been lacking in the literature. It does, however, resist the recent tendency to dismiss magic and religious belief as irrelevant to an understanding of indigenous or prehistoric art. The pendulum of opinion has probably swung too far in its reaction to the nineteenth- and twentieth-century antiquaries who oversimplified their role. Scholarly research into such matters as the nature of the primitive mind, the importance of symbolism in primitive cultures, the early history of religion, and the meaning and context of rock art has done much to advance a more balanced and rational assessment of the surviving evidence. The expanded length of the list reflects these considerations.

The present approach is based on three general principles. First, an open mind is needed regarding the range of potential source material. Second, any maps found in these sources cannot be studied apart from other forms of contemporary art or in isolation from the total context in which this art was produced, even if this means relying not only on the archaeological record but also on anthropological parallels. And finally, a new theoretical framework may have to be created for what is in effect a new subject.

THE SOURCE MATERIAL AND ITS INTERPRETATION

All the major forms of prehistoric art are of potential interest to the historian of cartography (fig. 4.1). However, by far the most important are the two classes of rock (or parietal) art: paintings (pictographs) and carvings (petroglyphs). Mobiliary art—art on unfixed surfaces such as pebbles or slates or on bone or metal artifacts, decoration on pottery, even sculptures or relief models—can also contain much of cartographic interest. Rock art is found in daylight situations (rock shelters and overhangs that often were inhabited) as well as in underground caverns and deep recesses that would have been reached only with extreme difficulty in prehistoric times. The art is composed of both naturalistic and non-naturalistic representations. Animals (mainly bison, mammoth, and horse, but occasionally birds and fish) and human figures make up most of the first category.

A variety of what appear to us as geometric and abstract markings forms the second. Much of the literature emphasizes the naturalistic images, especially those (such as the bison and mammoth from Lascaux and other caves of the Dordogne region and the Cantabrian Pyrenees) famous for their beauty of line and execution. This has resulted in a biased impression of their numerical importance. Recent work is balancing this by showing that the same caves also contain vast numbers of nonnaturalistic markings.⁸ The suggestion, however, that the abstract or geometric figures may be later in date than the naturalistic figures is probably little more than speculation.⁹

While it is very difficult to place individual figures into chronological sequence, much less assign precise dates, prehistoric art can be described in the broadest of terms as dating either from the Upper Paleolithic and the Mesolithic, periods of hunter-gatherer-fisher populations, or from the post-Paleolithic period of agricultural populations (fig. 4.2). The Upper Paleolithic dates, in Europe, from about 40,000 B.C. to about 10,000 B.C. Where Upper Paleolithic cultural characteristics are found at a later date (as in northern Africa), the term Epipaleolithic is used. The first datable art in the world comes from Europe near the start of the Upper Paleolithic.¹⁰ It is already highly accomplished, and this must imply that the graphic and sculpting skills involved were by no means in their infancy even at this date. Given the total length of the Upper Paleolithic period—some thirty thousand years—its style of art as well as of life is remarkably homogeneous. In contrast, the economic and social characteristics of the post-Paleolithic era are exceedingly diverse, possibly a reflection of the environmental changes that accompanied the gradual disappearance of the ice sheets from Europe, although this was not matched by major changes in art. Prehistorians have long recognized three major cultural subdivisions: the Neolithic (with its transitional terminal phase, the Chalcolithic or Copper Age); the Bronze Age; and the

8. For example, cave decoration at Niaux (Tarascon-sur-Ariège) includes 2–3 human figures and 114 animal figures but also no fewer than 136 “tectiform” signs of various styles and nearly as many circular signs in addition to numerous other geometric or abstract markings: Antonio Beltran-Martínez, René Gailli, and Romain Robert, *La Cueva de Niaux*, Monografías Arqueológicas 16 (Saragossa: Talleres Editoriales, 1973), 227–46.

9. Magín Berenguer, *Prehistoric Man and His Art: The Caves of Ribadesella*, trans. Michael Heron (London: Souvenir Press, 1973), 79 ff. But see Mircea Eliade, *A History of Religious Ideas*, trans. Willard R. Trask (Chicago: University of Chicago Press, 1978), vol. 1, *From the Stone Age to the Eleusinian Mysteries*, chap. 1.

10. Peter J. Ucko and Andrée Rosenfeld, *Palaeolithic Cave Art* (New York: McGraw-Hill; London: Weidenfeld and Nicolson, 1967), 66; Desmond Collins and John Onians, “The Origins of Art,” *Art History* 1 (1978): 1–25.

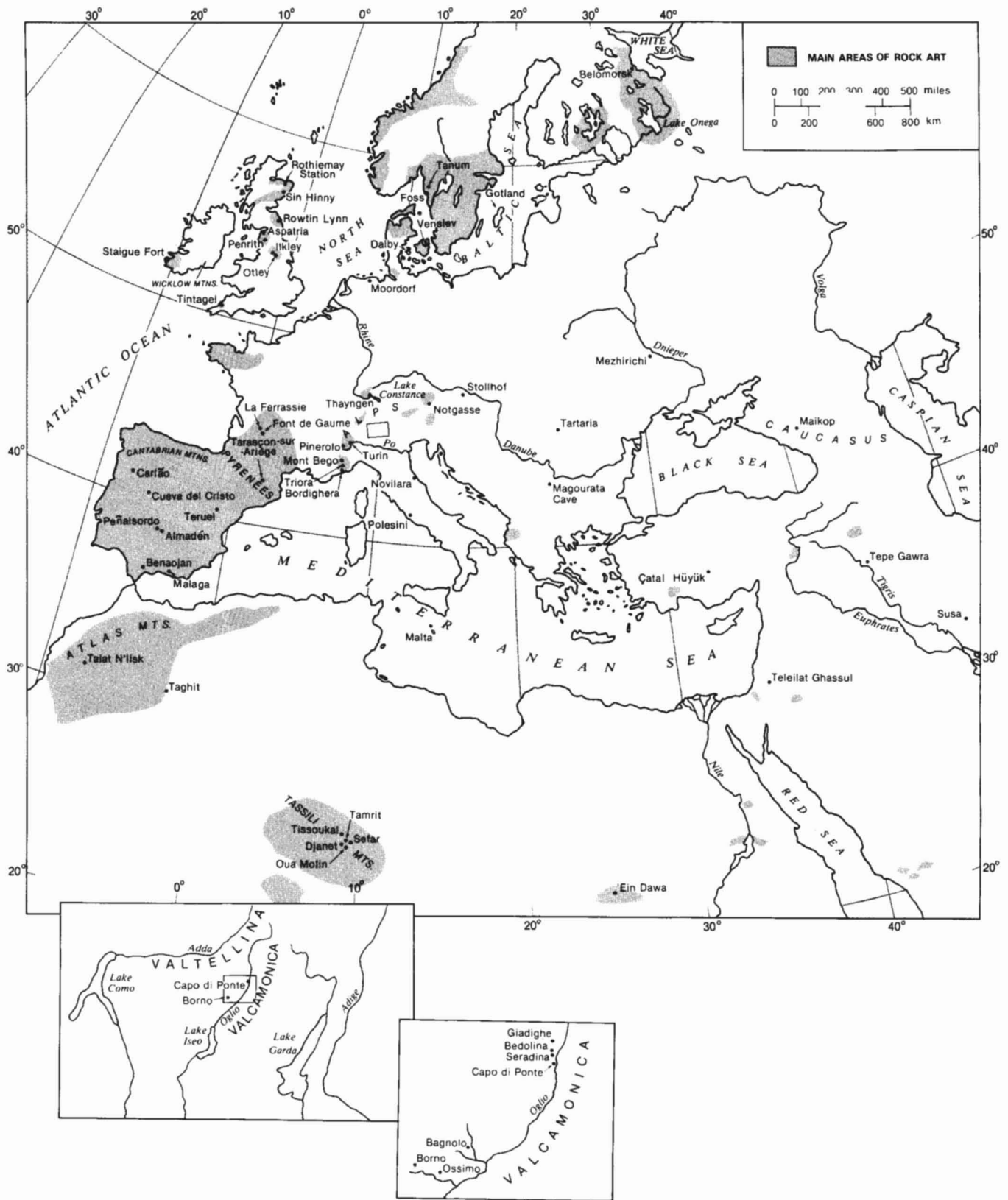


FIG. 4.1. PRINCIPAL AREAS AND SITES ASSOCIATED WITH PREHISTORIC ROCK ART IN THE OLD WORLD.

Iron Age. Each of these cultural periods started earlier in southern and eastern regions (first Mesopotamia and Egypt, then Asia Minor, Greece, and southern Italy) than in the western Mediterranean or northern Europe. Throughout the Upper Paleolithic, the Scandinavian area lay under an ice sheet and was uninhabited. The main periods of post-Paleolithic rock art coincide with the Neolithic and Bronze ages in southern Europe and with the Bronze and early Iron ages in Scandinavian Europe. The end of the prehistoric period, readily identified by the appearance of writing, likewise varied regionally. In the Middle East the appearance of writing and the rise of the great civilizations of Mesopotamia starts from about 3000 B.C., and the same is true in Egypt. Along the northern and southern shores of the western Mediterranean, however, the prehistoric period lasted well into the final millennium B.C. Northern France and Britain remained prehistoric until the arrival of the Romans. In Scandinavia the Iron Age is generally accepted as continuing until the eighth or ninth century A.D.

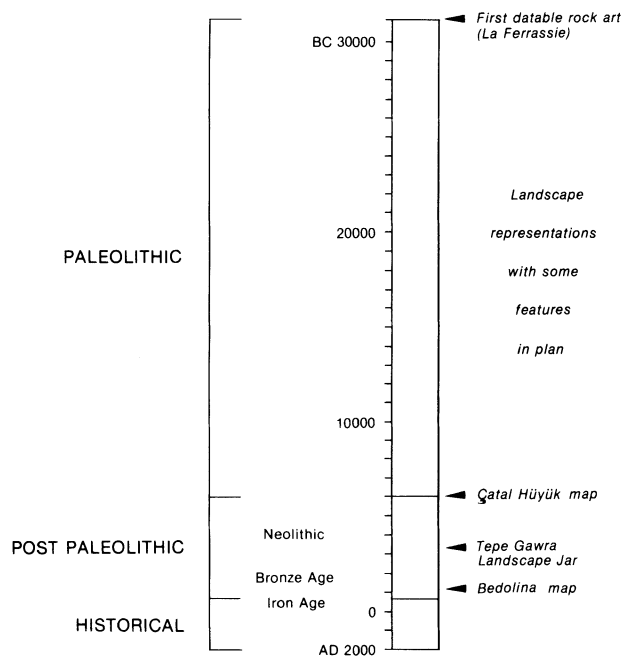


FIG. 4.2. THE PREHISTORIC AND HISTORICAL TIME SCALE. The period of European and Middle Eastern rock and mobiliary art is compared with the historical period. Maps usually described as the “earliest”—such as those on Mesopotamian clay tablets—come from the historical period. The dates of two of the better-known prehistoric maps are indicated.

Notwithstanding these archaeological distinctions based on material culture, the essential characteristics of rock art were maintained throughout the entire prehistoric period. There are detailed differences, such as a change of content according to region or period (differ-

ent animals or objects are depicted) and a change of location (post-Paleolithic rock art tends to be in the open air, being found on exposed rock surfaces and cliff faces and even, in some areas, within sight of contemporary farmland). But one of the crucial features of prehistoric art of any date is the way certain surfaces were used over and over again while neighboring rocks, to our eyes as suitable and as attractive, remain pristine. This characteristic is held to emphasize the sacredness of specific sites. The general distribution of rock art reinforces this conjecture. In part it must reflect accident of discovery or intensity of search (as in Valcamonica, Italy, or in southern Sweden). On the other hand, there are strongly marked clusters of sites within even the best-searched areas (around Mont Bégo in the Ligurian Alps, for example). It is this that has led many to postulate the sacredness of certain localities, and even of specific topographical features, as a factor in the distribution of rock art. Similarly arresting is the absence of composition in European rock art.¹¹ This makes all the more outstanding those assemblages in rock or mobiliary art where order or regularity is discernible.

Nearly all evidence for human activity in the prehistoric period has been acquired through archaeological investigation. But perhaps surprisingly, considering the extraordinary wealth and detail of information generally available for the Old World, the archaeological record is far from adequate when it comes to the interpretation of prehistoric art and hence its cartographic component. Archaeological information is unevenly spread geographically, through time, and by topic. More often than not, little direct and unambiguous evidence is available for reconstructing a behavioral picture of the people whose beliefs and values account for the different forms of the art. One reason for the ambiguities is that the most basic archaeological criterion—an absolute date

11. As compared with southern Africa, for example, where “narrative compositions are far more common and much more explicit: people are clearly depicted dancing, fighting, hunting or performing . . . ritual activities”: J. David Lewis-Williams, *The Rock Art of Southern Africa* (Cambridge: Cambridge University Press, 1983), 11. For the debate over just how much order there may be in European rock art, see Ann Sieveking, *The Cave Artists* (London: Thames and Hudson, 1979), 208–9. For instance, André Leroi-Gourhan has suggested that there is a significant grouping of what he sees as male/female animal types and sexual signs: see his *Art of Prehistoric Man in Western Europe*, trans. Norbert Guterman (London: Thames and Hudson, 1968), and his *The Dawn of European Art: An Introduction to Palaeolithic Cave Painting*, trans. Sara Champion (Cambridge: Cambridge University Press, 1982), but this is not supported by statistical analysis: John Parkington, “Symbolism in Palaeolithic Cave Art,” *South African Archaeological Bulletin* 24, pt. 1, no. 93 (1969): 3–13. It has even been suggested that some cave decoration represents local hunter territory, particularly when the natural irregularities of the cave wall are included in the composition: Anne Eastham and Michael Eastham, “The Wall Art of the Franco-Cantabrian Deep Caves,” *Art History* 2 (1979): 365–85.

for each picture—cannot be satisfied. Secure dating for a rock art figure is available only if it is found within a properly stratified and datable context, as, for example, at Çatal Hüyük.¹² Prehistorians often attempt to identify the different production stages of a rock art palimpsest by reference to variations in technique and in style of drawing or to degree and nature of subsequent patination. Only slightly safer ground is provided by comparing the depiction of an object with an identical one dated by excavation. But while relative chronologies may perhaps be established in this manner, absolute dates arrived at by such methods have to be regarded with skepticism. This means, for the historian of cartography, that it is difficult to associate a map example with a specific prehistoric culture. Limited knowledge about the art itself means that an advance in understanding its meaning is also held back.

Archaeological investigation has established two important general points, both relating to the purpose of rock art. First, excavations have demonstrated that rock art was associated with belief and religion. The picture map from Çatal Hüyük, for instance, like the other wall paintings from this remarkable Neolithic site in central Turkey, was excavated from a room whose contents and internal arrangements show it was a shrine or some sort of holy room.¹³ Second, both at Çatal Hüyük and elsewhere, excavation has also shown that this art was a “product of the moment,” created for, or during, ritual and not at all intended to last beyond that event.¹⁴ Although very little rock art is associated with so informative an archaeological context, concordance of ethnographic and archaeological evidence supports such conclusions.

The historian of cartography who is concerned with maps from the prehistoric period in the Old World faces not only conceptual and methodological problems familiar to scholars working on the ‘primitive’ maps of still-extant New World peoples¹⁵ but also a number of additional problems that limit from the outset any hopes for direct interpretation of the evidence. The greatest conceptual problem involves the researcher’s attitude to indigenous and prehistoric cultures. The modern mind is blinkered by its own literacy to the extent that “the effects of oral states of consciousness are bizarre to the literate mind.”¹⁶ It is difficult to imagine what a primarily oral culture is like. This may help explain why its products have been all too easily dismissed as irrational, quaint, or (in the pejorative sense) primitive. Another recent revelation is that oral persons tend not to recognize or to have a discrete category for abstract shapes.¹⁷ They see a circle, for instance, as the object they know it represents, so that one circle is described as a plate, another as the moon, and so on. But apart from these general matters, the researcher into European

rock art is at a disadvantage. Suitable ethnic survivors in the Old World are lacking, and the time span between the prehistoric period and the present, or even the recent past, is far too long to allow inference from tradition, myth, or legend.¹⁸

Hence non-European ethnographic parallels, where they are well documented, can and must be used to provide insight into the context of prehistoric rock art. They are needed as a guide both to its function and to the meaning of its content. The first lesson to be learned

12. See note 7 above. Problems of independent dating are illustrated by Ronald I. Dorn and David S. Whitley, “Chronometric and Relative Age Determination of Petroglyphs in the Western United States,” *Annals of the Association of American Geographers* 74 (1984): 308–22.

13. Mellaart, “Excavations,” 53–55 (note 7), and James Mellaart, *Çatal Hüyük: A Neolithic Town in Anatolia* (London: Thames and Hudson, 1967), 77. Subsequent excavation revealed an unusual and distinctive feature in this particular shrine: a burial. Moreover, the dead woman was decorated in nonlocal style, prompting speculation about her association with the subject of the wall painting and the eruption of Hasan Dağ (Mellaart, personal communication).

14. Indeed, there is evidence of its having been destroyed after its period of utility: at Çatal Hüyük the walls were regularly replastered and sometimes repainted. Diane Kirkbride, “Umm Dabaghiyah 1974: A Fourth Preliminary Report,” *Iraq* 37 (1975): 3–10, esp. 7, and J. B. Hennessy, “Preliminary Report on a First Season of Excavations at Teleilat Ghassul,” *Levant* 1 (1969): 1–24, also report replastering and repainting, in one case at Teleilat Ghassul up to twenty times. Elsewhere, engraved slate plaques have been found deliberately broken: Gerhard Bosinski, “Magdalenian Anthropomorphic Figures at Gönnersdorf (Western Germany),” *Bolletino del Centro Camuno di Studi Preistorici* 5 (1970): 57–97, esp. 67. Also relevant is “the fact that some decorated stones [in Megalithic burial architecture] were never meant to be seen again”: Glyn Daniel, review in *Antiquity* 55 (1981): 235, of Elizabeth Shee Twohig, *The Megalithic Art of Western Europe* (Oxford: Clarendon Press, 1981).

15. Discussed by Michael Blakemore, “From Way-finding to Map-making: The Spatial Information Fields of Aboriginal Peoples,” *Progress in Human Geography* 5, no. 1 (1981): 1–24.

16. Walter J. Ong, *Orality and Literacy: The Technologizing of the Word* (London and New York: Methuen, 1982), 30.

17. A. R. Luriya, *Cognitive Development: Its Cultural and Social Foundations*, ed. Michael Cole, trans. Martin Lopez-Morillas and Lynn Solotaroff (Cambridge: Harvard University Press, 1976), 32–39. Reported by Ong, *Orality and Literacy*, 50–51 (note 16).

18. The link undoubtedly exists, though it is much complicated by the substitution of characters and events as individual myths pass from one culture to another. See Stephen Toulmin and June Goodfield, *The Discovery of Time* (London: Hutchinson, 1965), 23ff., and Peter Munz, *When the Golden Bough Breaks: Structuralism or Typology?* (London and Boston: Routledge and Kegan Paul, 1973); Claude Lévi-Strauss, *Structural Anthropology*, trans. Claire Jacobson and Brooke Grundfest Schoepf (New York: Anchor Books, 1967), chap. 11. The usefulness of ethnographic evidence is illustrated by the way certain signs in Australian aboriginal art, which appear to have no topographical significance, may be explained by the artists or users as topographical in meaning; signs for hills used by the Walbiri, for example. Nancy D. Munn, “Visual Categories: An Approach to the Study of Representational Systems,” *American Anthropologist* 68, no. 4 (1966): 936–50; reprinted in *Art and Aesthetics in Primitive Societies*, ed. Carol F. Jopling (New York: E. P. Dutton, 1971), 335–55.

from the ethnographic evidence, as already noted, is that the maps cannot, in the first instance at least, be studied in isolation, any more than can the rock art corpus as a whole be divorced from its social context. To reach the ideas expressed in the art, it is essential to distill the vital concepts from the ethnography and then show how they are transformed into graphic representation.¹⁹ This can be done only by looking at generalized and repeated features, and not, as has long been the tendency, by selecting the immediately attractive pictures and attempting to match them to specific myths or practices.²⁰ The second lesson is that rock art is not about the mundane practicalities of daily life. Contrary to views held earlier this century on the importance of “sympathetic magic,” it is possible to demonstrate from ethnography that the artists were not concerned with the provision of food.²¹ It is also clear that such maps as there may be in rock art are less likely to have been created, as are modern maps, for wayfinding or as a device for the storage of information.²² Ethnography shows that permanent directional aids are not normally needed within small indigenous, land-based societies,²³ though they might be needed by peoples who must navigate extensive areas of undifferentiated terrain, oceanic or snowbound territories,²⁴ or by those living in a community which has so outgrown its territory that there are members to whom it is no longer all intimately familiar.²⁵ What ethnography does show is that the primary aspects of human spatial consciousness may be transferred to the ground (as in settlement planning) or used in the creation of imagined worlds (the cosmos).²⁶ It has been shown, too, that initiation rites contain the secrets of a society’s symbolic knowledge²⁷ and that it is information about the cosmological world, rather than profane and practical familiarity with the local territory, that is transmitted through those rites.²⁸ In fact, ideas about the “other world” and the nature of the passage from one part of the cosmos to another are found to be of fundamental importance in indigenous societies. That this was also the case in prehistoric times cannot be doubted, given, for example, the presence in prehistoric art of cosmological symbols such as ladders and trees as well as “guides to the beyond” in the form of labyrinthine designs. Finally, and importantly, ethnography reveals the way the art is composed of “crystallised metaphors”²⁹ and that it is as resonant with symbolic meaning as any of the more ephemeral gestures or rites of the society that produced it.

The role of image, symbol, and symbolism in oral societies is now well documented. Indeed, it is recognition of the “importance of symbolism in archaic thinking and . . . the fundamental part it plays in the life of any and every primitive society”³⁰ that distinguishes modern scholars from those of the nineteenth century

in these studies. An appreciation of symbolism closes the gap between prehistoric rock art in general and prehistoric cartography in particular. Maps, like rock art, are executed to convey “a message . . . encoded in visual form.”³¹ The difficulty is that this code needs to be broken before the message can be reached. It is well known that signs and symbols carry messages particular to a social group, or to individuals within that group (the initiated), and that the meaning of each sign has to be learned. Cross-cultural equivalents do exist, but an apparently familiar symbol with a wide distribution may have not only a wide range of meanings but also mean-

19. Lewis-Williams, *Rock Art*, 37 (note 11).

20. Lewis-Williams, *Rock Art*, 37 (note 11).

21. Lewis-Williams, *Rock Art*, 19 (note 11). See also Lewis-Williams, “Testing the Trance Explanation of Southern African Rock Art: Depictions of Felines,” *Bollettino del Centro Camuno di Studi Preistorici* 22 (1985): 47–62.

22. The last phrase is Thrower’s, *Maps and Man*, 1 (note 2).

23. See, for example, R. A. Gould, *Living Archaeology* (Cambridge: Cambridge University Press, 1980), 84; David Lewis, “Observations on Route Finding and Spatial Orientation among the Aboriginal Peoples of the Western Desert Region of Central Australia,” *Oceania* 46, no. 4 (1976): 249–82, esp. 271. However, there are indications that there may have been a greater demand for navigational aids in small land-based societies than might have been expected. For example, the long journey of the Hopi Indians to fetch salt described by Leo W. Simmons, ed., *Sun Chief: The Autobiography of a Hopi Indian* (New Haven: Yale University Press, 1942), 232–45. I owe this last point to Herbert C. Woodhouse.

24. See discussion in Christopher R. Hallpike, *The Foundations of Primitive Thought* (New York: Oxford University Press; Oxford: Clarendon Press, 1979), 301–13.

25. As in the case of large-scale societies, supported by cultivation and living in permanent settlements. The nature of the agricultural routine and implied division of labor may also mean—as it has in recent times—that few inhabitants of the settlement visit all parts of its territory and that most would not be intimately familiar with all local places: see Catherine Delano Smith, *Western Mediterranean Europe: A Historical Geography of Italy, Spain and Southern France since the Neolithic* (London: Academic Press, 1979), 27–29. On the other hand, it is also arguable that such knowledge of the total territory is not needed in the normal pattern of life: Hugh Brody has demonstrated that individual Indian hunters had their own hunting and gathering areas within the same reserve and respected each other’s, which must have remained relatively unfamiliar if not wholly unknown: *Maps and Dreams* (New York: Pantheon Books, 1982).

26. Jean Piaget and Bärbel Inhelder, *The Child’s Conception of Space*, trans. F. J. Langdon and J. L. Lunzer (London: Routledge and Kegan Paul, 1956); Hallpike, *Foundations*, 285–96 (note 24).

27. For example, Fredrik Barth, *Ritual and Knowledge among the Baktaman of New Guinea* (New Haven: Yale University Press, 1975).

28. Arnold van Gennep, *The Rites of Passage*, trans. Monika B. Vizedom and Gabrielle L. Caffee (London: Routledge and Kegan Paul, 1960), viii, for instance. The original, written in French in 1909, *Les rites de passage: Etude systématique des rites* (Paris: E. Nourry, 1909), was long ignored but is still not superseded.

29. Lewis-Williams, *Rock Art*, 44 (note 11).

30. Mircea Eliade, *Images and Symbols: Studies in Religious Symbolism*, trans. Philip Mairet (London: Harvill Press, 1961), 9.

31. Blakemore, “Way-finding,” 3 (note 15).

ings that are total opposites.³² So even where meanings become relatively fixed (and are therefore available to us), as in the case of pictographic, ideographic, or hieroglyphic writing, it is unwise to transpose meanings from one spatial or temporal context to another.³³

In the relatively closed world of a small indigenous or traditional society, the messages conveyed by signs and symbols are readily learned. There are many constantly recurring regularities,³⁴ experiences shared by all and therefore recognized by all. It is this homogeneity of experience that makes signs and symbols an effective and economical form of communication, at least within that particular society and its initiates. To understand these signs and symbols, the historian of cartography must learn to see the same world in the same way as their creators.³⁵ On a modern map, signs are similarly used to convey the maximum amount of information to the user.³⁶ However, the nature of this primary information is generally elucidated by a written explanation or key in the course of verbal instruction. On a different level, hidden, symbolic, or coded messages are discovered when the historian of cartography has learned to understand not just the overt content of the map itself but its total context.³⁷ In the absence of a key or other guide indicating even the primary meanings of the signs employed in prehistoric art, the need to come to terms with the total context of that art is all the more urgent.

A final complication is the matter of style. One difficulty is knowing whether the artist is portraying the object in profile or in plan.³⁸ Another is that, in rock art no less than in art in general, some artists attempt to economize in representation to the extent that they produce highly stylized figures. These can look like abstract or geometric signs even though the intent is an iconic representation. Henri Breuil, the pioneer authority on European rock art, reproduced a set of figures from the Paleolithic cave of Calapata (Teruel) showing the evolution of the portrayal of a stag.³⁹ The figures ranged from lively iconic representations to a stylized motif looking like a coarse comb with missing or deformed teeth. Such stylization is also the basis of alphabetic characters.⁴⁰ The point is, of course, that “the better an act is understood . . . the more formal and cursory may be the movement that represents it. . . . It becomes an act of *reference* rather than of representation.”⁴¹

Faced with such problems, and in the absence of a title, key, or known context such as can identify a modern map, the historian of cartography has to develop a way of identifying prehistoric maps. Hitherto such prehistoric maps as have entered the literature have been identified by spontaneous recognition (“it looks like a map”). But this is a highly conditioned, optical reaction based on experience of maps from the historical period. In dealing with the enigmatic images and signs of the

rock and mobiliary art of the prehistoric period, it is necessary to construct first principles by asking, What is a “map”? What are the essential visual characteristics of a cartographic image that distinguish it from other

32. Hallpike, *Foundations*, 149–52 (note 24), gives the color white as an example of a symbol with both cross-cultural equivalences and also contradictory meanings. It almost universally symbolizes purity and goodness, but it can also mean disease, destruction, and punishment.

33. Joseph Needham suggests that the Chinese character for a mountain “was once an actual drawing of a mountain with three peaks,” while that for fields shows “enclosed and divided spaces”: *Science and Civilisation in China* (Cambridge: Cambridge University Press, 1954–), vol. 3, *Mathematics and the Sciences of the Heavens and the Earth*, 497. See also Ulrich Freitag, “Peuples sans cartes,” in *Cartes et figures de la terre*, exhibition catalog (Paris: Centre Georges Pompidou, 1980), 61–63. Small visual differences may substantially alter the meaning: in the domestic decoration of the Mesakin of Nuba (Sudan) a row of colored triangles signifies mountains; uncolored, it means female breasts; and two lines enclosing the row make it a nonrepresentational design: Ian Hodder, *Symbols in Action: Ethnoarchaeological Studies of Material Culture* (Cambridge: Cambridge University Press, 1982), 171. These difficulties of interpretation are no doubt what Blakemore had in mind when writing of the “insularity of symbology” in “Way-finding,” 20 (note 15).

34. Hallpike, *Foundations*, 167 (note 24). See also Roger William Brown, *Words and Things* (New York: Free Press, 1958), 59–60. Brown suggests that something as familiar as a stick figure χ is a *learned* sign; a child’s natural tendency is to draw circular forms, representing the rounded, fleshed body, not the invisible skeleton represented by this type of sign.

35. Brown, *Words and Things*, 59 (note 34).

36. François de Dainville, *Le langage des géographes* (Paris: A. et J. Picard, 1964), 324.

37. Michael J. Blakemore and J. B. Harley, *Concepts in the History of Cartography: A Review and Perspective*, Monograph 26, *Cartographica* 17, no. 4 (1980): esp. 76–86. J. B. Harley, “Meaning and Ambiguity in Tudor Cartography,” in *English Map-making, 1500–1650*, ed. Sarah Tyacke (London: British Library, 1983), 22–45.

38. For example, there is little to distinguish the image of a stylized animal shown in comblike profile (see note 39 below) from that of a sheep pen drawn in plan, rather more carefully done but similarly stylized. The latter can be found, for instance, on maps drawn by Antonio di Michele for the Dogana della Mene delle Pecore (a grazier institution) in 1687 (Archivio di Stato, Foggia), one of which is reproduced in Delano Smith, *Western Mediterranean*, 247, pl. 10 (note 25). Essential reading on the problems associated with style is contained in many papers in Peter J. Ucko, ed., *Form in Indigenous Art: Schematisation in the Art of Aboriginal Australia and Prehistoric Europe*, Australian Institute of Aboriginal Studies, Prehistory and Material Culture Series no. 13 (London: Gerald Duckworth, 1977). See also Jan B. Deregowski, *Distortion in Art: The Eye and the Mind* (London: Routledge and Kegan Paul, 1984), and, for a critique of Deregowski’s earlier writings, Robert Layton, “Naturalism and Cultural Relativity in Art,” in *Indigenous Art*, 34–43 (above).

39. Henri Breuil, “The Palaeolithic Age,” in *Larousse Encyclopedia of Prehistoric and Ancient Art*, ed. René Huyghe (London: Paul Hamlyn, 1962), 30–39, esp. 37.

40. S. H. Hooke, “Recording and Writing,” in *A History of Technology*, ed. Charles Singer et al., 7 vols. (Oxford: Clarendon Press, 1954–78), vol. 1, *From Early Times to Fall of Ancient Empires*, 744–73.

41. Susanne K. Langer, *Philosophy in a New Key: A Study in the Symbolism of Reason, Rite, and Art*, 3d ed. (Cambridge: Harvard University Press, 1957), 156, her italics.

motifs, ensuring its recognition even where other diagnostics, such as the key or known context, are missing? At some stage, we must also answer the question, What were such maps for? Modern preconceptions about the function of maps, biasing our interpretation of their content or appearance, have to be set aside.⁴²

What appears to be spontaneous recognition of a map in fact involves three assumptions: that the artist's intent was indeed to portray the relationship of objects in space; that all the constituent images are contemporaneous in execution; and that they are cartographically appropriate. In the context of prehistoric art, it is difficult to prove that all three conditions are met. The first has to be taken largely for granted, although it is the most basic, once the contemporaneity of the constituent images is assured. Thus, to use an early historical example as a model, the gesticulating stick men and their animals on the Rajum Hani' stone (fig. 4.3) are assumed to have been intentionally placed inside the enclosure, a point confirmed in this case by the accompanying inscription.⁴³ The demonstration of the second condition, that of contemporaneity, is closely associated with the first and is a vital step in the interpretation of a prehistoric map. Assemblages of images in prehistoric rock art in Europe are outstandingly disordered, lacking any suggestion of deliberate composition.⁴⁴ Images are commonly found superimposed,⁴⁵ drawn at all angles, or even upside down, and only very exceptionally is there a frame other than the natural edge of the stone or the undecorated portion of the cliff face. It is thus usually difficult to be convinced that the rock art assemblage was originally both intended and executed as an entire composition and that it has not survived merely as a palimpsest or as the result of accidental juxtaposition of individual images that could have been executed at long intervals. For maps drawn in plan, a way out of this problem can be suggested: only where it is reasonably clear that the engraved or painted lines connect neatly with each other, are neither superimposed nor isolated, and are identical in technique and style, should it be assumed that a composition was intended and that the individual images are constituents of a larger whole and are contemporaneous. For picture maps, the only check available is that of stylistic and technical similarity.

The third condition, the cartographic appropriateness of each constituent image of a prehistoric map, presents a different order of problem. A modern topographic map is composed largely of familiar signs, the meaning of which is reinforced by the accompanying key or has been made clear by an alternative form of explanation. Otherwise there would be no way of being certain about the meaning of a sign: any image can be used to stand for any object. It is usual—and sensible—to maintain some degree of correspondence between the image selected

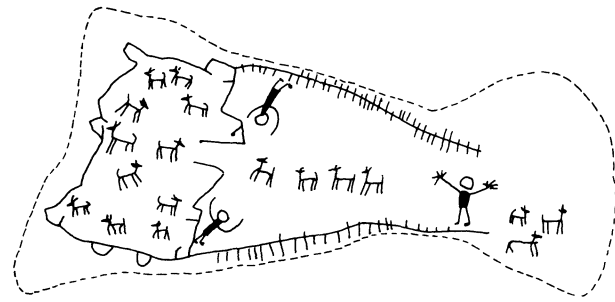


FIG. 4.3. THE RAJUM HANI' STONE. The interpretation of this Jordanian inscription from the early centuries A.D. as a part-plan, part-profile representation of a livestock enclosure is confirmed by the text on the reverse of the stone.

Size of the original: 50 × 95 cm. After G. Lankester Harding, "The Cairn of Hani'," *Annual of the Department of Antiquities of Jordan* 2 (1953): 8–56, fig. 5, no. 73.

42. These problems, of identification and of function of prehistoric maps, are also aired in Catherine Delano Smith, "The Origins of Cartography, an Archaeological Problem: Maps in Prehistoric Rock Art," in *Papers in Italian Archaeology IV*, pt. 2, *Prehistory*, ed. Caroline Malone and Simon Stoddart, British Archaeological Reports, International Series 244 (Oxford: British Archaeological Reports, 1985), 205–19, and her "Archaeology and Maps in Prehistoric Art: The Way Forward?" *Bollettino del Centro Camuno di Studi Preistorici* 23 (1986): forthcoming.

43. The Rajum Hani' stone serves well as a model, since the carved representation is accompanied by an explanatory text. The text reads: "By Mani'at, and he built for Hani'. And he drew a picture of the pen [or, enclosure] and the animals pasturing by themselves": G. Lankester Harding, "The Cairn of Hani'," *Annual of the Department of Antiquities of Jordan* 2 (1953): 8–56, and plates; Harding's translation (with brackets), p. 30. The vertical strokes along the two extended arms of the enclosure have been interpreted as its having been palisaded and "presumably . . . made of branches of the desert trees and shrubs": "Desert Kites," *Antiquity* 28 (1954): 165–67, quotation on 165. Emmanuel Anati, *L'arte rupestre del Negev e del Sinai* (Milan: Jaca Book, 1979), has an aerial photograph of a livestock enclosure on p. 12 and a reproduction of the Wadi Ramliyah engraving of similar design but prehistoric in date on p. 57.

44. See note 11 above.

45. There seem to be two quite different situations relating to the superimposition of figures in rock art. On the one hand, the preexisting figure is seen either as destroyed by or irrelevant to the addition of a new one. For example: "This haphazard placing of motifs leads one to deduce that the motifs were inherently significant for the carvers but that their placing on the stone or their relation to one another was unimportant": Elizabeth Shee, "Recent Work on Irish Passage Graves Art," *Bollettino del Centro Camuno di Studi Preistorici* 8 (1972): 199–224, quotation on 218. North American Indian parallels show that individual sites were associated with specific ideas or needs and that the markings made there were part of the current "ritual," prayer, or wish (e.g., for pregnancy), no notice being taken of previous marks: Dale W. Ritter and Eric W. Ritter, "Medicine Men and Spirit Animals in Rock Art of Western North America," in *Acts of the International Symposium on Rock Art: Lectures at Hankø 6–12 August, 1972*, ed. Sverre Marstrand (Oslo: Universitetsforlaget, 1978), 97–125. On the other hand, there may be situations where "superimpositioning was . . . a deliberate way of linking paintings according to certain conventions": Lewis-Williams, *Rock Art*, 40–41, 55, 61 (note 11).

and the object it is intended to represent or symbolize (partly as insurance against forgetting its meaning). So it is reasonable to assume, in the case of prehistoric art, that the naturalistic figures such as those for animals and houses are iconic or pictorial representations, at least at the first level of meaning.⁴⁶ Those most likely to be commonplace on a topographic map (a house, for instance, rather than a weapon) can be selected from those less likely to have cartographic significance. Another guideline is the frequency of occurrence, within a single composition, of the individual images. Examination of a modern map shows that it is composed of a range of images, most, if not all, of which occur frequently. This should also be the case with the prehistoric map.

By applying the three diagnostic criteria together—composition, appropriateness of the images, and their frequency within the composition—to prehistoric rock art, some headway has been made in identifying prehistoric maps portraying the landscape from above, as is demonstrated later in this chapter. However, those parts of the Old World examined in this volume have not as yet been found to be rich in examples meeting these criteria.

The arguments for regarding compositions such as those of Mont Bégo or Valcamonica as examples of plan topographic maps are beguiling (fig. 4.4). In the final analysis, however, the matter rests on the intention of the artist who so painstakingly hammered the hard rock surfaces into a complex association of signs and symbols but left no key. An acceptably complete substitute for a key, for at least one of these maps, has yet to be found.

The second type of map—the picture map—is common in prehistoric art. It is characterized by having some images in plan and some in elevation or profile. But while some of the constituent images represent relatively permanent landscape features (mountains, huts, or rivers, for example), others are anthropomorphs or animals. As a whole, such compositions appear to be scenarios in which the spatial layout and the landscape features are of secondary consequence to the event being depicted. This type of map has its counterpart in the historical period, in some of the earliest surviving fragments of classical cartography such as the Mycenaean fresco at Thera,⁴⁷ the documents of the Roman *agrimensores*,⁴⁸ or the European battle plans of the sixteenth and seventeenth centuries. Looking at prehistoric rock and mobiliary art in Europe and its adjacent regions, it is seen that the idea of such picture maps, in which hybridization of plan and profile features is found, dates back to the Upper Paleolithic period. These protocartographic images are, so far, the earliest surviving graphics to reveal, unambiguously, thinking that is manifestly cartographic and a number of examples are listed in appendix 4.2.

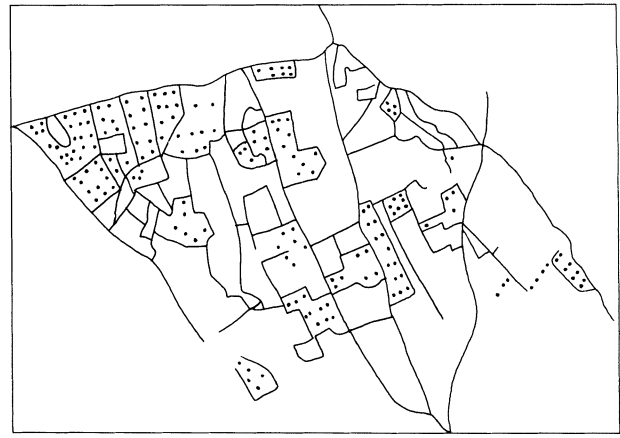


FIG. 4.4. ELEMENTS IN A MODERN TOPOGRAPHICAL MAP. This tracing of field boundaries, paths, roads, streams, and trees is employed to suggest that the visual characteristics of modern maps may be similar to those of comparable prehistoric maps. Shown here are the landscape features which it has been argued are also represented on the Bedolina rock (fig. 4.28), with which it should be compared.

After Istituto Geografico Militare, sheet 164 I NE, 1964, Manfredonia, Italy.

There is no doubt that by the beginning of the Upper Paleolithic man possessed both the cognitive capacity and the manipulative skills to translate mental spatial images into permanently visible images. It is possible to identify alternative modes of cartographic expression in the rock art record, ranging from the supermundane to the real world, for instance, and including perceptions of landscape from sometimes a low, sometimes a high, and occasionally, a vertical angle. An obvious suggestion is that such variations of topographical perspective are linked to terrain. It is tempting to argue that people living in mountainous regions, or in lowlands overlooked by hills, would have found it easier to depict the landscape from above, in plan, but there is as yet far too little evidence to advance this hypothesis.⁴⁹ A less contentious suggestion is that the degree of abstract or cognitive interpretation required is greater for depicting large

46. The three levels of meaning in the subject matter of works of art were first defined by Erwin Panofsky, *Studies in Iconology: Humanistic Themes in the Art of the Renaissance* (Oxford: Oxford University Press, 1939), 5–8, and have been applied to maps by J. B. Harley: see Blakemore and Harley, *Concepts*, 76–86 (note 37), and Harley, “Tudor Cartography” (note 37).

47. See p. 132 below.

48. James Nelson Carder, *Art Historical Problems of a Roman Land Surveying Manuscript: The Codex Arcerianus A*, Wolfenbüttel (New York: Garland Publishing, 1978); O. A. W. Dilke, *The Roman Land Surveyors: An Introduction to the Agrimensores* (Newton Abbot: David and Charles, 1971).

49. The concentration of late Neolithic and Bronze Age maps in plan in the southern Alps, for instance, may be no more than a temporary bias of discovery.

areas than it is for portraying small, local areas or for representing stellar patterns on stone or skin or in the sand.⁵⁰ Prehistoric maps of very large areas have not been found in the European evidence, despite the views of some antiquarian writers such as Taubner, who thought he discerned a map of the whole of southern Scotland and northern England on a stone at Aspatria (Cumberland).⁵¹

On the question of the function of topographical maps (as opposed to cosmological or celestial maps) from the prehistoric period, it can be affirmed only that their function would not have been identical to that of maps created in a modern society. By making critical and careful use of ethnographic material to illuminate a study of one of the world's richest storehouses of rock art (that of southern Africa), at least one archaeologist has been able to demonstrate what has long been generally accepted, namely that this art is "an astonishing expression" of those ideas which most seriously moved the primitive artists' minds and filled them with religious feeling.⁵² Assuming some sort of link between the object depicted and the artist's intention, any maps or maplike representations found in prehistoric art should be seen as symbolizing abstract attributes, or emotions, associated with the landscape or landscape features portrayed. In this sense they could be relicts of fossilized prayers rather than records of the existence or distribution of such landscape features. A review of the rock art evidence leads to the firm conclusion that while some, at least, of the maps of prehistoric and indigenous societies look exactly like those of so-called advanced societies, they would have served a quite different purpose. This point was missed by most antiquarian recorders of prehistoric maps. The discussion now turns to these early observers.

RECOGNITION OF TOPOGRAPHICAL MAPS BY ANTIQUARIANS IN EUROPEAN ROCK ART

The study of European rock art can be documented back to the seventeenth century, but its modern discovery dates mainly from the middle of the nineteenth century.⁵³ In the case of the Middle East and North Africa, it is even later; many of the most important discoveries in the Sahara, for instance, belong to the period after the First World War.⁵⁴ A more significant difference lies in the nature of its discovery. In Europe, the antiquarians of the nineteenth century began to build up a considerable literature on the incidence, form, and interpretation of the newly discovered prehistoric art, but there is no such antiquarian or indigenous literature in either the Middle East or North Africa. In these regions the discovery of rock art, together with that of the ancient settlements and prehistoric sites, was effected by outsiders,

namely Europeans. This means that from the start the bulk of reporting and comment in these regions came from the pens of visiting scholars or professional travelers.⁵⁵

The new popular "scientific" climate of nineteenth-century Europe had the effect of directing attention to many aspects of the environment. Not only naturalists

50. Indeed, some historians of cartography deny that simply copying the distribution of stars in a night sky, "without reference to geographic mapping," constitutes cartography at all: for instance, P. D. A. Harvey in "Cartographic Commentary," *Cartographica* 19, no. 1 (1982): 67–69, quotation on 68; see pp. 84–85.

51. Taubner, "Landkartenstein-Theorie" (note 3). No prehistoric maps of very large areas have been identified with certainty in the Old World.

52. Lewis-Williams, *Rock Art*, 66 (note 11).

53. The first publication of rock art seems to have come from Scandinavia. In 1627 a schoolteacher from Kristiania sent his copies of carvings to Ole Worm, but they were not published until 1784, by Peter Frederik Suhm, *Samlinger til den Danske historie* (Copenhagen: A. H. Godishes, 1779–84), vol. 2, no. 3: 215–16, and folded illustration. See P. V. Glob, *Helleristninger i Danmark* (Rock carvings in Denmark), Jysk Arkaeologisk Selskabs Skrifter, vol. 7 (Copenhagen: Gyldendal, 1969), 286 (English summary). Another early commentator on "hieroglyphs," as he called them, was Dimitrie Cantemir (born 1673), prince of Moldavia. Some examples of his notes and sketches were published as fragments from his collected writings, *Operele principelui Demetriu Cantemiru*, 8 vols. (Bucharest, 1872–1901), vol. 7, app. 3. Although one of his sketches is of an early site, none of the petroglyphs appears anything but historical in date. I owe this reference to Dennis Reinhartz (University of Texas at Arlington).

54. For instance, although F. Fourneau had reported in 1894 on the existence of carvings in the Tassili, and Chudeau had shown in 1905 that many carvings could be found in just one small locality, it was 1933 before the Sahara was revealed to be as rich in rock paintings as it was already known to be in rock carvings. Letter from F. Fourneau, *Comptes Rendus des Séances de l'Académie des Inscriptions et Belles-Lettres*, 4th ser., 22 (1894): 98–99. Letters to E. T. Hamy, "Exploration de M. R. Chudeau dans le Sahara," *Géographie: Bulletin de la Société de Géographie* 13 (1906): 304–8. Chudeau was to find over five hundred engravings within a two-kilometer stretch near Ahaygar. Henri Lhote refers to Lieutenant Brenan's police operation in the Oued Djeret in 1933, which initiated the discovery and study of the paintings: *The Search for the Tassili Frescoes*, trans. Alan Houghton Brodrick (London: Hutchinson, 1959), 10. Much of Saharan Africa was explored late. In 1923 and 1927, Douglas Newbold searched for rock carvings in the Libyan desert in areas not previously visited by Europeans or, in some cases, even by the Arabs: "Rock-Pictures and Archaeology in the Libyan Desert," *Antiquity* 2, no. 7 (1928): 261–91.

55. One of the earliest reports of petroglyphs in North Africa came from the explorer Heinrich Barth, who had started his African travels in 1850 from Tripoli. His sketches of engraved animal figures and figures of humans with animal heads from a "desolate valley" in the Fezzan are now lost, but the area was identified and the pictures recopied nearly a century later: Leo Frobenius and Douglas C. Fox, *Prehistoric Rock Pictures in Europe and Africa* (New York: Museum of Modern Art, 1937), 38–41. Other early mentions came from archaeologists, but they were too excited by the prospects of excavation at the great sites to pay any attention to rock art in the deserts, except for Hans Alexander Winkler, *Rock Drawings of Southern Upper Egypt*, 2 vols., Egyptian Exploration Society (London: Oxford University Press, 1938).

and archaeologists but also medical men, clerics, and classicists began to notice and to discuss the meanings of the artificial markings they noticed on certain rock surfaces. For some the markings had cartographic meaning. For example, rocks decorated with cup-and-ring marks found at Staigue Fort and in other parts of Kerry (Ireland) were examined in 1851 by the Very Reverend Charles Graves, president of the Royal Irish Academy, and in 1852 by the Reverend William Greenwell. Heartened by the correlation he thought he noticed between the distribution of the marks on the rocks and the forts on the ground, Graves made his discoveries public only in 1860 and maintained his original conjecture that these carvings were primitive maps, representing the disposition of the neighboring forts.⁵⁶ Greenwell appears to have suggested that the cup-and-ring marks on the newly discovered rocks near Rowtin Lynn (Routing Linn, Old Bewick, Northumberland) were plans of the forts themselves, showing their multiple ramparts, scatter of huts within, and single entrance with trackway (fig. 4.5).⁵⁷ However, in his presidential address to the Berwickshire Naturalists' Club in July 1853, George Tate disagreed with such interpretations of cup-and-ring marks, pointing out that "their wide distribution, and, notwithstanding differences in detail, their family resemblance, prove that they had a common origin, and indicate a symbolical meaning."⁵⁸ The temptation to match local carvings to local features, however, has proved difficult to resist. Even today there remains both in Britain and in Europe a stratum of popular interpretation characterized by its imaginativeness, overfancifulness, and total lack of reference to the wider academic issues involved.

On the European mainland, the situation was very much the same. In Germany, in the last decades of the century, the august Anthropological Society of Berlin was the forum for a spate of incautious enthusiasm concerning rock markings from all over the world and their possible cartographic meaning. Because of the wide circulation of the society's proceedings, (*Zeitschrift für Ethnologie*), some of these contributions received greater attention and a more extensive diffusion than they seem to have merited, at least today. The Russian historian of cartography Bruno Adler was certainly a close follower of the *Zeitschrift*, and it would have been in this way that he encountered the views of the irrepressible but wholly unscientific Fritz Rödiger and of Kurt Taubner. Rödiger, an agriculturalist from Solothurn (Switzerland), was attracted by the patterns he thought he could see in the partly artificial and partly natural markings on cliff faces and on newly excavated prehistoric artifacts in Germany and in Switzerland. By matching these markings with such modern topographic maps as he had in hand, he convinced at least himself of the astounding skill of prehistoric cartographers who

mapped trade routes, settlements, major natural features, and even property boundaries.⁵⁹ Rödiger's imagination was prolific, but both Adler and Bagrow confined their remarks to the engraved patterns on two shaped bone fragments recovered from the Kesslerloch cave at Thayngen (near Schaffhausen) in Switzerland and on a similarly shaped piece of lignite from the same exca-

56. Charles Graves, "On a Previously Undescribed Class of Monuments," *Transactions of the Royal Irish Academy* 24, pt. 8 (1867): 421–31. Graves discounted any astronomical significance in view of the absence of recognizable signs for key elements such as the sun or the moon (p. 429). The terms "cups," "cup-and-ring marks," "cups and rings" refer to a range of circular and concentric sculpted figures that are probably the most common form of prehistoric petroglyphs throughout the world (for example, see fig. 4.5). They are made up of a basic vocabulary of four key motifs, according to Ronald W. B. Morris, "The Prehistoric Petroglyphs of Scotland," *Bollettino del Centro Camuno di Studi Preistorici* 10 (1973): 159–68, esp. 159. In southern Scotland, 535 sites have cup marks only; 295 sites have cups and rings; 29 sites have rings and grooves; and 15 sites have rings or spirals (p. 161). James Young Simpson (Queen Victoria's physician) made an admirably objective analysis of the various forms: *Archaic Sculpturings of Cups, Circles, etc. upon Stones and Rocks in Scotland, England, and Other Countries* (Edinburgh: Edmonston and Douglas, 1867). They dominate British rock art too. In general terms, British rock art is thought to date from the early Bronze Age (before about 2000 B.C.): see Colin Burgess, *The Age of Stonehenge* (London: J. M. Dent, 1981), 347. Cup-and-ring marks in Sweden are also described by Arthur G. Nordén, *Östergötlands Bronsålder* (Linköping: Henric Carlssons Bokhandels Förlag, 1925), 155.

57. William Greenwell's paper to the Newcastle meeting of the Archaeological Institute in July 1852 was excluded from the "two ponderous volumes professing to be a record of its proceedings": George Tate, *The Ancient British Sculptured Rocks of Northumberland and the Eastern Borders, with Notices of the Remains Associated with These Sculptures* (Alnwick: H. H. Blair, 1865), 3–4. Apparently the paper was lost: Simpson, *Archaic Sculpturings*, 52 (note 56). By 1859 J. Gardner Wilkinson, vice-president of the British Archaeological Association, had retracted his first opinion that neither the cups and rings he himself had seen at Penrith (Cumberland) and on Dartmoor nor those on the Rowtin Lynn stone "related to the circular camps, and certain dispositions connected with them": J. Gardner Wilkinson, "The Rock-Basins of Dartmoor, and Some British Remains in England," *Journal of the British Archaeological Association* 16 (1860): 101–32, quotation on 119.

58. George Tate, address to members at the anniversary meeting held at Embleton, 7 September 1853, *Proceedings of the Berwickshire Naturalists' Club* 3, no. 4 (1854): 125–41, esp. 130. As Evan Hadingham points out, neither Graves nor Greenwell (nor Tate, it should be added) was to know that over two thousand years separated the builders of the forts from the carvers of the rocks: Evan Hadingham, *Ancient Carvings in Britain: A Mystery* (London: Garnstone Press, 1974), 43–44; idem, *Circles and Standing Stones: An Illustrated Exploration of Megalith Mysteries of Early Britain* (Garden City, N.Y.: Anchor Press/Doubleday, 1975), 136–37.

59. Fritz Rödiger, "Vorgeschichtliche Zeichensteine, als Marchensteine, Meilenzeiger (Leuksteine), Wegweiser (Waranden), Pläne und Landkarten," *Zeitschrift für Ethnologie* 22 (1890): Verhandlungen 504–16; idem, "Kartenzeichnungen," 237–42 (note 2); idem, "Erläuterungen und beweisende Vergleiche zur Steinkarten-Theorie," *Zeitschrift für Ethnologie* 23 (1891): Verhandlungen 719–24.

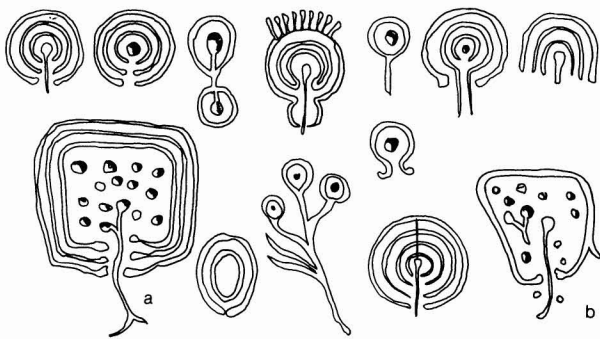


FIG. 4.5. CUP-AND-RING MARKS FROM NORTHUMB-
BERLAND. Figures such as these have been extensively cited
in the antiquarian literature as having a cartographic purpose.
Two markings, *a* and *b*, were initially seen as being plans of
neighboring forts, even though the shape of the supposed
camps did not correspond to the rock markings; nor were the
markings of the same period as the earthworks.
After George Tate, *The Ancient British Sculptured Rocks of
Northumberland and the Eastern Borders, with Notices of the
Remains Associated with These Sculptures* (Alnwick: H. H.
Blair, 1865), 7.

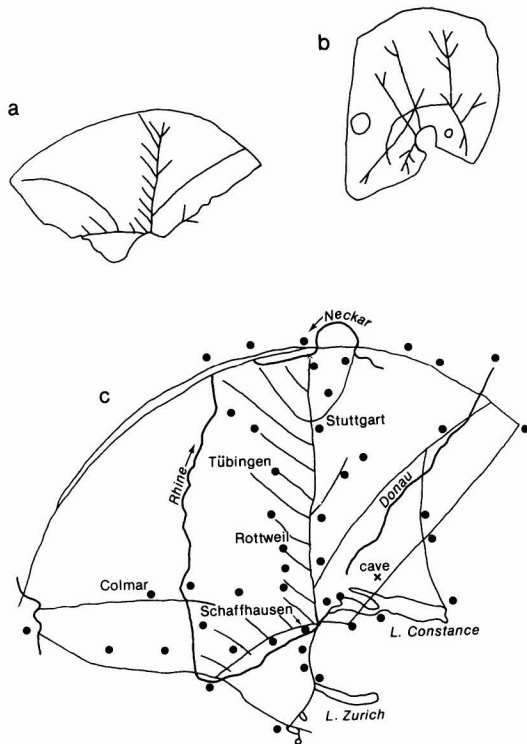


FIG. 4.6. KESSLERLOCH BONE PLAQUES. Rödiger's drawing
of the two decorated bone plaques from Kesslerloch cave,
Switzerland (*a* and *b*); *c* shows his interpretation of *a* as a map
of the surrounding district, redrawn with named localities.
After Fritz Rödiger, "Vorgeschichtliche Kartenzeichnungen in
der Schweiz," *Zeitschrift für Ethnologie* 23 (1891): Verhand-
lungen 237–42, figs. 8, 6, and 9 respectively.

vation (figs. 4.6 and 4.7).⁶⁰ Adler was not entirely un-
sympathetic to Rödiger's suggestions that each of these
represented a prehistoric map of the local area, but Bag-
row was skeptical from the outset.⁶¹ Neither discussed



FIG. 4.7. KESSLERLOCH LIGNITE ORNAMENT. The
lignite ornament from Kesslerloch cave, worked in the same
manner as the two bone plaques in figure 4.6. For Rödiger's inter-
pretation of this as a topographical map of the area between
Lake Constance and Schaffhausen, see "Vorgeschichtliche
Zeichensteine, als Marchsteine, Meilenzeiger (Leuksteine),
Wegweiser (Waranden), Pläne und Landkarten," *Zeitschrift
für Ethnologie* 22 (1890): Verhandlungen 504–16.
From Conrad Merk, *Excavations at the Kesslerloch Near
Thayngen, Switzerland, a Cave of the Reindeer Period*, trans.
John Edward Lee (London: Longmans, Green, 1876), pl. IX,
no. 50.

60. The excavator, a local schoolmaster with an established ar-
chaeological interest, made no interpretative comments on these de-
signs: Conrad Merk, *Excavations at the Kesslerloch Near Thayngen,
Switzerland, a Cave of the Reindeer Period*, trans. John Edward Lee
(London: Longmans, Green, 1876). Neither of the items in question
was among those later discovered to have been faked: see Merk, *Ex-
cavations*, in the preface by Lee (above); see also Robert Munro,
Archaeology and False Antiquities (London: Methuen, 1905), 55–56.
It may be of interest to compare these with the pierced and decorated
tablets from Tartaria (Romania), which possibly date from as early as
the fifth millennium B.C. See Sarunas Milisauskas, *European Pre-
history* (London: Academic Press, 1978), 129–31.

61. Adler agreed that there is a resemblance between the patterns
on the Schaffhausen (Kesslerloch) artifacts and the appearance of a
map but suggested that this was accidental. On the other hand, he did
not dismiss the idea that "primitive man, with his acute powers of
observation, hearing and smell which helped him orientate himself
and with his proven ability to draw on rock and bone" would have
been capable of such an exercise: Adler, "Karty," 218 (note 2), trans-
lation by John P. Cole (University of Nottingham). After two of Rö-
diger's contributions and Taubner's, the president of the Anthropol-
ogical Society, R. L. C. Virchow, was driven to advising that the study
of rock and stone drawings "offers the imagination such easy oppor-
tunities, that it is a little difficult to allow for the supposition that
those drawings should everywhere have a topographical significance
. . . it is with pictures of people as it is with clouds, that a stimulated
imagination can see therein all sorts of animal and human shapes.

Taubner's interpretations, though each cited his paper.⁶² Taubner, admitting that he had been influenced by A. Ernst,⁶³ declared that cup marks were topographical representations and that a double circle could represent isolated humps. He went on to describe the Bunsöh stone (Holstein) as a topographical representation of the local area, a suggestion that is not without its proponents even today.⁶⁴ Taubner also introduced the idea that stone maps could represent not just the immediate vicinity but much larger regions. By matching the distribution of the cup-and-ring marks and divided circles on the side stone of a cist grave at Aspatria (Cumberland) with a map of Britain taken from a school atlas, he interpreted the pattern as a map of northern England and southern Scotland, complete with settlements such as Carlisle.

One of the fundamental weaknesses of such antiquarian interpretations is the unsystematic approach and lack of discussion of the whole archaeological context and other related points. The underlying assumption is that it is sufficient to look for a simple match between the pattern on the rocks and one in the landscape without questioning such matters as contemporaneity, scale, or appropriate geometry. What fits is included; what does not fit is conveniently disregarded, and the vital fact that prehistoric, like indigenous, maps could only have been constructed according to principles of topological geometry (not Euclidean) remains unappreciated.

A notable exception to such weaknesses was the work of a most remarkable Englishman, Clarence M. Bicknell. Bicknell, born at Herne in Kent and a clergyman in the East End of London before renouncing holy orders, moved to the Italian Riviera for health reasons.⁶⁵ He spent his time there botanizing and sketching. Exploring the Maritime Alps inland from Bordighera, he came across the rock carvings below the peak of Mont Bègo (in those days on the Italian side of the frontier) and eventually devoted twelve summers from the end of the century to his death in 1918 to discovering, copying, and commenting on some fourteen thousand individual carved figures—seven thousand from Val Fontanalba and most of the rest from Val Meraviglie. Bicknell's intellectual strength lay in his taxonomic approach, and he classified all these figures into eight subject classes:

1. Horned figures
2. Ploughs
3. Weapons and instruments
4. Men
5. Huts and properties
6. Skins
7. Geometrical forms
8. Miscellaneous indeterminable forms.⁶⁶

It is the fifth group (huts and properties) that Bicknell referred to as maps or "topographical figures" in his

writings. His texts, published from 1897 onward, remain the standard works for the region.⁶⁷ There have been additional discoveries, bringing the total number of figures to an estimated one hundred thousand,⁶⁸ and

May this warning not go unheeded! But may it not be so received as to discourage any further investigation": *Zeitschrift für Ethnologie* 23 (1891): Verhandlungen 258. Bagrow wrote in 1917: "There are grounds for suggesting that prehistoric man was already attempting to represent a locality known to him in order to help a departing traveler orientate himself in unknown territory. Among the finds from the Schaffhausen cave were two bone plaques, covered with a network of marks in which Rödiger tried, by means of a comparison with [modern] maps of the given locality, to discern a map made by the ancient inhabitants. Some scholars see in rock art an attempt to give directions about a place, i.e., a prototype map, but all this remains an unclarified question and the cartography of prehistoric man remains in grave doubt": *Istoriya*, 2 (note 4), translation by John P. Cole (University of Nottingham).

62. Taubner, "Landkartenstein-Theorie" (note 3). In his text Adler refers to Westedt, "who drew attention to the presence of similar [petrolyphic] elements on a stone in Holstein": "Karty," 218 (note 2), translation by John P. Cole (University of Nottingham). But in Westedt's article, "Steinkammer," 247–49 (note 3), there are no interpretations for the markings, let alone the suggestion that they form a map. Taubner, on the other hand, does see this Bunsöh stone as a map, and it looks as though Adler was mistaken in his reference to Westedt instead of Taubner.

63. A. Ernst, "Petroglyphen aus Venezuela," *Zeitschrift für Ethnologie* 21 (1889): Verhandlungen 650–55.

64. Paul Volquart Molt, *Die ersten Karten auf Stein und Fels vor 4000 Jahren in Schleswig-Holstein und Niedersachsen* (Lübeck: Weiland, 1979), 43–92. But see note 121 below.

65. An outline of Bicknell's life and the context of his work is given in Carlo Conti, *Corpus delle incisioni rupestri di Monte Bego: I*, Collezione di Monografie Preistoriche ed Archeologiche 6 (Bordighera: Istituto Internazionale di Studi Liguri, 1972), 6–8. Enzo Bernardini, *Le Alpi Marittime e le meraviglie del Monte Bego* (Genoa: SAGEP Editrice, 1979), 144.

66. Clarence M. Bicknell, *A Guide to the Prehistoric Rock Engravings in the Italian Maritime Alps* (Bordighera: G. Bessone, 1913), 39.

67. Clarence M. Bicknell's first paper was "Le figure incise sulle rocce di Val Fontanalba," *Atti della Società Ligustica di Scienze Naturali e Geografiche* 8 (1897): 391–411, pls. XI–XIII. His major works, besides *Guide* (note 66), were *The Prehistoric Rock Engravings in the Italian Maritime Alps* (Bordighera: P. Gibelli, 1902) and *Further Explorations in the Regions of the Prehistoric Rock Engravings in the Italian Maritime Alps* (Bordighera: P. Gibelli, 1903). For a complete list of his writings see Henry de Lumley, Marie-Elisabeth Fonvielle, and Jean Abelanet, "Vallée des Merveilles," *Union International des Sciences Préhistoriques et Protohistoriques, IX^e Congrès, Nice 1976*, Livret-Guide de l'Excursion C1 (Nice: University of Nice), 178. The originals of Bicknell's tracings and notes are now in the University of Genoa (Institute of Geology).

68. Henry de Lumley, Marie-Elisabeth Fonvielle, and Jean Abelanet, "Les gravures rupestres de l'Âge du Bronze dans la région du Mont Bègo (Tende, Alpes-Maritimes)," in *Les civilisations néolithiques et protohistoriques de la France: La préhistoire française*, ed. Jean Guilianne (Paris: Centre National de la Recherche Scientifique, 1976), 2:222–36, esp. 223. Bernardini, *Alpi*, 127 (note 65), says that about 250,000 rock carvings are known.

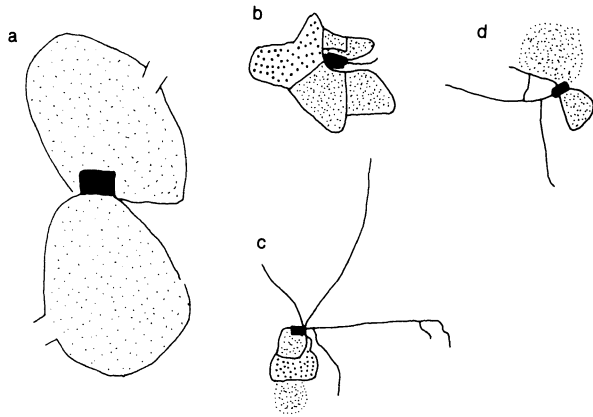


FIG. 4.8. "TOPOGRAPHICAL FIGURES" FROM MONT BÉGO. Bicknell identified these as representations of "huts and properties" or "huts with enclosures" as seen from above. After Clarence M. Bicknell, *Further Explorations in the Regions of the Prehistoric Rock Engravings in the Italian Maritime Alps* (Bordighera: P. Gibelli, 1903), pl. I-13 (a), and Clarence M. Bicknell, *A Guide to the Prehistoric Rock Engravings in the Italian Maritime Alps* (Bordighera: G. Bessone, 1913), pls. XVIII-43, XXXIV-12, and XXXII-41 (b-d, respectively).

some alternative classifications,⁶⁹ but there has been nothing so far to match Bicknell's balanced and systematic studies, nor has there been a definitive analysis of any one of the categories. Most ignored of all have been the so-called topographical figures (in Bicknell's group 5), which have been either misunderstood⁷⁰ or simply omitted from discussion in recent literature.⁷¹

There is little excuse for bypassing Bicknell's remarkably homogeneous category "huts and properties" or "huts with enclosures" (fig. 4.8). The key to his interpretation was simple empiricism. On his many journeys up and down the valleys to Mont Bégo, he repeatedly observed the striking likeness of the carved combinations of solid rectangles, subcircular forms, pecked surfaces, and irregularly interconnecting lines to features in the landscape when these are viewed from above—seen in plan, that is, from a vantage point high up the mountainside. Thus he interpreted the "rectangular figure with semi-circle or other sort of closed line joining it" as "signifying huts or sheds with a piece of ground enclosed by a wall"⁷² and the interconnecting lines as paths. He also suggested that the variety of enclosures containing stippling, made by hammering with a single blow or repeatedly, arranged with obvious regularity or randomly or left blank, could imply different categories of land use (see fig. 4.20, for example). He concluded, cautiously, that about 194 of the groups of rock-carved figures in the Fontanalba valley and another 15 in Val Meraviglie might be representations of either a hut with a path or huts with enclosed plots.⁷³

Not all modern archaeologists are willing to accept Bicknell's interpretation of the "topographical figures." A common objection is that many of these appear to have been "distorted" to fit the outlines of the rocks they were carved on and thus could not be "accurate" representations of some real layout. But this is to ignore the key property of topology, which is the preservation

69. Conti, *Corpus*, 29–32 (note 65), has twelve classes:

1. Human figures of religious nature.
2. Superhuman figures or figures in sacred apparel.
3. Farmers.
4. Fighters or men making sacrifices.
5. Figures of sinister appearance.
6. Horned figures.
7. Weapons.
8. Plows, harrows, and sickles.
9. Rectangular figures.
10. Ideographic representations.
11. Signs probably indicating numbers and primitive alphabetic characters.
12. Figures of unknown significance.

70. Recent objections have been on the grounds that they are unlikely to have been topographical figures because there are not, nor can there ever have been, cultivation and permanent settlement at these altitudes (2,000–2,750 m above sea level): see André Blain and Yves Paquier, "Les gravures rupestres de la Vallée des Merveilles," *Bollettino del Centro Camuno di Studi Preistorici* 13–14 (1976): 109–19, and Bernardini, *Alpi*, 171 (note 65), who talks similarly in terms of the "vocazione pastorale" of the land. Such objections are irrelevant; drawings are not necessarily made with the subject in sight, nor did Bicknell suggest that there ever had been cultivation at these altitudes. On the contrary, he stressed that "it was not among the wilderness of glaciated rocks or boulders at an elevation of 2,100 m and more that they ploughed. There the land has never been cultivated. . . . But years ago, Val Casterino and the lower parts of the Miniera valley may well have been tilled as they are now, and terraces long since abandoned are still to be discerned far up the steep mountain sides. Here . . . people who stood on the terraces might have looked down at the ploughing in the flat land of the valley, or on other terraces beneath them, and seen the operation from above as it seems to be depicted on the rocks of the higher regions": Bicknell, *Prehistoric Rock Engravings*, 38–39 (note 67). Blain and Paquier seem confused (p. 109) over the distinction between rural settlement types (isolated steadings, hamlet, village, etc.) and the social and economic structure or organization associated with each type. A topographical map by definition depicts only the former, the formal aspects of the landscape. Recent mining, as well as grazing, has been responsible for much deforestation. Though there are still some larches in Val Fontanalba, in the seventeenth century Pietro Gioffredo reported thick larch forests: *Corografia delle Alpi Marittime*, 2 books (1824); republished with his *Storia delle Alpi Marittime in Monumenta historia patriae*, vol. 3, *Scriptorium I* (Genoa: Augustae Taurinorum, 1840), 47. A. Issel, "Le rupi scolpite nelle alte valli delle Alpi Marittime," *Bollettino di Palaeontologia Italiana* 17 (1901): 217–59, simply disagrees with Bicknell's interpretation, holding instead that the so-called topographical figures are not plans but "conventional signs of individuals or tribes."

71. See, for example, de Lumley, Fonvielle, and Abelanet, "Merveilles" (note 67); idem, "Gravures rupestres" (note 68); and Conti, *Corpus* (note 65).

72. Bicknell, *Guide*, 53 (note 66).

73. Bicknell, *Guide*, 53, 56 (note 66).

of contiguity but not shape, and to assess the prehistoric figures according to the then unformulated principles of Euclidean geometry (which stress the properties of distance, direction, and angle that preserve shape and underlie the modern concept of scale). Many of Bicknell's suggested topographical figures do in fact satisfy the cartographic criteria presented here for ichnographic or plan maps, and for this reason (and in the total absence of realistic alternative interpretations) these have been included in the list in appendix 4.1.

The notion that the prehistoric rock artists may have been making graphic representations of parts of the earth's surface is not the only cartographic suggestion to have been made in the nineteenth century and preserved in the antiquarian literature. The apparently randomly distributed cup marks on natural surfaces or on prehistoric monoliths were seen by some observers as representations of the major constellations, while others raised issues of cosmological import. These views are discussed in the sections dealing with celestial and cosmological maps later in this chapter. It must be stressed, however, that of all the theories from the early literature put forward to explain the purpose or original meaning of the rock art figures and motifs, those relating to maps represent but a tiny proportion. Out of no fewer than the 104 such explanations recently amassed by Ronald Morris for the British Isles, all of which "have been put forward in all seriousness from time to time by archaeologists and others," only seven concern maps or plans in any way.⁷⁴ Moreover, most of these relate to cup-and-ring markings, probably the most ambiguous of all rock art motifs.

THE CLASSIFICATION OF PREHISTORIC MAPS FROM EUROPE, THE MIDDLE EAST, AND NORTH AFRICA IN THE PREHISTORIC PERIOD

The prehistoric material considered here as of cartographic interest has come from a variety of sources. The antiquarian literature, apart from Bicknell's writings, has yielded little that is worth further examination. A number of references to examples of prehistoric art that have already been interpreted as maps can be gleaned from modern archaeological literature, however. Other examples have been described as landscape representations, and these too are part of the history of mapping. The total corpus is thus derived almost wholly from published sources. The examples are discussed under three main headings: topographical maps, celestial maps, and cosmological maps. Nothing has been found that convincingly suggests representations of the sea. The topographical examples, however, fall into two basic categories, picture maps and plan maps; the latter

are further subdivided into simple maps, complex maps, and maps in relief.

TOPOGRAPHICAL MAPS

Picture Maps and Their Antecedents

Four picture maps—as already defined—have been identified in Old World rock and mobiliary art.⁷⁵ But just as interesting in the history of cartographic ideas are a number of pictures or small compositions that contain certain landscape features depicted in plan. Some of these plan figures are very simple indeed. Probably the oldest are those from Iberian or French cave paintings, thought to date from the Upper Paleolithic. From the Los Buitres cave (Peñalsordo, Badajoz), for example, comes a composition consisting of a subcircular outline with an external fringe of rays and two sets of markings inside that could represent, in highly stylized form, anthropomorphic figures (fig. 4.9).⁷⁶ Other compositions, such as those from Font de Gaume in Dordogne, have similar outlines but lack the internal images, though there may be other markings. These have entered the literature as representations of a "delimited area (hut?)"⁷⁷ or "game enclosures" (fig. 4.10).⁷⁸ Similar

74. Ronald W. B. Morris, *The Prehistoric Rock Art of Galloway and the Isle of Man* (Poole: Blandford Press, 1979), 15–28. Summarizing these under the headings used in this essay, with Morris's reference number in parentheses, they are:

Topographical maps:	Maps of the countryside (58) Building plans (59) Plans for megalithic structures (83)
Celestial maps:	Star maps (60) Early astronomers' night memoranda (93)
Cosmological maps:	Plans for laying out mazes (84) Field plowing plans (85)

The last two both concern labyrinth designs, and since this sign has universal association with death and the afterlife, it has been classed here as cosmological. Morris ascribed each explanation what he calls a "plausible ranking." According to this, the explanations above are to be rejected out of hand, a conclusion with which we do not hesitate to agree. Only explanation 93, that night watchers might have found it useful to have a tactile reference plan of certain constellations handy for use in the dark, is given modest credence by Morris.

75. See p. 62 above for definition.

76. Figure 2 in appendix 4.2. Henri Breuil, *Les peintures rupestres schématiques de la Péninsule Ibérique*, 4 vols., Fondation Singer-Polignac (Paris: Imprimerie de Lagny, 1933), vol. 2, *Bassin du Guadiana*, 58–59 and fig. 16. Maria Ornella Acanfora, *Pittura dell'età preistorica* (Milan: Società Editrice Libreria, 1960), 263.

77. Figure 1 in appendix 4.2. Acanfora, *Pittura*, 262 (note 76). This, from Nuestra Señora del Castillo, Almadén, was first published by Breuil, *Bassin*, pl. VIII (note 76).

78. Two come from the cave of La Pileta, Malaga, and a third from Font de Gaume (Dordogne). All appear under this heading in Johannes Maringer, *The Gods of Prehistoric Man*, trans. Mary Ilford, 2d ed. (London: Weidenfeld and Nicolson, 1960), 95. See also Lya Dams, *L'art paléolithique de la caverne de la Pileta* (Graz: Akademische

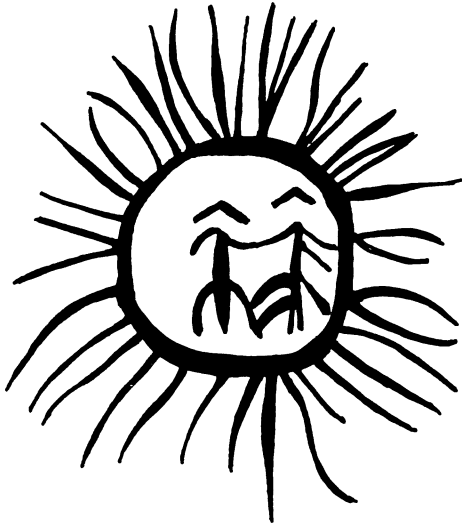


FIG. 4.9. PICTURE WITH POSSIBLE MAP ELEMENTS FROM PEÑALSORDO, BADAJOZ, SPAIN. This has been interpreted as a representation of two figures within a hut or enclosure. If this is the case, then both elements of a picture map (the features being shown both in plan and in profile) are present.

Size of the original: 12 × 10 cm. After Henri Breuil, *Les peintures rupestres schématiques de la Péninsule Ibérique*, 4 vols., Fondation Singer-Polignac (Paris: Imprimerie de Lagny, 1933), vol. 2, *Bassin du Guadiana*, fig. 16f.

compositions of Neolithic or later date are known from the central Sahara. Among the rock paintings in the Tassili Mountains of southern Algeria are a number that have been interpreted as hut scenes.⁷⁹ Each hut is represented in plan by a broad, more or less circular band. The human figures within and just outside are in various postures, and the intention of the artist seems to have been to use the plan outline of the hut as a device for permitting a simultaneous view of both exterior and interior activities (fig. 4.11). Probably much later in date is the example that shows a camellike profile in a circular outline (fig. 4.12).⁸⁰ Such examples seem to reflect some essential cartographic concepts, for example, by depicting some landscape features in plan and portraying all features in more or less correct spatial relationships.

There are some later compositions, a similar mixture of picture and plan, in southern Europe, though none is as yet known farther north. One Bronze Age petroglyph from Valcamonica comes from side 4 of the stone found at Borno. This includes what has been described as a composition with ibex running toward the river (fig.

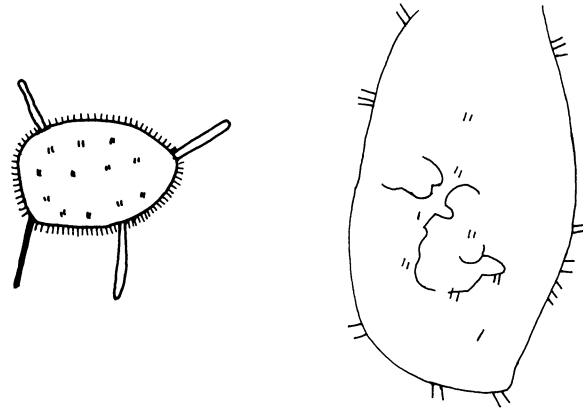


FIG. 4.10. ROCK PAINTINGS FROM LA PILETA, MALAGA, SPAIN. Although described as “game enclosures,” this is so tenuous an identification that they are excluded as examples of prehistoric maps, though they may suggest the use of a circle to depict in plan the enclosing element of a landscape feature such as a field or a hut.

Width of the originals: 40 cm each. After Henri Breuil, Hugo Obermaier, and W. Verner, *La Pileta à Benaoljan (Malaga)* (Monaco, Impr. artistique V^o A. Chêne, 1915). The figure on the left, described by Breuil, Obermaier, and Verner as “tortoise-like,” is illustrated in pl. V and also in pl. X (23). That on the right, one of three similar ones, is shown in pl. X (27). The figure here is taken from Johannes Maringer, *The Gods of Prehistoric Man*, trans. Mary Ilford, 2d ed. (London: Weidenfeld and Nicolson, 1960), fig. 21. See also Lya Dams, *L’art paléolithique de la caverne de la Pileta* (Graz: Akademische Druck, 1978), fig. 91 (23-VI and 26-III).

Druck, 1978). For a critique of Breuil’s interpretations (from which these are derived) see M. Lorblanchet, “From Naturalism to Abstraction in European Prehistoric Rock Art,” in *Indigenous Art*, 44–56 (note 38). Closed shapes, such as circles and rectangles, and the topological concepts of inclusion and separateness are among the primary spatial concepts, and it is not surprising to find them in the earliest drawings: Piaget and Inhelder, *Child’s Conception of Space*, 44–79 (note 26).

79. Figures 3–7 in appendix 4.2. Henri Breuil, *Les roches peintes du Tassili-n-Ajjer* (Paris: Arts et Métiers Graphiques, 1954), 33 and fig. 65 (this work is an extract from *Actes du II^e Congrès Panafricain de Préhistoire*, Alger 1952). Another painting (fig. 66) features three smaller circles made with a single line, and it is interesting to speculate whether these two were intended, given the context, to represent huts—that is, were signs for huts. If so, a further speculation is how often, elsewhere or in other periods such as the Upper Paleolithic, circular signs were used as hut signs or settlement signs.

80. Figure 9 in appendix 4.2. Leo Frobenius, *Ekade Ektab: Die Felsbilder Fezzans* (Leipzig: O. Harrassowitz, 1937). Lhote, *Tassili Frescoes*, 202–3 (note 54); Henri Lhote suggests that camel pictures belong to the historical period because this animal was not introduced into North Africa until about the first century A.D.: *Les gravures rupestres du Sud-Oranais*, Mémoires du Centre de Recherches Anthropologiques Préhistoriques et Ethnographiques 16 (Paris: Arts et Métiers Graphiques, 1970), 171. But Michael M. Ripinsky suggests



FIG. 4.11. PICTURE WITH POSSIBLE MAP ELEMENTS FROM I-N-ETEN, TASSILI MOUNTAINS, ALGERIA. The circular bands seem to represent (in plan) a hut that contains human figures (shown in profile). Although both groups of figures appear on the same panel and are described by Breuil as two separate groups, they are illustrated as if forming a single group. Hence, the illustration here shows the huts as a single group while in appendix 4.2 they are listed separately (nos. 3 and 4).

Diameter of the upper circle: 25 cm. After Henri Breuil, *Les roches peintes du Tassili-n-Ajjer* (Paris: Arts et Métiers Graphiques, 1954), fig. 65.

4.13).⁸¹ Much less easily interpretable is the line drawing on a fragment of mammoth tusk excavated in 1966 from a site in Mezhirichi (Ukraine), which lies on the Ros River. The fragment has been dated, like the site, to the Upper Paleolithic. Though most of the markings are narrow bands or simple lines, four shapes along a central strip have been interpreted as profile representations of dwellings on the banks of a river shown in plan (fig. 4.14).⁸² Single transverse lines in the river are thought to indicate fishing nets or seines and the domed structures are said to be identical in shape with the excavated Paleolithic huts at the site, which were constructed largely from mammoth bones.

Four more complicated—and arguably more interesting—compositions merit discussion in this section. Three of them have already been described as possible maps: the Landscape Jar from Tepe Gawra (Iraq), the silver vase from Maikop (USSR), and the wall painting from

Çatal Hüyük (Turkey). In addition there is the Great Disk from Talat N'liisk (Morocco).

The interpretation of the Landscape Jar has already proved controversial. Ten of the twelve painted panels that make up its decoration contain linear and geometric patterns. One of the other two contains what A. J. Tobler concluded was not just a landscape painting but “a kind of map. . . probably the oldest map yet discovered.”⁸³

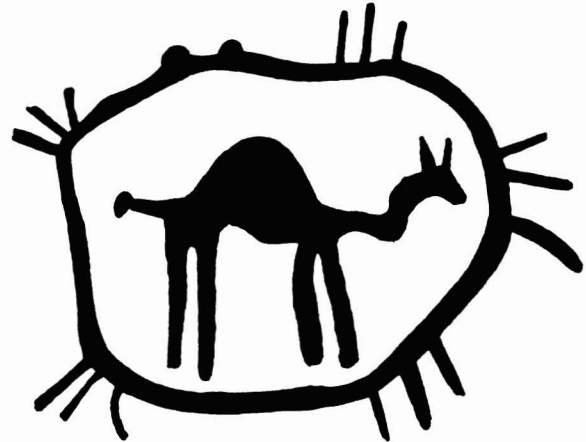


FIG. 4.12. PICTURE WITH POSSIBLE MAP ELEMENTS FROM THE TASSILI MOUNTAINS, ALGERIA. This seems to portray a camel within an enclosure.

After Leo Frobenius, *Ekade Ektab: Die Felsbilder Fezzans* (Leipzig: O. Harrassowitz, 1937), fig. 10.

that the camel was domesticated in the Old World not later than the fourth millennium B.C. and that predynastic Egyptians were acquainted with it: “The Camel in Ancient Arabia,” *Antiquity* 49, no. 196 (1975): 295–98.

81. Map 42 in appendix 4.1. Emmanuel Anati, *Camonica Valley*, trans. Linda Asher (New York: Alfred A. Knopf, 1961), 102; idem, *Il masso di Borno* (Brescia: Camuna, 1966), where the same drawing is reproduced (figs. 16 and 17) and described as probably forming a scene. The double line to which the animals are advancing seems to indicate a river (p. 34). On the other hand, figure 15 is a photograph of this side of the stone and shows that the double line continues as a single line, forming a closed subrectangular or roughly circular form. It may be that some of the Mont Bègo figures (e.g., those with herds of oxen or plow teams in enclosures) should be included in this category of picture maps.

82. Personal communication from B. P. Poleyov. Ivan Grigorévich Pidoplichko, *Pozdnepaleoliticheskiye zbilishcha iz kostey mamonta na Ukraine* (Late Paleolithic dwellings of mammoth bone in the Ukraine) (Kiev: Izdatelstvo “Naukova Dumka,” 1969); idem, *Mezhiricheskyye zbilishcha iz kostey mamonta* (Mezhirichi dwellings of mammoth bone) (Kiev: Izdatelstvo “Naukova Dumka,” 1976).

83. Map 52 in appendix 4.1. Arthur J. Tobler, *Excavations at Tepe Gawra: Joint Expedition of the Baghdad School and the University Museum to Mesopotamia*, 2 vols. (Philadelphia: University of Pennsylvania Press, 1950), 2:150–51, pl. LXXCIIb. William Harris Stahl also sees the Tepe Gawra vase painting as an example of what he calls the “alternation between planimetric views and vertical projections” taking place in the Near East in Neolithic times: “Cosmology and Cartography,” part of “Representation of the Earth’s Surface as an Artistic Motif,” in *Encyclopedia of World Art* (New York: McGraw-Hill, 1960), 3:cols. 851–54, quotation at 853.

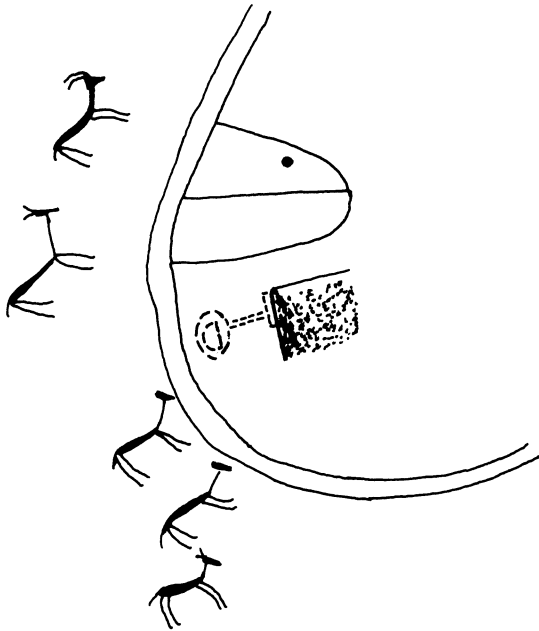


FIG. 4.13. PICTURE WITH POSSIBLE MAP ELEMENTS: SIDE 4 OF THE BORNO STONE FROM VALCAMONICA. This is thought to show deerlike animals (in profile) running toward a river, on the other side of which is a subdivided enclosure (both river and enclosure being in plan). Size of the original: 70 × 84 cm. After Emmanuel Anati, *Camonica Valley*, trans. Linda Asher (New York: Alfred A. Knopf, 1961; reprinted London: Jonathan Cape, 1964), 102.

According to Tobler, the painting shows a hunting scene in a broad valley, the latter flanked by mountains (indicated by the two rows of triangles) and containing the tortuous course of a river with its tributaries (figs. 4.15 and 4.16). He also suggested that the artist must have had some real landscape in mind. However, not all agree either with this interpretation or with his interpretation of the ten geometric panels as representations of different types of terrain such as rolling plains, mountains, deserts, and marshes.⁸⁴ Beatrice Goff, for instance, considers the scene to be a highly schematized and not uncommon form of decoration that was a means of giving expression to “deep-seated feelings of aggression” rather than a representation or a picture of a familiar landscape.⁸⁵

Very much more difficult to interpret is the decoration of the Great Disk at Talat N’iisk in the Atlas Mountains of Morocco.⁸⁶ This rock painting, with a diameter of about 100 cm, is by far the largest of any in the area (fig. 4.17). It is its internal decoration, however, rather than its sheer size, that attracts attention, although there does not appear to be any discussion of this aspect in the literature. On the one hand, it is quite unlike anything else in the same district. On the other hand, it has a striking resemblance to the landscape panel on the jar

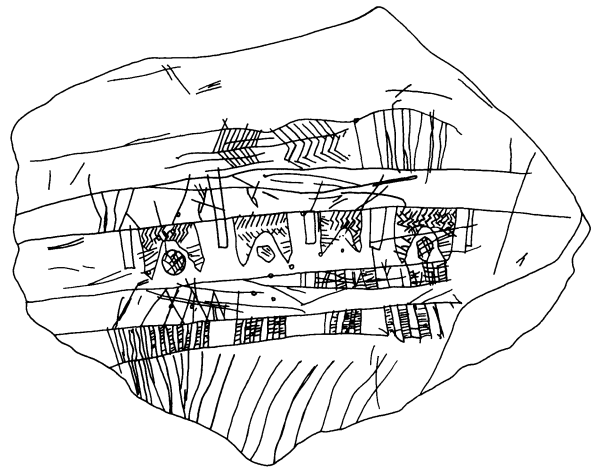


FIG. 4.14. PALEOLITHIC ENGRAVING ON MAMMOTH BONE. Found at Mezhirichi (Ukraine); the four domed features are thought to represent riverside dwellings. The engraving is oriented here as in the original publication; it is difficult, however, to see a close resemblance between the features scratched onto the bone and the excavated mammoth bone dwellings whichever way the drawing is oriented. After Ivan Grigorévich Pidoplichko, *Pozdnepaleoliticheskie zhilishcha iz kostey mamonta na Ukraine* (Late Paleolithic dwellings of mammoth bone in the Ukraine) (Kiev: Izdatelstvo “Naukova Dumka,” 1969), fig. 58.

from Tepe Gawra (and an even closer resemblance to the Babylonian clay tablet from Nuzi).⁸⁷ While smaller circles in the district contain either a formless scribble or a simple internal rim pattern, the internal features of the Great Disk seem to have been carefully arranged. Moreover, they could be interpreted as representing a broad valley between two mountain ranges with a major river in the middle, flanked by tributaries or relic channels and abandoned meanders⁸⁸ and by two dots, perhaps representing sites or settlements. The schematic nature of the landscape representation (if that is what it is), together with the absence of human or animal figures, distinguishes the Talat N’iisk disk from other prehistoric picture maps such as the Çatal Hüyük wall painting or the Tepe Gawra Landscape Jar. Its interpretation as an attempt to depict a landscape remains highly subjective and speculative. Nevertheless, in order to draw attention to the existence of such graphic representations and their

84. Tobler, *Tepe Gawra*, 150 (note 83).

85. Beatrice Laura Goff, *Symbols of Prehistoric Mesopotamia* (New Haven: Yale University Press, 1963), 29.

86. Map 57 in appendix 4.1. Jean Malhomme, *Corpus des gravures rupestres du Grand Atlas*, fascs. 13 and 14 (Rabat: Service des Antiquités du Maroc, 1959–61), pt. 1, 91, pl. 4. Paule Marie Grand, *Arte preistorica* (Milan: Parnaso, 1967), fig. 65.

87. See chapter 6, “Cartography in the Ancient Near East,” p. 113 and fig. 6.11.

88. In a pattern familiar to anyone who has seen present-day Mediterranean valleys from the air or on aerial photographs.

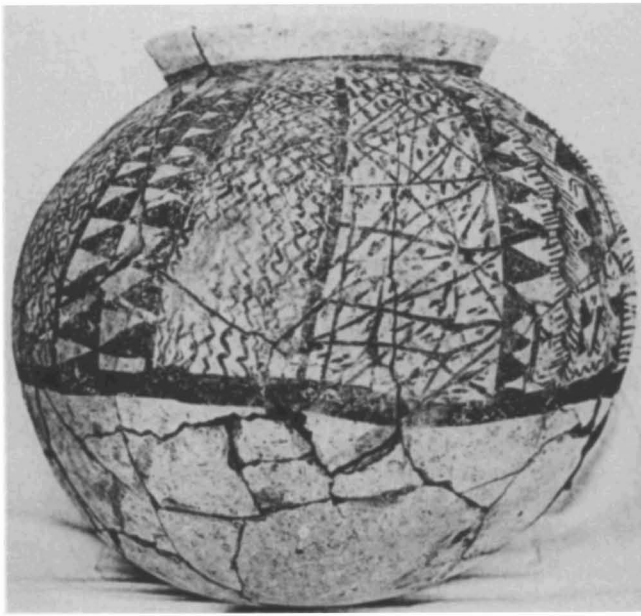


FIG. 4.15. THE TEPE GAWRA (IRAQ) LANDSCAPE JAR. The reconstituted jar is shown with the panel that gives the jar its name on the right (see fig. 4.16). Diameter of the original: 70 cm. From Arthur J. Tobler, *Excavations at Tepe Gawra: Joint Expedition of the Baghdad School and the University Museum to Mesopotamia*, 2 vols. (Philadelphia: University of Pennsylvania Press, 1950), vol. 2, pl. LXXVIIIa. By permission of the Iraq Museum, Baghdad.

potential interest in the history of cartography, it is classed here as a possible example of an early picture map (appendix 4.1).

The silver Maikop vase, with its engraved decoration, was found in the course of excavations of late Neolithic or Chalcolithic tombs in the North Caucasus in 1895 (fig. 4.18).⁸⁹ Most prominent are the naturalistically represented large quadrupeds (lions, bulls, horses, goats, and such), together with landscape features. These latter Rostovtzeff considered to be an entirely separate and distinct scheme of ornamentation and “a first timid attempt to subordinate landscape to figures.”⁹⁰ Two rivers are thought to be shown flowing from the mountains and meeting in a sea or lake. There are also palm trees, waterfowl, a small bear, and some sort of water plant. The rivers are shown in plan, shaded by wavy lines, and the mountains in profile, albeit in varied rather than strictly conventional outlines. In Russia this representation was long considered the earliest geographical

89. Mstislav Farmakovskiy, “Arkhaicheskii period v Rossii: Pamyatniki grecheskogo arkhaischeskogo i drevnego vostochnogo iskusstva, naidënnnye v grecheskikh koloniyakh po severnomu beregu Chërnogo morya v kurganakh Skifi i na Kavkaze” (The archaic period in Russia: Relics of Greek archaic and ancient Eastern art found in the Greek colonies along the northern coast of the Black Sea in the barrows



FIG. 4.16. PICTURE MAP ON THE TEPE GAWRA (IRAQ) LANDSCAPE JAR. One of twelve decorated panels, this is by far the most complex and unusual. The juxtaposition of animal figures (absent from other panels), parallel lines of triangles (commonly found on pottery representing mountains), and the sinuous herringbone pattern down the middle (interpreted as a river with its tributaries) led one excavator to suggest the panel portrayed a landscape or even a map of a specific area. From Arthur J. Tobler, *Excavations at Tepe Gawra: Joint Expedition of the Baghdad School and the University Museum to Mesopotamia*, 2 vols. (Philadelphia: University of Pennsylvania Press, 1950), vol. 2, pl. LXXVIIIb. By permission of the Iraq Museum, Baghdad.

of Scythia and in the Caucasus), *Materialy po Arkheologii Rossii, Izdavayemye Imperatorskoy Arkheologicheskoy Komissiyey* 34 (1914): 15–78, esp. 59.

90. Map 51 in appendix 4.1. Mikhail I. Rostovtzeff, *Iranians and Greeks in South Russia* (Oxford: Clarendon Press, 1922), 22–25, pl. III (1–2), and fig. 2, quotation on 25. Rostovtzeff devoted several paragraphs to a discussion of the decoration, comparing it with Babylonian and Egyptian landscape portrayal, though there he considered landscape subordinate to the figures whereas on the Maikop vase landscape and most of the animals are merely juxtaposed. He also decided that it contains a “survival of prehistoric motives” as well as novelties. A drawing of the vase can be found in Stuart Piggott, *Ancient Europe from the Beginnings of Agriculture to Classical Antiquity* (Edinburgh: Edinburgh University Press, 1965), fig. 37, as well as in

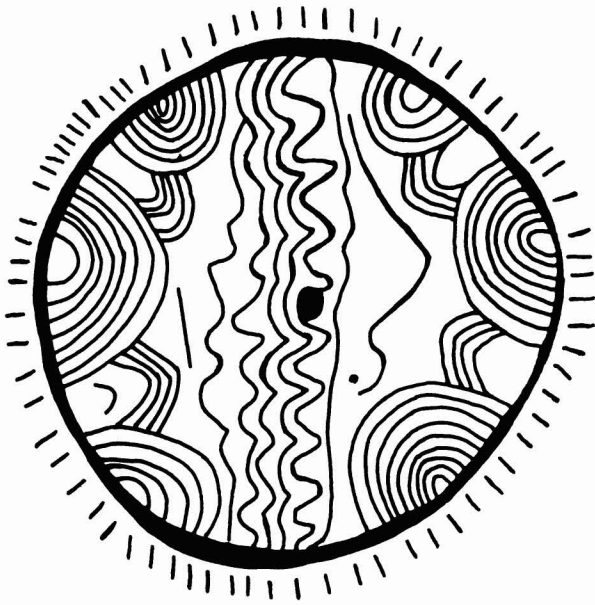


FIG. 4.17. PICTURE MAP: THE "GREAT DISK" FROM TALAT N'ISSIK, MOROCCO. Outstanding, in the local context, for its size and for the orderliness of its internal decoration, this rock painting could be interpreted as showing, in plan, an arrangement of parallel ranges of mountains and a braided river similar to that of the Landscape Jar of Tepe Gawra (fig. 4.16).

Diameter of the original: approximately 1 m. After Jean Malhomme, *Corpus des gravures rupestres du Grand Atlas*, fascs. 13 and 14 (Rabat: Service des Antiquités du Maroc, 1959–61), pl. 4.



FIG. 4.18. PICTURE MAP ON THE SILVER VASE FROM MAIKOP, RUSSIA. Dating from ca. 3000 B.C., this representation shows two rivers flowing from a range of mountains identified by some as the Caucasus.

Height of the original: 10–12 cm. After Mikhail I. Rostovtzeff, *Iranians and Greeks in South Russia* (Oxford: Clarendon Press, 1922), fig. 2.

map, the mountains being identified with the Caucasus.⁹¹

Better known to historians of cartography is the oldest of these examples of picture maps, the wall painting from Çatal Hüyük at Konya in west-central Turkey.⁹² Only one of a large number of wall paintings discovered from this partially excavated Neolithic site, it was found in 1963 and has been given a date of 6200 ± 97 B.C. (fig. 4.19). In the present context it is unique in several respects: it has been dated relatively precisely; it has a well-documented archaeological context; and it appears to be the only "urban plan" from the prehistoric period in the Old World. Like many, though by no means all, of the other wall paintings at Çatal Hüyük it comes from a shrine, a common item of domestic architecture at the site, as the excavator, James Mellaart, has stressed: "out of 139 living rooms excavated . . . not less than forty . . . appear to have served Neolithic religion."⁹³ The painting is on two walls that had been regularly replastered and repainted, a point which underlines the contention already made, that it was the context of painting or the act of painting (or both) that was of prime importance rather than the durability of the image itself.⁹⁴ The painting itself is nearly three meters long and consists of eighty or so closely packed rectangles, each with a dot or small circle in the angles and a hollow or blank interior. It would be difficult to see in this rectangular pattern anything of cartographic relevance were it not for the extraordinary resemblance of the rectangles in the wall painting to those drawn by the archaeologists as part of their excavation plan. It was this that inspired Mellaart's interpretation that the painting "is a representation of a neolithic town, probably Çatal Hüyük itself, the houses of which rise in exactly the same manner as is shown in the painting."⁹⁵ Behind the houses is the profile of a "strange double-peaked object," which Mellaart suggests is identifiable with the two cones of the volcano Hasan Dağ—possibly in eruption—the source of obsidian, one of Çatal Hüyük's most valued commodities and the basis of its wealth.

Plan Maps

The difficulties involved in the unambiguous identification of topographical maps in plan in rock art and the

Bagrow's *Istoriya*, 4 (note 4), *Geschichte*, fig. 97 (note 2), and both *History of Cartography* (note 2) and *Meister* (note 4), fig. 74. Bagrow accepted that the representation could be of the northern Caucasus and suggested that these artistic renderings are "proto-types" of maps and plans; *Istoriya*, 4.

91. K. A. Salishchev, *Osnovy kartovedeniya: Chast' istoricheskaya i kartograficheskiye materialy* (Moscow: Geodezizdat, 1948), 118–19.

92. Map 54 in appendix 4.1.

93. Mellaart, *Çatal Hüyük*, 77 (note 13).

94. See note 14 above.

95. Mellaart, "Excavations," 55 (note 7).



FIG. 4.19. PICTURE MAP: THE NEOLITHIC WALL PAINTING FROM ÇATAL HÜYÜK, TURKEY. This wall painting was identified as a portrayal, in plan, of the former settlement by its similarity to the layout of the excavated houses uncovered by archaeologists. Behind the settlement is a representation of the mountain Hasan Dağ in profile with its volcano erupting.

Length of the original: approximately 3 m. After the copy by Grace Huxtable in James Mellaart, "Excavations at Çatal Hüyük, 1963: Third Preliminary Report," *Anatolian Studies* 14 (1964): 39–119, pl. VI.

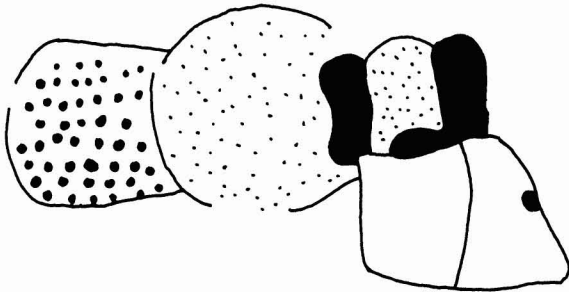


FIG. 4.20. PETROGLYPH MAP FROM VAL FONTAN-ALBA, MONT BEGO. This is typical of the maplike images found as petroglyphs in this valley. With more than six but fewer than eighteen topographical signs, it qualifies as a simple, but not a complex, map as defined in the text.

After Clarence M. Bicknell, *A Guide to the Prehistoric Rock Engravings in the Italian Maritime Alps* (Bordighera: G. Besone, 1913), pl. XVIII-39.

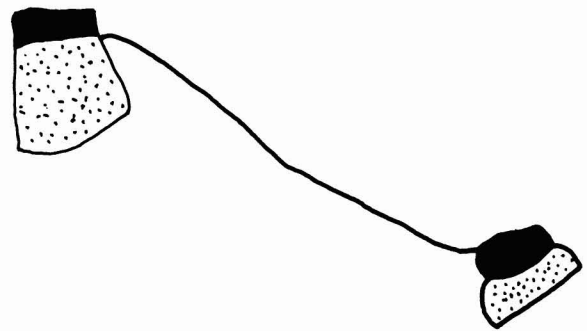


FIG. 4.21. PETROGLYPH MAP FROM VAL FONTAN-ALBA, MONT BEGO. With more than six topographical signs incorporated into its design, this qualifies as a simple map as defined in the text.

After Clarence M. Bicknell, *A Guide to the Prehistoric Rock Engravings in the Italian Maritime Alps* (Bordighera: G. Besone, 1913), pl. XVIII-32.

three main criteria for their diagnosis—composition, appropriateness of image, and the frequency with which individual images occur within a single composition—have already been discussed (pp. 61–62 above). A more precise threshold is needed, however, to exclude assemblages that are too fragmentary or too ill defined to be worthy of serious attention from the corpus (appendix 4.1). A minimum of six cartographic signs is suggested as this threshold. The usefulness of such a threshold can be demonstrated by reference to three examples (figs. 4.20, 4.21, 4.22). According to our new restrictive definition, only two of these qualify as maps. Figure 4.20 (map 6 in appendix 4.1) is the most clearly cartographic. It not only fulfills all three of the diagnostic criteria but also encompasses a total of ten signs: two

(at least) hut signs; five enclosures (or four enclosures, one with a path across it); and three land-use signs (two forms of stippling and unstippled areas). Figure 4.21 (map 4 in appendix 4.1), with two hut signs, two enclosure signs, one path line, and one or two forms of stippling for land use, making a total of six or seven cartographic signs, just qualifies. Figure 4.22, however, has only four signs (one hut, one enclosure, one path, one land-use sign) and therefore fails to qualify.

Rock art maps or plans identified according to these criteria can be further differentiated, once again based on the number of cartographic elements present, into *simple* and *complex* plans or maps. It has already been suggested that simple maps should contain a minimum of six signs. Complex topographical maps should em-



FIG. 4.22. NONCARTOGRAPHIC PETROGLYPH FROM VAL FONTANALBA, MONT BÉGO. Unlike the petroglyphs shown in figures 4.20 and 4.21, this does not qualify as a simple map as defined in the text because it contains only four elements.

After Clarence M. Bicknell, *A Guide to the Prehistoric Rock Engravings in the Italian Maritime Alps* (Bordighera: G. Bes-sone, 1913), pl. XXXII-43.

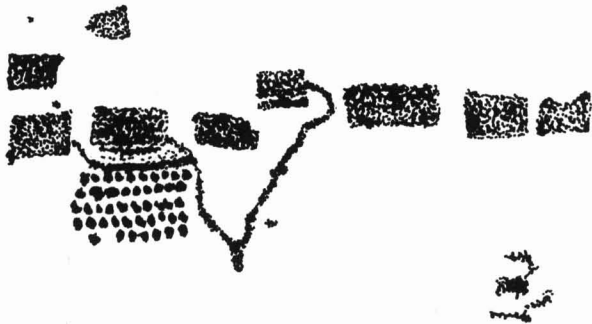


FIG. 4.23. SIMPLE TOPOGRAPHICAL MAP FROM SERADINA, ITALY. Often cited as an example of a prehistoric map, this seems to show an orderly layout of buildings with interconnecting paths and a field or orchard.

Size of the original: 45 × 90 cm. Drawn from a photograph kindly supplied by Centro Camuno di Studi Preistorici, Capo di Ponte, Brescia 25044, Italy.

body at least three times as many signs (i.e., a minimum of eighteen). Compare the examples in figures 4.20 and 4.21 with those in figures 4.26 and 4.27. It is important to note that the quantitative distinction might also suggest a different order of technical effort involved in the production of complex maps. This, in turn, could imply underlying conceptual differences, such as those associated with the purpose or function of the map, the amassing and ordering of the data, and the planning of the map's execution.

Simple Maps The category of simple topographical maps accounts for by far the largest proportion (90 percent) of the present corpus of topographical maps in plan. Interestingly, most examples come from a compact area covering scarcely a dozen square kilometers around Mont Bégo in the Ligurian Alps (dating from as early as the late Neolithic), the remainder coming from elsewhere in the Alps, notably Valcamonica (mostly from the middle or late Bronze Age, 1900–1200 B.C.).⁹⁶ The distribution of those at Mont Bégo is highly localized even within that area. As already noted, all but fifteen

of Bicknell's two hundred or so topographical figures come from a single valley, Val Fontanalba, on the northern side of the peak.⁹⁷ On the other hand, it is important to stress that even within Val Fontanalba the topographical figures constitute a very minor part (between 2 and 4 percent) of all the petroglyphic subject matter.

Bicknell suggested that 195 of the petroglyphs he studied at Mont Bégo might be interpreted as "topographical figures." A number of these have been discounted in the context of the present discussion as too small, incomplete, or ambiguous to qualify as maps. Of the five examples in this group coming from Valcamonica and discussed here, only one, from Seradina (Capo di Ponte), has already entered the literature of the history of cartography.⁹⁸ It seems to depict an orderly layout of buildings with interconnecting paths and at least one (unenclosed) field (fig. 4.23). Another example that is to be found close by, on the riverside rock at Ponte San Rocco, is a much less orderly arrangement of what are thought to be buildings and path signs (fig. 4.25).⁹⁹ The topographical representations on side 2 of the Borno stone (thought to be late Neolithic or Chalcolithic in date) were first described before the stone had been completely excavated.¹⁰⁰ The writer Raffaello Battaglia was already familiar with the larger topographical compositions of Bedolina and Giadighe (see below) and thought he could discern on the Borno stone similar representations of "cultivated fields, fruit groves and paths seen from above."¹⁰¹ There is little interconnection between any of the markings on the stone, and even the one group of possibly cartographic signs fails to qualify as a map for this reason.¹⁰²

96. Bronze Age maps are still being found by Professor E. Anati and his assistants. Not yet published is a large group of figures (covering about four square meters), thought to be of Bronze Age date, on rock 23 at Foppe di Nadro. This was found in 1982, and I am grateful to Professor Anati and to Tiziana Cittadina for allowing me to see this in the process of recording and for subsequent details.

97. See note 73. Concerning the concentration in the immediate vicinity of Mont Bégo, Bicknell remarked on the awesomeness of this peak, especially under certain weather conditions, and suggested it might have been a "Holy Place," a view accepted by M. C. Burkitt. Bicknell, *Prehistoric Rock Engravings*, 64–65 (note 67). M. C. Burkitt, "Rock Carvings in the Italian Alps," *Antiquity* 3, no. 10 (1929): 155–64.

98. Map 45 in appendix 4.1. Harvey, *Topographical Maps*, 45, fig. 20 (note 6). Additional examples of "maps" have recently been reported by Ausilio Priuli, *Incisioni rupestri della Val Camonica* (Ivrea: Priuli and Verlucca, 1985), including a second one from Seradina (fig. 33) similar to that described here. Few, if any, it would seem, would meet the suggested cartographic criteria.

99. Map 44 in appendix 4.1.

100. Map 42 in appendix 4.1.

101. Raffaello Battaglia and Maria Ornella Acanfora, "Il masso inciso di Borno in Valcamonica," *Bollettino di Paleontologia Italiana* 64 (1954): 225–55, esp. 237.

102. Anati, *Borno*, 20 (note 81), refers to the "plans of cultivated fields, paths, walls, tree plantations."

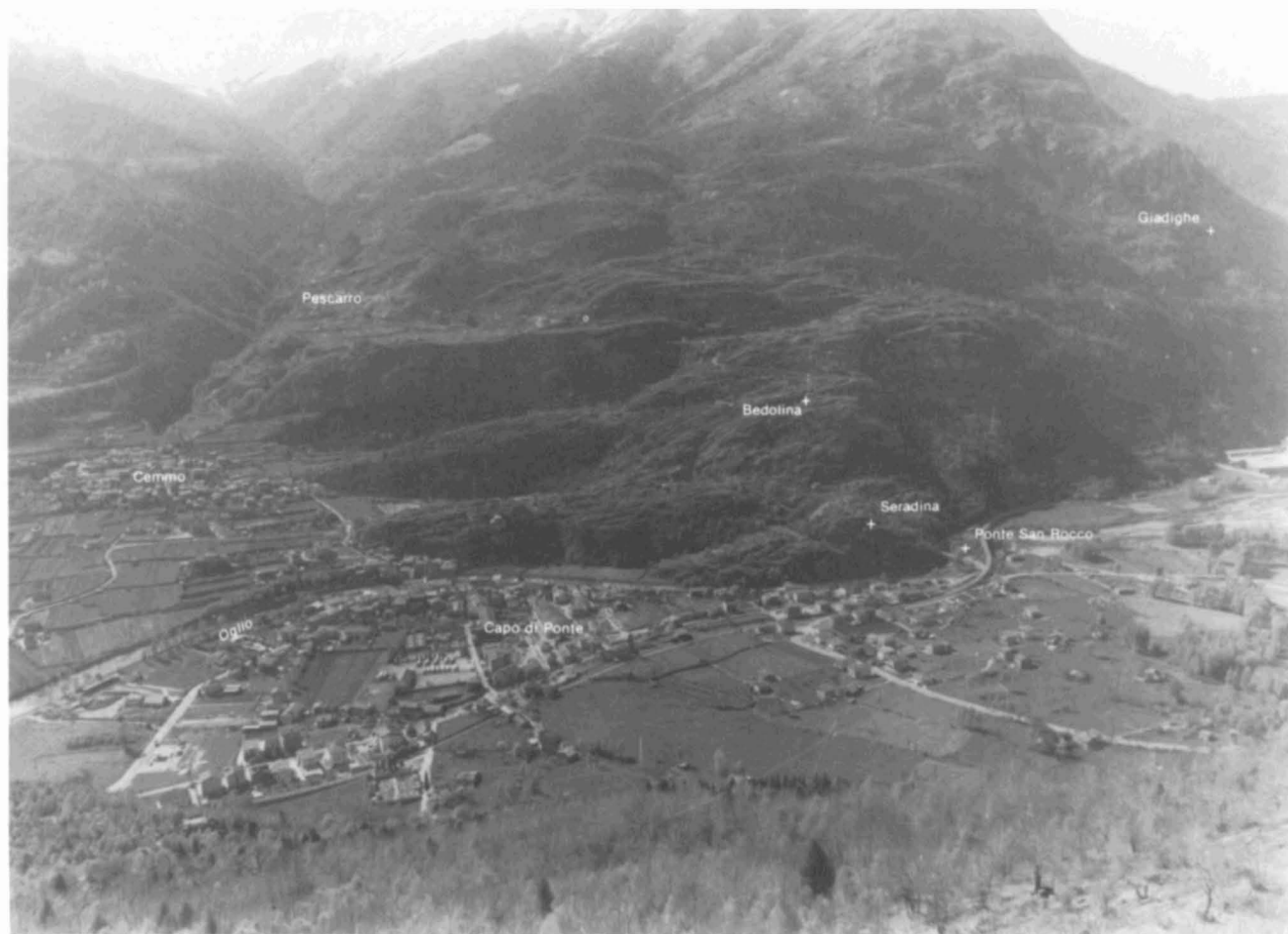


FIG. 4.24. PHOTOGRAPH OF CAPO DI PONTE, VALCAMONICA. The winding Oglio River is shown with the hillside rock art sites near Capo di Ponte identified.

Photograph kindly supplied by Ausilio Priuli.

The rest of Italy has little to offer, so far, in the way of possible examples of prehistoric maps, even from other Alpine areas such as Valtellina and Lake Garda, also rich in petroglyphs. Sometimes a topographical motif, such as a field-type rectangle, is found in isolation.¹⁰³ A different problem is presented by one of the images on the stela of Novilara (seventh–sixth century B.C.). It has been suggested that this could represent a river with a town in the middle of its course,¹⁰⁴ but despite the proximity of a ship on the same stone, this must remain conjectural. Still less has come from elsewhere in Europe. The rock art of Karelia and the shores of Lake Onega and the White Sea is close to that of Scandinavia in both subject matter and style. Like the Scandinavian art, it has not so far been found to have much in the way of figures of potential cartographic interest, though B. P. Polevoy describes some of the drawings discovered at Zalavruga (on the Vyg River, south of Belomorsk) in 1963–64 as “somewhat reminiscent of geographical maps, with representations of routes, as well as boats,

animals and skier-hunters.”¹⁰⁵ In central Norway isolated rectangular motifs, complete with stippled infilling, have been documented as “perhaps pictures of fields.”¹⁰⁶

103. Bric del Selvatico (Lanzo Valley, Turin), for instance. Roberto Roggero, “Recenti scoperte di incisioni rupestri nelle Valli di Lanzo (Torino),” in *Symposium International d’Art Préhistorique Valcamonica, 23–28 Septembre 1968*, Union Internationale des Sciences Préhistoriques et Protohistoriques (Capo di Ponte: Edizioni del Centro, 1970), 125–32.

104. I am grateful to O. A. W. Dilke for drawing this feature to my attention and to Antonio Brancati (director of the Museo Archeologico Oliveriano of Pesaro) for supplying relevant literature. Most archaeological commentators on the stone refer to the “double S” feature only as of “uncertain significance”: Gabriele Baldelli, *Novilara: Le necropoli dell’età del ferro*, exhibition catalog (Pesaro: Museo Archeologico Oliveriano, Comune di Pesaro, IV Circoscrizione, n.d.), 28.

105. Written communication, 1982. The drawings are illustrated by Yury A. Savvateyev, *Risunki na skalakh* (Rock drawings) (Petrozavodsk: Karelskoye Knizhnoye Izdelstvo, 1967).

106. Sverre Marstrand, “A Newly Discovered Rock-Carving of Bronze Age Type in Central Norway,” in *Symposium International*, 261–72 (note 103).



FIG. 4.25. SIMPLE TOPOGRAPHICAL MAP FROM PONTE SAN ROCCO, ITALY. Although confused by the anthropomorphic figures, this seems to show a loosely grouped scatter of buildings linked by paths. Size of the original: 90 × 45 cm. Drawn from a photograph kindly supplied by Centro Camuno di Studi Preistorici, Capo di Ponte, Brescia 25044, Italy.

Scarcely more promising is a single small composition from Finntörp (near Tanum), Sweden.¹⁰⁷ Comprising an empty rectangle, a number of attached lines, and some scattered dots, it is reminiscent of the style of the Bedolina map in Valcamonica but fails to meet the cartographic criteria. Nor has anything that qualifies as a simple map yet been reported from the Middle East or North Africa. There has been a suggestion that an “inadequately explained feature” associated with the painted star fresco at Teleilat Ghassul in Jordan might represent the plan of a building¹⁰⁸ (see plate 1 and p. 88 below), but this has not received general acceptance.

107. I am indebted to John M. Coles, University of Cambridge, for bringing this to my attention and for supplying a photograph.

108. Carolyn Elliott, “The Religious Beliefs of the Ghassulians, c. 4000–3100 B.C.,” *Palestine Exploration Quarterly*, January–June 1977, 3–25, though the grounds for her rejection (its early date) are not acceptable to us.

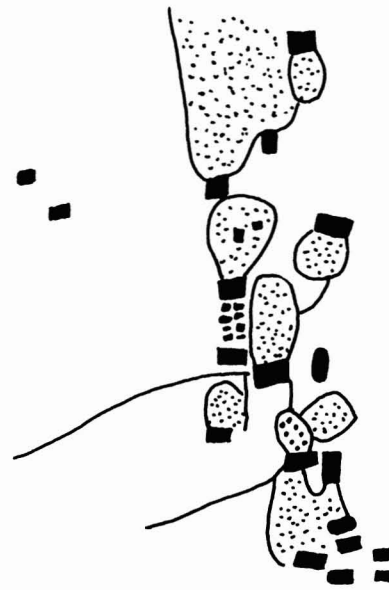


FIG. 4.26. THE “SKIN HILL VILLAGE” MAP FROM VAL FONTANALBA, MONT BEGO. This is one of the most complex assemblages in the area. Size of the original: 97 × 36 cm. After Clarence M. Bicknell, *A Guide to the Prehistoric Rock Engravings in the Italian Maritime Alps* (Bordighera: G. Bessone, 1913), pl. XLIII-4.

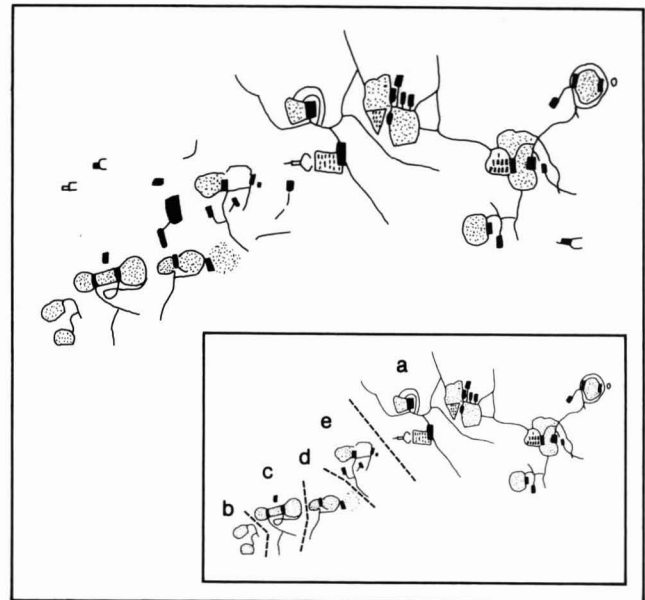


FIG. 4.27. THE “MONTE BEGO VILLAGE.” This cannot be accepted in the light of the cartographic criteria as having been intended as a single composition, and the four smaller groups (b–e) are classed as simple maps. Size of the original: 1.40 × 2.40 m. After Clarence M. Bicknell, *A Guide to the Prehistoric Rock Engravings in the Italian Maritime Alps* (Bordighera: G. Bessone, 1913), pl. XLV-1; Bicknell’s reproduction shows the long axis vertically on the rock, not horizontally as here.

Complex Maps Four prehistoric maps, all petroglyphs and all from the Alps, are described in appendix 4.1 as complex topographical maps. Two come from Mont Bégo in the Ligurian Alps. Both have shared the fate of all Clarence Bicknell's topographical figures; that is, they have been ignored. In what Bicknell christened the "Skin Hill Village" map¹⁰⁹ there are at least nineteen or twenty hut signs; seven complete enclosures and three or four half-completed ones; nine path signs; and at least two types of stippling or land-use signs (fig. 4.26). All are interlinked. The "Monte Bégo Village" map¹¹⁰ presents more of a problem, since it is clear Bicknell assumed that all five separate groups of topographical images composed a single assemblage. Applying the criterion of linkage, however, it is arguable that the assemblage is composed of a single large composition and four small ones (fig. 4.27). Even on its own, though, the former qualifies as a complex topographical map, containing fifteen hut signs, eleven enclosures, at least twenty interconnecting path signs, and three land-use signs (two types of stippling and some enclosed but unstippled areas). The four small groups have been listed as simple topographical maps. Half a dozen isolated infilled rectangles, possible hut signs, have to be ignored.

In contrast to the "topographical figures" from Mont Bégo, at least one prehistoric map from Valcamonica early received attention in the literature of the history of cartography as the oldest known map. This is the assemblage at Bedolina (Capo di Ponte),¹¹¹ which for nearly two decades was the only Old World prehistoric map apparently known to historians of cartography (fig. 4.28). Even so, thirty years had to pass between its first announcement at an archaeological conference in London (and its publication in the proceedings two years later)¹¹² and its appearance in *Imago Mundi* in 1964.¹¹³ Known as Bedolina 1 (there are a number of fragmentary or incomplete figures of the "topographic" type in the vicinity), the petroglyph occupies most of an ice-polished,¹¹⁴ undulating rock that projects—like so many others in the district—from the now terraced mountainside. It overlooks the broad, flat-bottomed valley where, some forty meters below, the Oglio River winds its way to the Po. The assemblage covers nearly all of the rock surface exposed today and measures 4.16 by 2.3 meters. Until now, the only detailed study has been a technical and stylistic one, aimed at identifying which figures belonged to the different phases of engraving.¹¹⁵ This showed that only 134 out of the 183 separate figures engraved on the rock could be considered part of the "map." These come from the second of the four stages of engraving (phase B). The house pictures are later additions, probably of Iron Age date, and should not be regarded as part of the main composition. The range of the topographical images is similar to those at Mont

Bégo, though slightly different in style, and their interpretation as topographical signs was clearly inspired by the work of Clarence Bicknell. One odd feature about the Bedolina composition is that it contains no clear-cut signs, parallel to those of Mont Bégo or even elsewhere in Valcamonica, that can be interpreted as house signs. Despite this, it has been suggested by more than one archaeologist that the Bedolina map was produced as an accurate representation of part of the cultivated landscape on the valley floor during the Bronze Age.¹¹⁶

The second petroglyphic composition in Valcamonica that qualifies as a complex topographical map is found on the same hillside, slightly upstream. It is also higher up the mountainside. There is no room for cultivation in the immediate vicinity, nor could there ever have been: the mountain slope falls steeply down to the now cultivated valley floor and the meandering Oglio River over a hundred meters below. Though known also as Plaz d'Ort, the first published reference names the locality Giadighe,¹¹⁷ the name retained here. Walter Blumer included a photograph of this assemblage in a discussion of Bedolina and Seradina but made no comment on it (fig. 4.29).¹¹⁸

Comparison with the Bedolina map reveals some major differences. The close network of "fields" makes the Giadighe representation a more compact composition.

109. Map 35 in appendix 4.1.

110. Map 36 in appendix 4.1.

111. Map 43 in appendix 4.1.

112. Raffaello Battaglia, "Incisioni rupestri di Valcamonica," in *Proceedings of the First International Congress of Prehistoric and Protohistoric Sciences, London, August 1–6, 1932* (London: Oxford University Press, 1934): 234–37.

113. Blumer, "Oldest Known Plan" (note 5).

114. Petroglyphs are usually described as appearing "as new" on discovery, although various degrees of patination are said to be discernible and are useful as an aid to dating. The main reason for this pristine appearance is the hardness of the rock, inevitably the finest grained, closest textured, and most resistant in the district. In some areas, however, this petrological resistance to weathering has been enhanced—it has been suggested—by the way the rock surface has been polished and smoothed by the movement of glacier ice, leaving few irregularities to catch surface water.

115. Miguel Beltrán Lloris, "Los grabados rupestres de Bedolina (Valcamonica)," *Bollettino del Centro Camuno di Studi Preistorici* 8 (1972): 121–58.

116. As has been suggested by Anati, *Camonica Valley*, 104–8 (note 81). Apart from artificial terraces built between the rocks on the lower slopes, there is no room for cultivation except on the valley floor or on deposition cones at the debouchment of tributary streams. It has been suggested by Priuli, *Incisioni rupestri*, 24 (note 98), that maps were executed on rocks, the undulations of which reflected those of the area depicted and that the Bedolina map might portray the zone of Castelliere del Dos dell'Archa. However, it does not seem wise to attempt to infer the Bronze Age landscape from the petroglyphic evidence without further archaeological evidence.

117. Raffaello Battaglia, "Ricerche etnografiche sui petroglifi della Cerchia Alpina," *Studi Etruschi* 8 (1934): 11–48, pls. I–XXII.

118. Blumer, "Felsgravuren" (note 5).

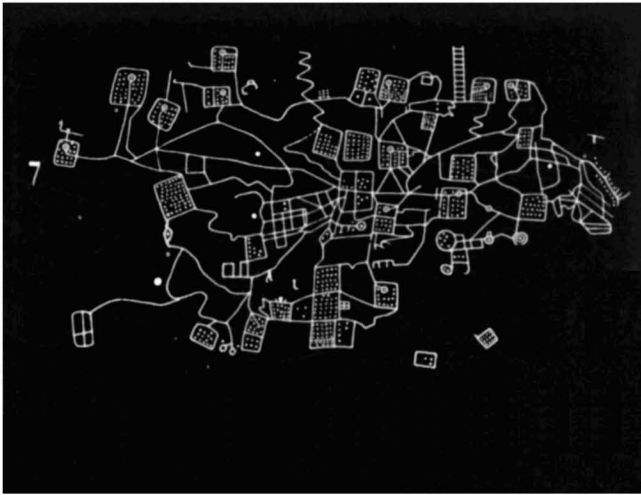


FIG. 4.28. COMPOSITE PETROGLYPH MAP FROM BEDOLINA, VALCAMONICA. The earlier figures and later additions have been removed to reveal a complex topographical map.

Size of the original: 2.30 × 4.16 m. After Miguel Beltrán Lloris, "Los grabados rupestres de Bedolina (Valcamonica)," *Bollettino del Centro Camuno di Studi Preistorici* 8 (1972): 121–58, fig. 48.

The absence of the points and circles, thought to indicate springs, and of the long, often zigzagging path signs of the Bedolina petroglyph makes the Giadighe figure the more homogeneous of the two. Though one or two lines are executed in a different technique, the only intrusive images (near the bottom of the rock) resemble the anthropomorphic figures common elsewhere in Valcamonica. Only a small proportion of the Giadighe fields are stippled, either by intention or simply because the composition is incomplete, and the stippling is formed of relatively large, regularly spaced, hammered or punched points. Some rectangular depressions could be interpreted as representations of buildings; if this is the case, they would indicate homesteads situated within the enclosures. Although natural fissures in the rock and subsequent erosion have led to discontinuities in the pattern, a particularly striking feature is a double line boldly sweeping in an S-shaped curve across the entire composition from top to bottom. It has been suggested that this represents the meandering river Oglio. Battaglia's interpretation of the Giadighe petroglyph as a map has not so far been challenged. He described it as the valley of the Oglio, "with its enclosed fields and fruit-groves among which the broad ribbon of the river meanders."¹¹⁹

No other European region has as yet produced comparable compositions in either rock or mobiliary art,

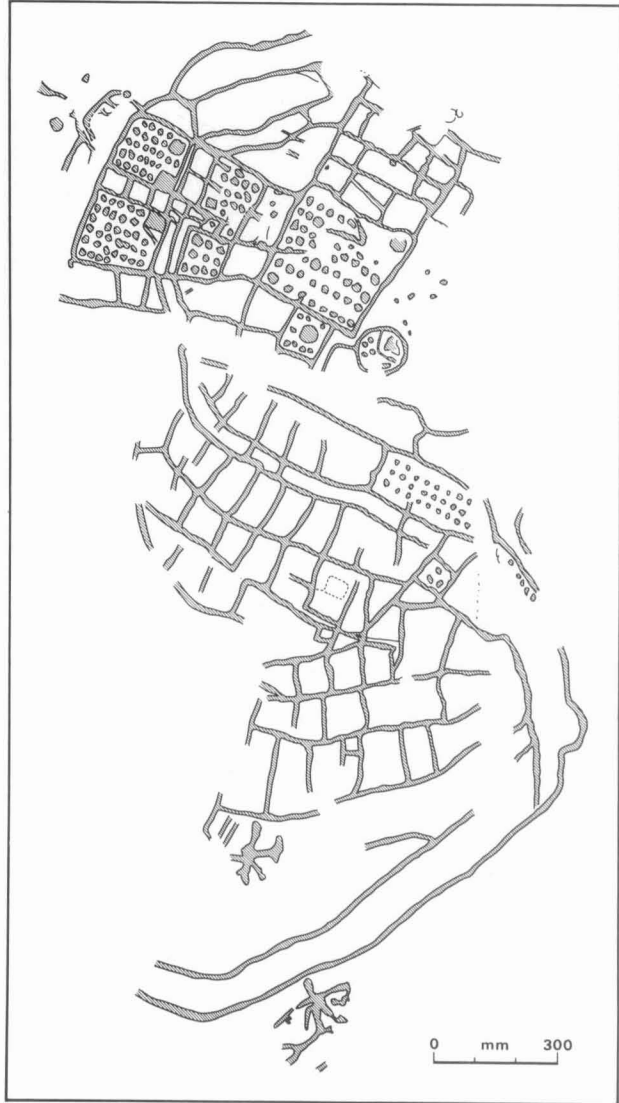


FIG. 4.29. PETROGLYPH MAP FROM GIADIGHE, VALCAMONICA. The rock is damaged by fissures and erosion but viewed in the field, the sweep of the broadly spaced double lines that are thought to represent a river is even more striking. There are two anthropomorphic figures toward the bottom. Size of the original: 2.59 × 1.25 m. Author's field drawing; see also Ausilio Priuli, *Incisioni rupestri della Val Camonica* (Ivrea: Priuli and Verlucca, 1985), fig. 25.

119. Battaglia, "Incisioni rupestri," 236 (note 112); Battaglia, "Ricerche etnografiche," 44–45 (note 117). See also Priuli, *Incisioni rupestri*, 26 and figs. 24 and 25 (note 98). The modern landscape, with its traditional features of *cultura promiscua* (intercropping), fits both the Bedolina and the Giadighe compositions though Priuli seems to think the stippling represents woodland and that this woodland was part of a "rotation cycle" that allowed, say, a fifteen-year period of soil recuperation (p. 24), though he offers nothing to support such an interpretation. It is possible that *cultura promiscua*, a typical Mediterranean farming system, was already established in Valcamonica in the second millennium B.C.

and nothing similar is known from the Middle East or North Africa. The four examples from Mont Bégo and Valcamonica are outstanding in terms of their cohesiveness and the appropriateness of their signs. They are accepted here as possible examples of prehistoric maps in accordance with the suggested cartographic criteria. On the same basis, other proposed examples have been discarded, notably the Clapier rock (Pinerolo, Italy) (fig. 4.30)¹²⁰ and several decorated stones in northern Germany.¹²¹

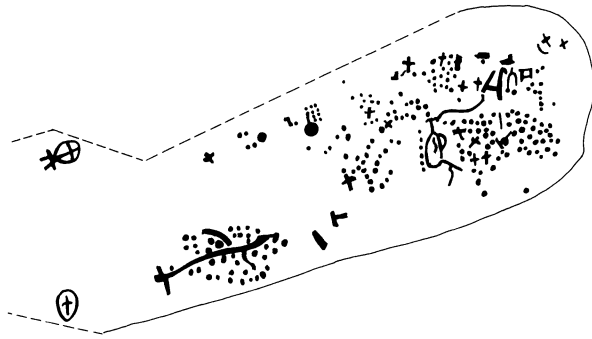


FIG. 4.30. THE CLAPIER ROCK, ITALY. A noncartographic figure, this consists of a collection of cups, rings, and other engravings.

Size of the original: 2.5 × 8.5 m. After Cesare Giulio Borgna, "La mappa litica di rocio Clapier," *L'Universo* 49, no. 6 (1969): 1023–42, pl. following 1042.

The topographical maps, including the simple ones, seem to demonstrate a concept of graphic representation distinct from that represented in picture maps, namely the depiction of all features in plan without apparent regard to the difficulty of interpretation by the uninitiated. This new viewpoint must have constituted a cartographic step every bit as significant in the context of the later prehistoric period as was the reintroduction of the ichnographic city plan in the sixteenth century A.D. The precise cause and context of this modification is, however, far from clear. It may have been related to a change in the original purpose or function of these prehistoric representations of space. It is arguable that what appears to be a new (or perhaps increased) incidence of maps drawn in plan reflects prehistoric man's recognition that depiction in plan provided a more effective means of recording a spatial distribution than did a pictorial map. Although the latter continued to be produced, the apparent proliferation of plan maps in these Alpine districts may suggest a new interest in this sort of factual record. While it is tempting to attribute this change to a more "modern" approach to mapping, it would be rash to impose this interpretation on all complex plan maps. The two examples from Mont Bégo are

high in the mountains, relatively inaccessible, and distant from the homesteads and arable fields seemingly depicted. In the absence of substantial indications to the contrary, it would be more appropriate to attribute these maps to the primarily symbolic purpose behind much prehistoric rock art, in which artistic or visual significance was subordinate to a now unknown abstract context or message. In contrast, the two examples from Valcamonica have a significantly different context, since each overlooks what would have been, even then, a cultivated valley and a route across the Alps. They are also slightly different stylistically, although the fact that they are the largest known plan maps from prehistoric Europe may reflect no more than the availability of large ice-polished rock surfaces. When the arguments and examples are weighed, it remains doubtful that even these two examples can in fact be seen as marking the introduction of the use of maps as factual records in the prehistoric era, although such a transition had taken place by early historical times.

Relief Maps Although nothing has been found in the prehistoric period similar to the three-dimensional representations of topography suggested for some of the coins of the classical period,¹²² the archaeology of the post-Paleolithic period is well endowed with finds of small clay models of buildings. These would have been used either as votive offerings or as funerary urns. There are also a number of painted or bas-relief portrayals of buildings and fortifications. These are all wholly profile views; consequently, notwithstanding their accuracy as

120. Cesare Giulio Borgna, "La mappa litica di rocio Clapier," *L'Universo* 49, no. 6 (1969): 1023–42. The Clapier rock (see fig. 4.30) is an extensive exposure (6 × 2 m) high on a mountainside, covered with cup marks (and a few crosses and disjointed lines) in no discernible pattern or order. Borgna sees it as a map of the environs showing the distribution of features of interest to the "seminomadic shepherds" of ancient times, such as springs, natural shelters, and pasturage. The basis for this interpretation is the apparent match of selected marks on the rock with major landscape features, such as neighboring mountain peaks, particularly those that also have rock carvings.

121. Molt, *Karten* (note 64), is an ingenious, sometimes thought-provoking, and painstaking study of several decorated rocks and stones in Schleswig-Holstein and Lower Saxony, including the Bunsöh stone. One interesting suggestion is that the constellations thought to be portrayed on this stone in various arrangements of the cup marks were used to represent individual landscape features of prehistoric times on the rock map (in the way, though Molt himself does not say so, North American Indians used totems on their maps). The chief weaknesses of Molt's approach are the arbitrariness of selection of those cup marks and other marks that appear to fit the supposed pattern from a much larger number present on the stones and the assumption that modern conceptions of mapmaking and surveying (notably the idea of scale and Euclidean geometry) can be applied to prehistoric times (Molt is a retired surveyor). The stones discussed, besides the Bunsöh and Hoidsdorf stones, are the megaliths of Plumböhm and Waldhusen.

122. See p. 158 and fig. 9.7 below.

a record of the architecture of specific buildings,¹²³ they are beyond the scope of this work. What have been said to be plan models from Malta, however, are in a class of their own. One of the two published examples is a sculptured limestone block that was found in a temple built at Tarxien late in the Neolithic period (fig. 4.31). It has been interpreted by some archaeologists as a detailed plan representation of a building with rectangular living spaces.¹²⁴ The second, less well known, is a terracotta model found at Hagar Qim. Two fragments survive of a larger original. They are sufficient to show that, when completed, they consisted of a modeled foundation slab on which the lower courses of what have been interpreted as the walls and jambs of a five-apsed temple rested.¹²⁵ The archaeological significance of the Hagar Qim fragment rests on the fact that when it was made no buildings of that particular form existed in Malta; its significance for historians of cartography is that it may perhaps be regarded as having been created as a demonstration model or as a three-dimensional reference plan for the actual process of construction.¹²⁶

CELESTIAL MAPS

The idea that there may have been advanced astronomical science in later prehistoric times was strongly held in at least two European countries in the nineteenth century and the early part of the twentieth. Both France and Scotland are rich in those geometric and abstract motifs that are the most difficult to understand and the most vulnerable to fanciful interpretations, namely cup-and-ring marks. They also are rich in concentrations of megalithic monuments and stone alignments, which again have given rise to much controversy about their astronomical or other significance.¹²⁷ One of the earliest

123. For example, Jean Capart, *Primitive Art in Egypt*, trans. A. S. Griffith (London: H. Grevel, 1905), 202, fig. 160, "Clay Model of a Fortified Enclosure." A bronze model from Toprakkale (Turkey) is illustrated by Seton Lloyd, *Early Highland Peoples of Anatolia*, Library of the Early Civilizations (London: Thames and Hudson, 1967), figs. 118–19.

124. Map 49 in appendix 4.1. Themistocles Zammit, *Prehistoric Malta: The Tarxien Temples* (London: Oxford University Press, 1930), 88 and pl. 24 (4). David H. Trump, "I primi architetti: I costruttori dei templi Maltesi" (Rome: Giorgio Bretschneider, 1979), 2113–24 and plates (extract from *φιλίας χάριν*, *Miscellanea in Onore di Eugenio Manni*).

125. Map 50 in appendix 4.1. Trump, "Primi architetti," 2122 (note 124).

126. Trump, "Primi architetti," 2122 (note 124). It was also once suggested that this apsidal shape is to be seen "repeated in the symbols carved in the stone altar and sacred slab . . . as well as in the forms of the seven statuettes . . . discovered at Hhagiar Kim, and in the numerous perforations which cover the greater portion of the stones of this building": P. Furse, "On the Prehistoric Monuments in the Islands of Malta and Gozo," *International Congress of Prehistoric Archaeology, Transactions of the Third Session, Norwich 1868* (1869), 407–16, quotation on 412.

proponents of prehistoric astronomical theories in Scotland was George Moore; one of the most persistent was Ludovic MacLellan Mann.¹²⁸ But it was George Browne



FIG. 4.31. THE LIMESTONE SCULPTURE FROM TARXIEN, MALTA. This is thought by some archaeologists to be part of a plan representation of a building. Size of the original: 28 × 28 × 22 × 2 (base) cm, with 2 cm of relief. By permission of the National Museum of Archaeology, Valletta, Malta.

127. That there may have been an astronomical motivation behind the construction of a range of ceremonial, burial, and other sites is less contentious than the suggestion that these were based on precise solar and lunar observations, involving a basic knowledge of applied mathematics and surveying, championed by Alexander Thom: "Astronomical Significance of Prehistoric Monuments in Western Europe," in *The Place of Astronomy in the Ancient World*, ed. F. R. Hodson, a joint symposium of the Royal Society and the British Academy (London: Oxford University Press, 1974), 149–56; see also Douglas C. Heggie, *Megalithic Science: Ancient Mathematics and Astronomy in Northwest Europe* (London: Thames and Hudson, 1981); Douglas C. Heggie, ed., *Archaeoastronomy in the Old World* (Cambridge: Cambridge University Press, 1982); James Cornell, *The First Stargazers: An Introduction to the Origins of Astronomy* (New York: Scribner, 1981); Christopher Chippindale, *Stonehenge Complete* (London: Thames and Hudson, 1983). Most authorities are willing to see a secondary symbolic or ritual significance in the sites, while few would doubt that the contemplation of the universe and of celestial phenomena is a practice as old as man himself. A preference for certain art forms may thus have been generated (disk, sphere, etc.): Eugenio Battisti in "Astronomy and Astrology," in *Encyclopedia of World Art*, 2:40 (note 83).

128. George Moore, *Ancient Pillar Stones of Scotland: Their Significance and Bearing on Ethnology* (Edinburgh: Edmonstone and Douglas, 1865). Ludovic MacLellan Mann, *Archaic Sculpturings: Notes on Art, Philosophy, and Religion in Britain 200 B.C. to 900 A.D.* (Edinburgh: William Hodge, 1915); idem, *Earliest Glasgow: A Temple of the Moon* (Glasgow: Mann, 1938).

who, in 1921, attempted to demonstrate in detail how the prehistoric astronomers used cup marks to represent individual constellations on rock and stone. According to Browne, the Sin Hinny stone in Aberdeenshire was an “instructional chart on which the magician could teach his apprentice, instead of teaching him by pointing with his finger to the stars in the sky, with no assurance that the apprentice was looking at the right star,”¹²⁹ and to this end he identified the Great Bear, Little Bear, and Corona among the cup marks and hollows on the stone. Similarly, the scatter of 107 cup marks on the Rothiemay stone (also in Aberdeenshire) is said to contain a representation of the Great Bear with accompanying stars—but, curiously, only when the cup-mark pattern is seen as being a mirror image. In France a similar tradition of relating rock carvings to astronomical positions and of recognizing constellations in the cup marks on stones led to publications such as Marcel Baudouin’s (1926).¹³⁰ To Baudouin, the channels that run outward from some cup-and-ring marks could have been intended as markers of important astronomical axes, while footprint-shaped hollows were made to indicate solar lines. Among the star maps discussed by Baudouin is one that could be the earliest of all, a representation of the Great Bear in a group of seven hollows (out of a total of eighteen) scooped out of a stone excavated from Aurignacian deposits at La Ferrassie.¹³¹

Enthusiasts like Browne and Baudouin were content to find single constellations in the stone markings. Others, notably Gudmund Schütte, who was well aware of the importance of what he called mythical astronomy in Scandinavia,¹³² sought to show that not only individual constellations were portrayed on the rocks but whole portions of the night sky as it would have been seen in the particular locality at a certain time of year. In 1920 Schütte produced a well-illustrated article in which he claimed to have identified at least three star “maps” among the rock carvings of Bohuslän (as illustrated by Baltzer) and in the cup marks of standing stones at Venslev (fig. 4.32) and at Dalby (fig. 4.33) in Denmark.¹³³ He recounted how it suddenly struck him, as he put it, that one of Baltzer’s illustrations of petro-

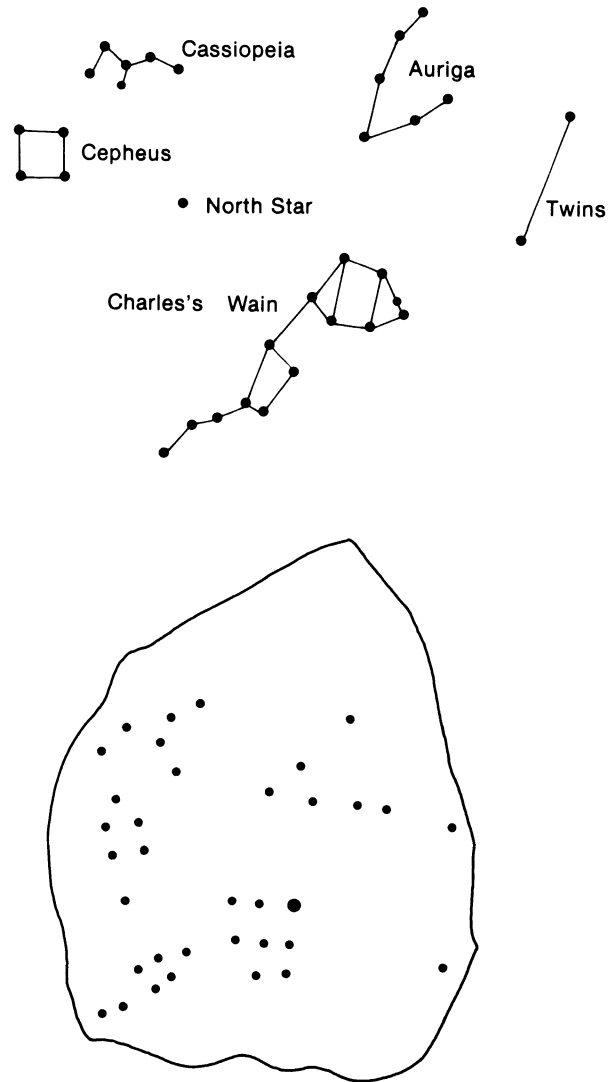


FIG. 4.32. CUP MARKS ON STONES AT VENSLEV, DENMARK. These possibly represent constellations. After Gudmund Schütte, “Primaeval Astronomy in Scandinavia,” *Scottish Geographical Magazine* 36, no. 4 (1920): 244–54, figs. 12 and 13.

129. George Forrest Browne, *On Some Antiquities in the Neighbourhood of Dunecht House Aberdeenshire* (Cambridge: Cambridge University Press, 1921), 159.

130. Marcel Baudouin, *La préhistoire par les étoiles* (Paris: N. Maloine, 1926).

131. Baudouin, *Etoiles*, xv (note 130). For an excellent photograph of the stone, see S. Giedion, *The Eternal Present: A Contribution on Constancy and Change*, Bollingen Series 35, vol. 6, 2 pts. (New York: Bollingen Foundation, 1962), pt. 1, 137, fig. 78.

132. Gudmund Schütte was the author of a book on home mythology, *Hjemligt Hedenskab: I Almenfattelig Fremstilling* (Copenhagen: Gyldendal, 1919), favorably reviewed in the *Scottish Geographical Magazine* 36, no. 2 (1920): 139–41.

133. Gudmund Schütte, “Primaeval Astronomy in Scandinavia,” *Scottish Geographical Magazine* 36, no. 4 (1920): 244–54. Not without interest is the fact that on 5 February 1921 the French journal *La Nature*, no. 2444, 81–83, published an article “L’astronomie préhistorique en Scandinavie,” which, though shorter and with fewer illustrations than the *Scottish Geographical Magazine* paper, is otherwise an obvious translation. The author of this paper, however, was given as Dr. M. Schönfeld. Whoever Dr. Schönfeld may or may not have been, Dr. Schütte is a bona fide author, responsible not only for the book on mythology but for several other articles (such as two on Ptolemy’s atlas in the *Scottish Geographical Magazine*, vols. 30 and 31). Curiously, though, Browne, *On Some Antiquities*, 162–63 (note 129), referred in detail to the French paper when he might have been expected to have had easier access to Schütte’s *Scottish Geographical Magazine* article.

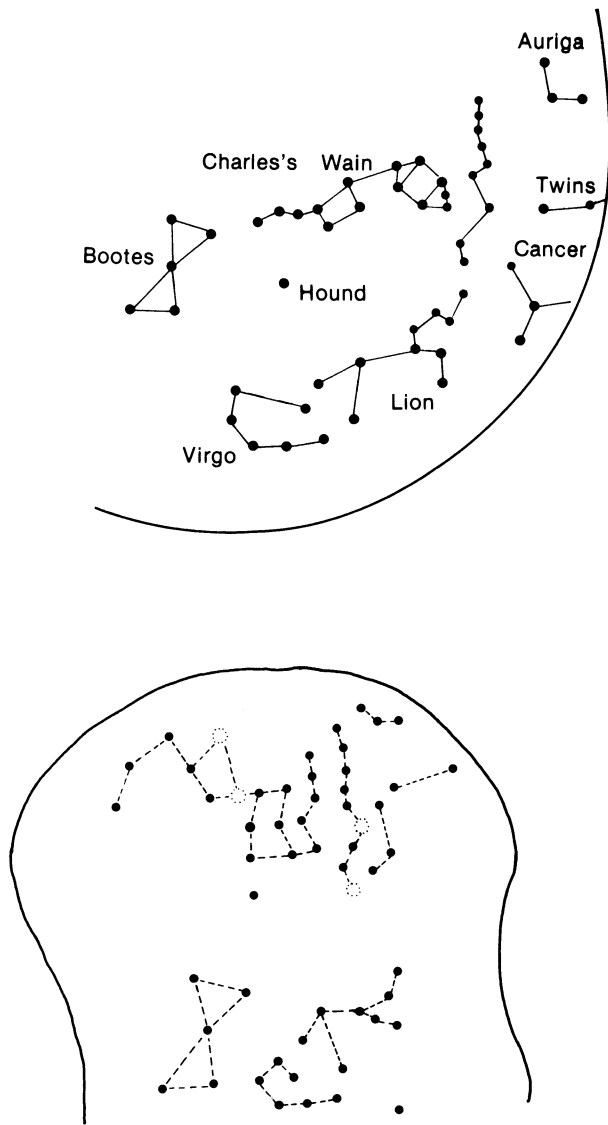


FIG. 4.33. CUP MARKS ON STONES AT DALBY, DENMARK. As in figure 4.32, these might represent constellations. After Gudmund Schütte, "Primaevial Astronomy in Scandinavia," *Scottish Geographical Magazine* 36, no. 4 (1920): 244–54, figs. 14 and 15.

glyphs from Tanum "contained an obvious representation of Charles's Wain (Ursa Major) and the Milky Way in fairly correct juxtaposition."¹³⁴ Looking more closely he also discerned, to his satisfaction, signs of the zodiac among the other figures on the rock—Cancer, Little (Lesser) Dog, Bull, Foal beside Pegasus, and Capricorn—and he accompanied this interpretation with a figure showing the main constellations visible from Bohuslän on 19 October. One weakness in such interpretations is the inexactitude of the match between the number and positioning of cup marks present on a stone and those needed to make up the constellation thought to be represented. For the Dalby stone, for

example, where there are fifty-six cup marks for fifty-one stars, Schütte admits that the relationship between the two groups of constellations (Charles's Wain and Lynx; Lion, Virgo, and Bootes) is not as correct as it should be.

Other would-be interpreters of cup marks have shown less concern for such matters and are much less specific. Maringer reproduces, apparently the wrong way up, a group of points, lines, and rayed figures from the rock shelter of Pala Pinta (Carlão, Portugal), describing it simply as a "starry sky and ritual axe."¹³⁵ Acanfora also reproduces this, together with a similar figure from Cueva del Christo.¹³⁶ The idea of a reversed star map also seems widespread. In 1929 one of the excavators of the Tarxien temple reported that the representation of five holes in a floor slab "has suggested to some the image of a constellation, that of the Southern Cross, for example, which at the time the temples were in use was easily seen in our hemisphere."¹³⁷ Recently it has been pointed out that it is a mirror image.¹³⁸ Also from Malta comes the "star stone" from a small late Neolithic building at Tal Qadi (fig. 4.34). The exact original position of this fragment is unknown. As regards both motifs and the rather crude nature of the engraving, it is different from anything else on the island. The slab is divided by radial lines into five segments, within which there are what appear to be symmetrical arrangements of "star" motifs, short straight lines, and—in one segment on its own—a crescent. The consensus among archaeologists is that it "may have had some religious significance or . . . some astronomical purpose"¹³⁹ and that it may have

134. Schütte, "Primaevial Astronomy," 246 (note 133). Charles's Wain is also known as the Plow or the Great Bear; the Milky Way is traditionally the "realm of the dead."

135. Maringer, *Gods*, 169 (note 78). First publication was J. R. dos Santos Júnior, "O abrigo pre-histórico da 'Pala Pinta,'" *Trabalhos da Sociedade Portuguesa de Antropologia e Etnologia* 6 (1933): 33–43.

136. Acanfora, *Pittura*, 260 (note 76). An excellent summary, with bibliography, of star representations in post-Paleolithic art and of archaeological evidence of interest in astronomy and astrology in the prehistoric period is given by Salvatore Puglisi in "Astronomy and Astrology," in *Encyclopedia of World Art*, 2:42–43 (note 83).

137. Themistocles Zammit, *The Neolithic Temples of Hal-Tarxien-Malta*, 3d ed. (Valletta: Empire Press, 1929), 13. The Tarxien temple is dated about 2300 B.C.

138. George Agius and Frank Ventura, "Investigation into the Possible Astronomical Alignments of the Copper Age Temples in Malta," *Archaeoastronomy* 4 (1981): 10–21, esp. 16.

139. Michael Ridley, *The Megalithic Art of the Maltese Islands* (Poole, Dorsetshire: Dolphin Press, 1976), 67. The stone was first described by Luigi M. Ugolini, *Malta: Origini della civiltà mediterranea* (Rome: Libreria dello Stato, 1934), 138 and fig. 79. I am grateful to Gerald L'E. Turner, Museum of the History of Science, University of Oxford, for introducing me to this stone; to Anthony V. Simcock, also of the museum, for the following reference: "The Moon and the Megaliths," *Times Literary Supplement*, 4 June 1971, 633–35; and to David H. Trump, University of Cambridge, for his comments. See also Alexander Marshack, *The Roots of Civilization: The Cognitive*

been used as “some kind of astronomical chart.”¹⁴⁰ The word chart here is used in the sense of a calendar; there is no suggestion that the markings represent individual constellations in correct spatial order. Finally, mention should be made of two finds from the Upper Paleolithic. One, recently reported from the USSR, is of a fossilized tortoise said to have the constellation of the Northern Hemisphere (Great Bear and North Star) inscribed on its shell.¹⁴¹ The other is of a comparatively well-known pebble, excavated in 1956 from the Italian cave of Polesini, marked with the outline of a wolf and a number of pockmarks or carved dots, the latter of which have been interpreted as various constellations of the summer sky as they would have been seen some fifteen to twenty-five thousand years ago.¹⁴²



FIG. 4.34. THE “STAR STONE” FROM TAL QADI, MALTA. The provenance of this loose stone fragment is unknown. It may have served either a religious or an astronomical purpose but, despite the view of some writers, it cannot be considered as a map. Size of the original: 24 × 29 cm. By permission of the National Museum of Archaeology, Valletta, Malta.

Today there are two schools of thought concerning the place of celestial maps in the history of cartography. According to one, they have no place. Such “sky maps” are “simply pictures of a part of the environment exactly as viewed by the observer, just like pictures of trees or animals,” lacking the “highly sophisticated idea of representing landscape as though viewed vertically from every point.”¹⁴³ According to the other, something is to be gained from a full appreciation of the wealth and, above all, diversity of human experience in spatial representation. All societies in the past have been fascinated by the terrestrial, celestial, and cosmological dimensions

of space.¹⁴⁴ Yet it is arguable that interest was focused first on celestial and cosmological representations—distant and uncertain aspects of life—rather than on those of the known and the familiar local topography. In any case, if societies’ achievements have varied at different times in the past, so have their aims, and it is only reasonable, insofar as it is possible, that the former should be judged according to the latter.

Apart from the polemic, there is a practical objection to most celestial “maps” encountered in the literature, and this concerns their definition. The identification of a single or a random group of constellations from large numbers of sometimes variously formed markings on a rock may or may not be a personal or an accidental matter, but in any case such figures cannot generally qualify as celestial *maps*. The requirements for regarding a petroglyph or a rock painting as a sky map are stringent

Beginnings of Man’s First Art, Symbol and Notation (London: Weidenfeld and Nicolson, 1972), 344–47, for possible Paleolithic parallels.

140. Ridley, *Megalithic Art*, 32 (note 139).

141. The *Daily Telegraph*, 19 August 1980, reported that “Tass news agency said deep holes in the shell of the tortoise, which symbolized the northern hemisphere in Asian mythology, represented the biggest stars forming the Ursa Major constellation, and the widest hole designated the North Star.” However, doubts have been cast on the authenticity of the fossilized tortoise. It is worth noting that the tortoise plays a major role in the cosmological mythology of several cultures, having, according to Chinese legend, the magic square (the four cardinal points and the center of the world) inscribed on its back; see A. Haudricourt and J. Needham, “Ancient Chinese Science,” in *History of Science*, 4 vols., ed. Rene Taton, trans. A. J. Pomerans (London: Thames and Hudson, 1963–66), vol. 1, *Ancient and Medieval Science from the Beginnings to 1450*, 161–77, esp. 173 and fig. 22. According to some Indian beliefs, it represents the form of the cosmos itself. Joseph Schwartzberg discusses this further in volume 2 of the present *History*.

142. The interpretation of the Polesini pebble as a star chart is made by Ivan Lee, “Polesini: Upper Palaeolithic Astronomy,” *Archaeology* 83: *The Pro-Am Newsletter* 2 (1983). Thanks are due to Ivan Lee for bringing it to our attention. According to Lee, constellations such as Serpens, Ophiuchus, Scorpio, Lyra, Libra, Aquila, Delphinus, and Sagitta can be identified. Earlier commentators on the pebble confined their attention to the wolf outline and to marks on the periphery of the stone suggestive of some sort of notation. See Arturo Mario Radmilli, “The Movable Art of the Grotta Polesini,” *Antiquity and Survival*, no. 6 (1956): 465–73; Alexander Marshack, “Polesini: A Reexamination of the Engraved Upper Palaeolithic Mobiliary Materials of Italy by a New Methodology,” *Rivista di Scienze Preistorici* 24 (1969): 219–81, esp. 272–76; Evan Hadingham, *Secrets of the Ice Age: The World of the Cave Artists* (New York: Walker, 1979) who mentions and illustrates the pebble on p. 254 but whose critique on interpretations of Paleolithic art in general is essential reading; and Martin Brennan, *The Stars and the Stones: Ancient Art and Astronomy in Ireland* (London: Thames and Hudson, 1983), 152.

143. Harvey in “Cartographic Commentary,” quotation on 68–69 (note 50).

144. See, for example, Robert David Sack, *Conceptions of Space in Social Thought: A Geographic Perspective* (Minneapolis: University of Minnesota Press; London: Macmillan, 1980).

but straightforward: first, each individual set of markings must correlate in form to make a distinct astronomical entity; and second, the relationship between each of the composite figures must correspond with the relationships between the astronomical entities.¹⁴⁵ These astronomical relationships are observable today and can be calculated for the past. In this respect, given the relatively unchanging nature of the night sky, it should be a simple matter to identify a true star map, particularly in comparison with the problems already encountered of identifying a map of unknown regional topography.

The case for maintaining a category for prehistoric celestial maps rests on solid foundations. The two most important bases are the substantial bodies of ethnographic and of traditional evidence for the importance of stars in routine life among indigenous peoples and, in the latter case, among our European forebears. The use of stars for something as specialized as navigation seems to have been highly developed only in areas of extensive undifferentiated terrain (snow, ocean, and desert).¹⁴⁶ Notwithstanding the use of stars for navigation in the Mediterranean, of much greater significance in the Old World has been the practice of referring to the seasonal appearance of certain constellations to determine the time for the agricultural tasks upon which all livelihood ultimately depended. It is worth noting that the astronomical knowledge needed for these purposes was minimal; it was sufficient to know and observe only a few stars or constellations with relative accuracy.¹⁴⁷ Nilsson pointed out, for example, that the Pleiades was the single most important group of stars among the indigenous people he had studied, owing to the ease with which it can be recognized. Consistent with this is the evidence from classical European literature. Hesiod, for instance, advised timing the whole agricultural year on the movements of no more than four constellations (Sirius, Pleiades, Orion, and Arcturus) and on the two solstices.¹⁴⁸

As far as the present corpus (appendix 4.1) is concerned, therefore, there is little of substance to include under the heading of prehistoric celestial maps. The view has been adopted that in this period the representation of a single constellation, as opposed to the total celestial sphere, does not constitute a celestial map. As a result, most of the suggested astronomical examples do not qualify as *maps*. Only the Dalby and Venslev stones are included in appendix 4.1, somewhat doubtfully. A point to note is how few of the constellations mentioned in the literature seem to be those relevant to an agricultural population.¹⁴⁹ It is too early, however, to close the lists entirely. As has recently been pointed out, “The weight of the evidence for prehistoric astronomy is cumulative and depends on the apparently repetitive occurrence of indications of the same set of observed phenomena.”¹⁵⁰

The realm of conjecture in prehistoric cartography has already been proved vast, but the case for prehistoric celestial maps should not be judged until more evidence is forthcoming.

COSMOLOGICAL MAPS

In contrast to the fate of celestial maps, historians of cartography have been much more aware of cosmological maps. They usually start with reference to the Babylonians, who are credited with making the earliest recorded attempt at a reasoned conception of the universe.¹⁵¹ The idea that prehistoric peoples also may have been interested in their cosmos has tended to be rejected as being beyond the intellectual capacity of such “primitive” groups. Bagrow’s words, still current in Skelton’s edition of his work, enshrine this attitude: “As a rule . . . the maps of primitive peoples are restricted to very small areas. . . . their maps are concrete. . . . they cannot portray the world, or even visualise it in their minds. They have no world maps, for their own locality dominates their thought.”¹⁵² It is interesting, therefore, to encounter comments even in the nineteenth century that have bearing not only on prehistoric religion but also—albeit perhaps unintentionally—on prehistoric cosmology. For instance, early in the 1800s the Reverend William Proctor passed on to George Tate his views on the original functions of the decorated rocks they had discovered in Northumberland and on the meaning of the cup-and-ring marks that constituted most of that decoration: “The prevailing figure of the circle . . . may have been designed to symbolise the immortality of the soul. Or the central dot may indicate the individual deceased, the surroundings have reference to his family or temporal circumstances, and the tract from the centre

145. Dorothy Mayer, “Miller’s Hypothesis: Some California and Nevada Evidence,” *Archaeoastronomy: Supplement to the Journal for the History of Astronomy*, no. 1, suppl. to vol. 10 (1979): 51–74, esp. 52.

146. Hallpike, *Foundations*, 302–3 (note 24).

147. Martin Persson Nilsson, *Primitive Time-Reckoning* (Lund: C. W. K. Gleerup, 1920), 129.

148. Martin Litchfield West, *Hesiod, Works and Days: Edited with Prolegomena and Commentary* (Oxford: Clarendon Press, 1976). The Roman agronomists advised in similar terms.

149. Circumpolar stars are less useful in computing the agricultural cycle, since they tend to remain in view all year round, only changing their position, and they are therefore little utilized by indigenous peoples: Hallpike, *Foundations*, 296–97 (note 24).

150. Richard J. C. Atkinson, review of A. Thom and A. S. Thom, *Megalithic Remains in Britain and Brittany* (Oxford: Clarendon Press, 1978), in *Archaeoastronomy: Supplement to the Journal for the History of Astronomy*, no. 1, suppl. to vol. 10 (1979): 99–102, quotation on 101.

151. Ronald V. Tooley, *Maps and Map-makers*, 6th ed. (London: B. T. Batsford, 1978), 3.

152. Bagrow, *History of Cartography*, 26 (note 2).

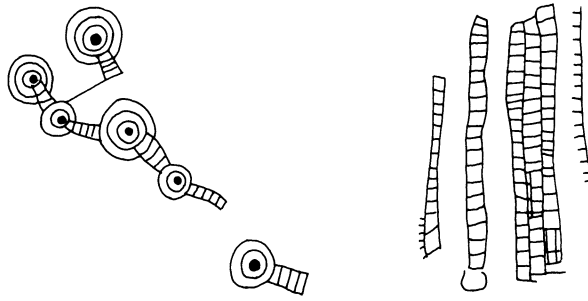


FIG. 4.35. CELESTIAL LADDERS. These examples are taken from stones at Ilkley, Yorkshire, (left), and Mont Bégo (right). Length of the originals: 23–30 cm (Ilkley), 82–119 cm (Mont Bégo). After Robert Collyer and J. Horsfall Turner, *Ilkley: Ancient and Modern* (Otley: W. Walker, 1885), lxxxvii–lxxxviii; and Clarence M. Bicknell, *A Guide to the Prehistoric Rock Engravings in the Italian Maritime Alps* (Bordighera: G. Bessone, 1913), pl. XXI.

through them may indicate his exit from this round world and its employments.”¹⁵³ The last idea is essentially cartographic. Moreover, it corresponds closely to the many ethnic and traditional views of the labyrinth motif, which the more complex rings resemble, strongly supported by the modern research discussed below. Nathan Heywood also touched on early cosmological and religious beliefs when, writing in 1888 about the rocks at Ilkley (Yorkshire) (fig. 4.35), he suggested that the ladder motifs “may have been intended as emblematical of some mysterious connection of the earth with the heavens or planets. . . . the cups and rings represented planets, and the circles added to give . . . the appearance of being in motion.”¹⁵⁴ Again, the idea of the ladder as a link between earth and heaven has wide currency; it is present in the Babylonian cosmos, for instance.

The approach to the recognition of prehistoric cosmological maps has to be different from the approach to either topographical or celestial maps. It is one thing to postulate that all the cosmic elements should be shown in their correct relative positions but another to be certain not only what these positions were but also what the elements themselves were. The starting point is clear enough, since it is generally accepted that the ancient cosmological beliefs of the Old World were themselves derived from the prehistoric period and were, at the dawn of literacy, in the process of transformation from one already ancient form (mythical) to another form (philosophical).¹⁵⁵ Modern philosophers tend to agree that the Neolithic period would have been the main period of their initial formulation.¹⁵⁶ This was the time when man underwent that “great transformation which endowed him with the gifts of creation and organization”; when the geometric idea of space was formulated; and when the cosmos came to be perceived of after the

human pattern.¹⁵⁷ This is not to deny Paleolithic man a cosmological interest, for which many find evidence in his art,¹⁵⁸ so much as to emphasize the degree to which his “cosmic anguish,” the source of religious art if not religion and art themselves,¹⁵⁹ may have been accentuated by these same transformative economic developments. Yi-Fu Tuan is not the first to have observed that fear is most highly, if not exclusively, developed not in the indigenous gathering-hunting people of the world today but among those dependent on agriculture, whose livelihood is far more exposed to man’s evil to man and vulnerable to the calamities of nature.¹⁶⁰ Moreover, ethnographic research has shown the widespread and profound interest of indigenous peoples in cosmology; it has also revealed the role of dreams and even of dancing in primitive metaphysics. Dream-laden, induced, or hallucinatory sleep is known to result in petroglyphs and pictographs, their content inspired by the dream.¹⁶¹ Eth-

153. Cited by Tate, *Sculptured Rocks*, 42 (note 57).

154. Nathan Heywood, “The Cup and Ring Stones on the Panorama Rocks, Near Rombald’s Moor, Ilkley, Yorkshire,” *Transactions of the Lancashire and Cheshire Antiquarian Society* 6 (1888): 127–28 and figs.

155. G. E. R. Lloyd, “Greek Cosmologies,” in *Ancient Cosmologies*, ed. Carmen Blacker and Michael Loewe (London: George Allen and Unwin, 1975), 198–224, esp. 198–200.

156. W. G. Lambert, “The Cosmology of Sumer and Babylon,” in *Ancient Cosmologies*, 42–65, esp. 46 (note 155). Juan Eduardo Cirlot, *A Dictionary of Symbols*, trans. Jack Sage (London: Routledge and Kegan Paul, 1971), xvi. Goff, *Prehistoric Mesopotamia*, 169 (note 85), sees the world view of the men of prehistoric Mesopotamia as “an inconsistent, inchoate collection of beliefs,” in contrast to most scholars, who view them, on the basis of later Sumerian myths, as ordered. This is, however, a difference of opinion over the nature, not the existence, of prehistoric beliefs in this part of the Old World.

157. Cirlot, *Dictionary*, xvi–xix (note 156) referring to Marius Schneider, *El origen musical de los animales-símbolos en la mitología y la escultura antiguas*, monograph 1 (Barcelona: Instituto Español de Musicología, 1946), and to René Berthelot, *La pensée de l’Asie et l’astrobiologie* (Paris: Payot, 1949).

158. For instance, Giedion, *Eternal Present* (note 131); Marshack, *Roots* (note 139); Gerald S. Hawkins, *Mindsteps to the Cosmos* (New York: Harper and Row, 1983).

159. Giedion, *Eternal Present*, 1:2 (note 131), referring to Wilhem Worringer, *Abstraction and Empathy: A Contribution to the Psychology of Style*, trans. Michael Bullock (London: Routledge and Kegan Paul, 1953), 15.

160. Yi-Fu Tuan, *Landscapes of Fear* (Oxford: Basil Blackwell, 1979), 53; Sieveking, *Cave Artists*, 55 (note 11), quoting James Woodburn, “An Introduction to the Hadza Ecology,” in *Man the Hunter*, ed. Richard B. Lee and Irvén DeVore (Chicago: Aldine, 1968), 49–55. Woodburn observed that hunting and gathering peoples can be unconcerned to the point of fecklessness as regards their food supply. More generally, in prehistoric art, see Marshack, *Roots* (note 139).

161. David Coxhead and Susan Hiller reproduce pictographs made by Orissans (India) according to instructions received in dreams: *Dreams: Visions of the Night* (New York: Avon Books; London: Thames and Hudson, 1976), 82–83. J. David Lewis-Williams shows that some of the rock paintings of South African bushmen “probably depict the hallucinations of trance performers”: “Ethnography and

nologists stress that to the primitive mind (as in Carl Jung's view) dreams are another level of reality, not mere imagination, and in this context *maps* are essential because they "show the way and minimise the risk of becoming lost."¹⁶² For instance, the abstract patterns on an Australian aborigine shaman's drum map his cosmic journey through the center of the three worlds in which he believes¹⁶³ just as the tambourines of indigenous peoples in Siberian Asia were decorated with representations of their three worlds, as will be shown in a later volume.¹⁶⁴

Ancient cosmologies reveal two basic views of the universe.¹⁶⁵ There are the "flat earth" cosmologies, in which the universe is seen as made up of separate layers (heaven, earth, underworld) that are in some way linked—by pillars (in the Egyptian mode) or by a staircase (Babylon) for example—and there are the spherical cosmologies of the Hindus and of Roman and medieval Europe. Either view may include a central or pivotal feature (the *axis mundi*) such as a mountain—the primeval hill of the Egyptians, Mount Meru of the Hindus—or the Tree of Life (Scandinavia). Some of these cosmological features have been discerned in prehistoric art. The Tree of Life, for instance, symbolizing the cosmic life force, is a common motif on Mesopotamian and Egyptian pottery and in Malta, where it also covers a ceiling in the Neolithic temple of Hal Saflieni.¹⁶⁶ Ernst Burgstaller sees the Tree of Life as standing for the cosmos itself and suggests that this is the meaning of several treelike motifs in European rock art. He gives as an example a petroglyph from Notgasse (Austria) (fig. 4.36).¹⁶⁷ At least one treelike sign is to be found among the cup-and-ring marks and other rock carvings on the moors at Otley (Yorkshire),¹⁶⁸ and some are found among the ship carvings in Scandinavia.¹⁶⁹ Another petroglyphic motif thought to represent the relationship of the earth to the cosmos or to the sun is formed by a combination of a rectangle and a circle; an example is

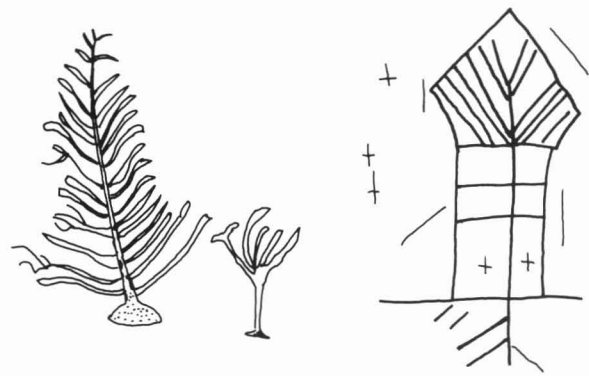


FIG. 4.36. TREE OF LIFE REPRESENTATIONS. These are from Lökeberg, Sweden (*left*) and Notgasse, Austria (*right*). After Oscar Montelius, "Sur les sculptures de rochers de la Suède," in *Congrès International d'Anthropologie et d'Archéologie Préhistoriques, compte rendu de la 7^e Session, Stockholm 1874* (Stockholm: P. A. Norstedt, 1876), 453–74, fig. 24; and Ernst Burgstaller, *Felsbilder in Österreich*, Schriftenreihe des Institutes für Landeskunde von Oberösterreich 21 (Linz, 1972), pl. LVII.

found in the cave in the Kienbach Gorge (Austria)¹⁷⁰ and another on the stela from Bagnolo (Valcamonica, Italy) (fig. 4.37).¹⁷¹ Herbert Kuhn saw the quartered circle as a representation of the cosmos.¹⁷²

Another very common geometric motif in Old World rock art is the labyrinth, a figure widely accepted as having cosmological connotations throughout the world. This mazelike figure is seen variously as difficult

166. Ridley, *Megalithic Art*, 63 (note 139).

167. Ernst Burgstaller, "Felsbilder in den Alpenländern Österreichs," in *Symposium International*, 143–47, pl. 62 (note 103). See also fig. I (from Toten Gebirge) in Burgstaller, "Zur Zeitstellung der Österreichischen Felsbilder," in *International Symposium on Rock Art*, 238–46 (note 45). I am grateful to Professor Burgstaller for an informative correspondence on the subject of Austrian rock art and its possible cartographic aspects.

168. "Tree of Life" stone, Low Snowdon. E. T. Cowling, "Cup and Ring Markings to the North of Otley," *Yorkshire Archaeological Journal* 33, pt. 131 (1937): 290–97.

169. As at Lökeberg (Foss, Sweden), illustrated by Oscar Montelius, "Sur les sculptures de rochers de la Suède," in *Congrès International d'Anthropologie et d'Archéologie Préhistoriques, compte rendu de la 7^e Session, Stockholm 1874* (Stockholm: P. A. Norstedt, 1876), 453–74 and fig. 24. Also on Viking memorial stones: H. R. Ellis Davidson, "Scandinavian Cosmology," in *Ancient Cosmologies*, 175–197, esp. 175–76 (note 155).

170. Ernst Burgstaller, personal communication, 31 December 1980.

171. Emmanuel Anati, *La stèle di Bagnolo presso Malegno*, 2d ed. (Brescia: Camuna, 1965); idem, *Evolution and Style in Camunian Rock Art*, trans. Laryyn Diamond (Capo di Ponte: Edizioni del Centro, 1976), fig. 76.

172. Herbert Kühn, *Wenn Steine reden: Die Sprache der Felsbilder* (Wiesbaden: F. A. Brockhaus, 1966), cited by Molt, *Karten*, 57 (note 64). It is more widely seen as a sun disk; see, for example, Glob, *Hellerstinger i Danmark*, 56–84 (note 53).

Iconography: Aspects of Southern San Thought and Art," *Man, the Journal of the Royal Anthropological Institute*, n. s., 15, no. 3 (1980): 467–82. See also Klaus F. Wellmann, "Rock Art, Shamans, Phosphores and Hallucinogens in North America," *Bollettino del Centro Camuno di Studi Preistorici* 18 (1981): 89–103. On dance, see Maria-Gabriele Wosien, *Sacred Dance: Encounter with the Gods* (New York: Avon Books; London: Thames and Hudson, 1974).

162. Coxhead and Hiller, *Dreams* (note 161), excerpt from caption to pl. 19, illustrating the cosmological maps of the Chukchi of Siberia.

163. For the Australian examples, see Coxhead and Hiller, *Dreams*, 94 (note 161), and especially Nancy D. Munn, "The Spatial Presentation of Cosmic Order in Walbiri Iconography," in *Primitive Art and Society*, ed. Anthony Forge (London: Oxford University Press, 1973), 193–220.

164. This will be discussed in volume 4 of the present *History*.

165. Usefully summarized in *Ancient Cosmologies*, ed. Blacker and Loewe, a series of lectures delivered at the University of Cambridge in 1972 (note 155).

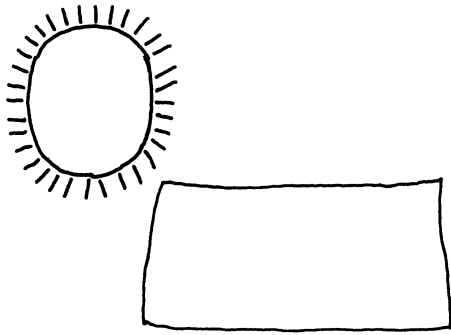


FIG. 4.37. COSMOGRAPHICAL SIGN ON THE BAGNOLO STONE. Originating from near Malegno, Valcamonica, the combination of a rectangle and a circle is thought to represent the relationship of the earth to either the cosmos as a whole or the sun in particular.

Size of the original: approximately 30 × 40 cm. After Emmanuel Anati, *La stele di Bagnolo presso Malegno*, 2d ed. (Brescia: Camuna, 1965), 17, and also 20–21.

to get into or difficult to get out of.¹⁷³ In the latter case it may also represent a trap for the uninitiated.¹⁷⁴ But the essential idea is that the figure is connected with the passage of the human soul after death to the afterlife or from one world to another. In current New Hebridean belief the labyrinth is explicitly described as a map embodying “The Path” to the other world: release from the impasse comes to him who knows the way, having committed it to memory during life.¹⁷⁵ Karl Kerényi has also considered the meaning of spirals and labyrinths, seeing both as symbols of death and concluding they are to be regarded as maps of the underworld, in which the ingoing movement of the spiral indicates death, the outgoing rebirth.¹⁷⁶ It is in this context that the labyrinth of Tintagel (Cornwall) is best interpreted, not as the plowing plan of adjoining fields as Ackroyd Gibson suggests.¹⁷⁷

All these—except perhaps when labyrinths are representations of structures on the ground—are cosmological signs rather than cosmological maps. Several suggestions have been made regarding prehistoric cosmological maps. One of the earliest, in the view of some, would be the eight-rayed star fresco from Teleilat Ghassul (Jordan, dated to the middle of the fourth millennium B.C.) (plate 1).¹⁷⁸ The archaeologists who discovered it avoided interpretation, but Unger heralded it as a painting of the universe and as a picture representing the cosmos.¹⁷⁹ He based this interpretation on the Babylonian world map, reconstructed from the drawing and cuneiform text of the sixth-century B.C. clay tablet that shows a central earth (with several named localities), the encompassing Bitter River, and the seven ray-

like islands. Although George Kish has recently adopted this cosmological interpretation without comment, there are those who remain doubtful.¹⁸⁰ Apart from the inexactitude of the match between the fresco star and the Babylonian model, and the great difference in dates, the besetting difficulty (common to any interpretation of the meaning of prehistoric art) is that while a design may incorporate certain symbols, this does not necessarily mean that the artist who painted it intended a particular symbolic interpretation.¹⁸¹ The same problem could be

173. Cirlot, *Dictionary*, 173 (note 156).

174. So, in Scotland, a labyrinth or “tangle thred” may be drawn in piped clay on domestic thresholds as a “no entry” sign, excluding unlucky influences: Janet Bord, *Mazes and Labyrinths of the World* (London: Latimer New Dimensions, 1976), 11. For an excellently illustrated and comprehensive survey of the labyrinth design, see Hermann Kern, *Labirinthi: Forme e interpretazione, 5000 anni di presenza di un archetipo manuale e file conduttore* (Milan: Feltrinelli, 1981); German edition, *Labyrinth: Erscheinungsformen und Deutungen, 5000 Jahre Gegenwart eines Urbilds* (Munich: Prestel-Verlag, 1982).

175. John W. Layard, *Stone Men of Malekula* (London: Chatto and Windus, 1942), 222, 650–51, quoting A. Bernard Deacon, “Geometrical Drawings from Malekula and the Other Islands of the New Hebrides,” *Journal of the Royal Anthropological Institute of Great Britain and Ireland*, n.s., 64 (1934): 129–75. The idea of providing guidance for the journeying dead is widespread; see, for example, Wilhelm Bonacker, “The Egyptian Book of the Two Ways,” *Imago Mundi* 7 (1950): 5–17; also below p. 120 and pl. 2.

176. Karl Kerényi, *Labyrinth-Studien: Labyrinthos als Linienreflex einer mythologischen Idee*, 2d ed. (Zurich: Rhein-Verlag, 1950), 11–12. See also Jill Purce, *The Mystic Spiral, Journey of the Soul* (London: Thames and Hudson, 1974), which illustrates “the first known spiral in the history of art,” a Paleolithic talisman from Siberia (figs. 13 and 14), and a Greek votive object (2800–2000 B.C.) decorated as a mandala with the spiral that was “the symbol which unified the Neolithic world.” Purce explains that the “central seven windings represent the six directions and the still centre” (fig. 42).

177. Personal communication from Ronald W. B. Morris. The discovery of two petroglyphic labyrinths in Rocky Valley, Tintagel (Cornwall), was reported by Ackroyd Gibson in “Rock-Carvings Which Link Tintagel with Knossos: Bronze-Age Mazes Discovered in North Cornwall,” *Illustrated London News* 224, pt. 1 (9 January 1954): 46–47. He also pointed out the symbolic meanings of such figures and the existence of another British example, the Hollywood stone from the Wicklow Mountains (now in the National Museum of Ireland, Dublin). See also G. N. Russell, “Secrets of the Labyrinth,” *Irish Times*, 16 December 1964, 10. I owe this reference to Ronald W. B. Morris, who also drew my attention to the interpretation of the Tintagel figure as a field-plowing plan.

178. Map 53 in appendix 4.1.

179. Alexis Mallon, Robert Koeppel, and René Neuville, *Teleilat Ghassul*, 2 vols. (Rome: Institut Biblique Pontifical, 1934–40), 1:135–40 and frontispiece (in color); Eckhard Unger, “From the Cosmos Picture to the World Map,” *Imago Mundi* 2 (1937): 1–7, esp. 6; idem, “Ancient Babylonian Maps and Plans,” *Antiquity* 9 (1935): 311–12; and William Harris Stahl, “By Their Maps You Shall Know Them,” *Archaeology* 8 (1955): 146–55.

180. George Kish, *La carte: Image des civilisations* (Paris: Seuil, 1980), 189, pl. 8. But see chapter 6 below, “Cartography in the Ancient Near East,” esp. pp. 111–13.

181. Goff stresses this important point: see *Prehistoric Mesopotamia*, 9 (note 85).

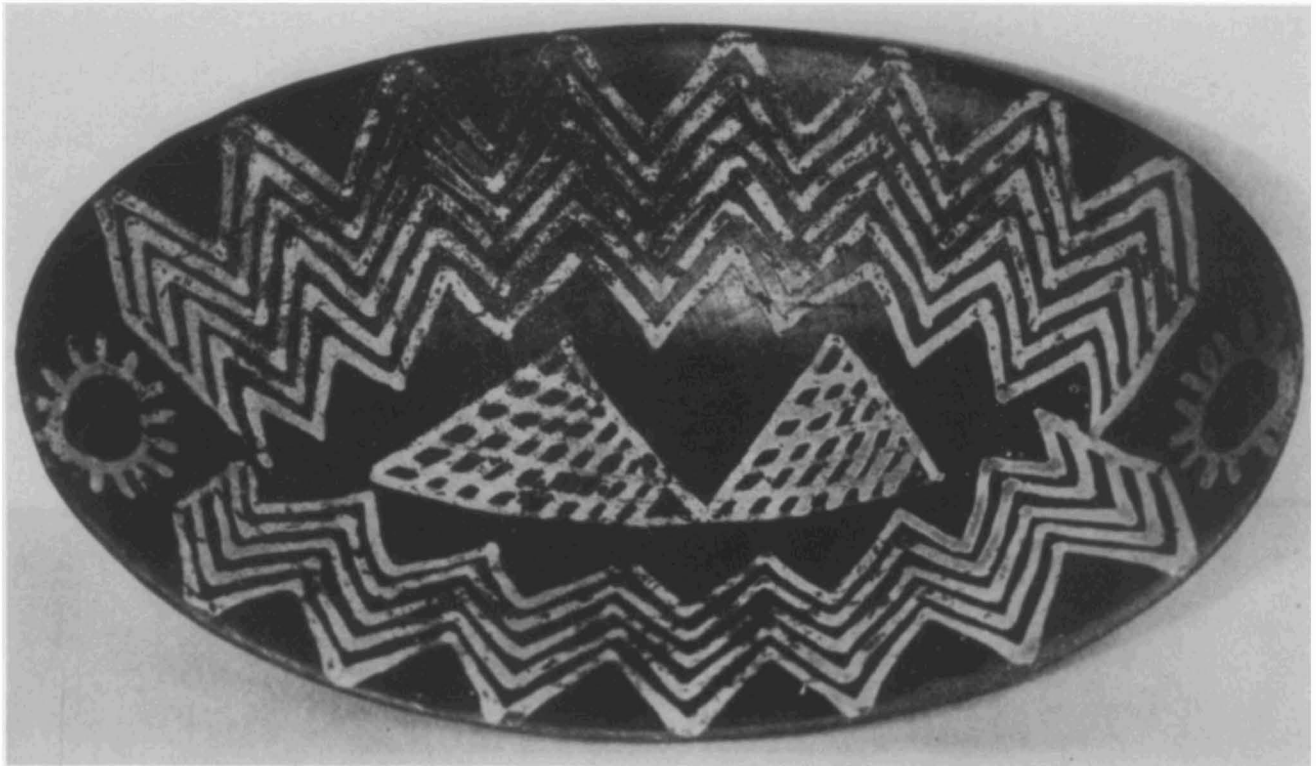


FIG. 4.38. COSMOLOGICAL MAP ON A PREDYNASTIC BOWL FROM EGYPT. The course of the sun from east to west is shown, along with the enclosing primeval ocean and the mountains of the East and the West. The bowl dates from the Amratian period, mid-fourth millennium B.C..

From S. Giedion, *The Eternal Present: A Contribution on Constancy and Change*, Bollingen Series 35, vol. 6, 2 pts. (New York: Bollingen Foundation, 1962), pt. 2, fig. 69. By permission of the Egyptian Museum, Cairo.

relevant in the case of the painted decoration on an oval pottery dish from predynastic Egypt (fig. 4.38). Giedion sees this as portraying in abstract form the course of the sun from east to west, the enclosing primeval ocean, and the two central mountains of East and West, and indeed there is widespread acceptance of such an idea in the interpretation of decorated pottery from the Middle East and sites such as Susa.¹⁸² From farther west, in the Sahara, comes an intriguing rock-painted figure (fig. 4.39). This was published by Frobenius under the caption “Goblin in house.”¹⁸³ However, it is arguable that a more appropriate interpretation would be that the house figure is a variation of the labyrinth—or even cosmological—motif, especially since it is wholly unlike the hut figures in the domestic scenes from the same area, already described. The unusual feature is the presence of a central double rectangle, enclosing what may be an anthropomorphic figure, and this lends credence to such an interpretation.

In eastern Europe, the paintings of the Magourata cave (Bulgaria) have been known since the eighteenth century. They may have been executed as early as the early Bronze Age (before about 2000 B.C.). Among them is a group which includes a “solar” figure (two rayed

concentric circles) below which are two motifs (parallel lines and a checkerboard pattern) that Anati has suggested might be symbols of water and of fields (fig. 4.40). The whole composition makes, for him, a representation of the sky and the earth as members or parts of an entity in which the various aspects of nature are synthesized.¹⁸⁴ Rather more promising, having less ambiguous symbols and spatial relationships, are the decorations on at least one of the two stone stelae from northern Italy that have been suggested as cosmological representations. The stelae also touch on a widespread and long-lived tradition

182. Map 56 in appendix 4.1. Giedion, *Eternal Present*, 2:129, fig. 69 (note 131) though other authors disagree; see below, p. 117. For interpretations of pottery from Susa, see Robert Klein, *Form and Meaning: Essays on the Renaissance and Modern Art*, trans. Madeline Jay and Leon Wieseltier (New York: Viking Press, 1970), 146. An early attempt to interpret prehistoric pottery decoration in terms of Babylonian cosmology was made by W. Gaerte, “Kosmische Vorstellungen im Bilde prähistorischer Zeit: Erdberg, Himmelsberg, Erdnabel und Weltenströme,” *Anthropos* 9 (1914): 956–79.

183. Map 55 in appendix 4.1. Frobenius, *Ekade*, 23, fig. 11 (note 80).

184. Map 1 in appendix 4.1. Emmanuel Anati, “Magourata Cave,” *Archaeology* 22 (1969): 92–100, quotation on 100. See also Anati, “Magourata Cave, Bulgaria,” *Bollettino del Centro Camuno di Studi Preistorici* 6 (1971): 83–107.

of decorated memorial stones that goes from, possibly, the megalithic period to the Viking Age in northern Europe. The first of these stelae (measuring $53 \times 28 \times 3.5$ cm) was found during World War II at Triora in the Ligurian Alps and is presumed prehistoric in date. It was not discussed in an archaeological review until 1956, when Acanfora described the incised decoration as a figurative composition arranged in two registers with a rayed sunlike figure in the upper, the two parts being separated by a band of decoration.¹⁸⁵ In 1973 Emmanuel Anati reinforced this interpretation by recognizing Acanfora's decorative band as a level in itself

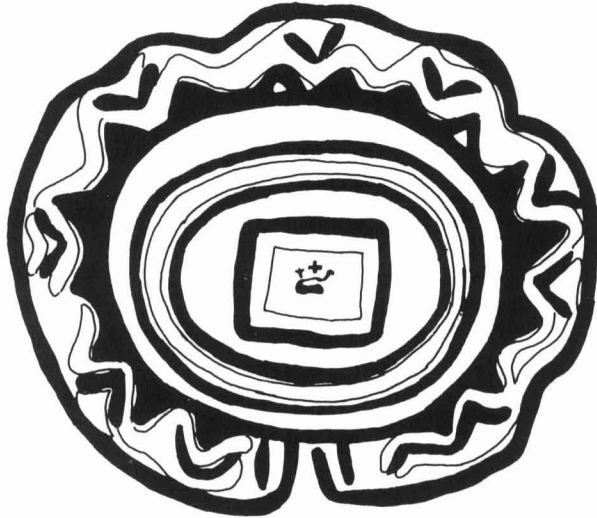


FIG. 4.39. LABYRINTHLIKE ROCK PAINTING FROM NORTH AFRICA. The labyrinth design is known to be associated, on a world scale and throughout history, with death and the route to the afterlife.

After Leo Frobenius, *Ekade Ektab: Die Felsbilder Fezzans* (Leipzig: O. Harrassowitz, 1937), fig. 11.

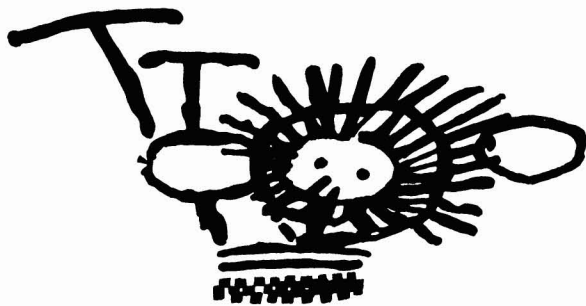


FIG. 4.40. COSMOLOGICAL PAINTING FROM THE MAGOURATA CAVE, BULGARIA. Thought to have cosmological significance, the sun may indicate the celestial level, the two parallel lines the earthly level, and the patterned line the netherworld.

After Emmanuel Anati, "Magourata Cave, Bulgaria," *Bollettino del Centro Camuno di Studi Preistorici* 6 (1971): 83–107, figs. 59 and 60.

(suggesting too that it may include a hut figure) and summarizing it as showing three registers, symbolizing sky, earth, and the underworld, which together were intended to represent a conception of the universe (fig. 4.41).¹⁸⁶ The stela from Ossimo (Brescia), which has been given a late Neolithic or Chalcolithic date, is less convincing in comparison. It has none of the motifs that can be regarded as conventional cosmological symbols, such as those found on the Triora stone. Instead, the decoration of the upper register is composed of a densely

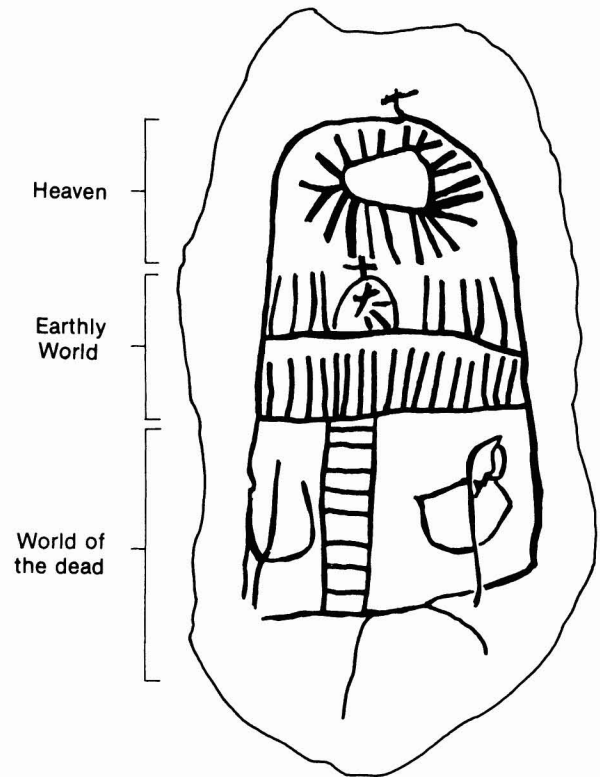


FIG. 4.41. THE TRIORA STELA. The three registers suggested by Emmanuel Anati, "La stele di Triora (Liguria)," *Bollettino del Centro Camuno di Studi Preistorici* 10 (1973): 101–27, are shown. They divide this conception of the universe into sky, earth, and underworld.

Size of the original: 53×28 cm. After Maria Ornella Acanfora, "Lastra di pietra figurata da Triora," *Rivista di Studi Liguri* 21 (1955): 44–50, fig. 2c (with additions).

185. Maria Ornella Acanfora, "Singolare figurazione su pietra scoperta a Triora (Liguria)," in *Studi in onore di Aristide Calderini e Roberto Paribeni*, 3 vols. (Milan: Casa Editrice Ceschina, 1956), 3:115–27, esp. 119. Notice of the find had been given by Acanfora the previous year: "Lastra di pietra figurata da Triora," *Rivista di Studi Liguri* 21 (1955): 44–50.

186. Emmanuel Anati, "La stele di Triora (Liguria)," *Bollettino del Centro Camuno di Studi Preistorici* 10 (1973): 101–27, esp. 121. However, Alessandro Bausani, "Interpretazione paleo-astronomica della stele di Triora," *Bollettino del Centro Camuno di Studi Preistorici* 10 (1973): 127–34, esp. 133, considers it a star map.

packed series of hoops; that of the middle includes eight "spectacle-spiral pendants," and the lowest is undecorated. Even so, the Ossimo stela has been described as "an extremely interesting synthesis of a cosmological concept."¹⁸⁷

From the other side of the Alps and a slightly earlier period comes a different type of artifact, an embossed gold sheet in the form of a disk measuring a few centimeters across. Several such disks have been found, from central Europe to the British Isles. They are usually associated by archaeologists with the solar cult, no significance being attached to the nature of the stylized, rather formal, decoration. Unger, however, was attracted by the decoration on a disk from Moordorf (Germany) (fig. 4.42). Inspired again by his Babylonian model, Unger recognized the same elements which, as he put it, "have been identified . . . as sun-discs, but which, to my mind, are definitely representations of the universe," portraying the central earth, the Bitter River, the mountainous belt of heaven and, finally, the heavenly ocean with the islands.¹⁸⁸ None of the other disks Unger cited has so complete a "cosmological" decoration and he saw these as possibly representing "foreshortened views of the world . . . in which various elements such as the belt of the heavens and the 'islands' are omitted."¹⁸⁹ One of these from the Chalcolithic (ca. 3000 B.C.) comes from Stollhof (Austria). This disk has a rim decoration of three rows of points and three centrally placed bosses as the main elements of its design.¹⁹⁰

Certain prehistoric traditions lingered on, or were revitalized, in the first millennium A.D. of northern Europe, notably in the art and symbolism of the Scandinavian memorial stones and the associated mythology. The memorial stones are characteristic from the sixth to the eleventh century, though there are several changes in their basic shape and decoration over this period.¹⁹¹ Throughout, however, there is a tendency for each stone to be divided into two more or less clearly defined registers, in the manner recalling the prehistoric Ligurian stelae. In the early period of the painted stones of Gotland (Sweden), the usual motif on the upper part of the stone is a disk, generally thought to represent the sun or in some way to be linked with a sun or sky deity.¹⁹² Another common motif is the World Tree. By the eighth century the two registers are more clearly differentiated, and the entire decoration is to be made up of mythological scenes apparently depicting the death of the individual, his journey to the afterlife, and his arrival in Valhalla, with the ship the almost inevitable symbol of that cosmic journey.¹⁹³ The strong evidence of parallelism in these and other Viking decorations has suggested to several authorities that the sculptors were working in a fixed tradition.¹⁹⁴ Finally, mention may be made of a quite different dimension of cosmological representa-



FIG. 4.42. COSMOLOGICAL MAP: THE GOLD DISK FROM MOORDORF. This disk, thought by some to be a cosmological map, was found near Aurich, West Germany. A central continent is surrounded by concentric rings showing, in turn, a first ocean (marked by lines), another continent (with its mountains), and a second ocean in which are set thirty-two islands (represented by triangles). Diameter of the original: 15 cm. By permission of the Niedersächsisches Landesmuseum, Hanover.

187. Emmanuel Anati, "La stèle di Ossimo," *Bollettino del Centro Camuno di Studi Preistorici* 8 (1972): 51–119, esp. 117 (English summary).

188. Unger, "Cosmos Picture," 5 (note 179).

189. Unger, "Cosmos Picture," n. 19 (note 179).

190. Max Ebert, *Reallexikon der Vorgeschichte* (Berlin: Walter de Gruyter, 1928), 12:442, pl. 110.

191. In view of the prehistoric terms of reference for this chapter, stones with runic inscriptions have been excluded from consideration.

192. H. R. Ellis Davidson, *Pagan Scandinavia* (London: Thames and Hudson, 1967), discusses the continuity of rock decoration traditions from the mid-Neolithic period and the Bronze Age into Viking times and summarizes the stylistic changes of the Viking Age memorial stones. See also Edward O. G. Turville-Petre, *Myth and Religion of the North: The Religion of Ancient Scandinavia* (London: Weidenfeld and Nicolson, 1964), 3–6.

193. Sverre Linquist, *Gotlands Bildsteine*, 2 vols. (Stockholm: Wahlström och Widstrand, 1941–42); David McKenzie Wilson and Ole Klindt-Jensen, *Viking Art* (London: George Allen and Unwin, 1966), 79–82, pl. xxvi, and fig. 42, discuss the compositions on the stones from Tjängvide and Ardre (Gotland).

194. Davidson, *Pagan Scandinavia*, 127 (note 192), and William Gershom Collingwood, *Northumbrian Crosses of the Pre-Norman Age* (London: Faber and Gwyer, 1927), 65.

tion, that manifested in the laying out of ancient Ireland as four great provinces and a center (Tara) to constitute the state as an ordered cosmos.¹⁹⁵

CONCLUSION

It is obvious from the foregoing that the only evidence we have for the mapmaking inclinations and talents of the inhabitants of Europe and adjacent parts of the Middle East and North Africa during the prehistoric period is the markings and designs on relatively indestructible materials. It is probable, given the prevalence of such activity in historical times among indigenous peoples, that additional cartographic representations were made by prehistoric man on more ephemeral materials such as sand, hide, bark, and the dust of cave floors. All surviving evidence, however, suggests that cartographic depictions in prehistoric rock art constitute a very minor portion of the total sum of that art. Even in Valcamonica, relatively rich in rock art and well searched, the “topographical figures” number a mere half dozen out of a rough total of 180,000 recorded figures from seventy-six sites.¹⁹⁶ The very rarity of cartographic depictions provokes interest in the motivation behind their production. Although some questions will always remain unanswered, there can be no doubt that prehistoric rock and mobiliary art as a whole constitutes a major testimony of early man’s expression of himself and his world view.¹⁹⁷ It is reasonable to expect some evidence in this art of the society’s spatial consciousness. But when it comes to drawing up the balance sheet of evidence for prehistoric maps, we must admit that the evidence is tenuous and certainly inconclusive. The historian of cartography, looking for maps in the art of prehistoric Europe and its adjacent regions, is in exactly the same position as any other scholar seeking to interpret the content, functions, and meanings of that art. Inferences have to be made about states of mind separated from the present not only by millennia but also—where ethnography is called into service to help illuminate the prehistoric evidence—by the geographical distance and different cultural contexts of other continents.

Despite all these difficulties, a number of statements can be made with confidence. There is, for example, clear evidence in the prehistoric art of Europe that maps—permanent graphic images epitomizing the spatial distribution of objects and events¹⁹⁸—were being made as early as the Upper Paleolithic. The same evidence shows, too, that the quintessentially cartographic concept of representation in plan was already in use in that period. Moreover, there is sufficient evidence for the use of cartographic signs from at least the post-Paleolithic period. Two of the basic map styles of the historical period—the picture map (perspective view) and the plan (ichno-

graphic view)—also have their prehistoric counterparts. The importance to prehistoric man of his cosmological ideas is reflected in the cartographic record. Less clear, however, is the evidence for celestial mapping. The paucity of evidence of clearly defined representations of constellations in rock art, which should be so easily recognized, seems strange in view of the association of celestial features with religious or cosmological beliefs, though it is understandable if stars were used only for practical matters such as navigation or as the agricultural calendar. What is certainly different is the place and prominence of maps in prehistoric times as compared with historical times, an aspect associated with much wider issues of the social organization, values, and philosophies of two very different types of cultures, the oral and the literate.

It is perhaps fitting to end by being aware of the remaining problems. What is urgently needed as conclusive evidence for the identification of map images such as those of Mont Bégo and Valcamonica, or even the Landscape Jar of Tepe Gawra or the Great Disk of Talat N’iisk, is a reconstruction of the real-world localities to which at least some maps may refer and the identification of the contemporary mentality. The primary task of recovering the contemporary local landscape is obviously an archaeological one, but there are also archaeologists who would not shirk an attempt to uncover the human reasoning of the times.¹⁹⁹ Then there are problems concerning the difference of function between prehistoric (and historical indigenous) maps and historical topographical maps and the dividing line between them. Should individual examples such as Bedolina or Giadighe be regarded as prototypes of those of the historical period, serving a clearly defined documentary purpose, or as still part of the prehistoric type, having a primarily symbolic function? One point is clear: there is no neat evolution from one type to another, either from prehistoric to historical contexts or even within the historical period. The *mappaemundi* of medieval Europe, for example, may be much closer in concept and purpose to the majority of prehistoric maps than are the estate plans on the clay tablets of protohistoric Babylonia. Whatever the outstanding problems, which are not to be under-

195. Alwyn Rees and Brinley Rees, *Celtic Heritage: Ancient Tradition in Ireland and Wales* (London: Thames and Hudson, 1961), esp. 147–49. I owe this reference to Anthony V. Simcock, Museum of the History of Science, University of Oxford.

196. Emmanuel Anati, “Art with a Message That’s Loud and Clear,” *Times Higher Educational Supplement*, 12 August 1983, 9.

197. Anati, “Art with a Message” (note 196).

198. See p. xvi above.

199. Colin Renfrew, *Towards an Archaeology of Mind*, Inaugural Lecture, University of Cambridge, 30 November 1982 (Cambridge: Cambridge University Press, 1982), 24–27.

estimated, the conclusion cannot be avoided that at least something of man's mapping impulse was manifested in

the art of prehistoric man in Europe, the Middle East, and North Africa.

APPENDIX 4.1

LIST OF PREHISTORIC MAPS

This appendix enumerates, with locations and citations to the relevant literature, the sites and artifacts in which cartographic representations have been identified. References included in this list are only those where a cartographic interpretation has been suggested or commented on, the general literature having been cited in the text. Full citations for these references can

be found in the bibliography following appendix 4.2. The identification of maps included in this list has been derived from a variety of disciplines, and in some cases their interpretation may be still regarded as controversial. It seems to be an appropriate juncture, however, to set out this corpus as a basis for future discussion and elaboration.

Number	Country, Administrative Unit	Commune and/or Locality (<i>italics indicate the usual name in the literature</i>). Description: nature of site or artifact; type of markings; map type; date; measurements; references; observations; figure number in text (if illustrated)
EUROPE		
1	BULGARIA Province of Vidin	<i>Magoura/Magourata</i> ; cave; painting; cosmological map; Bronze Age (Anati 1969) or Iron Age (Georgiev 1978); Anati (1969, p. 99; 1971, figs. 59 and 60), Georgiev (1978, fig. 4); figure 4.40.
2	DENMARK County of Fyn	<i>Dalby</i> ; stone; cup marks; celestial map(?); late Neolithic; Schütte (1920, figs. 14 and 15), Schönfeld (1921, fig. 7), Delano Smith (1982, fig. 5); figure 4.33.
3	County of Frederiksborg (on Sjaelland Island)	<i>Venslev</i> ; stone; cup marks; celestial map(?); late Neolithic; Schütte (1920, figs. 12 and 13), Schönfeld (1921, fig. 6); figure 4.32.
4	FRANCE Department of Alpes-Maritimes	<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 28 × 38 cm; Bicknell (1902, pl. Vh; 1913, pl. XVIII-32); figure 4.21.
5		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); approx. 10 × 45 cm; Bicknell (1902, pl. Vh).
6		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 27 × 44.5 cm; Bicknell (1902, pl. VI; 1913, p. XVIII-39); Louis and Isetti (1964, fig. 37, no. 39), Blain and Paquier (1976, fig. 39), Bernardini (1979, fig. 200), Delano Smith (1982, fig. 3c). Photograph no. 57 XVIII-7, from the photographic archives of <i>Centro Camuno di Studi Preistorici</i> at Capo di Ponte, is headed "plan of a house with yard, enclosures and ploughed fields(?)"; it is kindly made available and published courtesy of E. Anati; figure 4.20.
7		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 16 × 30 cm; Bicknell (1897, pl. XIIe, "byre with pond for watering"; 1902, pl. VIg; 1913, pl. XVIII-38), Louis and Isetti (1964, fig. 37, no. 38), Delano Smith (1982, fig. 3a).
8		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 34 × 42.5 cm; Bicknell (1902, pl. VII1; 1913, pl. XIX-1), Delano Smith (1982, fig. 3d).
9		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976), Bicknell (1902, pl. VIa; 1913, pl. XLV-1—shown here as part of "Monte Bégo Village," but see comments on map 36 below and in text, p. 78), Delano Smith (1982, fig. 3b), fig. 4.27b.
10		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); approx. 40 × 80 cm; Bicknell (1903, pl. I-13). The enclosures are not in the usual Mont Bégo style (slightly earlier?), but the figure is essentially similar to "game enclosures" of Font de Gaume; figure 4.8a.

Number	Country, Administrative Unit	Commune and/or Locality (<i>italics indicate the usual name in the literature</i>). Description: nature of site or artifact; type of markings; map type; date; measurements; references; observations; figure number in text (if illustrated)
11		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); approx. 48 × 50 cm; Bicknell (1903, pl. I-29).
12		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); approx. 44 × 64 cm; Bicknell (1903, pl. III-2). See map 29 below.
13		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 23 × 84 cm; Bicknell (1903, pl. III-4; 1913, pl. XXXII-4). Appears to be overlain by another figure or mark.
14		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 41 × 51 cm; Bicknell (1903, pl. III-6; 1913, pl. XVIII-45), Louis and Isetti (1964, fig. 37, no. 45).
15		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); approx. 33 × 69 cm; Bicknell (1903, pl. IV-3).
16		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 17 × 24 cm; Bicknell (1902, pl. Vj; 1913, pl. XVIII-31), Louis and Isetti (1964, fig. 37, no. 31).
17		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 23 × 36.5 cm; Bicknell (1897, pl. XIIIf; 1913, pl. XVIII-33), Louis and Isetti (1964, fig. 37, no. 33), Delano Smith (1982, fig. 3g).
18		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 11 × 44 cm; Bicknell (1913, pl. XVIII-36), Louis and Isetti (1964), Delano Smith (1982, fig. 3e).
19		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 34 × 35 cm; Bicknell (1903, pl. I-29; 1913, pl. XVIII-37), Louis and Isetti (1964, fig. 37, no. 37), Delano Smith (1982, fig. 3f).
20		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 21.5 × 29 cm; Bicknell (1913, pl. XVIII-40), Louis and Isetti (1964, fig. 37, no. 40).
21		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 34 × 42.5 cm; Bicknell (1913, pl. XVIII-43), Louis and Isetti (1964, fig. 37, no. 43); so-called Napoleon rock; figure 4.8b.
22		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 25 × 95 cm; Bicknell (1913, pl. XVIII-44; pl. XXXII-38), Louis and Isetti (1964, fig. 37, no. 44).
23		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 7 × 26 cm; Bicknell (1913, pl. XXV-11).
24		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 14 × 14.5 cm; Bicknell (1913, pl. XXX-6).
25		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 19 × 33 cm; Bicknell (1913, pl. XXX-28).
26		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 22 × 39 cm; Bicknell (1913, pl. XXX-29).
27		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 15 × 43.5 cm; Bicknell (1913, pl. XXX-30).
28		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 42 × 48 cm; Bicknell (1913, pl. XXXII-41); figure 4.8d.
29		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 62 × 82 cm; Bicknell (1913, pl. XXXIV-12). This is so nearly identical to map 12, though given as being in a different locality and of different size, that it is hard to believe they are not the same map; figure 4.8c.
30		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 28 × 53 cm; Bicknell (1913, pl. XXXIV-32).
31		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 6 × 19 cm; Bicknell (1913, pl. XXXIV-36).

Number	Country, Administrative Unit	Commune and/or Locality (<i>italics indicate the usual name in the literature</i>). Description: nature of site or artifact; type of markings; map type; date; measurements; references; observations; figure number in text (if illustrated)
32		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 37 × 46.5 cm; Bicknell (1913, pl. XXXVI-4), Delano Smith (1982, fig. 3i).
33		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 25 × 39 cm; Bicknell (1913, pl. XXXVII-48).
34		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 67 × 78 cm; Bicknell (1913, pl. XLIII-6); rather geometric style.
35		<i>Mont Bégo</i> ; rock; petroglyph; complex map (“Skin Hill Village”); Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 36 × 97 cm; Bicknell (1913, pl. XLIII-4), Delano Smith (1982, fig. 3j); figure 4.26.
36		<i>Mont Bégo</i> ; rock; petroglyph; complex map (“Monte Bégo Village”); Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); 1.40 × 2.40 m (entire complex); Bicknell (1913, pl. XLV-1 and pl. XIX-2); Bicknell appears to have included all the five groups on this rock as one representation. However, the four smaller groups have here been classed as simple maps (maps 9, 37, 38, and 39); figure 4.27a.
37		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); Bicknell (1913, pl. XLV-1 shown here as part of “Monte Bégo Village” group); see comments in text, p. 78; figure 4.27c.
38		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); Bicknell (1913, pl. XLV-1, shown here as part of “Monte Bégo Village” group); see comments in text, p. 78; figure 4.27d.
39		<i>Mont Bégo</i> ; rock; petroglyph; simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); Bicknell (1913, pl. XLV-1, shown here as part of “Monte Bégo Village” group); see comments in text, p. 78; figure 4.27e.
40		<i>Mont Bégo</i> ; rock; petroglyph; probably simple map; Bronze Age (de Lumley, Fonvielle, and Abelanet 1976); Bernardini (1979, fig. 199—this photograph does not show the whole representation, which is captioned “a ‘topographical map’ of fields, closes and huts, probably the village of the day” [author’s translation], and it is uncertain whether this is in fact part of one already published by Bicknell, though it does not look familiar.
41	GERMANY State of Niedersachsen	<i>Moordorf</i> near Aurich; gold disk; repoussé; cosmological map(?); Bronze Age ca. 1500 B.C.; 15 cm diameter; Unger (1937, pl. opp. p. 1), Kish (1980, pl. 10), Delano Smith (1982); figure 4.42.
42	ITALY Province of Brescia	<i>Borno</i> ; stone; side 4; petroglyph; picture map; Chalcolithic/early Bronze Age; approx. 70 × 105 cm; Battaglia and Acanfora (1954), Anati (1960, p. 102; 1966, figs. 16 and 17); figure 4.13.
43		Capo di Ponte, <i>Bedolina</i> ; rock; petroglyph; complex map; Bronze Age (ca. 1500 B.C.); 2.30 × 4.16 m; Battaglia (1934a, b), Anati (1958; 1959, fig. 2 and pl. 5; 1961; 1964, p. 106–7); Blumer (1964; 1967; 1968, fig. 3), Beltran Lloris (1972, fig. 48), Harvey (1980, fig. 21), Delano Smith (1982, fig. 1a, b), Priuli (1985, figs. 20 and 21); figure 4.28.
44		Capo di Ponte, <i>Ponte San Rocco</i> ; rock; petroglyph; simple map; Bronze Age; approx. 45 × 90 cm; Anati (1959, pl. IV; 1975, fig. 33), Leonardi (1970, fig. 116), Priuli (1985, fig. 36); figure 4.25.
45		Capo di Ponte, <i>Seradina</i> ; rock; petroglyph; simple map; early Bronze Age (ca. 2000 B.C.); 45 × 90 cm; Anati (1960; 1961; 1964, 1976, fig. 67), Blumer (1967, 1968, fig. 2), Harvey (1980, fig. 20), Delano Smith (1982), Priuli (1985, fig. 32); figure 4.23.
46		Capo di Ponte, <i>Pozzi</i> ; rock; petroglyph; simple map; Bronze Age; Anati (1959), who says (caption, pl. 7): “Plan of a hamlet . . . one of the huts . . . has a garden in front of it, planted (with ?trees), and possibly surrounded by a wall”

Number	Country, Administrative Unit	Commune and/or Locality (<i>italics indicate the usual name in the literature</i>). Description: nature of site or artifact; type of markings; map type; date; measurements; references; observations; figure number in text (if illustrated)
47		(author's translation). The illustration is not sufficiently clear to draw from, and the site has not been checked in the field. Sellero, Plaz d'Ort or <i>Giadighe</i> ; rock; petroglyph; complex map; presumably Bronze Age; 259 × 125 cm; Battaglia (1934b, pl. XV), Anati (1959), Blumer (1967), Delano Smith (1982), Priuli (1985, figs. 24 and 25); figure 4.29.
48	Province of Imperia	<i>Triora</i> ; stela; petroglyph; cosmological map; Chalcolithic(?); 28 × 53 cm; Acanfora (1955, fig. 2c), Anati (1973, figs. 19 and 20), Bausani (1973), Delano Smith (1982, fig. 6); figure 4.41.
49	MALTA	<i>Tarxien</i> ; stone found in temple; sculpture; relief map(?); Neolithic (third millennium B.C.); triangular fragment approx. 22 × 28 × 28 × 2 cm (base) with another 2 cm relief; Zammit (1930, pl. XXVI[4]), Trump (1979, pl. 3); figure 4.31.
50		<i>Hagar Qim</i> ; terra-cotta found in temple (two fragments); model; relief map(?); Neolithic (third millennium B.C.); Trump (1979, pl. 2).
51	USSR (European Russia) Territory of Krasnodar Krai	<i>Maikop</i> ; silver vase from tomb; engraving; picture map; Chalcolithic (late third millennium B.C.); approx. 10–12 cm high; Rostovtzeff (1922, pl. 3 and fig. 2), Bagrow (1964, fig. 74); figure 4.18.
52	MIDDLE EAST IRAQ	Khorsbad, <i>Tepe Gawra</i> ; pottery; painted; picture map; Neolithic (end fourth millennium B.C.); Tobler (1950, pl. LXXVIII), Stahl (1960), Goff (1963, fig. 148b); known as the "Landscape Jar"; figures 4.15, 4.16.
53	JORDAN	<i>Teleilat Ghassul</i> ; interior wall plaster in temple; painting; cosmological map(?); Neolithic (ca. 3500 B.C.); 1.84 m; Unger (1937, p. 6), Kish (1980, pl. 8); known as the "Star Fresco"; plate 1.
54	TURKEY Province of Konya	Küçükkoy, <i>Çatal Hüyük</i> ; interior wall plaster in domestic shrine; painting; picture map; Neolithic (radio carbon date 6200 ± 97 B.C.); approx. 3 m; Mellaart (1964, pl. VI; 1967, figs. 59 and 60), Virágh (1965, fig. 3), Delano Smith (1982, fig. 4); figure 4.19.
55	NORTH AFRICA ALGERIA	Wadi Iddo (Idôo), <i>Tissoukal</i> ; rock; painting; cosmological map(?); "late," i.e., protohistoric period(?); Frobenius (1937, fig. 11), Lajoux (1963, p. 190); Lajoux's photograph shows the labyrinthlike figure the other way up; figure 4.39.
56	EGYPT	Cairo Museum (original provenance not given); pottery (open dish); painted; cosmological map; Amratan (ca. 4,000 B.C.); Giedion (1962, fig. 69); figure 4.38.
57	MOROCCO Province of Marrakesh (Great Atlas)	Yagour (mountain), <i>Talat N'Iisk</i> ; rock; painting; picture map(?); Neolithic; approx. 1 m diameter; Malhomme (1959–61, pt. 1, pl. 4); figure 4.17.

APPENDIX 4.2

SHORT LIST OF PREHISTORIC LANDSCAPE FIGURES

This appendix lists a selection of figures from the rock art of Europe and North Africa that have been described in the literature as representations of certain landscape features (usually huts) *in plan*. While these figures do not constitute maps (they are nearly always of single features), they are of considerable interest as indicating early thinking that is manifestly carto-

graphic. Some date from the Upper Paleolithic or (in the case of the Sahara) epi-Paleolithic; others are later. The list is by no means exhaustive, but it gives an idea of the widespread distribution and consistency of these early plan figures. Full citations for the shortened references below can be found in the bibliography following.

Number	County, Administrative Unit	Commune and/or Locality (<i>italics</i> indicate the usual name in the literature). Description: nature of site or artifact; type of markings; map type; date; measurements; references; observations; figure number in text (if illustrated)
EUROPE		
1	SPAIN Province of Ciudad Real	Almadén, <i>Nuestra Señora del Castillo</i> ; cave; painting; figure in plan; Upper Paleolithic; Acanfora (1960, p. 262).
2	Province of Badajoz	Los Buitres, <i>Peñalsordo</i> ; cave; painting; figure in plan; Upper Paleolithic; 10 × 12 cm; Breuil (1933, vol. 2, fig. 16f), Frankowski (1918, fig. 41), Acanfora (1960, p. 263); Breuil considered this an “exceptional” figure and expressed his agreement with Frankowski’s interpretation that it was a representation of a round hut on piles, regarding the figure as a portrayal of “a family at home” (Breuil, pp. 58–59); figure 4.9.
NORTH AFRICA		
3	ALGERIA Department of Oasis (in Tassili Mountains)	Tamrit, <i>I-n-Eten</i> (In Iten) (1); rock; painting; figure in plan; Neolithic (sixth to end of third millennium B.C.); 25 cm diameter; Breuil (1954, fig. 65a); figure 4.11.
4		Tamrit, <i>I-n-Eten</i> (In Iten) (2); rock; painting; figure in plan; Neolithic; 24.5 cm diameter; Breuil (1954, fig. 65b); figure 4.11.
5		<i>Oua Molin</i> ; rock; painting; figure in plan; Neolithic; Tschudi (1955, pl. 20); two outline (plan) huts shown in scene.
6		<i>Sefar</i> ; rock; petroglyph; figure in plan; Neolithic; Lajoux (1963, p. 134), who comments on the “curious style of perspective. The hut . . . is shown in plan while the man lying down, the child . . . are shown in profile . . . an obvious connection with Egyptian painting.”
7		<i>Sefar</i> ; rock; painting; figure in plan; Neolithic; Lajoux (1963, pp. 122–23); “Couple, [in profile] sitting face to face beside what represents [in plan] a hut,” which seems to be “closed by a door of straw matting (?), exactly like the huts used by the Peuls today.” In addition to the two huts listed here from <i>Sefar</i> , there are another four or five in simple outline among the rock paintings illustrated by Lajoux.
8	Department of Saoura	<i>Taghit</i> ; rock; petroglyph; figure in plan; Neolithic; 14 cm diameter; Frobenius and Obermaier (1925, pls. 24 and 32).
9	Department of Oasis (in Tassili Mountains)	(Locality unspecified); rock; painting; figure in plan; “late,” i.e., protohistoric period(?); Frobenius (1937, fig. 10); the “enclosure” contains what appears to be a camel; figure 4.12.
10	LIBYA	Jebel Uweinat (mountain), <i>’Ein Dawa</i> ; rock; painting; figure in plan; Neolithic; 63 cm; Caporiacco and Graziosi (1934, pl. 1; probable representation of a hut), Graziosi (1942, pl. 147), Rhotert (1952, fig. 6).

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