

7 · Egyptian Cartography

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Although the so-called Turin map of a gold-bearing region, dating from about 1150 B.C., remains the only map of topographical interest from ancient Egypt, the term map is also commonly applied to representations of cosmological and mythical concepts, such as that of the imaginary land over which the deceased could pass to the afterlife. These are found on a small number of painted wooden coffins from about 2000 B.C. and were first published in scholarly form in 1903.¹ The character of Egyptian drawing produced “picture maps” of a type also found in other contexts in the ancient and medieval worlds, notably battle scenes on temple walls, genre scenes of daily life on walls of tomb chapels, and depictions of cosmological and mythological concepts. Apart from the Turin map of the gold region, no secular map survives except for a very limited number of building plans and cadastral maps. The paucity of material of this type, considering the long span of the ancient civilization of Egypt, makes it difficult to draw firm conclusions concerning the contribution and achievement of the ancient Egyptians to the origins and long-term development of cartography.

About the year 3100 B.C. the land of Egypt, from the Delta south to what is now the first cataract above Aswan, was united under the authority of a single ruler to whom later tradition gave the name Menes. For nearly three thousand years thereafter Egypt was ruled by kings, who in the early second century B.C. were divided by the Egyptian priest Manetho (fl. 280 B.C.) into thirty dynasties. These have been adopted by scholars as the basis of Egyptian chronology. The main historical periods with approximate dates are found in figure 7.1. Later compilers referred to the short period of the Second Persian Period as the Thirty-first Dynasty. This period of Persian occupation was followed by the rule of the Macedonian and Ptolemaic kings. On the deaths of Antony and Cleopatra VII in 30 B.C., Egypt was incorporated as a province of the Roman Empire.

The history of human settlement in the Nile valley may be traced back, unbroken, for over a millennium before the unification (predynastic period). The earliest datable drawing occurs on the decorated pottery of the Amratian (Negada I) period. However, none of this dec-

oration can be unambiguously interpreted as topographical drawings or primitive maps.² A rudimentary topography may be depicted on the decorated pottery of the succeeding Gerzean period (Negada II) of this predynastic age (fig. 7.2). Nile boats are shown. Above and below are symbols that can be interpreted as trees and marsh birds. The desert is depicted beyond, with schematic hill formations and antelopes.

TOPOGRAPHICAL DRAWING AND RELIGIOUS CARTOGRAPHY

The unification of Upper and Lower Egypt, about 3100 B.C., initiating the dynastic or pharaonic period, coincided with the appearance of writing and the increased availability of copper for tools, which resulted in the great stone funerary monuments of the Old Kingdom. It is to this period that the first Egyptian maps can be traced. A characteristic style of drawing and composition evolved in the decoration of these funerary monuments in which walls were divided up into a series of separate horizontal strips known as registers, each with its own base line. Objects were drawn from multiple perspectives—in plan, in profile, or in a combination of both—and as isolated images against a flat background.³ Insofar as topography is reproduced, the mode of representation resembles a bird’s-eye view and superficially suggests a picture map by the very character of the drawing. Images were conventionally rendered and placed in

1. Hans Schack-Schackenburg, ed., *Das Buch von den zwei Wegen des seligen Toten (Zweiwegebuch): Texte aus der Pyramidenzeit nach einem im Berliner Museum bewahrten Sargboden des mittleren Reiches* (Leipzig: J. C. Hinrich, 1903). See below, note 8, for recent studies. For the Turin map see note 12 and figure 7.7. For a concise general survey of maps in ancient Egypt see Rold Gundlach, “Landkarte,” in *Lexikon der Ägyptologie*, ed. Wolfgang Helck and Eberhard Otto (Wiesbaden: O. Harrassowitz, 1975–), 3:cols. 922–23; Robert North, *A History of Biblical Map Making*, Beihefte zum Tübinger Atlas des Vorderen Orients, B32 (Wiesbaden: Reichert, 1979), 23–29.

2. For an example of a topographic interpretation of Amratian pottery see chapter 4 above, p. 89 and figure 4.38.

3. On the nature of Egyptian drawing, see Heinrich Schäfer, *Principles of Egyptian Art*, ed. with epilogue by Emma Brunner-Traut, ed. and trans. with introduction by John Baines (Oxford: Clarendon Press, 1974). “Maps” are commented upon on page 160.

the manner of the standard signs of more modern maps, that is, so as to indicate the presence of a feature, not its individuality. Landscape generally was only sketchily indicated. The country was distinguished from the town by the presence of a tree or a clump of papyrus. In much

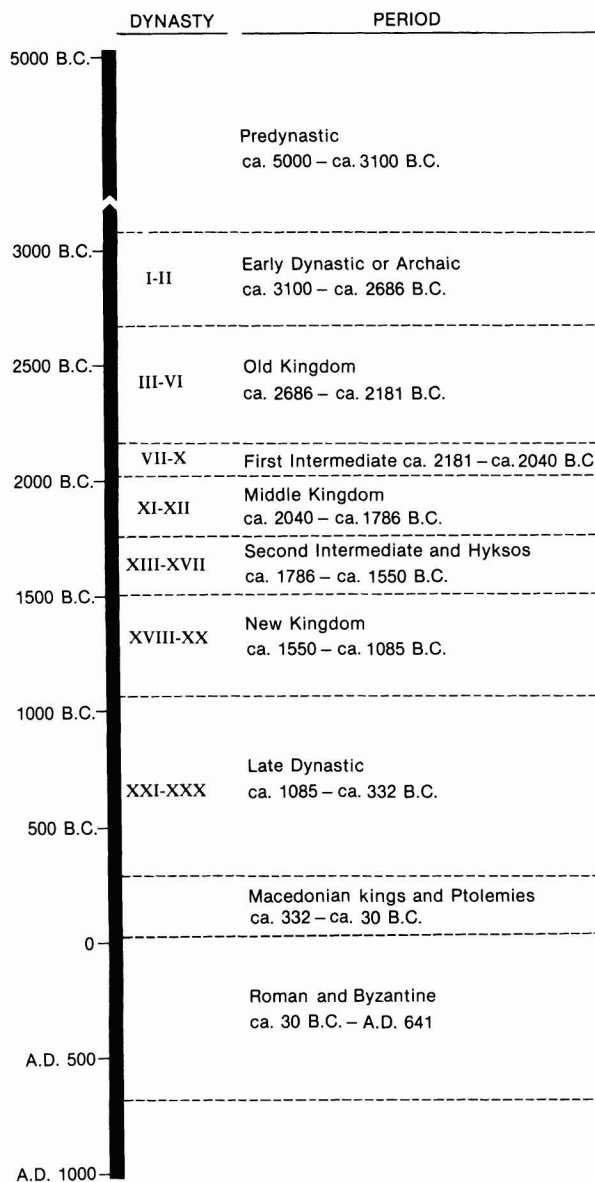


FIG. 7.1. THE MAIN DYNASTIES AND PERIODS OF EGYPTIAN HISTORY. Ancient Egyptian and Greek sources ascribe the unification of that part of the Nile Valley that we know as Egypt to the conqueror Menes. He was the first of a long line of kings whose reigns were arranged into thirty dynasties by Manetho, an Egyptian priest writing in Greek in the second century B.C. With the advent of Alexander the Great in 333 B.C. Egypt came under the rule of the Macedonian kings and the Ptolemies until it was incorporated within the Roman Empire on the deaths of Antony and Cleopatra VII in 30 B.C. It later formed part of the Eastern Roman and Byzantine empires until it became part of the Islamic world in A.D. 641.

the same manner, no true picture is given of the aspect of the Nile valley by later panoramic depiction.⁴

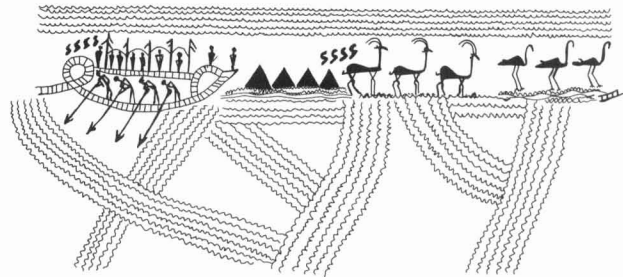


FIG. 7.2. RUDIMENTARY TOPOGRAPHIC DESIGNS ON EGYPTIAN DECORATED POTTERY. Dating from the predynastic Gerzean (Negada II) period, ca. 3700–3100 B.C., Nile boats are shown in the midst of the desert with hills represented schematically.

After redrawing in W. M. F. Petrie, *Prehistoric Egypt, Illustrated by over 1,000 Objects in University College, London* (London: British School of Archaeology in Egypt, 1917), pl. XXI.

The drawings of gardens found in painted tombs of the New Kingdom at Thebes (ca. 1400 B.C.), however, are maplike diagrams, without perspective, that depict regularly laid out paths lined by date palms and sycamores, a rectangular or T-shaped sheet of water on the central axis, lotus plants, fish and birds, and walled orchards with trellised vines (fig. 7.3).⁵ The overall impression is that of a formal garden; the balance and for-

4. On landscape, see Joachim Selim Karig, "Die Landschaftsdarstellung in den Privatgräbern des Alten Reiches" (Ph.D. diss., University of Göttingen, 1962); Helmut Pitsch, "Landschaft (-Beschreibung und -Darstellung)," in *Lexikon*, 3:cols. 923–28 (note 1). A panorama from the ancient world, not from Egypt but possibly of Alexandrine origin, has survived in the Nilotic landscape known as the Paestrina (Praeneste) or Barberini mosaic (p. 246 n. 75), a large composition depicting a peopled landscape, with upper rocky terrain and a lower marshy prospect, forming a sort of picture map of the Nile from source to sea. The most recent studies of the mosaic are Giorgio Gullini, *I mosaici di Paestrina*, Supplemento di Archeologia Classica 1 (Rome: Archeologia Classica, 1956); Helen Whitehouse, *The Dal Pozzo Copies of the Paestrina Mosaic*, British Archaeological Reports, Supplementary Series 12 (Oxford: British Archaeological Reports, 1976); and Angela Steinmeyer-Schareika, *Das Nilmosaik von Paestrina und eine Ptolemäische Expedition nach Äthiopien*, Halbelts Dissertationsdrucke, Reihe Klassische Archäologie 10 (Bonn: Halbelt, 1978).

5. For surveys of gardens in the New Kingdom see Marie-Francine Moens, "The Ancient Egyptian Garden in the New Kingdom: A Study of Representations," *Orientalia Lovaniensia Periodica* 15 (1984): 11–53; Luise Klebs, *Die Reliefs und Malereien des Neuen Reiches* (Heidelberg: C. Winter, 1934), 22–33; Alexander Badawy, *Le dessin architectural chez les anciens Egyptiens* (Cairo: Imprimerie Nationale, 1948), 247–60; idem, *A History of Egyptian Architecture: The Empire (the New Kingdom)* (Berkeley: University of California Press, 1968), 488–99; Leslie Mesnick Gallery, "The Garden of Ancient Egypt," in *Immortal Egypt*, ed. Denise Schmandt-Besserat (Malibu: Undena Publications, 1978), 43–49; Dieter Wildung, "Garten," in *Lexikon*, 2:cols. 376–78, and Wolfgang Helck, "Gartenanlage, -bau," in *Lexikon*, 2:cols. 378–80 (note 1).

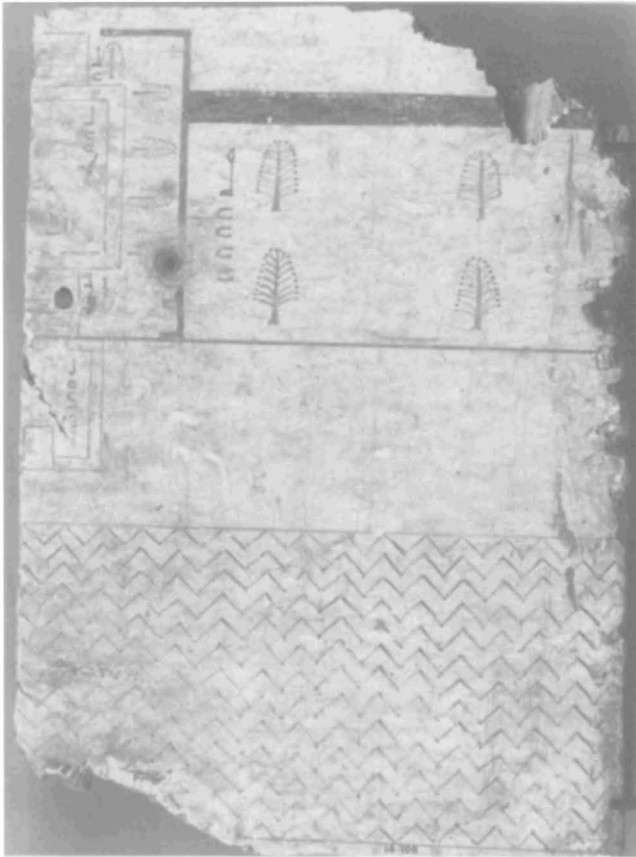


FIG. 7.3. PLAN OF AN EGYPTIAN GARDEN. Red and black ink on a wooden tablet surfaced with plaster, excavated at Thebes, and dating from the XVIII Dynasty. Size of the original: 32.5 × 23.5 cm. By permission of the Metropolitan Museum of Art, New York (gift of N. de Garis Davies, 1914 [14.108]).

mality, however, may be misleading and might result from the draftsman's desire for a harmonious composition that may or may not have reflected the real world. A common vignette (illustration) in the collection of spells known as the *Book of the Dead* and inscribed on papyrus about 1400 B.C. is that of an ideal plot of land to be worked by the deceased, set in the mythical realm of Osiris (fig. 7.4). The area depicted is rectangular and cut by canals, and its cartographic appearance is enhanced by the use of color.⁶

There is evidence of an increased interest in the representation of landscape in the New Kingdom, for elements in the great narrative scenes of royal exploits, executed in relief on the walls of temples of the Nineteenth and Twentieth dynasties, are laid out in sequences of maplike images. The progress, for example, of Sethos I (1318–1304 B.C.) past watering stations and frontier forts along the desert highway to Canaan is

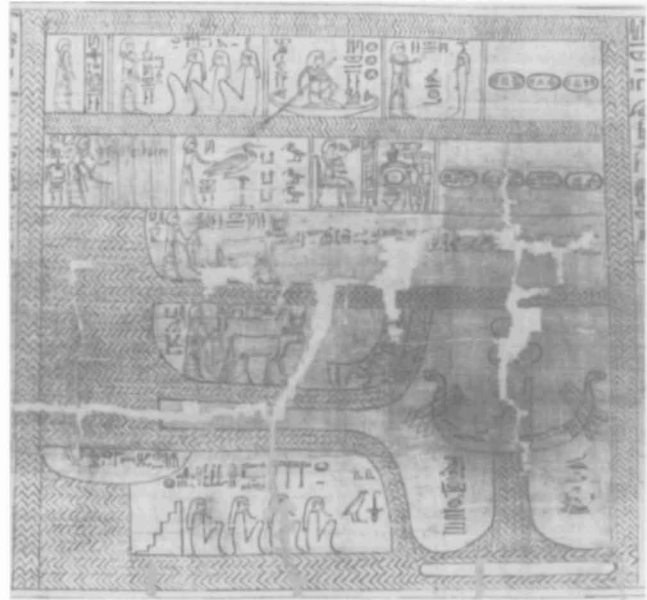


FIG. 7.4. SEKHET-HETEPET, OR THE “FIELDS OF PEACE.” Vignette accompanying spell 110 from the *Book of the Dead*, taken from the “Papyrus of Nebseny,” depicting the ideal plot of land to be worked in the mythical realm of Osiris, ca. 1400 B.C.. Size of the original: 31.5 × 33 cm. By permission of the Trustees of the British Museum, London (BM 9900, sheet 18).

drawn in a cartographic manner. The fortress of Kadesh, situated in the valley of the Orontes where the river is joined by a tributary, is conventionally rendered as a fort upon a hilly slope. But in depictions of the attack on the same town by his successor, Ramesses II, preserved in a number of versions, the draftsmen attempted to give more faithful renderings of the topography through the depiction of the river. It encircles the town and continues as a winding strip of water separating the two armies as successive incidents of the battle involving the enemy's crossing of the river are portrayed.⁷

6. For a bibliography of publications see Paul Barguet, *Le livre des morts des anciens Egyptiens* (Paris: Editions du Cerf, 1967), 28–30. See also Jean Leclant, “Earu-Gefilde,” in *Lexikon*, 1:cols. 1156–60 (note 1). The *Book of the Dead* is the name given in modern times to copies of a heterogeneous collection of funerary spells written down on papyrus and deposited in tombs from the Eighteenth Dynasty down to the Roman period. The number of spells (also called chapters) contained in individual copies and their order vary from copy to copy. The spells derive from similar collections of earlier times, the Coffin Texts of the Middle Kingdom and the Pyramid Texts of the Old Kingdom.

7. For these narrative scenes see Helene J. Kantor, “Narrative in Egyptian Art,” *American Journal of Archaeology* 61 (1957): 44–54; G. A. Gaballa, *Narrative in Egyptian Art* (Mainz: Philipp von Zabern, 1976), 99–129; William Stevenson Smith, *Interconnections in the Ancient Near-East: A Study of the Relationships between the Arts of Egypt, the Aegean, and Western Asia* (New Haven: Yale University Press, 1965), 168–79.



FIG. 7.5. COSMOGRAPHICAL MAP: THE LAND OF EGYPT WITH THE GODDESS NUT. South is at the top in this cosmographic representation found on the cover of a stone sarcophagus from Saqqara. It dates from the Thirtieth Dynasty, ca. 350 B.C.

Diameter of the interior circle: 72 cm. By permission of the Metropolitan Museum of Art, New York (gift of Edward S. Harkness, 1914 [14.7.1]).

The most notable example of the cartographic nature of Egyptian topographical drawing is to be found with certain spells, usually copied on the floor of a series of painted coffins of Early Middle Kingdom date (ca. 2000 B.C.) from the single site of al-Bersha in Middle Egypt. These are accompanied by an illustration of a rectangular area with two routes depicted by broad, sinuous bands of color: the upper one is blue and represents a passage by water, the lower one is black and depicts an overland route that takes up about one-third of the composition (plate 2). The presence of color enhances the cartographic quality of the topographical depiction of this mythical land, so that this assemblage of spells forms a sort of compendium of mythical maps, known to modern scholars as *The Book of the Two Ways*.⁸

Funerary spells of this character were of necessity obscurantist. The texts give no clear explanation of the landscape they accompany. They contain allusions to

myths of which we have no complete or connected account. The three surviving versions of *The Book of the Two Ways*, two long and one short, constitute a conflation of differing and conflicting earlier expositions. It is scarcely possible to reconstruct a systematic narrative of the deceased's passage from this text. It would be a mistake to suppose that the topographical drawing accompanying the spells, which occurs in one group of coffins only, was intended to provide a guide by which the deceased might choose his path after death and find his way to a desired goal. The composition may be loosely compared to a passport or *laissez-passer* papers. Knowledge of the spells accompanying the vignette would guarantee safe passage through this mythical and mysterious land, populated by deities and spirits both friendly and hostile, through which the soul would be ever traveling as it left and returned to the body preserved in the coffin. The two routes are not, it seems, to be considered alternative ones. Though they are described as the ways of Osiris, they seem also to be depictions of the paths of the day and night journeys of the sun-god Re, the two paths uniting to form the circuit of the sun as conceived by the Egyptians.

That Egyptian cartography was often more pictorial than planimetric is confirmed by other illustrations of religious geography. Pictures of the structure of the universe as seen by the ancient Egyptians lack even the diagrammatic, maplike quality of their depictions of the imaginary route to, and terrain of, the afterlife. They occur only within religious and magical texts, mostly in

8. Spells 1029–1130, Adriaan de Buck, *The Egyptian Coffin Texts VII*, Oriental Institute Publications, vol. 87 (Chicago: University of Chicago Press, 1961), hieroglyphic texts 252–471, plans 1–15; translation with discussion, Leonard H. Lesko, *The Ancient Egyptian Book of Two Ways*, University of California Near Eastern Studies Publications, vol. 17 (Berkeley: University of California Press, 1972); Alexandre Piankoff, *The Wandering of the Soul*, completed and prepared for publication by Helen Jacquet-Gordon, Egyptian Religious Texts and Representations, Bollingen Series 40, vol. 6 (Princeton: Princeton University Press, 1974); Raymond O. Faulkner, ed. and trans., *The Ancient Egyptian Coffin Texts*, 3 vols. (Warminster: Aris and Phillips, 1978), 3:127–69. For discussion of the interpretation of the text, see also Paul Barguet, “Essai d’interprétation du Livre des deux chemins,” *Revue d’Égyptologie* 21 (1969): 7–17; Wilhelm Bonacker, “The Egyptian Book of the Two Ways,” *Imago Mundi* 7 (1950): 5–17; Hermann Grapow, “Zweiwegebuch und Totenbuch,” *Zeitschrift für Ägyptische Sprache und Altertumskunde* 46 (1909): 77–81; Hermann Kees, *Totenglauben und Jenseitsvorstellungen der alten Ägypter* (Berlin: Akademie-Verlag, 1956), 287–302; Leonard H. Lesko, “Some Observations on the Composition of the *Book of Two Ways*,” *Journal of the American Oriental Society* 91 (1971): 30–43; Jan Bergman, “Zum Zwei-Wege-Motiv: Religionsgeschichtliche und exegetische Bemerkungen,” *Svensk Exegetisk Årsbok* 41–42 (1976–77): 27–56, esp. 51–54; Hellmut Brunner, “Die Unterweltbücher in den ägyptischen Königsgräbern,” in *Leben und Tod in den Religionen: Symbol und Wirklichkeit*, ed. Gunter Stephenson (Darmstadt: Wissenschaftliche Buchgesellschaft, 1980), 215–28. See also Ursula Rössler-Köhler, “Jenseitsvorstellungen,” in *Lexikon*, 3:cols. 252–67 (note 1).

the context of a man's journeyings after death, often in the retinue of the sun-god, and are replete with mythical figures in human or animal form. In the New Kingdom the star-studded universe is sometimes depicted with an arched figure of the goddess Nut representing the sky. She is shown held aloft, over the recumbent figure of the earth-god Geb, by the figure of the god Shu in human form representing the space between earth and sky. On the cover of a stone sarcophagus dating to the Thirtieth Dynasty (ca. 350 B.C.), a depiction of the land of Egypt and regions surrounding it is drawn in circular form, probably as a result of foreign influence, below and between the arms and legs of the arched figure of Nut. An inner circular band is occupied by various standards associated with the ancient territorial divisions of Egypt (nomes), at this time still of great religious significance. The exterior ring depicts various peoples and symbols representing Egypt's neighbors. To the left and to the right on the circumference of the outer ring are respectively the goddess of the east and the goddess of the west, the upper part of the diagram therefore representing the south (fig. 7.5).⁹



FIG. 7.6. CELESTIAL MAP OF THE PLANETS, CONSTELLATIONS, AND ZODIAC. An example of a late Egyptian astronomical depiction carved on the ceiling of the chapel of Osiris, temple of Dendera, from the end of the Ptolemaic period (first century B.C.).

Size of the original: 2.55 × 2.53 m. By permission of the Musée du Louvre, Paris.

Astronomical ceilings, the earliest known being that in the tomb of Senmut, the minister of Hatshepsut (ca. 1470 B.C.), depict decans (diagrams of stars for calculating the passage of the hours at night), constellations, and planets. Representations of heavenly bodies with figures such as a standing pregnant hippopotamus or a crocodile tend to destroy any resemblance to a modern map. Only in the case of the depiction of decans is a more chartlike rendering found.¹⁰ Although in the later period there was cross-fertilization of Babylonian and Greek ideas and astronomical observation was necessary for astrology, the same mythical figures were retained. A circular picture of the sky, dating to the end of the Ptolemaic period, which reproduces planets and constellations with some degree of accuracy in their relation to one another, occurs on the ceiling of the chapel of Osiris on the roof of the temple of Dendera, now in the Louvre. It depicts a synthetic image of the sky in which traditional Egyptian constellations and decans are mingled with the twelve signs of the zodiac, imported from Babylonia but Egyptianized in their forms (fig. 7.6).¹¹

TURIN MAP OF THE GOLD MINES

In contrast with the number of texts of a religious or funerary character to be found on temple and tomb walls or on papyri from burials, survival of administrative and business documents is relatively rare. Except for the Ramesside period (Nineteenth to Twentieth dynasties), little more than isolated pieces have been preserved from before the sudden increase in everyday documents in both Egyptian and Greek from the Greco-Roman period. One of the best known of all maps from the ancient world belongs to the Ramesside period and is now preserved in the Museo Egizio, Turin. Originally part of the collections of Bernardino Drovetti formed before 1824, the map was first identified by Samuel Birch in 1852 as an ancient plan of gold mines which he located in Nubia. The circumstances of the find are not known, but the

9. C. L. Ranson, "A Late Egyptian Sarcophagus," *Bulletin of the Metropolitan Museum of Art* 9 (1914): 112–20. For a second fragmentary example, see J. J. Clère, "Fragments d'une nouvelle représentation égyptienne du monde," *Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo* 16 (1958): 30–46. On Egyptian representations of the universe see Heinrich Schäfer, *Ägyptische und heutige Kunst und Weltgebäude der alten Ägypter: Zwei Aufsätze* (Berlin: Walter de Gruyter, 1928), 83–128.

10. These texts and representations dealing with decans, star clocks, zodiacs, and planets are assembled and discussed in Otto Neugebauer and Richard A. Parker, eds. and trans., *Egyptian Astronomical Texts*, 3 vols. (Providence and London: Lund Humphries for Brown University Press, 1960–69); for a concise account, see Richard A. Parker, "Ancient Egyptian Astronomy," *Philosophical Transactions of the Royal Society of London*, ser. A, 276 (1974): 51–65.

11. Neugebauer and Parker, *Egyptian Astronomical Texts*, 3:72–74, pl. 35 (note 10).

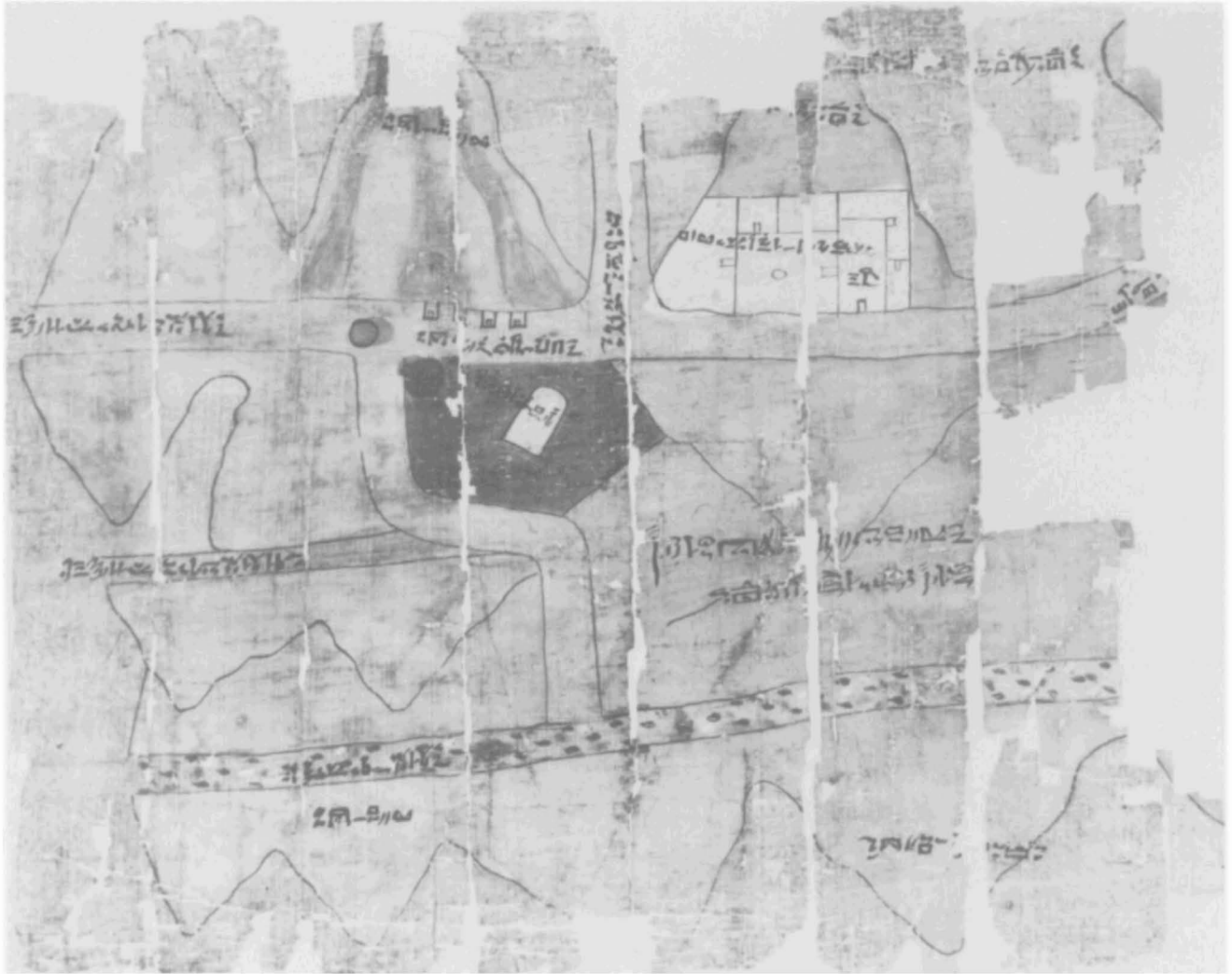


FIG. 7.7. MAP OF GOLD MINES FROM THE TURIN PAPPYRUS. Dating from the Ramesside Period, this section shows the location of gold-bearing mountains, gold-working settlements, and roads between the Nile and the coast of the Red Sea.

carelessness of Drovetti's agents resulted in fragmentation of the original papyrus and loss of some parts.¹²

The extant papyrus consists of two principal sections, earlier thought to belong to two different documents. The more important section is a fragment, measuring approximately forty centimeters high, generally called the "map of the gold mines" (fig. 7.7). It depicts two broad roads, running parallel to each other through pinkish red mountainous regions. They are drawn horizontally across the papyrus, the lower with indications of a rocky bed or sparse vegetation, characteristic of the larger dried-up watercourses or wadis that form the natural routes across the eastern desert from the Nile to the Red Sea. Legends written in hieratic, the cursive everyday hand of the time, explain where these routes to the left are leading. A broad, winding crossway wadi

Height of the papyrus: 41 cm. By permission of the Soprintendenza per le Antichità Egizie, Turin.

12. First published as the plan of a royal tomb, Richard Lepsius, *Auswahl der wichtigsten Urkunden des ägyptischen Alterthums: Theils zum erstenmale, theils nach den Denkmälern berichtigt* (Leipzig: Wigand, 1842), pl. XXII. See also Samuel Birch, "Upon an Historical Tablet of Ramses II., 19th Dynasty, relating to the Gold Mines of Æthiopia," *Archæologia* 34 (1852): 357–91 esp. 382–83; François J. Chabas, *Les inscriptions des mines d'or* (Chalon-sur-Saône: Dejustieu, 1862), also published in *Bibliothèque Egyptologique* 10 (1902): 183–230; A. H. Gardiner, "The Map of the Gold Mines in a Ramesside Papyrus at Turin," *Cairo Scientific Journal* 8, no. 89 (1914): 41–46; G. W. Murray, "The Gold-Mine of the Turin Papyrus," *Bulletin de l'Institut d'Égypte* 24 (1941–42): 81–86; and the contribution by G. W. Murray in John Ball, *Egypt in the Classical Geographers* (Cairo: Government Press, Bulâq, 1942), 180–82 and pls. VII–VIII (in color). The most recent and fullest discussion of the papyrus is Georges Goyon, "Le papyrus de Turin dit 'Des mines d'or' et le Wadi Hammamat," *Annales du Service des Antiquités de l'Égypte* 49 (1949): 337–92. For representations of the gold mine area in color photographs, see Ernesto Scamuzzi, *Museo Egizio di Torino* (Torino: Fratelli Pozzo, 1964), pl. 88, and Georges Posener et al., *A Dictionary of Egyptian Civilization*, trans. Alix Macfarland (London: Methuen, 1962), 112.

connects the two routes, from which an alternative route is indicated and labeled, also leading to the left. Running vertically from the upper route is yet another road with hieratic text that gives its destination. The significance of the area painted red is explained by another legend that reads, “the mountains where gold is worked: they are colored in red.” The Egyptian term used here for red, *dšr*, is that most generally employed for all shades of red, the color used to depict red granite, sandstone, and the tawny hue of the desert. The term “mountains of gold” is repeated elsewhere in the area colored red, as well as apparently the phrase “mountains of silver and gold.” In places the red area is brought to a point and given a distinctive name such as “the peak” or “the peak on which Amun is.” The intention was apparently to render the basic outlines of mountains laid down flat on either side of the valley route rather than to delineate precisely and accurately the area of auriferous rocks.

There are other distinctive features outlined, colored, and labeled in hieratic. Near the junction of the cross valley with the upper route a circular, dark-colored image is marked, with a second partially overlapping design in a darker black line. The figure is probably intended to represent a well, though no text identifies it. A little below and to the right of the design is another, more oblong in shape, colored green with the zigzag lines by which the ancient Egyptians conventionally represented water. Within the design there are traces of a hieratic group, apparently to be read as “cistern,” “waterplace,” or the like. In the same central section of the map a round-topped stela is also indicated in white, with a legend dating it to the reign of Sethos I of the Nineteenth Dynasty. The feature is presumably to be identified with one of the rock-cut stelae executed by that king, depicting Amun or another deity, preserved on the mountain face flanking the wadi.

There are also two man-made features on the upper side of the upper route. One is clearly a large building containing several courts or rooms with connecting doors, described as the “resting place” or “abode” (*hnu*) of “Amun of the pure mountain.” There are also three small rectangular forms labeled “the houses of the gold-working settlement.”

The second section of the papyrus comprises a number of fragments for which the final placement, based on careful study of the fibers of the papyrus, has yet to be made. Its principal feature is the continuation of the wide, winding route of the wadi interspersed with stones. This constitutes the lower route of the other section (fig. 7.8). In contrast with the gold-mine section, the area on each side of the road is colored black, and the legend indicates that in this area the stone known to the ancient Egyptians as *bekhen* is to be found. This black or dark

green stone, generally called schist by Egyptian archaeologists, is more properly identified as graywacke. The surviving fragments give no indication of precise locations comparable to those found on the section depicting the gold-mining region and its settlements.

The Turin papyrus fragments were long considered the earliest surviving topographical map from Egypt to have come to light. The papyrus clearly has a character distinct from the cosmological drawings of the universe or of the routes to or depiction of the afterlife found within the formal context of religious art. The draftsman has distributed distinctive features in accordance with the reality of a particular area, adding clarity by the use of legends and contrasting colors. The texts indicate that the area depicted must be along the natural route from Coptos (Qift) on the Nile through the eastern desert via Wādī al-Ḥammāmāt to the port of Quseir on the Red Sea. This route was used in ancient times in the course of expeditions to the Red Sea for trading voyages south to the land known to the Egyptians as Punt (Pwenet). The central area, between Bīr al-Ḥammāmāt and Bīr Umm Fawākhir, was visited as a source of ornamental stone and of gold, and it is rich in rock tablets recording quarrying expeditions and in archaeological evidence of ancient gold mining. More precise location rests on the interpretation of the orientation of the map. This requires the resolution of questions concerning the placement of fragments in the second section and the identification of the places to which the roads to the left of the viewer are said to lead. In descriptions of property in the later period the points of the compass are given in the order south, north, east, west, suggesting that Egyptians oriented themselves facing south, with north behind them, the west to their right and the east to their left. It would be natural, then, for them to designate the top of the papyrus as south. Such a view seems to be supported by the legend designating the upper route of the gold map leading off to the left as “the road that leads to the *ym*,” that is, to “the [Red] sea,” taking *ym* in its most common meaning. The route marked as leading off from the cross valley to the left is likewise described as “another road that leads to the *ym*.” The placement of the second section to the right of the map of the gold region seems correct, since it would then constitute the beginning of a papyrus roll, which would normally suffer greater damage. The map would then show on the right (that is, the west) the darker “schist” area of the main part of Wādī al-Ḥammāmāt, with the gold mines of the region of Bīr Umm Fawākhir some twenty-five kilometers to the east. A more recent comparison of the features shown on the map with the ground matches the various features specifically mentioned in the gold map with the central area of Wādī al-Ḥammāmāt and with the upper part of the papyrus

FIG. 7.8. THE SECOND SECTION OF THE TURIN PAPYRUS. As at present mounted in the Museo Egizio, this shows the fragments other than those in figure 7.7.

Height of the papyrus: 41 cm. By permission of the Soprintendenza per le Antichità Egizie, Turin.



constituting the north.¹³ If this placement were correct and the fragments of the second portion were to be placed to the right, it would require the *ym* to which the road now leads westward, that is, back to the Nile, to be taken in some sense other than Red Sea. It would likewise place the area of *bekhen* stone to the east of the location of the main quarry inscriptions in Wādī al-Ḥammāmāt.

The difficulties in matching features depicted and labeled on the papyrus with those on the ground are compounded by the absence of any indications of scale. The map seems to be a freehand drawing. The only indication of its purpose seems to be given in the series of hieratic notations written on those areas left blank above and below the route and the black areas depicted on the fragments of the second section. In contrast with the hieratic texts on the gold map identifying geographical features, these texts refer to the transport of a statue. A text of five lines, of which the first four lack their beginnings, seems to reflect a situation in which a king sent an expedition to the Wādī al-Ḥammāmāt to bring a statue back to Thebes. It was, we are informed, deposited in a workshop beside the mortuary temple of Ramesses II (Ramesseum) on the west bank of the Nile at Thebes and subsequently taken, half-worked, to the Valley of the Kings in a regnal year 6. Such a docket must have been written at Thebes, the papyrus obviously having been at some time in the possession of one of the scribes attached to the work gang responsible for constructing and decorating the royal tombs in the Valley of the Kings. Jottings on the back of the papyrus include a reference to the statue of Ramesses IV of the Twentieth Dynasty, suggesting that year 6 should refer to the reign of that king.¹⁴ The purpose of the map is still obscure. Annotations on the second portion of the papyrus suggest that the document was

drawn up in connection with work on the extraction and transport of stone, ultimately destined perhaps for a royal tomb in the Valley of the Kings. Some of these notes seem to give measurements of blocks; one seems to provide measurements of actual distances separating points on the map. The papyrus may be the result of calculations of distances for logistical purposes. To judge from instructions contained in a model letter copied by a pupil as part of his scribal training (instructions that seem to refer to the same general area as the Turin map), calculations of distance are the kind of work a scribe might be expected to do.¹⁵ What is unusual is that a rough sketch map is included. Surveying rarely resulted in graphic maps, and in this respect ancient Egypt is very similar to medieval Europe until well into the fourteenth and fifteenth centuries.

LAND SURVEY, CADASTRAL MAPS, AND BUILDING PLANS

There is little direct record of the way surveying was practiced, although one passage from Herodotus is used as early evidence for the Egyptian practice of surveying:

Sesostris was also the king, the priests went on to say, who was responsible for the division and distri-

13. Goyon, "Papyrus de Turin" (note 12). In light of the annotation in demotic script to Papyrus Lille 1 (see below, note 26), it seems more likely that south is represented at the top of the papyrus.

14. Jaroslav Černý, *A Community of Workmen at Thebes in the Ramesside Period* (Cairo: Institut Français d'Archéologie Orientale, 1973), 61–62, 66–67.

15. Papyrus Anastasi VI (London, British Museum, Pap. BM 10245), lines 67–74, text by Alan H. Gardiner, *Late-Egyptian Miscellanies*, Bibliotheca Aegyptiaca 7 (Brussels: Edition de la Fondation Egyptologique Reine Elisabeth, 1937), 77; Ricardo A. Caminos, *Late-Egyptian Miscellanies*, Brown Egyptological Studies 1 (London: Oxford University Press, 1954), 296–98 nn. 70–71.



bution of land into individual square holdings, of equal size, among the Egyptians and for making the plots his source of revenue by fixing the amount of tax to be paid yearly on each holding. Should the river encroach upon any holding, its owner might approach the king and report what had happened. The king would send men to inspect and measure the loss of cultivated land in order that from then on some of the tax proportionate to the report of the loss might be remitted. I attribute the invention of geometry to this cause and from Egypt it spread to Greece.¹⁶

Wood and stone measuring rods have survived, but these are votive offerings rather than actual implements. Ropes knotted at regular intervals—which presumably were used for measurement for tax purposes—are depicted in agricultural scenes showing fields of standing corn from the New Kingdom tombs at Thebes. There are also statues of high officials from the same period that were intended to be placed in temples or tombs. Sitting back on their heels with coiled measuring ropes resting on their knees, in an activity known as “stretching the cord,” they symbolized the role of surveyor in the construction of temples. The rope terminates in a ram’s head in honor of the god Khnum-Shu.¹⁷ The basic linear measure was a cubit of differing standards. A unit of one hundred cubits squared, approximately two-thirds of an acre, constituted the basic measure of area, in Egyptian *stst*, which corresponds to the *aroura* of Greek documents.

From later textual material relating to foundation ceremonies in the construction of temples, we know of two more implements that permitted great accuracy in orienting buildings. In Egyptian texts they are called *merkhet*, literally “instrument of knowing,” and *bay*, “palm rib.” An example of each, purchased in Cairo and dating

perhaps to about 600 B.C., was identified by Ludwig Borchardt in 1899.¹⁸ The *merkhet*, a type of plumb-line sighter, was aligned with an object by means of the *bay*, a palm rib with a V-shaped slot cut at the wider end.

16. Herodotus *History* 2.109, author’s translation. On the passage see Henry Lyons, “Two Notes on Land-Measurement in Egypt,” *Journal of Egyptian Archaeology* 12 (1926): 242–44. See also the commentary of A. R. Lloyd in *Herodotus, Book II: Commentary* 99–182, *Etudes Préliminaires aux Religions Orientales dans l’Empire Romain* 43 (Leiden: E. J. Brill, forthcoming). Strabo, *Geography* 17.3 also says geometry was invented to meet the need for the annual remeasurement of holdings; see *The Geography of Strabo*, 8 vols., ed. and trans. Horace Leonard Jones, Loeb Classical Library (Cambridge: Harvard University Press; London: William Heinemann, 1917–32). Similarly Diodorus Siculus, 1.81.2; see *Diodorus of Sicily*, 12 vols. trans. C. H. Oldfather, Loeb Classical Library (Cambridge: Harvard University Press; London: William Heinemann, 1933–67). On ancient Egyptian measurements and measuring see Adelheid Schlott-Schwab, *Die Ausmaße Ägyptens nach altägyptischen Texten* (Wiesbaden: O. Harrassowitz, 1981). For a concise discussion of surveying and surveying implements see Somers Clarke and Reginald Engelbach, *Ancient Egyptian Masonry: The Building Craft* (London: Oxford University Press, 1930), 64–68; O. A. W. Dilke, *The Roman Land Surveyors: An Introduction to the Agrimensores* (Newton Abbot: David and Charles, 1971), 19–30; S. P. Vleeming, “Demotic Measures of Length and Surface, chiefly of the Ptolemaic Period,” in P. W. Pestman et al., *Textes et études de papyrologie grecque, démotique et copte*, *Papyrologica Lugduno-Batava* 23 (Leiden: E. J. Brill, 1985), 208–29.

17. For scenes of the measuring of the fields see Suzanne Berger, “A Note on Some Scenes of Land-Measurement,” *Journal of Egyptian Archaeology* 20 (1934): 54–56. For the type of statue, see Jacques Vandier, *Manuel d’archéologie égyptienne*, 6 vols. (Paris: A. et J. Picard, 1952–78), vol. 3, *Les grandes époques: La statuaire* (1958), 476–77. For Khnum-Shu see Paul Barguet, “Khnum-Chou, patron des arpenteurs,” *Chronique d’Égypte* 28 (1953): 223–27.

18. Berlin 14084, 14085: Ludwig Borchardt, “Ein altägyptisches astronomisches Instrument,” *Zeitschrift für Ägyptische Sprache und Altertumskunde* 37 (1899): 10–17; Staatliche Museen, Preußischer Kulturbesitz, *Ägyptisches Museum, Berlin* (Berlin: Staatliche Museen, 1967), 54, with photographic illustration. The method by which the

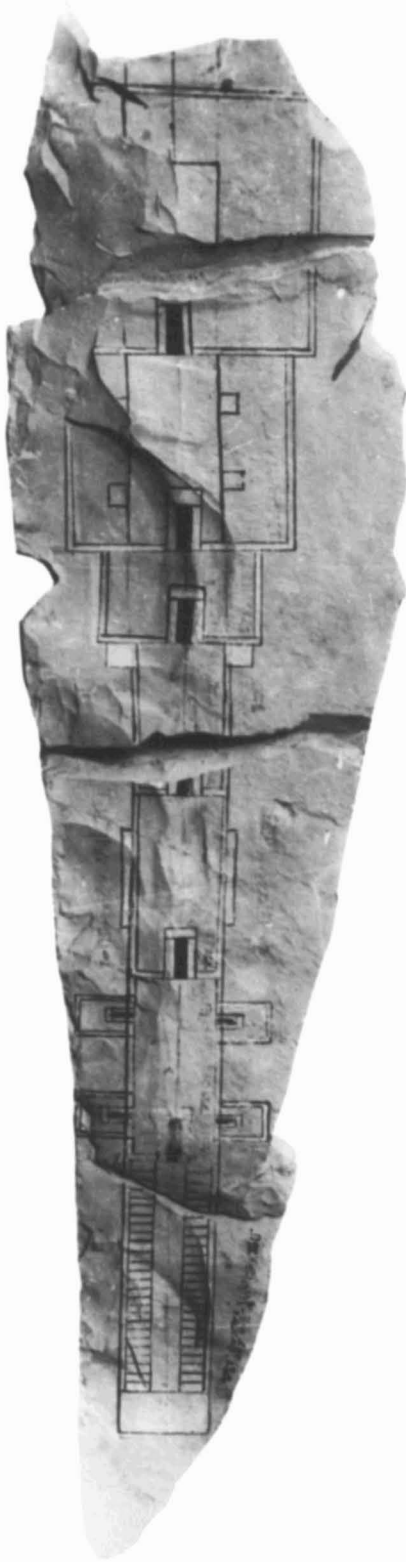


FIG. 7.9. PLAN OF EGYPTIAN TOMB FROM THE VALLEY OF THE KINGS. This is possibly a working plan on an ostrakon of the tomb of Ramesses IX.

Size of the original: 83.5 × 14 cm. By permission of the Egyptian Museum, Cairo (Ostrakon 25,184).

A limestone ostrakon in the Cairo Museum, of obscure purport, dating perhaps to the Nineteenth Dynasty, notes distances between tombs in the Valley of the Kings and mentions significant features, which apparently include a willow tree and some form of water.¹⁹ No sketch accompanies this text. However, among a number of documents recording measurements of royal tombs in the Valley of the Kings there are two with plans. One, an ostrakon in Cairo, is probably a working plan of Tomb 6 (Ramesses IX); its hieratic legends have faded considerably (fig. 7.9).²⁰ The other is a more elaborate colored plan carefully drawn on papyrus and preserved in the Museo Egizio, Turin (fig. 7.10).²¹ Around the design of the rock-cut tomb the surface of the papyrus is colored brownish, with alternate broken lines of red and black enclosed within a red outline depicting desert hills. The plan of the tomb is neatly executed in parallel thin black lines, as if indicating the walls of a building rather than the sides of rock-cut chambers. A series of rooms and chambers are depicted in plan, but the yellow colored doors are in elevation. Hieratic legends describe the stage of the work and dimensions of the chambers. The drawing is not to scale, and the plan gives only a rough approximation of the real shape and proportions of the rooms. The plan and measurements correspond closely to the tomb of Ramesses IV. The finished nature of the document, including a drawing of the shrines that would have surrounded the sarcophagus, suggests that the plan was a final one drawn up immediately before the burial. Like the map of the gold mining and quarrying area, its purpose cannot be precisely defined,

Egyptians oriented buildings is most authoritatively discussed in Zbyněk Žába, *L'orientation astronomique dans l'ancienne Egypte et la précession de l'axe du monde*, Archiv Orientální, suppl. 2 (Prague: Editions de l'Académie Tchecoslovaque des Sciences, 1953). See also I. E. S. Edwards, *The Pyramids of Egypt*, new and rev. ed. (Harmondsworth: Viking, 1986), 154–61, and Günther Vittmann, "Orientierung (von Gebäuden)," in *Lexikon*, 4:cols. 607–9 (note 1).

19. Elizabeth Thomas, "Cairo Ostrakon J. 72460," in *Studies in Honor of George R. Hughes*, Studies in Ancient Oriental Civilization no. 39 (Chicago: Oriental Institute of the University of Chicago, 1976), 209–16.

20. Georges Daressy, *Ostraca*, Catalogue Général des Antiquités Egyptiennes du Musée du Caire, vol. 1 (Cairo: Institut Français d'Archéologie Orientale, 1901), 35, pl. XXXII (no. 25184); William H. Peck, *Drawings from Ancient Egypt* (London: Thames and Hudson, 1978), no. 130.

21. Howard Carter and Alan H. Gardiner, "The Tomb of Ramesses IV and the Turin Plan of a Royal Tomb," *Journal of Egyptian Archaeology* 4 (1917): 130–58; Peck, *Drawings*, no. 129 (note 20); Clarke and Engelbach, *Ancient Egyptian Masonry*, 48–51 (note 16); Jaroslav Černý, *The Valley of the Kings* (Cairo: Institut Français d'Archéologie Orientale, 1973), 23–34. For sketches in connection with work on nonroyal tombs, see William C. Hayes, *Ostraka and Name Stones from the Tomb of Sen-Mūt (no. 71) at Thebes*, Publications of the Metropolitan Museum of Art Egyptian Expedition, vol. 15 (New York: Metropolitan Museum of Art, 1942), no. 31 and pl. VII.

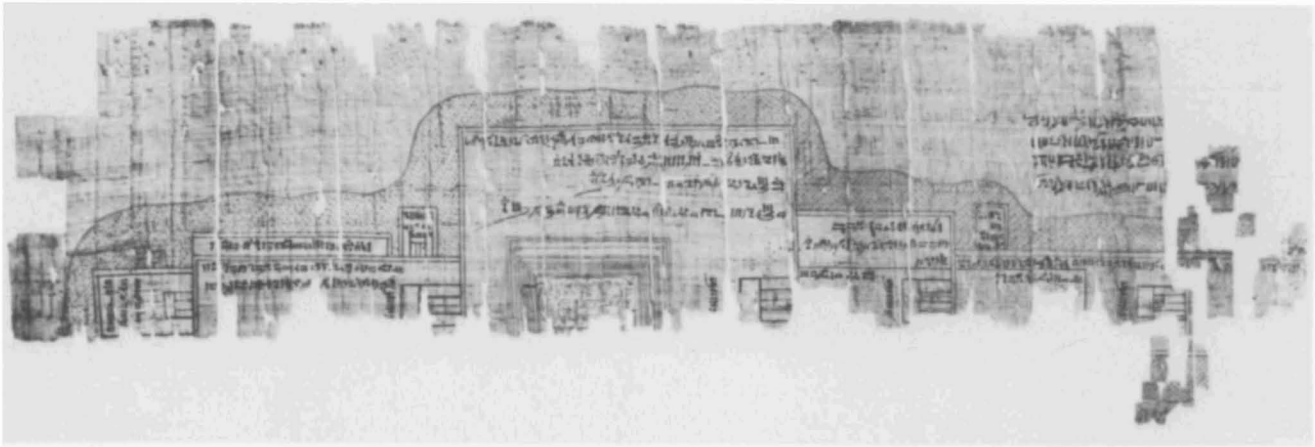


FIG. 7.10. PAPYRUS PLAN OF EGYPTIAN TOMB. Although the plan is not drawn to scale, the measurements in the legends correspond closely to those of the tomb of Ramesses IV.

though it is probable that such drawings of tomb plans are records of the progress of work following inspections.²² Whatever other land maps might be found, this careful plan of the tomb of Ramesses IV suggests that the Egyptian draftsman, familiar though he was with the use of a strict canon of proportion in the drawing, for instance, of the human figure, did not attempt to convey distance by the deliberate use of scale, being content with a more or less accurate freehand drawing, with precise measurements, if required, written in.



FIG. 7.11. ARCHITECTURAL DRAWING FROM DĪR AL-BAĦRĪ. A shrine and an enclosure wall are shown on this fragment of pottery dating from the twelfth or thirteenth century B.C.

Size of the original: 9.5 × 9.8 cm. By permission of the Trustees of the British Museum, London (BM 41228).

Size of the original: 31.1 × 104.8 cm. By permission of the Soprintendenza per le Antichità Egizie, Turin.

A number of architectural drawings or working plans of buildings and houses are known. One, a sketch on a pottery fragment from Dīr al-Baĥrī, depicts a shrine and enclosure wall with measurements not to scale. It has a text that, if completely preserved, would have allowed the determination of the plan's orientation (fig. 7.11).²³ At present there are no maps of fields or properties known before the Ptolemaic period.²⁴ Fragments from Gebelein, with notations in Greek and demotic, come from a map of Pathyris and its environs, drawn up perhaps for official administrative purposes or as a

22. See the report of a scribe engaged upon drawing a plan, Černý, *A Community of Workmen*, 12 (note 14).

23. S. R. K. Glanville, "Working Plan for a Shrine," *Journal of Egyptian Archaeology* 16 (1930): 237–39. For house plans see, for example, Clarke and Engelbach, *Ancient Egyptian Masonry*, 51–52 (note 16), and Norman de Garis Davies, "An Architect's Plan from Thebes," *Journal of Egyptian Archaeology* 4 (1917): 194–99. Another example, from the vicinity of the tomb of Hepusonb, in Lydia Collins, "The Private Tombs of Thebes: Excavations by Sir Robert Mond, 1905 and 1906," *Journal of Egyptian Archaeology* 62 (1976): 18–40, esp. 36, is apparently one copied by Černý in the Cairo Museum. For an example from the Meroitic period (ca. 200 B.C.–A.D. 200) see Jean Jacquet, "Remarques sur l'architecture domestique à l'époque méroïtique: Documents recueillis sur les fouilles d'Ash-Shaukan," in *Aufsätze zum 70. Geburtstag von Herbert Ricke*, ed. Abdel Moneim Abubakr et al., *Beiträge zur Ägyptischen Bauforschung und Altertumskunde*, no. 12 (Wiesbaden: F. Steiner, 1971), 121–31, esp. 130 and pls. 19–20.

24. Sketches of fields are included among diagrams accompanying arithmetical problems concerning the calculation of areas of land, for example, in the Rhind Mathematical papyrus, copied ca. 1600 B.C., T. Eric Peet, *The Rhind Mathematical Papyrus* (Liverpool: University Press of Liverpool, 1923); A. B. Chace, *The Rhind Mathematical Papyrus*, 2 vols. (Oberlin, Ohio: Mathematical Association of America, 1927–29). W. W. Struve, *Mathematischer Papyrus des Staatlichen Museums der Schönen Künste in Moskau* (Berlin: J. Springer, 1930). Similar diagrams are found in demotic in Richard A. Parker, *Demotic Mathematical Papyri* (Providence: Brown University Press, 1972).

diagram of a plot of land forming the matter of some private transaction.²⁵ Little can be gleaned from it other than that the river or canal is shown in blue. Extensive archives from the region date from the second century to the earlier part of the first century B.C. Two earlier examples of diagrams accompanying memorandums are found among the papers concerned with the management of the large estate of Apollonius, who was head of the civil administration in the Faiyum under Ptolemy II. One, recovered from a cartonnage case of a mummy in the necropolis of Ghoran in the Faiyum, is dated 259 B.C. (fig. 7.12).²⁶ It shows a schematic plan of a plot intersected by canals and dikes. The orientation of the diagram is given in both Greek (the language of the memorandum) and demotic. The Greek text gives the west as the top of the diagram. In order to read the compass points as drafted by the demotic writer, however, the papyrus must be turned clockwise through 90 degrees so that south is at the top. The second diagram is to be found on another papyrus from the extensive archive of Zenon, who managed the estate on behalf of Apollonius. It shows the course of a canal and the position of a palisade between the house of a certain Artemidorus to the north and the temple of Poremannes to the south (fig. 7.13).²⁷ The palisade was designed to protect pigs and other animals against flooding.

Such diagrams are very rare, though a large number of private documents concerning the sale, lease, and mortgage of land and buildings survive from Greco-Roman Egypt. No sketch maps accompany public cadastral surveys. Two surveys from the pharaonic period, Papyrus Wilbour and Papyrus Reinhart, likewise lack sketches. Similarly, no map accompanies a "town register" of the west of Thebes between two named locations. This register, dating to the end of the Ramesside period and preserved on the verso of a papyrus concerned with the investigation of tomb robberies, is a list of 182 houses ordered from north to south, in some seven narrow columns of hieratic.²⁸ Given the importance of the assessment of land for taxation, and of the delimitation of boundaries in a country whose agricultural land is subject to annual flooding, we might expect that field maps would have existed.²⁹ Their absence might be explained as a matter of chance survival of papyrus or as part of the general lack of administrative documents before the Greco-Roman period. In light of the little evidence of the use of maps for administrative purposes, however, it is perhaps more likely that here, as in other aspects of their culture, the ancient Egyptians

25. Cairo, Egyptian Museum, Pap. dem. Cairo 31163, Wilhelm Spiegelberg, *Die demotischen Denkmäler*, 2 vols. (Leipzig: W. Druggulin, 1904–8), vol. 2, *Die demotischen Papyrus*, 261–63, pl. cv; Greek text, Friedrich Preisigke, *Sammelbuch griechischer Urkunden aus Ägypten* (Strasburg: K. J. Trübner, 1915), vol. 1, no. 4474.

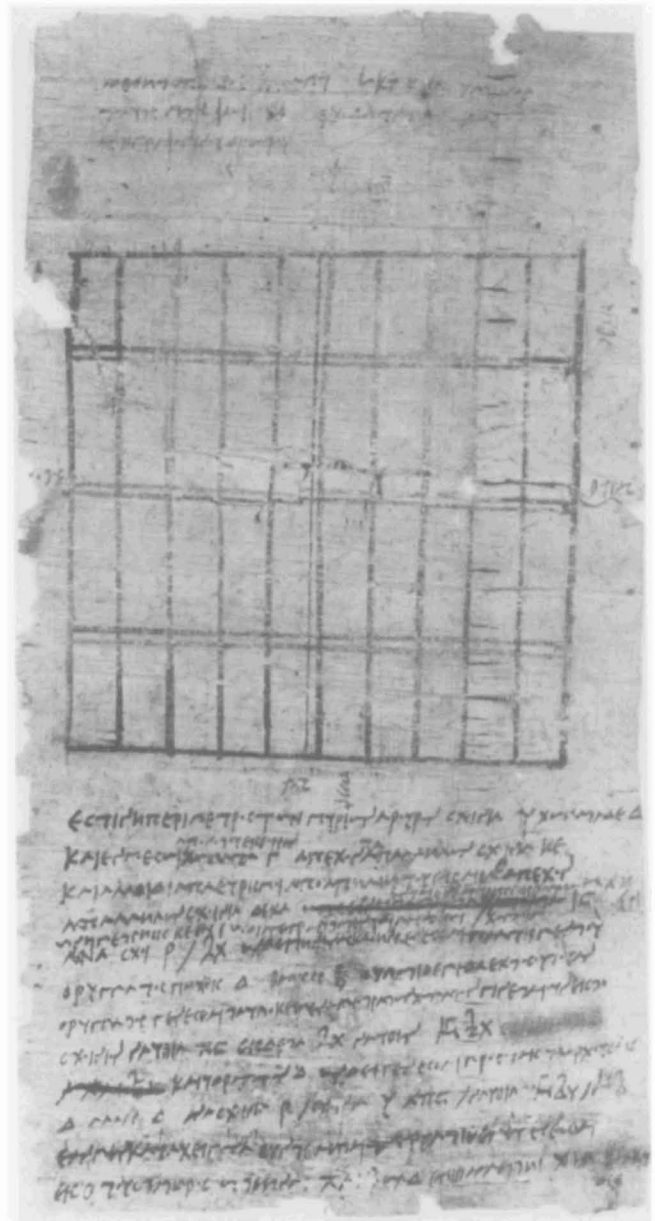


FIG. 7.12. SCHEMATIC PLAN OF DIKES AND CANALS IN THE FAIYUM. A papyrus document dated 259 B.C. from the estate of Apollonius, head of Ptolemy II's civil administration. Size of the papyrus: 61 × 31 cm. Institut de Papyrologie de la Sorbonne, Paris (Papyrus Lille 1). Photograph by Samie Guilbert.

26. Paris, Institut Papyrologique, Papyrus Lille 1, most recently edited with full commentary by P. W. Pestman, *Greek and Demotic Texts from the Zenon Archive*, *Papyrologica Lugduno-Batava* 20 (Leiden: E. J. Brill, 1980), 253–65 and pl. XXIX.

27. Campbell Cowan Edgar, *Zenon Papyri in the University of Michigan Collection*, *Michigan Papyri* vol. 1 (Ann Arbor: University of Michigan Press, 1931), 162 (no. 84) and pl. VI.

28. London, British Museum, Pap. BM 10068v; T. Eric Peet, *The Great Tomb-Robberies of the Twentieth Egyptian Dynasty* (Oxford: Clarendon Press, 1930), 83–87, 93 ff.

29. See note 16 above.

showed no great predilection for change or development once a certain level of achievement had been attained. Their principles of drawing incorporated all that was necessary for map drawing, and they possessed the means and the bureaucracy for measuring, calculating, and registering areas. Nevertheless, just as they were reluctant to adopt a system of full alphabetic writing long after such a system had been invented elsewhere, what might seem to us a natural progression in representation was not exploited further, given the circumstances of their agricultural life and economy. It was left to others to develop the potential of mapmaking.



FIG. 7.13. PLAN OF CANAL AND PALISADE. Associated with a memorandum to Zenon, Apollonius's estate manager (see fig. 7.12), this undated document was found at Philadelphia, Egypt.

Size of the papyrus: 25.5 × 22 cm. By permission of the Department of Rare Books and Special Collections, University of Michigan Library (P. Mich. Inv. 3110).

Should more material, from a wider range of dates, be discovered, we may well find that the achievement of the ancient Egyptians in the sphere of cartography was greater than the chance survival of our present material suggests. Such is the preserving quality of parts of Egypt that we may expect new documents relating to the civil administration of the country to come to light. This would certainly help in interpreting such major finds as the Turin papyrus of the gold mines. A definitive edition of both sections of this unique map is clearly a major desideratum.

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