

TITLE: *Turin Papyrus*

DATE: 1150 B.C.

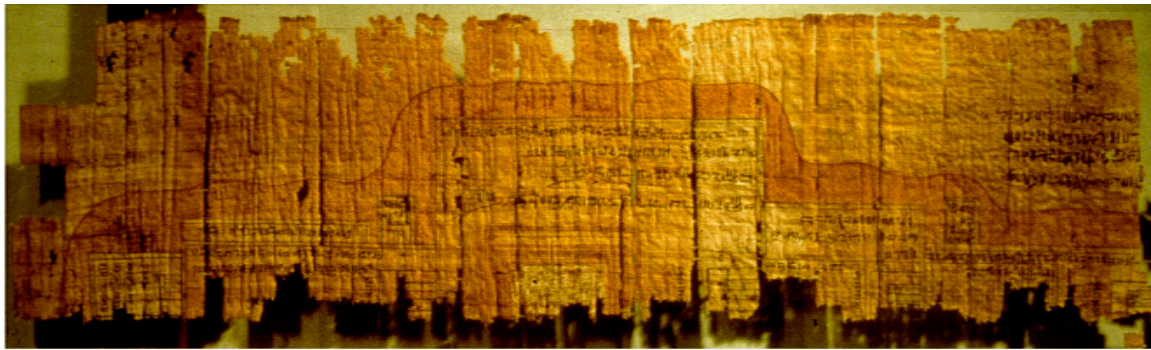
AUTHOR: *unknown*

DESCRIPTION: More than 3,000 years ago, a government official took a roll of papyrus and sketched out the features of a valley in the Eastern Desert with such detail and accuracy that the document is considered to be the earliest geologic map in history. In so far as ancient cartography is concerned, perhaps the greatest extant Egyptian artifact is represented by what is known as the *Turin Papyrus*, collected by agents of Bernardino Drovetti, the French Consul General in Egypt, between 1814 and 1821 and now preserved in the Egizio Museum of Turin, Italy. The map was made about 1150 B.C. by the well-known 'Scribe of the Tomb' Amennakhte, son of Ipuu. It was prepared for one of the quarrying expeditions sent to Wadi Hammamat by King Ramesses IV (1156-1150 B.C.) of the New Kingdom's 20th Dynasty. The purpose of these expeditions was to obtain blocks of bekhen-stone that would be carved into statues of the gods, king and other notables. A now famous rock-cut inscription or *stela* (officially designated CM 12) was left on the quarry wall by this king to commemorate his final and largest expedition during the third year of his six-year reign. According to the inscription, this included 8,362 men, which makes it the largest recorded quarrying expedition to Wadi Hammamat after one about 800 years earlier during the Middle Kingdom's 12th Dynasty. It is almost certainly for Ramesses IV's big expedition that the map was made, but what purpose it served is unclear. It could not have been a road map showing the way to the quarry because it only covers a small area with the 75 km between Wadi Hammamat and the Nile Valley excluded. The region is desolate—it is more than an hour's drive to the nearest settlement—but plenty of visitors have found their way here throughout history. Within a single square mile we could see ruins that span 30 centuries: an abandoned British mill from the 1930s, a Roman-age stone fort, the remains of a Ptolemaic mining settlement, and Egyptian stone tools that date to at least the 11th century B.C., during Egypt's New Kingdom. Most likely, the map was drawn as a visual record of the expedition to be viewed by either Ramesses IV or Ramessenakhte, the High Priest of Amun in Thebes, who organized the expedition for the king.

Although Amennakhte did not sign his name to the map, it is clear that he is its author. There are two pieces of evidence that support this identification. First, the text on the map side is in Amennakhte's distinctive handwriting, which is well known to Egyptologists who have studied his many other writings. And second, the first and earliest text on the backside of the papyrus was written and signed by Amennakhte. It is not at all surprising that Amennakhte would have made the map. As one of the two 'Scribes of the Tomb' during Ramesses IV's reign (along with Hori, son of Khons, who also wrote some of the later texts on the back), Amennakhte was an important administrative official in the Theban region and this is where the map (text 18) says the blocks of bekhen-stone were taken. He is well known from his many other surviving works to be an individual with an unusual combination of scribal, cartographic and artistic skills as well as a 'sense of geology'. These attributes are especially well displayed on another of his papyri in Turin's Egyptian Museum. Shown below is an architectural plan of Ramesses IV's tomb in the Valley of Kings. It is by far the most elaborate and sophisticated tomb plan to survive from ancient Egypt. It has Amennakhte's distinctive handwriting labeling the parts of the tomb and giving their dimensions, and on the back is his last will and testament. The plan also includes elements of geology, such as a drawing of the king's sarcophagus in the central burial

chamber painted to resemble the pink granite of Aswan from which it was carved, and the location of the tomb under a mountain of well-layered, inclined strata, which is an accurate depiction of the situation in the Valley of Kings.

It is now known that Drovetti obtained both the quarry map and tomb plan, along with many other papyri, from Amennakhte's family tomb at Deir el-Medina. If the map was made for Ramesses IV's big quarrying expedition then why did Amennakhte keep it, and why did he and others reuse its backside for documents and drawings unrelated to the map? The answer to the first question is unknown, but that to the second is clear. Because papyrus paper was an expensive commodity in ancient Egypt, it was common practice among scribes to use the originally blank backsides once whatever was written or drawn on the front side was no longer needed. In other words, the papyrus map became scrap paper after the quarrying expedition it recorded lost its importance, perhaps following Ramesses IV's death a few years after the map was made. The enormous expenditures of the Pharaohs and the priesthood were met principally by taxes on the land, payable usually in the form of grain crops. For purposes of such taxation, the land was carefully measured and registered, and the boundaries marked. There is reason to believe that this type of data was put down on maps. Centuries later, the Greek scientist Eratosthenes (#112) made use of these early Egyptian measurements in his treatises.



Ramesses IV's Tomb Plan drawn by Amennakhte, son of Ipuy. Turin's Egyptian Museum.

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 40 cm high, generally called the "map of the gold mines". 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 *wadi's* that form the natural routes across the eastern desert from the Nile to the Red Sea. Legends written in hieratic, the cursive hieroglyphic everyday hand of the time, explain where these routes to the left are leading. A broad, winding crossway *wadi* 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 washed: they are colored in red." The Egyptian term used here for red, *dsr*, 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 some 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 the 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", "water-place," 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 19th 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 "shrin", "resting place" or "abode" of "Amun of the Pure Mountain." There are also three small rectangular forms labeled "the houses of the gold working settlement."

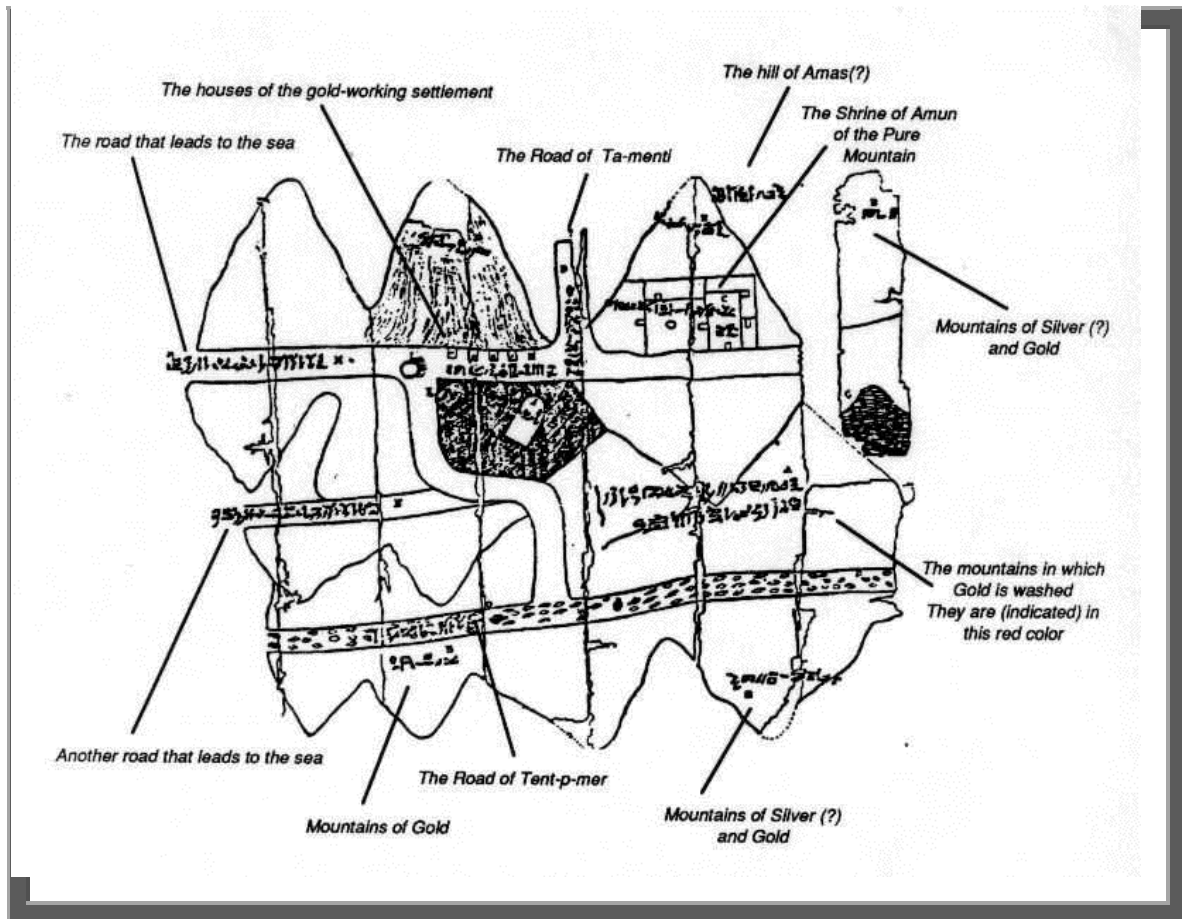


Papyrus fragment of a map of the gold mines, Twentieth Dynasty, Museo Egizio, Turin, Italy

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. 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 after-life 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 *Wadi al-Hammamat* 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* [Somaliland]. The central area, between *Bir Al-Hammamat* and *Bir Umm Fawakhir*, was visited as a source of ornamental stone and gold, and it is rich in rock tables, 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 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" areas of the main

part of *Wadi al-Hammamat*, with the gold mines of the region of *Bir Umm Fawakhir* 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 *Wadi al-Hammamat* and with the upper part of the papyrus constituting the North. 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 the Red Sea. It would likewise place the area of *bekhen* stone to the east of the location of the main quarry inscriptions in *Wadi al-Hammamat*.

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 statute. 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 *Wadi al-Hammamat* 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 of Thebes and subsequently taken, half-worked, to the Valley of the Kings in a regal year six. 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 statute of Ramesses IV of the 20th Dynasty, suggesting that year six should refer to the reign of that king.

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. 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 14th and 15th centuries.

In summary then, the orientation of this particular map places South at the top. The geographical content depicts three roads leading from unidentified Egyptian gold mines to the Red Sea. A prominent feature of the plan is what seems to be a winding *wadi*, or ravine, about the same width as the roads, in the mountains of Egypt's eastern desert between Qift on the Nile, down from Thebes, and Quseir on the Red Sea. The map was drawn in connection with a statue of a pharaoh that had never been completed. It is believed that this map also displays the gold-bearing basin to the east of *Coptos* (shown in pink on the original map) in the mountainous region of *Nubia* [part of modern Sudan] located at *Bir Umm Fawakhir* in the *Wadi Hammamat*. The scroll notes the locations of the mine and quarry, the gold and silver content of surrounding mountains and the destination of the roadways. The mapmaker has tried to show how the two

main east-west roads lie in valleys that are linked by a road that curves through a mountain pass. One of the roads runs from *Pelusium* to *Heroopolis*. On either side of the main roads the map outlines saw-tooth mountain ranges in an early attempt at rendering topographical detail. The nature of the country, the houses, buildings and entrances to galleries are also illustrated. The map is thought by some scholars to commemorate the triumphal return of Seti I from Syria (1366-1333 B.C.E.).

Two geologists from the University of Toledo in Ohio examined the map and recognized topographical features from the map, a roadway still in use and the mountains on both sides, shown as cones. The colors pink, brown, black and white were used to illustrate mountains and other features; however, the geologists James Harrell and Max Brown believe that these colors were not used for aesthetics, but that they “correspond with the actual appearance of the rocks making up the mountains”. One region’s sedimentary rocks, which range from purplish to dark gray and dark green, are mapped in black. Pink granite rocks correspond with the scroll’s pink and brown-streaked mountain. According to these geologists, this is probably one of the oldest surviving geological maps and the earliest evidence of geological thought. According to the geologist Harrell, “In order for it to be a geological map, it must show distribution of different rock types. Secondly, it should indicate the location of geological features like mountains and valleys. In both regards the scroll qualifies and reminds us of modern geological mapping.” The English surveyor William Smith is credited with initiating modern geologic mapmaking in 1815.

The following is an excerpt from an article by James A. Harrell, Ph.D., Professor of Geology Department of Environmental Sciences at the University of Toledo.

DISCOVERY AND RECONSTRUCTION OF THE MAP

An ancient Egyptian map drawn on a scroll of papyrus paper was discovered between 1814 and 1821 by agents of Bernardino Drovetti, the French Consul General in Egypt. The map came from a private tomb in the ancient village of Deir el-Medina, near the modern-day city of Luxor (ancient *Thebes*) in Egypt (**Figure 1**). This village housed the workers responsible for excavating and decorating the royal tombs of the Egyptian New Kingdom (1539-1075 BC) in the nearby Valley of Kings and Valley of Queens. Soon after it was found, the map was sold to king Charles Felix, ruler of the northern Italian Kingdom of Sardinia and Piedmont. In 1824, this king established the Egyptian Museum in Turin, the kingdom’s capital, and here the map has resided ever since. The many map fragments were originally considered parts of three separate papyri that were designated as *Papyrus* or *P. Turin* 1869, 1879 and 1899. Most of these fragments were eventually recombined to form a single map about 280 cm long by 41 cm wide (**Figure 2**).

The current reconstruction of the map in the Egyptian Museum, which dates to the early 1900’s, is incorrect in several of its details. A new arrangement of the map fragments has been proposed and this is shown in **Figures 3, 4, 5** and **6**. The principal changes are the transposition of map fragments **H-J** and **E**, the placement of **L** at the bottom of **E**, and the narrowing of gaps between many of the fragments (which shortens the map to about 210 cm). This new reconstruction is consistent with the requirements that: (1) the adjoining fragments should correlate closely in terms of the features drawn on the map side, the texts and drawings on the map’s backside (**Figures 7** and **8**), and the fiber patterns in the papyrus paper; (2) the width of the fragments and the spacing between the breaks within them should match for those fragments that are vertically

juxtaposed; and (3) the topography and geology of the area shown on the map should be taken into account. **Figures 3, 5, 6, 7 and 8** are computer-generated photo-mosaics derived from digital scans of photographs taken of the papyrus.

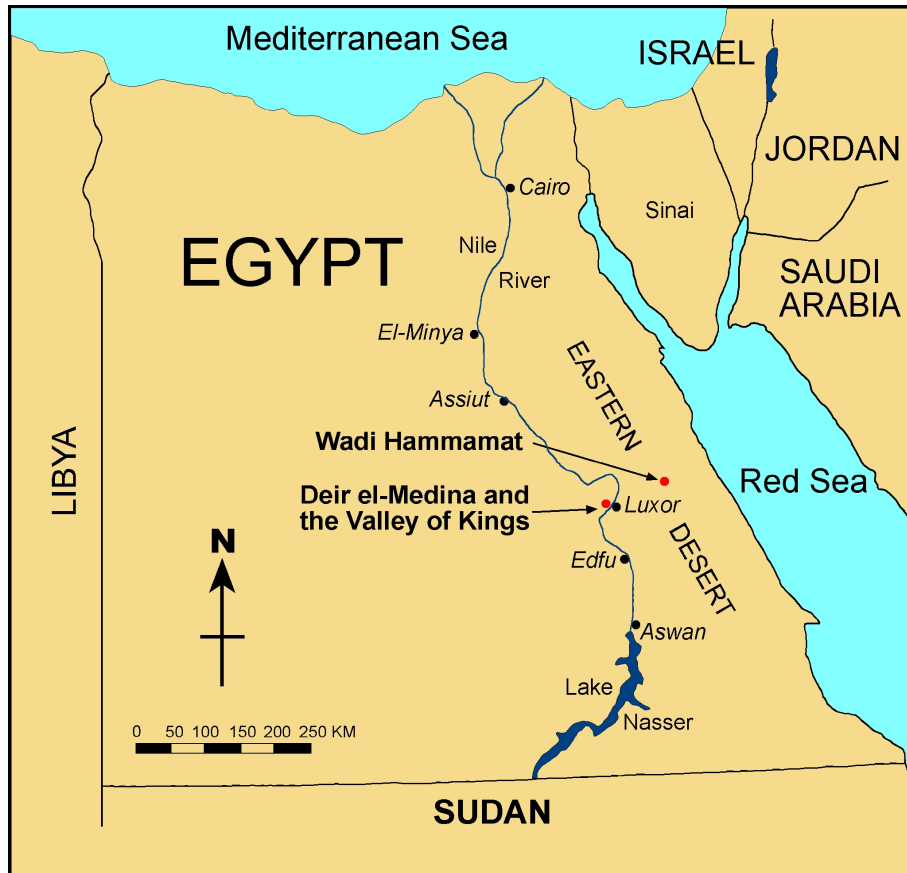


Figure 1. Map of Egypt showing the locations of Reir el-Medina, the Valley of Kings and Wadi Hammamat.

The map was rolled up when discovered and subsequently handled, and this explains the especially poor preservation of the rightmost portion in **Figure 3**, which formed the outer abraded surface of the scroll. An unknown amount of the papyrus has been lost at its right edge and so fragments **K** and **N-P** cannot be correctly placed. The map is not truncated here, but drawings of an unknown number of stone blocks and the accompanying texts are missing. The Egyptian Museum has many small map fragments that it left out of its reconstruction (and are also missing from **Figures 3-8**) and eventually these 'pieces of the puzzle' will be added to create a more complete map.

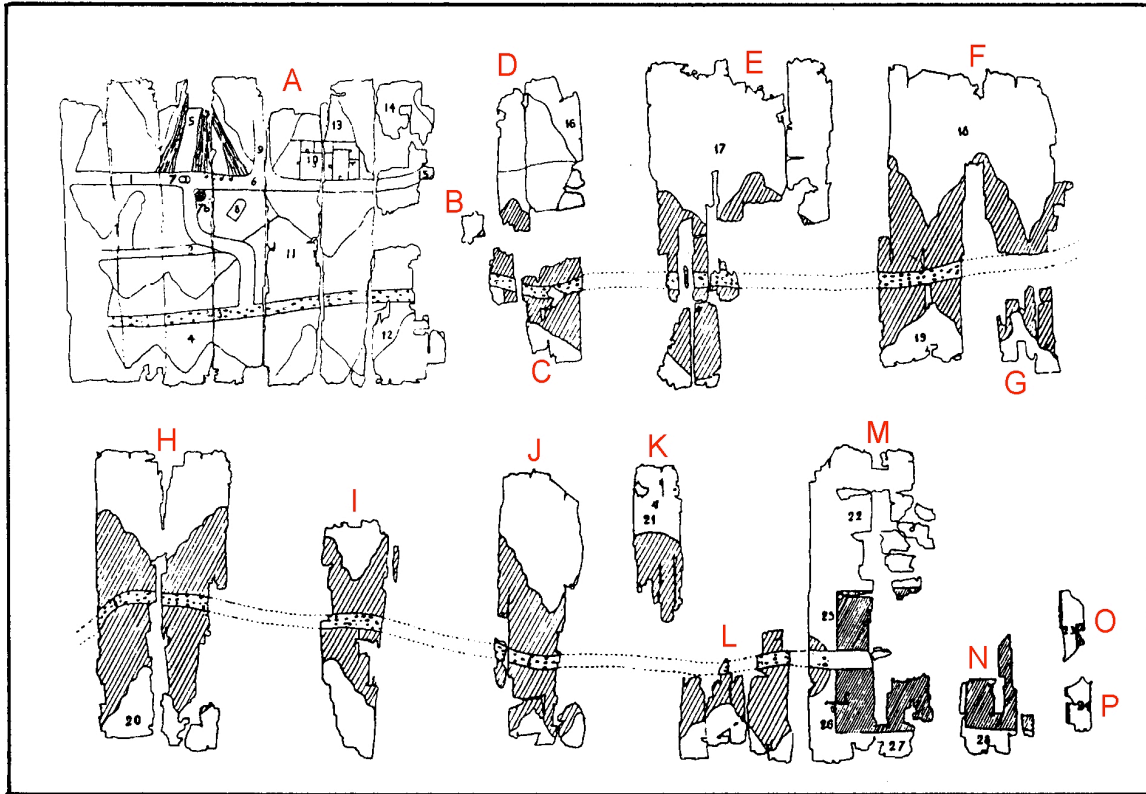


Figure 2. The arrangement of the papyrus map fragments as currently displayed in the Egyptian Museum in Turin, Italy. The texts are identified by numbers (as in Figure 4 and Table 1) and the fragments are identified by letters (as in Figures 4-8 and Table 3)

TOPOGRAPHIC AND GEOLOGIC CONTENT OF THE MAP

The Turin papyrus map is notable for being the only topographic map to survive from ancient Egypt and also for being one of the earliest maps in the world with real geographic content. Although there are a few older topographic maps from outside Egypt, they are all quite crude and rather abstract in comparison to the relatively modern-looking map drawn on the Turin papyrus. This map shows a 15 km stretch of *Wadi Hammamat* ('Valley of Many Baths') in the central part of Egypt's Eastern Desert (**Figure 1**). The top is oriented toward the south and the source of the Nile River with west on the right side and east to the left. There is no constant scale used on the map, but by comparison with the actual distances in *Wadi Hammamat* it is evident that the scale varies between 50 and 100 m for each 1 cm on the map.

From the good agreement between the modern maps of the area and the Turin Map, it can be seen that the papyrus clearly depicts *Wadi Hammamat's* long course and eventual confluence with wadis *Atalla* and *el-Sid*, the surrounding hills (shown as stylized conical forms with wavy flanks that are laid out flat on both sides of the valleys), the quarry for bekhen-stone, and the gold mine and settlement at *Bir Umm Fawakhir* ('Well of the Mother of Pottery'). *Bekhen*-stone (geologically, metagraywacke sandstone and siltstone) is a beautiful grayish-green ornamental stone that was highly prized by the ancient Egyptians. The only quarry was in *Wadi Hammamat*, and this was worked sporadically from the Early Dynastic period through Roman times (about 3000

BC to 400 AD). The gold mine at *Bir Umm Fawakhir* was active during the New Kingdom and again in the Ptolemaic through Early Byzantine periods (about 1500 BC to 600 AD).



Figure 3. The Turin papyrus map reconstructed by Harrell and Brown (1992)

Fragment **A** shows five cultural features associated with the gold-mining settlement, including: four houses, a temple dedicated to the God Amun (the large white area subdivided by walls), a monument stone honoring King Sety I (1290-1279 BC of the New Kingdom's 19th Dynasty), a water reservoir, and, at the confluence of wadis *Hammamat* and *el-Sid*, a water well with an encircling wall that casts a shadow on its right side. The brown patch of ground opposite the settlement may represent an area where either mine tailings were dumped or farming was practiced.

On map fragments **A** and **H**, within the main valley represented by multi-colored dots, there are three small drawings of trees, which from their form can be identified as Tamarisks. The tree on fragment **H** (**Figure 9**), which is drawn upside-down, is just opposite the *bekhen*-stone quarry (the green oval at the base of the brownish black hill) and at the center of the sharp bend in the valley. On the ancient map, this is the only major bend in *Wadi Hammamat* prior to its confluence with *Wadi Atalla*. As seen in **Figure 9**, however, *Wadi Hammamat* actually has many sharp bends as well as wide meanderings. Because the ancient map was drawn on a papyrus scroll, which would have resembled a modern roll of paper towels, the author did not have the freedom to show the true wandering course of *Wadi Hammamat* and so included only the most important bend, the one near the *bekhen*-stone quarry.

The papyrus map also has numerous annotations written in hieratic script (the cursive form of hieroglyphic writing) that identify the features shown on the map (see **Table 1** for translations), including: the destinations of the valley routes (texts 1-3, 9 and 16 on fragment **A**), the distance between the *bekhen*-stone quarry and gold mine (text 17 on fragment **E**), the location of gold deposits in the hills (texts 4-5, 11-12 and 16' on fragments **A** and **D**), the gold-mining settlement (texts 6-8 and 10 on fragment **A**), the *bekhen*-stone quarry (text 20 on fragment **H**), and the sizes of the quarried *bekhen*-stone blocks (texts 23 and 25-28 on fragments **M-P**). Text 18 on fragment **F** is especially important for understanding the purpose of the map because it refers to a *bekhen*-stone quarrying expedition and the destination of the quarried blocks.



Figure 9. Detail of the papyrus map (fragment H) showing an upside down tree in the wadi directly opposite from the bekhen-stone quarry, which is shown as a greenish oval embedded within the brownish black hillside.

Besides being a topographic map of surprisingly modern aspect, the Turin papyrus is also a geologic map because it accurately shows the geographic distribution of different rock types (the black hills with Hammamat siliciclastics, and the pink hills with Dokhan volcanics, Atalla serpentinite and Fawakhir granite) and the lithologically diverse wadi gravel (the brown, green and white dots within the main valley that represent different kinds of rocks), and it also contains information on quarrying and mining (see **Table 2** for a description of the geologic units). Additionally notable are the representation of iron-stained, gold-bearing quartz veins with three radiating bands on the pink hill above the gold-mining settlement on fragment **A** (beneath text 5), and text 11 on fragment **A**, which reads very much like a legend on modern geologic maps by explaining what the pink coloring represents. The Turin papyrus is the oldest known geologic map in the world and it is all the more remarkable considering that it would be another 2900 years before the next geologic map was made and this was in France during the mid-1700's. There is no reason to think, however, that the ancient author intentionally set out to make a geologic map. From the colors used for the hills and wadi gravel, it is evident that he merely drew what he literally saw in the desert – the real hills and surface gravels have the same general colors as those on the map (**Table 2**).

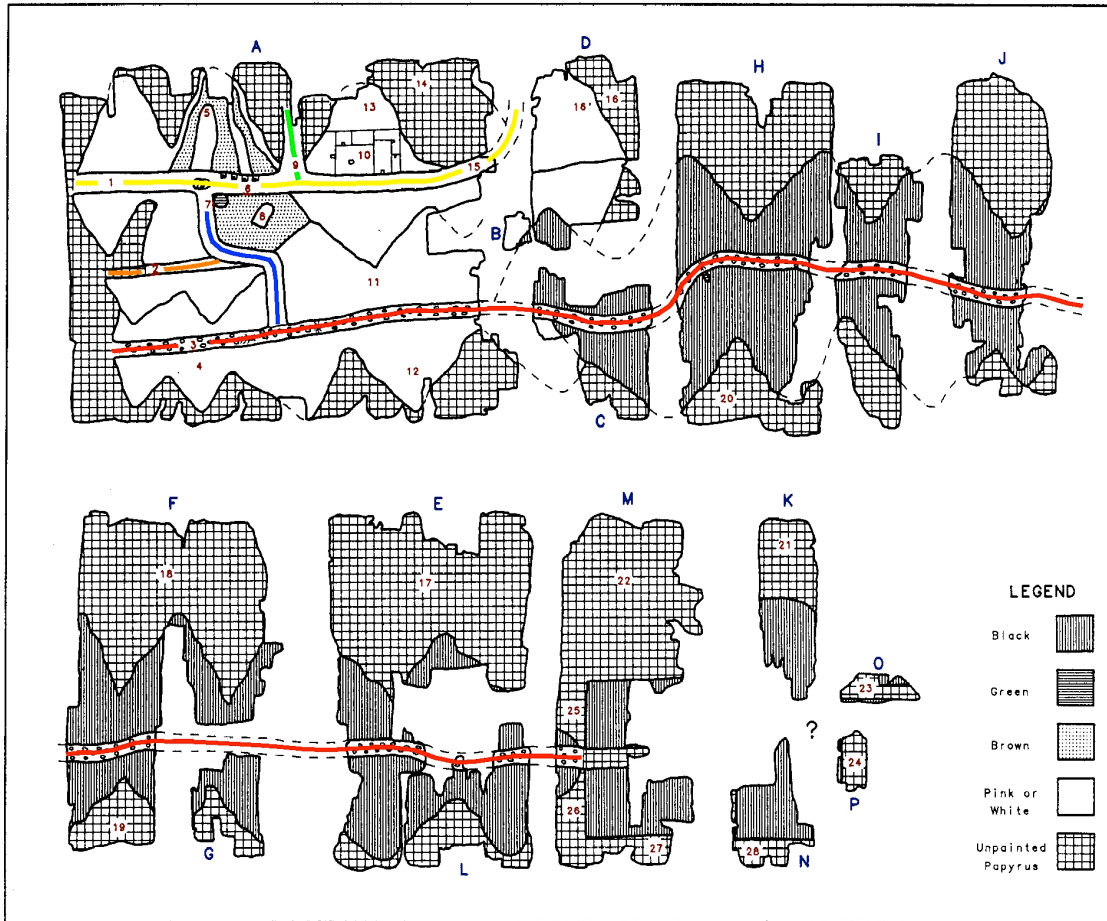


Figure 4. Schematic of the papyrus map showing the reconstruction by Harrell and Brown in Figure 3. The numbers refer to texts and the letters to map fragments as in Figure 2. Corresponding features on this map and the modern are indicated by the colored lines.

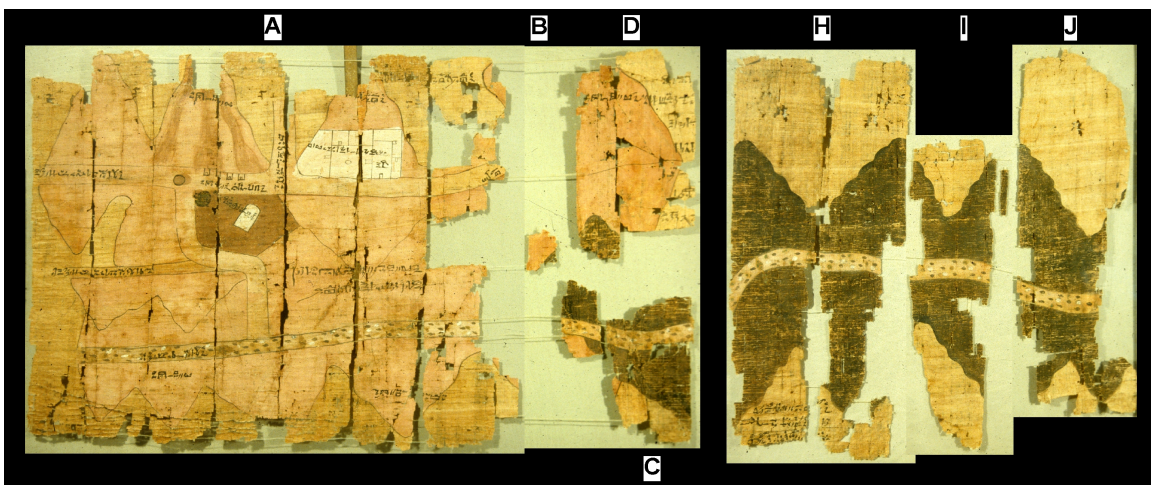


Figure 5. The left (eastern) half of the papyrus map. See Table 1 for translations (as numbered in Figures 2 and 4).



Figure 6. The right (western) half of the papyrus map.
See Table 1 for translations of the texts (as numbered in Figures 2 and 4).



Figure 7. The backside of the left (eastern) half of the papyrus map



Figure 8. The backside of the right western) half of the papyrus map

James Harrell, an archaeological geologist who is now retired from the University of Toledo, says that there are no known contemporary equivalents to the *Turin papyrus*. It's likely that other maps were made during pharaonic times, but such documents typically were not placed in tombs, and papyrus rarely survives for millennia. Other ancient cultures didn't seem to produce diagrams with such a level of detail. In fact, the next known geologic map appears in the historical record about 29 centuries after the *Turin papyrus*.

"It wasn't until the mid-1700s that the science of geology had evolved to the point where people thought of doing a spatial representation of the geologic world," Harrell said. In 1989, Harrell studied the Turin map closely and became the first person to confirm that it features *Wadi Hammamat*. He took a copy to Egypt, drove to the *wadi*, and hiked for 10 miles (16 kilometers) under the fierce sun. Along the way, he realized that the colors of the local rock—the sort of details that jump out at a geologist—can still be recognized on the papyrus. "It shows a very strong sensitivity to the geology in the choice of colors for the rock, and also in the little colored spots that represent the gravel on the *wadi* floor," Harrell said. "These are shown in brown and white and green, and those are actually the colors, more or less, of the actual gravel."

"It has annotations that say things like 'hills where gold is found' or 'hills of gold and silver,'" Harrell said. The Turin museum contains another papyrus on which Amennakhte, with the same keen eye for geologic detail, sketched a diagram of the underground tomb of Ramses IV, in the Valley of the Kings.

**Table 1: Translations of the hieratic texts
on the map side of the Turin papyrus**
(adapted from Harrell and Brown 1992: Table 1)

Text Number	Translation
1	the road that leads to the sea
2	another road that leads to the sea
3	the road of <i>Tent-p-mer</i> [the translation of the last word is uncertain – it may be the name of an unknown locality or it may mean ‘treasurer’ or ‘harbor’]
4	mountains of gold
5	mountains of gold
6	the houses of the gold-working settlement
7	cistern [or ‘water reservoir’; the text is written on top of the water sign]
8	stela of <i>Menma’atre</i> , life, health and prosperity! [King Sety I, 1290-1279 BC, of the New Kingdom’s 19 th Dynasty] ²
9	the road of <i>Ta-menti</i> [the last word is apparently the name of an unknown locality]
10	the shrine of <i>Amun</i> of the pure mountain
11	the mountains in which gold is worked, they are colored pink
12	mountains of gold and silver [or perhaps ‘mountains of electrum’, where electrum is a natural mixture of gold and silver]
13	...the hill of <i>Amun</i>
14	the hill where <i>Amun</i> rests
15	[not translatable; appears to be part of a name for some locality]
16	[too fragmentary to translate, but it appears to be comments on travel from one unnamed locality to another; a travel time of ‘one day’ and ‘gold’ are mentioned] 16’ mountains of gold [appears to be a continuation of 16 but is a separate text]
17	distance from the gold-working settlement to the mountain of <i>bekheny</i> ,... <i>khet</i> [this text is repeated three times, apparently for emphasis; the distance in units of <i>khet</i> is missing] ^{3,4}
18	...the <i>bekheny</i> -stone that is found in the mountain of <i>bekheny</i> , the king...[name lost] life, health, prosperity, having sent the great magistrates to bring the portrait statue of <i>bekheny</i> -stone...to Egypt. They deposited it in the Place of Truth beside the Temple of <i>Userma’atre setepenre</i> , the great God [i.e., near the Valley of Kings at the mortuary temple of Ramesses II, 1279-1213 BC, of the New Kingdom’s 19 th Dynasty; also known as the Ramesseum]...left it at the enclosure of the Tomb and there it lay being half worked in year 6 ³
19	[not translatable]
20	the place in which they work in the great business of <i>bekhen</i> -stone which was established as a quarry
21	the measurement of this...
22	[not translatable]
23	...of stone that is pulled by men from the east...3 cubits wide [about 1.6 m] ⁴
24	... <i>bekheny</i> ...

- 25 breadth of 2 cubits, 2 palms [about 1.2 m]; thickness of 2 cubits, 3 palms...fingers [about 1.3 m]
26 breadth of 2 cubits [about 1.0 m]; thickness of 2 cubits
27 ...palms...fingers
28 ...palms; thickness of 2 cubits...palms

1. See Figures 2 or 4 for locations of texts. Note that “...” indicates missing text, untranslated ancient Egyptian words are italicized, and comments are given within brackets.

2. All dates in this article are taken from p. 36-37 of Baines and Malek (2000).

3. Texts 17 and 18 are written in a script that is bold, calligraphic and near-hieroglyphic in style. All other texts are written in a less elaborate hieratic script.

4. The ancient Egyptian units of measure are as follows: 1 *khet* = 100 cubits; 1 cubit (the standardized distance from the elbow to the tip of the longest finger) = 7 palms (palm widths) = 28 fingers (finger widths); 1 cubit = 52.31 cm, 1 palm = 7.47 cm, 1 finger = 1.87 cm.

**Table 2: Comments on the hieratic texts and drawings
on the backside of the Turin papyrus map**
(adapted from Harrell and Brown 1992: Table 3)

Map Fragment ¹	Comments
A (across top)	Synopsis: Amennakhte, in his house one morning, bears witness to a sworn oath and statement (not recorded in the text) by a 'citizen' (name lost). Signed by Scribe of the Tomb Amennakhte (date lost). [this is almost certainly the earliest text written on the backside because Egyptian scribes filled in scrolls from top to bottom and right to left]
A (left half & top of right half)	Synopsis: A wooden statue of Ramesses VI is to be carved, and ornamented with a kilt of gold, and a crown of lapis lazuli (and another mineral?). It is to be placed in the mortuary temple of Ramesses II (the Ramesseum) in the Chapel of Hathor for the purpose of establishing a cult for the worship of Ramesses VI. The required offerings on festival days and the duties of the temple personnel attached to this cult are also described. [unsigned and undated, but Amennakhte's handwriting]
A (the rest of the right half) ²	Synopsis, Part 1: Hori went to Karnak Temple in Thebes at the summons of Ramessenakhte, the High Priest of Amun. There he was told to gather a large quantity of copper [which would have been used for the tools wielded by the workers excavating the royal and private tombs] and bring them to the Temple. Hori returned to the necropolis in the company of two Guards of the Treasury, Paynodjom and Amenmose son of Tjewenany, and the servant Pnekhemope. Dated year 6, 3 rd month of Akhet, day 20. Synopsis, Part 2: Hori returned to Karnak Temple in the company of Paynodjom and Amenmose plus the two Foremen of the Tomb, Nekhemmut (Hori's brother) and Anherkhe. They met with Ramessenakhte and turned over the requested copper to the Scribe Khonsmose, who received it for the Treasury of Amun. Dated year 6, 4 th month of Akhet, day 7. Signed by Scribe of the Tomb Hori, son of Khons.
A (upper right edge), B & D	[untranslated, but possibly Hori's handwriting]
A (lower right corner) & C	[untranslated, but the handwriting is that of either Amennakhte or another, unknown scribe]
D (right edge & upper part of left edge)	[untranslated, but the handwriting is that of either Hori or another, unknown scribe]

H (right half), I & J	[untranslated, but appears to be a list, possibly of statues and their associated festival days; the large, bold, calligraphic and near-hieroglyphic script in this text is like that in texts 17 and 18 on the map side, and probably is Amennakhte's handwriting in his more formal script]
J (upper right edge), F (upper two-thirds of left half)	[untranslated, but appears to be a memorandum plus a hymn, possibly to Horus, that is in Amennakhte's handwriting]
F (lower one-third of left half)	[untranslated, but the handwriting may be that of Amennakhte or another, unknown scribe]
F (right half)	[untranslated, but Amennakhte's handwriting]
G	[untranslated, but Amennakhte's handwriting]
E	[untranslated, but possibly Hori's handwriting]
extending across the bottom edge of A, C, H, I, J, F, G, E, L & M	[untranslated, but one long line of text in possibly Hori's handwriting]
L & M (lower right)	drawing showing a scattering of squarish pebbles (?) edge) plus two curved parallel lines, the latter similar to those used to indicate wadis on the map side
M	a grid-square in red ink with fragmentary drawings of the sky goddess Nut, and below, the god of air and light, Shu, or perhaps the god of earth, Geb; a tiny stick-man is standing on Nut's back
M (top)	drawing of a crocodile
N	fragmentary drawings of a tree trunk (palm?) and a wing (either the vulture goddess Nekbet or the falcon god Horus)

1 See Figures 7 and 8 for locations of map fragments. Fragments K, O and P have no texts or drawings.

2 The gist of these two texts has been revised from Harrell and Brown (1992: Table 3) based on a new translation by Janssen (1994).

LOCATION: Egizio Museum, Turin, Italy

REFERENCES:

- *Bagrow, L., *The History of Cartography*, p. 32.
- *Baines, J. and J. Malek, *Cultural Atlas of Ancient Egypt*.
- *Ball, *Egypt in the Classical Geographers*.
- Bierbrier, M. L., *The Tomb-Builders of the Pharaohs*.
- *Bricker, C., *Landmarks in Mapmaking*, p. 147.
- *Brown, L., *The Story of Maps*, p. 33.
- Carter, H. and A. H. Gardiner, "The tomb of Ramesses IV and the Turin plan of a royal tomb," *Journal of Egyptian Archaeology* 4 (1917): 130-158.
- Christophe, L., "La stèle de l'an III de Ramsès IV au Ouâdi Hammâmât (No. 12)." *Bulletin de l'Institut Français d'Archéologie Orientale* 48 (1948): 1-38.
- Černý, J., *A Community of Workmen at Thebes in the Ramesside Period*.
- *Dilke, O.A.W., *Greek and Roman Maps*, pp. 14-15.
- Gardiner, A. H., "The map of the gold mines in a Ramesside papyrus at Turin." *Cairo Scientific Journal* 8 (1914): 41-46.
- Goyon, G. "Le papyrus de Turin: dit des mines d'or et le Wadi Hammamat." *Annals du Service des Antiquités de l'Égypte* 49 (1949): 337-392.
- *Harley, J.B., *The History of Cartography, Volume One*, pp. 117, 121-125.
- Harrell, J. A. and V. M. Brown, "The oldest surviving topographical map from ancient Egypt (Turin Papyri 1879, 1899 and 1969)," *Journal of the American Research Center in Egypt* 29 (1992): 81-105.
- *Harwood, J., *To the ends of the Earth, 100 Maps that changed the world*, pp. 17-18.
- Janssen, J. J., "An exceptional event at Deir El-Medina (P. Turin 1879, verso II)," *Journal of the American Research Center in Egypt* 31 (1994): 91-97.
- Millard, A. R., "Cartography in the ancient Near East." *The History of Cartography. Volume 1: Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean*, pp. 107-116.
- Peden, A. J., *The Reign of Ramesses IV*.
- *Raisz, E., *General Cartography*, p. 6.
- Romer, J., *Ancient Lives: The Story of the Pharaoh's Tomb Makers*.
- *Scamuzzi, E., *Egyptian Art in the Egyptian Museum of Turin*.
- *Shore, A. F., "Egyptian cartography." *The History of Cartography. Volume 1: Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean*, pp. 117-129.
- * Talbert, R.J.A., David O'Connor, *Ancient Perspectives*, 2012, pp. 59-66.

*illustrated

