

EGYPTIAN CUBIT RODS

By Nora E. Scott

Junior Research Fellow, Department of Egyptian Art

A group of Egyptian antiquities which has never been satisfactorily published is that of the "ceremonial cubit rods." This is not the time for a thorough study as it is impossible to obtain photographs and information from the museums in which most of these rods are to be found. But it may not be out of place to add two fragments¹ to those already known in the hope that it may eventually help to explain their exceedingly interesting and puzzling inscriptions.

The cubit was the standard linear measure in Egypt, as in the rest of the ancient Near East. The Egyptians, however, used cubits of two lengths. The *short cubit* of six palms, or 45 cm. ($17\frac{3}{4}$ in.), just about the length of the forearm from elbow to finger tips, was almost the same as that of the Romans, the Greeks, and the Hebrews; this cubit was employed chiefly in the measurement of monuments. The *royal cubit* contained seven palms and was approximately 52.3 cm. ($20\frac{9}{16}$ in.) long. This was the cubit in general use.

In addition to these official measures every Egyptian community had its local standards. The overseer expected his workmen to complete so many lengths of his own staff or palette, or counted the results of their labors with an odd stick marked off into sections. Short measurements could be taken in *small spans* (thumb to forefinger) or *great spans* (thumb to little finger); and although *spans* and *fists* and *shoulders* found a place in the national standard, we may be sure that the villager of the time of the pharaohs used his own hand and

arm rather than any official measuring rod, just as his descendant does today. The observation made by William Lane² 120 years ago must have been equally true in ancient times: "Of the measures and weights used in Egypt I am not able to give an exact account; for, after diligent search, I have not succeeded in finding any two specimens of the same denomination perfectly agreeing with each other."

A certain number of cubit rods in what was evidently the official form have come down to us. The most striking example of this standard cubit is the one from the tomb of the architect Kha^c now in the Museum of Turin.³ Its material—wood overlaid with gold—is unique, but in other respects it may be taken as typical of the rods designed for real use. It is rectangular in section, but the upper half of the front face is beveled. Along the lower (vertical) half of this face the rod is marked off into seven palms. Each of these palms contains four fingers, but only the first sixteen fingers are indicated.⁴ Along the lowest edge of this face the first finger is divided into halves, the second into thirds, and so on to the fifteenth, which is divided into sixteenths⁵; a sixteenth of a finger was evidently the smallest fraction of the cubit in common use. In spaces above the subdivisions are written the symbols for the appropriate fractions—(*one*) *half*, *third*, *quarter*, and so on.

The beveled face is inscribed with the names of the larger divisions of the cubit. The first three fingers are labeled, over the fourth is

¹ Acc. no. 25.7.41, green slate, l. $3\frac{1}{8}$ in., w. $1\frac{5}{8}$ in., h. $\frac{9}{16}$ in., gift of Dr. and Mrs. Thomas Foulds; and acc. no. 41.160.102, chert, l. $1\frac{3}{16}$ in., w. $2\frac{1}{16}$ in., h. $1\frac{5}{16}$ in., bequest of W. Gedney Beatty.

² *The Manners and Customs of the Modern Egyptians* (London, 1871), vol. II, p. 325.

³ [E. Schiaparelli], *Relazione sui lavori della missione archeologica italiana in Egitto (anni 1903-1920)*, vol. II: *La tomba intatta dell'architetto Cha* (Turin, n.d.).

⁴ On most of the "ceremonial" rods, described below, all 28 fingers are indicated, at least on the top and on the bevel, where each has its individual inscription.

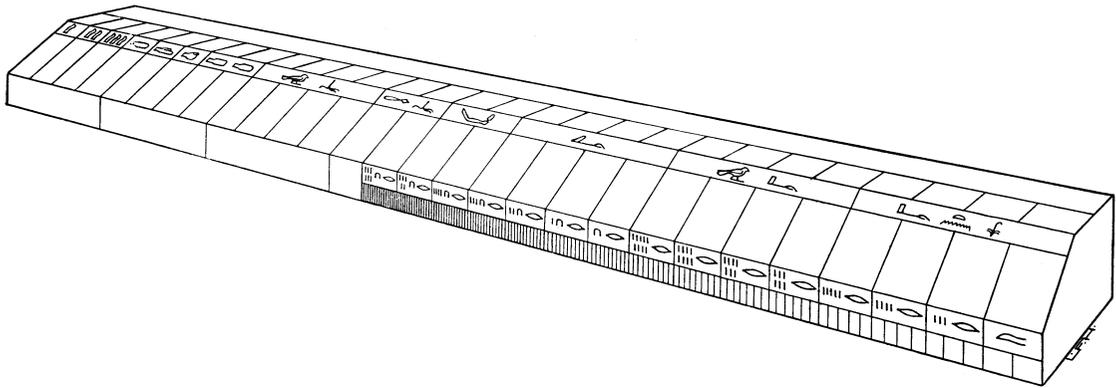
⁵ Beginning at the left end of this rod; in every other case these subdivisions begin at the right. The 6th finger of the Museum's fragment acc. no. 25.7.41 (see p. 72) is divided into sevenths which are wrongly labeled *eighth*.

EGYPTIAN CUBIT RODS

written *palm* (a hand without the thumb), over the fifth is *hand*, over the sixth is *fist* (a clenched hand with the thumb extended), over the eighth is *two palms*. The twelfth finger is the *small span* and the fourteenth is the *great span*. Another division, which suggests the length of the forearm from elbow to wrist, falls at the end of the fourth palm. Next comes the *rmn*, the upper arm or shoulder, five palms long; and over the sixth and seventh palms respectively are written (*short*) *cubit* and *royal cubit*. The other surfaces of this rod carry in-

sions, as befitted a present from the king). But most of the inscribed rods which have been preserved bear dedicatory texts, and as in the majority of cases the material is stone, unsuitable for an implement which was to be carried around, they have been given the name "ceremonial."

The twenty-six ceremonial cubit rods, and fragments of rods, to which we have reference fall into four classes according to the multiplicity of their inscriptions. The first⁶ seems to have no inscriptions other than dedicatory



A RECONSTRUCTION OF A CEREMONIAL CUBIT ROD, SHOWING THE DIVISIONS WITH THEIR NAMES.
LENGTH 52.3 CM.

scriptions dealing with exploits of Amen-hotep II, who had probably presented it to Kha^c. This rod bears a certain resemblance to a modern ruler, and very possibly it was really used by its architect-owner (on very special occa-

texts. On the second⁷ these texts accompany indications of the divisions of the cubit. The third⁸ and fourth⁹ classes are similar as regards their upper surfaces, but the former bears dedicatory texts¹⁰ on the bases, whereas the in-

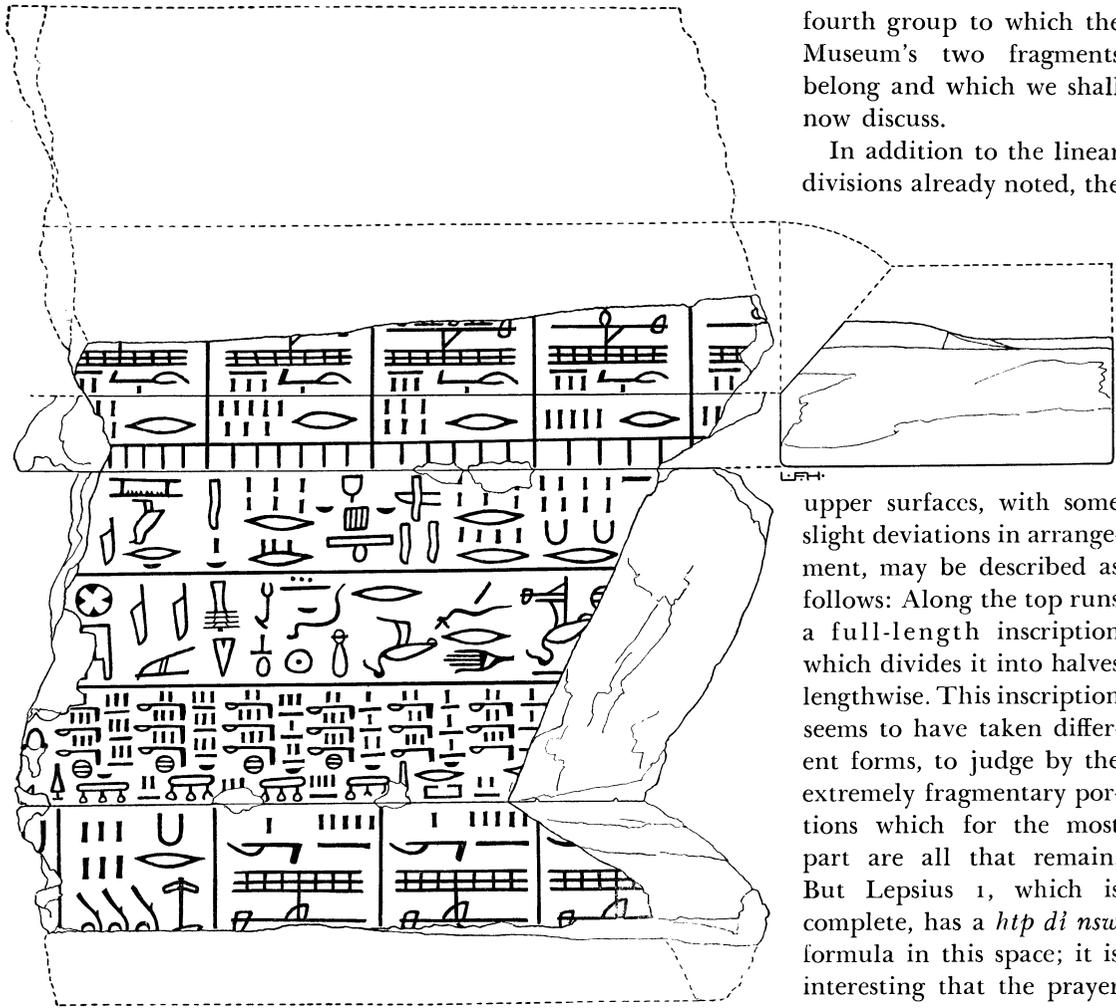
⁶ Petrie 4, see W. M. F. Petrie, *Ancient Weights and Measures* (London, 1926), pl. xxiv.

⁷ Lepsius 3, see R. Lepsius, *Die alt-ägyptische Elle* (Berlin, 1865), pl. II; Lepsius 4, *ibid.*, pl. III; Lepsius 6, *ibid.*, pls. III, V; Lepsius 6 bis, *ibid.*, pl. V; Lepsius 7, *ibid.*, pl. IV; Lepsius 8, *ibid.*, pl. IV; Lepsius 9, *ibid.*, pls. IV, V (text consisting only of name and title of owner); Lepsius 10 (?), *ibid.*, p. 17 (not reproduced); Legrain 1, see G. Legrain in *Annales du Service des Antiquités*, vol. XVI (1916), pp. 149 ff.

⁸ Lepsius 1, *ibid.*, pl. I; Lepsius 2, *ibid.*, pl. II; Lepsius 5 (?), *ibid.*, pl. III (inscription on base illegible); Lepsius 11, 12, *ibid.*, p. 17 (not reproduced; similar to Lepsius 2); Petrie 2 (?), *loc. cit.* (base apparently broken off); Petrie 3, *loc. cit.*; British Museum 36.656 (?), see British Museum, *A Guide to the Fourth, Fifth and Sixth Egyptian Rooms* (London, 1922), p. 207 (not reproduced).

⁹ Borchardt 1, see L. Borchardt, *Die alt-ägyptische Zeitmessung* (Berlin, 1920), pl. 11; Borchardt 2, *loc. cit.*; Borchardt 3, *loc. cit.* (inscriptions on base given by G. Daressy in *Recueil de travaux*, vol. XX [1898], p. 78); Borchardt 4, *loc. cit.* (inscriptions on all faces of this rod given by G. Roeder in *Ägyptische Inschriften aus den Königlichen Museen zu Berlin*, part 5 [1913], p. 310); one other in Cairo, mentioned by Borchardt, *op. cit.*, p. 14 (not reproduced); Petrie 1, *op. cit.*, pls. XXIV, XXVI; M.M.A. acc. no. 25.7.41; M.M.A. acc. no. 41.160.102.

¹⁰ One cannot help making a comparison between the shape in section of the rods and that of the small (model ?) sundials. It may not be a coincidence that the dedicatory inscriptions of the two types of instrument are strikingly similar, the donors in each case regularly desiring "a long time and a fine old age."



FRAGMENT OF A CEREMONIAL CUBIT ROD, CONSISTING OF PART OF THE THIRD, THE FOURTH, FIFTH, SIXTH, AND PART OF THE SEVENTH FINGER. THE TOP OF THE ROD IS MISSING. A LITTLE OVER ACTUAL SIZE.

ACC. NO. 25.7.41

scriptions on the bases of the latter, described below, are of quite a different character. The rods which comprise the first three groups may have been funerary furnishings. But the inscriptions of the fourth group contain such a bewildering amount of assorted information that "almanac" seems a better word than "cubit rod" by which to describe them, and they may have been part of the temple paraphernalia, rather than objects intended to be buried with private individuals. It is this

fourth group to which the Museum's two fragments belong and which we shall now discuss.

In addition to the linear divisions already noted, the

upper surfaces, with some slight deviations in arrangement, may be described as follows: Along the top runs a full-length inscription which divides it into halves lengthwise. This inscription seems to have taken different forms, to judge by the extremely fragmentary portions which for the most part are all that remain. But Lepsius 1, which is complete, has a *htp di nsw* formula in this space; it is interesting that the prayer is addressed to "all the gods and the Royal Cubit."

Each of the twenty-eight fingers of the cubit was sacred to a particular god,

and the names of these gods are written in the correct positions along the other half of the top. Moreover, the fingers were connected in some way with the nomes, and their names are inscribed on the bevel, with the twenty-two nomes of Upper Egypt in the first twenty-two digits, the first six of Lower Egypt appearing in the remaining spaces. This is of practical assistance to the modern scholar, as a fragment bearing the name of one of these twenty-eight nomes, or that of a god, or with a subdivided

EGYPTIAN CUBIT RODS

digit, can be placed in its correct position. The names of the remaining fourteen nomes are carried around to the back of the rod, but here the evidence of position is untrustworthy: sometimes the list recommences at the left end and sometimes at the right, and on one rod at least¹¹ the first digit is called the "House of the Royal Cubit," the seventh nome of Lower Egypt being in the second space. Under each nome-sign is a measurement given in cubits and palms. Nothing like a complete series is available at the moment; the measurements which we have vary from one cubit one palm to two cubits three palms.

The backs of the few rods which might give the remaining thirteen or fourteen fingers of the back complete have not been reproduced. The four fragments of these fingers which we know¹² show that some of the spaces were inscribed with numbers or measurements of astronomical proportions—at least to the ancient Egyptian—such as "a million cubits," "one million five hundred thousand cubits," with divisions of the *hk̄ṣt* measure, and with other apparently unrelated matters.

Only one rod,¹³ as far as we can tell, has an inscription on the end. This states that the cubit is "Life, Prosperity, and Health"—another indication of the deification of the measurement.

The base is divided into three horizontal registers, each filled with an inscription.¹⁴ The texts of these three lines are very corrupt. They must have been copied by scribes who understood them no better than we do. The

second line evidently contains the clue to the meaning of the other two. It seems to begin, "This is a communication for those who enter daily (?) into Mendes," and continues, "As Khnūm lives, as the sun goes down and that which is in heaven arises. . . ." Then come the name and titles of the reigning king; the line ends, "An instruction for those who are in this temple . . . [in] the writing of Tḥōt, . . . daily." It is probably the reference to the sun and "that which is in heaven" which links this register to the others, and to the measurements under the nome-signs.

The topmost register is divided into two parts. The first begins, "The hour according to the cubit," and apparently continues, "A *sḥ* jar¹⁵ of copper filled with water." It then goes on to give quantities according to the divisions of the *hk̄ṣt* measure—the ancient Egyptian way of computing volume. This, one would guess, has to do with the reading of a water clock, although the instructions do not suggest to us just how this was to be done.

The rest of the line—measurements in cubits and palms listed according to the months of the year—has been interpreted by Borchardt as possibly a table by which readings of a sundial might be interpreted. He suggests that the rod itself, placed vertically, was used as the gnomon, and that the length of its own shadow was measured. A number of points are not covered by this explanation, among them the fact that the readings are evidently to be taken three times a night. On the other hand, it is hard to imagine any lunar or sidereal

¹¹ Petrie 3.

¹² Petrie 1; Petrie 2; Lepsius 5; M.M.A. acc. no. 25.7.41; see illustration on p. 72.

¹³ M.M.A. acc. no. 41.160.102; see illustration on p. 74.

¹⁴ Borchardt 1, 2, and 3 together give us the full length of the first two of these texts. Borchardt 3, unfortunately, seems to have been left unfinished, and its third register has not been inscribed. The only evidence for the beginning of this text is to be found on M.M.A. acc. no. 41.160.102 (see ill. on page 74), which supplies the first 2½ fingers. Following this about 2½ fingers of the third register are missing, then comes Petrie 1, with fingers 6 to 8 of all three registers. Borchardt 1 begins at about the 8th finger and continues to the 21st. Borchardt 2 begins at the

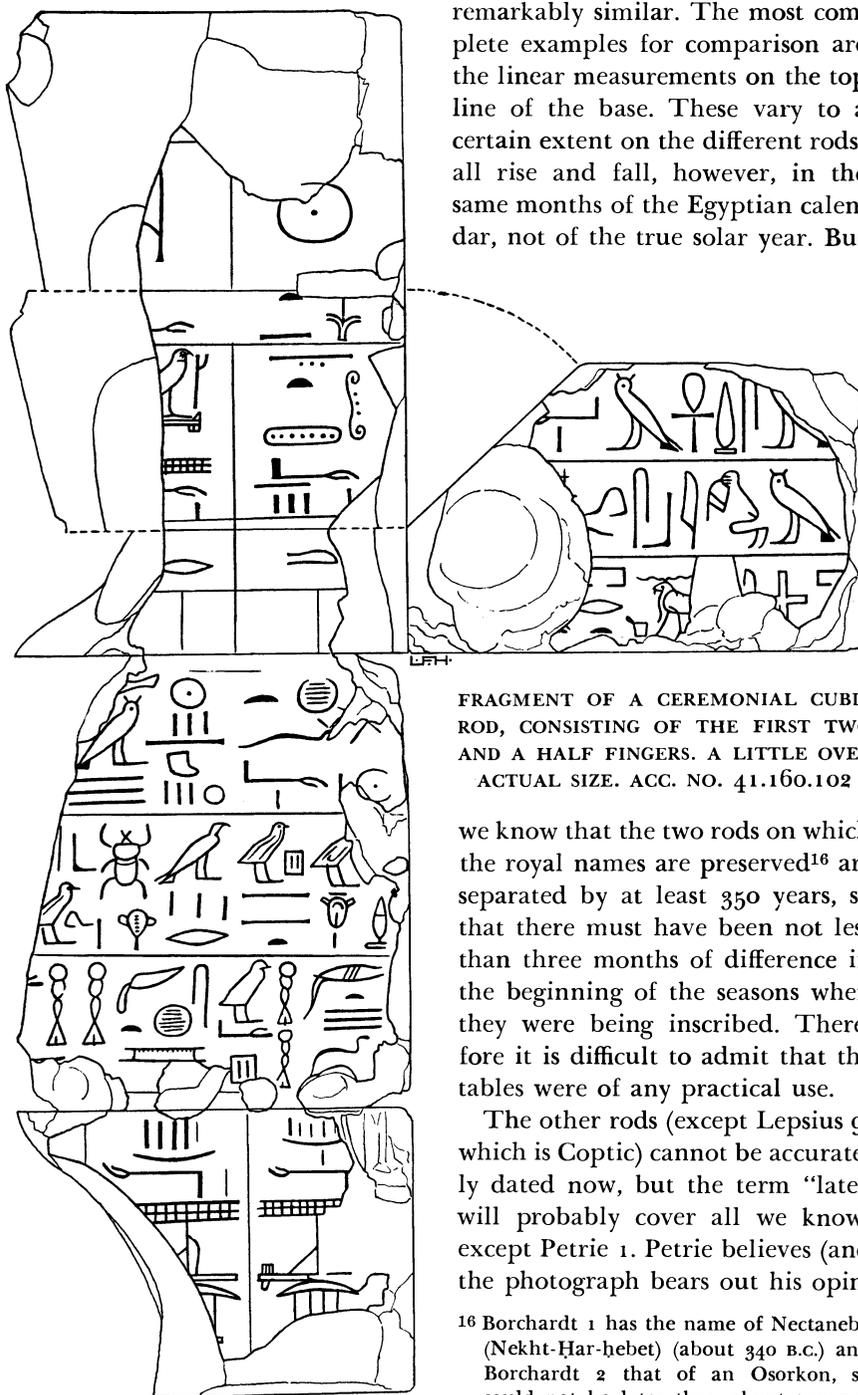
18th finger and continues to the end. Two other fragments supplement these texts, M.M.A. acc. no. 25.7.41 (ill. on opposite page) with the 22nd to 25th finger, and Borchardt 4, with the 24th to 27th. As Borchardt neither reproduces nor describes the upper surfaces of his nos. 1, 2, and 3, the estimates of their lengths in fingers given here are only approximate. And it is unfortunate that the photograph of Borchardt 1 is so unsatisfactory. Many of the signs can only be guessed at, and it would be pointless to try to reproduce it here. The photograph of Borchardt 3 is also poor, but this can be checked with the copy given by Daressy.

¹⁵ So Borchardt 3; is the *hrw* sign on M.M.A. acc. no. 41.160.102 a mistake for this?

movements which would be better suited to the measurements given on this table.

The bottom line, which commences with a reference to the inundation, consists of another series of measurements, this time in relation to certain towns. The measurements are given in cubits, palms, and fingers, and in *itrw*, a measure of about 4,000 cubits, roughly two kilometers, corresponding to the Greek *schoinos*.

We have now reviewed briefly the inscriptions which cover these ancient compendiums. If the tables of measurements concern any of the heavenly bodies—their movements or shadows—or the rise and fall of the Nile, they must be only an inheritance from a time when they had real meaning. The Egyptian year was a quarter of a day too short, hence the beginning of the inundation, which was supposed to mark a new year, really moved around the calendar. Now, the tables on all these rods are



remarkably similar. The most complete examples for comparison are the linear measurements on the top line of the base. These vary to a certain extent on the different rods; all rise and fall, however, in the same months of the Egyptian calendar, not of the true solar year. But

FRAGMENT OF A CEREMONIAL CUBIT ROD, CONSISTING OF THE FIRST TWO AND A HALF FINGERS. A LITTLE OVER ACTUAL SIZE. ACC. NO. 41.160.102

we know that the two rods on which the royal names are preserved¹⁶ are separated by at least 350 years, so that there must have been not less than three months of difference in the beginning of the seasons when they were being inscribed. Therefore it is difficult to admit that the tables were of any practical use.

The other rods (except Lepsius 9, which is Coptic) cannot be accurately dated now, but the term "late" will probably cover all we know, except Petrie 1. Petrie believes (and the photograph bears out his opin-

¹⁶ Borchardt 1 has the name of Nectanebo (Nekht-Ḥar-hebet) (about 340 B.C.) and Borchardt 2 that of an Osorkon, so could not be later than about 700 B.C.

It is true that Borchardt 1 is broken off before the table which we are discussing, but all three registers overlap enough to show that the inscriptions are virtually the same.

EGYPTIAN CUBIT RODS

ion) that this example is not later than the XII Dynasty; he would like to call it Old Kingdom. Even if this cannot be proved, we may infer that similar rods existed at an early period from the fact that Rē^c and not Amūn¹⁷ leads the procession of gods whose names are inscribed along the tops of the rods: the association between the cubit and the divine hierarchy must have been very ancient. And if we could prove with which (if any) astronomical events the tables deal, we should be able to work out at what date they agree with both the Egyptian calendar and the solar year: then we should know just when the prototype of all

¹⁷ Although a hymn to Amūn written on a papyrus of the early XIX Dynasty says: "His is the royal cubit which measureth the blocks of stone." (A. Erman, *The Literature of the Ancient Egyptians*, p. 296, English translation by A. M. Blackman [London, 1927]).
¹⁸ W.M.F. Petrie and F. Ll. Griffith, *Two Hieroglyphic Papyri from Tanis: II* (London, 1889).

the rods was made. As it happens we have tangible evidence of their existence during the IV Dynasty, that is, if an Egyptian who lived at about A.D. 100 was correct in his information.

One day this ancient savant had the opportunity of visiting a tomb which he believed to have been made during the reign of King Khufu. There, lying on the ground, he found a *cubit rod of Thōt*. It was covered with writings which he copied off onto a sheet of papyrus.¹⁸ This papyrus was rolled up and put away with other rolls; and one day the house it was in burned down. It was found in 1884 by Petrie—charred and damaged by dampness and broken by the weight of the rubbish on top. The fragments were arranged and mounted, and on them we can find many scraps of the information that appears on our rods; it is to be hoped that one day all may be compared and published together.