Notes on Egyptian Mummies

Author(s): A. Macalister

Source: *The Journal of the Anthropological Institute of Great Britain and Ireland*, Vol. 23 (1894), pp. 101-121

Published by: [Royal Anthropological Institute of Great Britain and Ireland](#)

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Accessed: 15/06/2014 06:31

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of the very greatest utility in encouraging all such workers to accumulate facts and to preserve such objects, as without their patient toil would probably be lost entirely to science.

Dr. GARSON remarked that he had had the opportunity of examining the cranium exhibited, and confirmed the various measurements of it which had been made by the author of the paper. From its low cephalic index it might be supposed that it belonged to the same race as the people whose remains are found in Long Barrows. It, however, possesses other characters which indicate that this is not the case, but that it belonged to a subsequent race which inhabited the country in what is termed the Romano-British times. This is in accordance with the archæological relics found with it. In future explorations in the same district it is very desirable that other parts of the skeleton should be preserved, especially the pelvis and limb bones, which are very important. The hob-nails which were found at the feet of this subject are exactly similar to some found with a skeleton at Woodcuts, by General Pitt-Rivers.

NOTES on EGYPTIAN MUMMIES. By A. MACALISTER, LL.D.,
D.Sc., M.D., F.R.S., President.

THE Cambridge Anatomical Museum contains a large series of Egyptian mummy heads, nearly five hundred of which have been obtained within the last few years through the kind assistance of Dr. Budge. These I have unwrapped with great care, and as I have also had the opportunity of unrolling five whole mummies, I have, whilst thus engaged, made notes on some points which supplement the accounts given by those authors who have written on the subject.

The literature of embalming is not very extensive; and most of the earlier references are abstracted in Pettigrew's work published in 1834.¹ The information in reference to the earlier stages of the operation obtained from Egyptian sources is scanty, the well-known and oft-quoted passage in Herodotus (ii, 86–88) still constitutes the chief fountain of the literary history of these early parts of the process. In regard to the later and more purely symbolical stages, our knowledge is much greater. Papyrus No. 3 of the Gizeh Museum² gives an elaborate description of this portion of the office, and papyrus 5158 of the Louvre, although it is, unfortunately, in a fragmentary condition, supplements this in several details. The several funeral

¹ "History of Egyptian Mummies," London, 1834.

² Maspero, "Mémoire sur quelques papyrus du Louvre," 1875, pp. 14–104.

rituals¹ which exist in several papyri, and in some tomb inscriptions, give additional information with reference to these later performances. There are, in addition to these, many references to parts of the ritual in monumental inscriptions.

In the present paper I intend only to treat of some points regarding the materials and methods used in embalming, which I have noted in the course of my unwrappings. I reserve my notes on the physical Anthropology of the Ancient Egyptians until I have completed my measurements and comparisons.

The mummies on which my observations have been made, according to the information obtained from the respective donors, are of different dates, but are chiefly of persons who lived in the times of the twelfth, nineteenth, and twenty-second dynasties, dating approximately from the twentieth to the eighth centuries before the Christian era. One belonged to the twenty-sixth dynasty, and two were of Ptolemaic age. They were mostly middle class folk, the class whom the explorer on the spot, to whom the wealth of more interesting remains is accessible, would naturally pass by without notice, but who are of interest to the anthropologist, as, in general, among all nations these are of less mixed blood than the classes of a higher or of a lower social grade. They were of all ages from twenty months up to edentulous old age, and consisted of individuals of both sexes.

The materials on which I have to remark are the linen of the bandages and the preserving materials; each has given a name to the mummy in the ancient language of Egypt. The body was called *kesir* "the wrapped up one," from its form and bandaged condition. It was also named *ab* "the pure one," from the belief that the spiritual parts were purified after death in the lower world just as the physical frame was preserved by the process of embalming.

As Pettigrew and others have noticed, the quantity of linen used in clothing the mummy was enormous. The bandages of one which I unrolled in Cambridge must have been nearly a kilometre in length, while those of another were over twelve kilogrammes in weight. In one neck I counted fifty-three layers of bandage superposed, and over one face thirty-five layers crossed at one spot.² The quantity used seems to have been in

¹ Schiaparelli, "Il Libro dei Funerali," 1882-1890. 3 vols.

² Greaves in his "Pyramidographia," 1646, writes, "there could not be lesse than a thousand els upon one body." See also "The Linen Trade," by A. J. Warden, 1864, p. 155. This work contains much curious information on the linen fabrics of antiquity.

some sort a measure of the affection of the relatives. In a papyrus in Leyden, a sorrowing husband, reproaching his wife for haunting him after her death, says to her:

"I have given clothes and bandages for thy burial. I have given to be made for thee many clothes."¹

I have microscopically examined very many pieces of this cloth from mummies of different periods, and I have found that in all cases it is pure linen. This point, indeed, has been set at rest by the microscopical researches of Bauer, as recorded by Thomson and Yates.² The last-named author has dealt exhaustively with the subject from the standpoint of classical literature, and has proved that the *σινδών βυσσίνη* of Herodotus, which was supposed, erroneously, by Rouelle and many others to be cotton,³ can be no other material than flaxen cloth. Not a trace of cotton fabric was found in any of the specimens which have come under my notice.

The texture of the linen which enwrapped these mummies is variable in strength and fineness, and justifies the somewhat extensive nomenclature of the different forms of the fabric which are so puzzling to the students of Egyptian texts. M. Rohault de Fleury⁴ published some years since a letter to M. Devéria, in which he tabulates the numerical constants of the linen taken from mummies in the Louvre, in terms of the weight of the square metre in grammes, the number of threads in the warp, and the number in the woof in each centimetre of length or breadth. I have made many similar observations, and have combined his results with mine in the following table, indicating my additions to the series by the letter M, those of his table being marked by F. In fabrics prepared by hand-spinning and hand-loom weaving one naturally expects a greater variety in the results than in the more uniform products of steam-power machinery; so it is probable that we have not exhausted in this table the varieties existing both in regard to the size of the yarn, and the closeness of texture:—

¹ Papyrus, i, 371. Transcribed in Maspero, "*Études Égyptiennes*," p. 155, and in "*Quelques Peintures*," p. 155.

² "*Philosophical Magazine*," 3rd Series, v, 1834, p. 355. Sir G. Wilkinson quotes this author as "*Thompson*," but does not give the reference.

Yates, "*Textrinum Antiquorum*," i, 254.

³ "*Mémoires de l'Académie Royale des Sciences*," 1750, p. 123.

⁴ "*Les Étoffes Égyptiennes*," "*Revue Archéologique*," N.S. 1870, p. 217.

No.	Warp.	Woof.	Weight.		No.	Warp.	Woof.	Weight.		No.	Warp.	Woof.	Weight.	
1	66	32	122	M.	8	32	17	109	F.	15	28	14	236	F.
2	62	32	42	F.	9	32	16	88	F.M.	16	28	12	390	F.
3	52	31	55	F.	10	30	20	76	F.M.	17	28	11	250	M.
4	46	20	88	F.	11	30	15	90	M.	18	28	10	..	M.
5	40	20	88	M.	12	30	14	153	F.M.	19	26	16	214	M.
6	40	17	200	F.M.	13	30	8	100	M.	20	24	22	..	M.
7	36	14	262	F.M.	14	28	16	171	F.	21	24	18	100	F.

No.	Warp.	Woof.	Weight.		No.	Warp.	Woof.	Weight.	
22	24	16	420	F.	29	20	10	166	F.
23	24	16	450	M.	30	20	9	343	F.
24	24	14	250	M.	31	16	8	375	F.
25	24	12	237	F.	32	14	14	276	M.
26	24	10	172	F.M.					
27	22	12	172	M.					
28	20	12	230	F.					

Almost all the specimens show that, as Thomson has described, the threads in the warp are always more numerous than those in the woof. At the same time M. Fleury puts it too strongly when he says "la chaîne a presque toujours deux fois plus de fils que la trame."

There is a great range of variety in the fineness of the yarn, and in the degree of closeness of the twist in its spinning. In the finer textures it is very firmly and closely twisted, there being five to seven twists in each mm., and the diameter of the yarn is from 0.12 to 0.2 mm. From this they range upwards to coarse threads of 1 mm. and even greater thickness, and with scarcely six twists in the cm. The woof yarn is much coarser than that employed for the warp; thus in the more common varieties like Nos. 20 to 26, it is about 0.35 mm. while that of the warp is about 0.26. In Ure's "Dictionary of Manufactures"¹ it is stated that the Egyptian spinner rarely made yarn finer than 50 leas, whereas the modern yarns are spun to 300 or even to 1,200 leas; but in the fabric No. 1 in our table the warp-yarn must have been spun to 325 leas and the woof-yarn to 160 leas.

¹ 6th edition, vol. ii, p. 337. Yarn is "counted" by the number of leas, each 300 yards in length which can be spun from 1 lb. avoirdupois of flax. In Marshall's tables ("The Practical Flax-Spinner," 1885, pp. 40 and 220) 350 leas is the finest texture given.

I have submitted a number of samples of these linens to my friend Mr. Hugh Porter, who is well acquainted with the different textures of Belfast linens, and he tells me that the linen which is most commonly used in the wrappings is extremely like that known in the trade as 11⁰⁰ linen, only that in the modern textures there is approximately the same number of threads in the cm. of warp and woof.

The varieties in the texture of the yarn are intelligible, when we observe the process of manufacture as shown on the monuments. In the tomb paintings at Beni-hasan as copied by Lepsius (Denkmäler, II., 126), we have depicted the successive stages of this industry; the "retting" of the flax, and the beating out of the fibres with wooden beetles. The twisting of

these into the yarn is accomplished with a spindle called *phesef*, seldom if ever with a distaff. There are in the several museums various patterns of these wooden spindles for different kinds of yarn.¹ In one of the pictures, the operation of spinning

is named *set*, and the spinner holds the end of the yarn in his hand. In another picture it is over his shoulder; in another the end is fastened to a forked upright staff (Rossellini, xli, 4), and the spindle is in the hand of the workman. In another the making of the very fine yarn is shown. It is being twisted on a flat stone, and after this it is rolled between the hands of work-women, who are represented kneeling and rubbing the threads smooth on the stone. It is to this process, which is named

teker (Champollion II., 342 and 362), that the highly polished, smooth and finely twisted warp threads of the stuffs Nos. 1, 2, and 3, in the table owe their closeness and lustre. The name

mesenā is applied to this process in the plate given by Lepsius. After spinning, the yarn is gathered into hanks for the weaver.

The process of weaving, which was named *sekhet*, is also represented on the monuments, and is referred to by Herodotus (ii, 35). I have not data sufficient to determine what was the breadth of the web of cloth in my specimens, as I have found few satisfactory pieces with a selvage on each side. The web must have been of considerable length, as some of my bandages measure over ten metres in length and have been cut off at one end. Mr. Griffith in his notes on the story of the

¹ Spindles of the twelfth dynasty are figured by Petrie "Kahun," Pl. IX, Fig. 26, and p. 27.

Sekhti translates one passage "the width of a piece of cloth," and suggests the probable explanation that the Egyptian looms usually produced cloth of a fixed width.¹

The textures marked 31 and 32 are remarkable, as in them each two contiguous threads of the warp are treated as one in shedding; that is, they are simultaneously raised and depressed to allow of the passage of the shuttle, which also carried two parallel threads of the weft simultaneously. The result is a pretty double-threaded texture resembling in pattern that represented by Ashenhurst in his figure 155B.² The linen fabric in the market at present, which resembles this most closely, is one called Java canvas, but this is slightly more complex, as it is diapered. There is a cotton cloth in the shops exactly like it, used for tennis shirting now-a-days. The fabric No. 32 is the only Egyptian cloth in my collection in which the numbers of threads in the warp and woof are equal. In one specimen the warp thread is double, each pair being twisted, while the woof thread is single. In another there are parallel pairs of warp threads as in No. 32, but only a single woof thread, making a pattern like Ashenhurst's Fig. 58 (p. 170).³

In all my pieces the end of the web is strengthened by strong woof filletings, each of four or five threads of yarn carried simultaneously, either parallel or twisted together in a bundle, by the shuttle, and returning either immediately at the next shedding or after two or more wefts of single threads of ordinary size. There are many varieties of this filleting which resembles that now in use in towels or coarse pocket-handkerchiefs. In some the woof threads between these double fillets of the border are of blue yarn⁴, making a blue stripe one cm. or more in width resembling the edge of a modern gingham. I have no examples of true diapering or twilling or of fancy weaving such as may be seen represented on some of the monuments, or such as M. Fleury has figured from specimens in the Turin Museum (*loc. cit.*)

There is often a stronger thread laid at regular intervals in the warp, and in like manner a proportionally thicker thread

¹ "Proc. Soc. Bib. Archæology," xiv, p. 466.

² Ashenhurst, "Weaving and Designing of Textile Fabrics," Huddersfield, 1887, p. 199.

³ The weights of the metre-lengths of the cloth are only approximate, as it is not easy to free the cloth of adhering foreign matter, and few pieces have a sel-vage along both sides. Of No. 6 in the Table, some pieces had 14, some 17, and some 20 woof threads. Its weight also varies from 200 to 220 grammes. One specimen of Fleury's 24 by 14 (No. 24) weighed 387 grammes.

⁴ The blue pigment was produced by the use of a plant called *terneken* (Dümichen, Dendera, 19, 10), probably indigo, as Thomson showed; the red is a vegetable dye, but I do not know its nature. Thomson believed it to be safflower. In one text the dye-stuff is called "the plant *nesti*."

used at about the same intervals in the woof, giving a somewhat chequered appearance to the stuff. This is so regular that it must have been done by design, not by accident.

The end may be left plain as an irregular ragged fringe when it is cut off from the beam, but sometimes it is carefully finished off as a regular fringe whose tags are from 5 to 12 cm. long. Each of these consists usually of four warp threads. Each pair of these threads is twisted into a cord, and the two contiguous cords are then twisted into one tag. These threads are knotted a little beyond the middle to prevent their unravelling, and from this to the free end they are loosely twisted so that the end appears loose and soft. The texture is wonderfully regular considering that the weaver used one or two sticks to answer the purposes of the healds, treadles, and battens of an ordinary hand-loom.¹ Indeed, it is amazing how with such simple appliances as those pictured on the monuments, fine cloths like No. 1 were woven. This very fine cloth was known even in the earliest times, for there are fabrics nearly as delicate in the Berlin Museum taken from the mummy clothing of Pepi, who died about B.C. 3200. My finest samples came from a twelfth dynasty mummy dating from about B.C. 2200.

The generic name for the clothing either of the living or dead was

hebs, often coupled with *menkh*, which

is often written by its determinatives alone. These words occur in texts of many kinds, especially in the funeral formula of the common proscynemata in which the gods, especially Anubis, are invoked to grant clothing to the deceased. It must be remembered that the process of embalming was a divine work throughout, and that the earthly embalmer was the representative of Anubis, who is pictured on almost every mummy case of the better class as performing with his own hands the operations of the preservation and enwrapping of the body, and who takes the credit and responsibility of the task. This is often expressed in the inscriptions on the cartonnage or coffin. For example, on the coffin of Hatbastru in the Leipzig Museum, Anubis is represented as saying

¹ It is probable that a comb-like slay was used to drive home the weft after each passage of the shuttle, like that mentioned by Ovid (*Met.* vi, 58),

"Percusso feriunt insecti pectine dentes."

There are three comb-like implements of this nature from tombs at Akhmîm and Thebes in the British Museum. (Nos. 18, 182; 20, 747; 20, 748.) Many similar combs with long handles have been found in the Scottish brochs (Anderson, "Scotland in Pagan Times, The Iron Age," p. 213), showing how widely spread this method of striking home the weft was among very diverse races.

“I come to thee and protect thee, I make perfect thy flesh, I dispose thy limbs in order, I articulate thy bones, I fill thy vessels, I stretch thy muscles.” Similarly a stele in Vienna

(No. 55) has the inscription “Anubis himself hath made the mummy.”

The flax plant and its derivative, linen, is named in the texts

meḥā, the word being sometimes used in the plural as in Papyrus Anastasi, iv, 8–11. This word is the parent of the Coptic name ¹ The ancient linologists distinguished the flax plants of Upper Egypt from those of Lower Egypt, and Pliny² informs us that there were four different kinds of linen made in Egypt, named from the provinces in which they were manufactured, Tanitic, Pelusiatic, and Butine from Lower Egypt, and Tentyritic from Upper Egypt. This distinction is confirmed by native records, for we find in Sallier Papyrus II, 13–7, that Lower Egypt is called the land of Meḥā, and the Thebaid is the land of Kema.³ In the papyrus 3 from Gizeh published by Mariette⁴ it is said that Harse-isis, son of Osiris, brings to the dead a portion of bandage of *Henes*, of the royal house, probably material from this last-named district.

The monuments refer to a fine linen called royal linen *suten šes*, and of this material the Great Harris Papyrus tells us garments, tunics, coverlets, caps, sheets of Horus, ear-flaps and coverings for the god Amen were made.⁵ It was of this royal linen that the bandages of Sauf were made, as we learn from the Rhind Papyrus,⁶ and it was expensive material, for in the same document it is called costly stuff.⁷ It was probably of the same nature as the cloth known as *seseḥ*, which, according to a text quoted by Brugsch, seems to have been red.

This royal linen is contrasted, in the Harris Papyrus, with a

¹ Goodwin, in “*Zeitschr. f. Ägypt.*,” 1867, p. 54.

² “*Hist. Nat.*,” xix, p. 1.

³ Brugsch, “*Dict. Géog.*,” 1202.

⁴ “*Pap. de Boulaq*,” p. v, 21.

⁵ Pl. XIVa–X–XVII. This material is sometimes called simply *suten*, see Maspero, “*Du genre épist.*,” 14.

⁶ Pl. VI, 2, and XXVII, 9.

⁷ Pl. VI, 6.

second kind, the *kemā nefer*, "good southern linen," i.e., linen of Upper Egypt, Pliny's Tentyritic linen. This was also used for tunics, earflaps and other clothes as detailed in the list of presents of Rameses III. to the house of Amen Rā.¹

There is a third variety of linen mentioned in the same document as *māku* linen. Birch² translated this "mixed linen," but it seems rather to mean domestic linen, linen for household use. Fewer articles of this fabric were presented by Rameses than of the other materials, as though it were less suitable for the purposes of offerings. The word seems connected with a root which means "to cover," and Brugsch suggests that it may have been a coarse fabric, but his reasons are not convincing.

The Rosetta stone uses another word for fine linen *peku* linen. This is probably the same as the *suten ses*, and it is rendered in the Greek version as equivalent to *ὀθόνιον βύσσινον*. The context tells us that this was made in the temples for the royal palace, and hence the distinctive name "royal." Of the tribute of this article Ptolemy Epiphanes remitted a part.³ This same material, royal linen, is mentioned in the funeral papyrus of Gizeh, in the text, "Thou hast received the bandage sacred to Pâ Râ and the piece of stuff woven in the temples."⁴

Linen was also made in other towns. That of Saïs was ordered for the bandages of the fingers; and in the funeral papyrus one cloth is described as "marvellous" from Pa Harmerui.

The different parts of the web had doubtless received different names from the Egyptian weavers. Mr. Griffith conjectures that the two words *stb* and *npnt* used to describe the edges of the cloth by which the covetous steward blocked up the way of the ass of the Sekhti, may mean the "cloth edge," and the "fringe," respectively.⁵ These words may fulfil the condition of the story, as we are told the cloth was square, otherwise as the fringe is formed of the warp it is at the long end of the cloth, and not at the side. Brugsch considers that *tes* means

"selvage," and De Rougé conjectured that *sa*, meant the fringe of a garment. This word, however, is also

¹ Pl. XIV-VI-XII. This is probably the same as the *nefer res* of the Medum inscription given by Prof. Petrie (Pl. XX.).

² "Records of the Past," vi, p. 40.

³ *Ibid.*, iv, p. 73.

⁴ "Pap. de Boulaq," 3, v, 5.

⁵ *Loc. cit.*, p. 467.

used as the name of a bandage. The priest in one portion of the funeral ritual is said to apply the *sau* bandage.¹

In several inventories there are at least three of these kinds of linens mentioned, and these are again classified numerically. Brugsch conjectures that this sub-division may depend on the number of threads in the yarn. Of the some is marked as some as and some . In one place a fourfold *ses* is mentioned. Brugsch quotes a text in which one is said to be

probably that called δ *âtma* or dark red. The other colours used in the funeral ritual are called δ *uat-t*, "green," and δ *aruti* or blue. In the funeral rituals such as that of the Louvre and Abydos, in the description of the later symbolical stages of the priestly operations, there is one chapter entitled δ δ δ δ δ δ "Chapter of putting on the white bandages." After this comes the "chapter of putting on the green bandage,"¹ then that of the investiture with the light red bandages (*ânsi*), then that of the dark red bandages (*âtemâi*). After this, the *Usekh* collar was put on. I have found nothing in my specimens corresponding to these successive layers of different colours, so it is probable that these investitures were only symbolical, or perhaps confined to royal or great personages: at least it is certain that in all my specimens there had not been a succession of these as real ceremonies.

The mummy cloth for the bandages was torn into strips, not cut. Most of the bandages used in swathing the head and neck were narrow, averaging from six to ten cm. in width. Sometimes, however, there are broader strips twenty cm. wide, used for covering the face and body.

These bandages are often referred to in funeral inscriptions and were called δ *ut*. They have given one of the names to the undertaker, who was called δ *uiti*, "the bandager." This application of swathes is a divine task; thus, in the Rhind papyrus, Anubis is called δ "Anubis the bandager." In other inscriptions bandages are sometimes called δ *bant*, and sometimes δ *ti* or δ *tai*, and the act of bandaging is called δ *tam*, a word which occurs in the Rhind papyrus. It is probable that there were generic differences between the bandages so differently named. In one text we are told δ δ δ δ δ δ δ δ δ δ δ δ δ δ δ

body is clothed in "a garment of the gods." The word *seben*, like its Coptic derivative *ceβen*, is also applied to bandages in general.

Some of these bandages on my specimens were in a remarkably good condition when taken off, requiring to be cut as they did not tear easily. We know from the story in Herodotus (vii, 181) that the same kind of linen was used for surgical bandages as for embalming; and, indeed, when these are rolled up they closely resemble the bandages out of a hospital surgery. There is a well known Greek epigram given by Brunck ("Analecta," iii, 169) which refers to this.

Ἰητρὸς Κρατέας, καὶ Δάμων ἑνταφιασῆς
 Κωὴν ἀλλήλοισ θέντο συνωμοσίην.
 Κάι ῥ' ὁ μὲν οὖς κλέπτεισκεν ἀπ' ἑνταφίων τελαμώνας
 Εἰς ἐπίδεσμεύειν πέμπει φίλῳ Κρατέα.
 Τὸν δ' ἀπαμειβόμενος Κρατέας εἰς ἑνταφιάζειν
 Πέμπειν ὄλους αὐτῷ τοὺς θεραπευομένους.¹

The methods employed in applying these bandages were very varied. I have not been as fortunate as Dr. Granville, who describes finding in the mummy which he unwrapped, examples of the *couvre-chef*, the scapularium, the eighteen-tailed bandage, the T-bandage, the capistrum, and the linteum scissum. I have from time to time in unwrapping my heads, found some specimens of most artistic and elegant bandaging, but have never seen these different forms combined in one body. The commonest form of head bandage is a modification of the figure of eight. There is in many a long wide piece of cloth beneath the bandages proper coming up over the breast, over the front of the neck and face and brought down over the top of the head and nape and down the back. This agrees with the description of the bandage of *Sebekh*, in the Boulaq papyrus, and possibly with the *nemes* (Schiaparelli, ii, 9), and it is directed to be put on when the body lies on the bier with its face upturned and its back soaked in oil. Over this is a narrow bandage applied first round the neck, then crossing on the back of the head, then brought over the forehead, then backwards over the neck, then after another turn round the neck it is made to cross again on the occiput. This is probably the bandage which in the papyrus of the embalmment is called "the bandage of Harmakhis of Hebit." Over this, a second bandage of the same width is applied in an opposite direction, so as to decussate the first. This is called the bandage of *Nekheb*, which is said to cover the forehead. A third bandage is applied at first round the neck and horizontally across the

¹ De Quincey's happy paraphrase of this is familiar to all readers of his Essay on "Murder as one of the Fine Arts."

face ; this is the bandage of Hathor the Lady of Ännu. This ends under the chin and finishes at the obelion. There is a fourth bandage also beginning around the neck, then passing over the occiput across the bregma, then down in front of the ear, under the chin, around the neck, then backwards over the sides of the face crossing the last on the top of the head, and so on. This is the bandage of Thoth Äp-herui. This bandage was probably applied as a double-headed roller. A similar bandage, I have once found, applied over this, crossing the cheeks from above downwards. This may be the appliance which is called on

account of its doubleness *ānkhtesu*, and is spoken

of as “ the two terui, two rolls of linen named ankhtesu.” It is possible that these may be the names of the plugs of cloth sometimes forced into the mouth. The continuation of this bandage below is probably the bandage of Nebthetep. Over this is another double-headed roller crossing on the vertex and under the chin alternately. This may be the band called the double *uṭa*, or else that called “ the bandage of Sekhet, the great, beloved of Ptah, of two pieces for the head.” Over this in some cases is an oblique bandage over the nape and forehead crossing on the

nape, which is possibly the *et'et* or the white bandage.

The portion of the bandages which crosses the ears is specified as the bandage of an excellent linen from Hät Hesen.¹

It is to be applied over the two ears “ by Thoth Äp-herui, the pacificator of the gods in Unnut.” The strip which fulfils this description is generally the continuation of No. 4. In all there are prescribed 22 folds on each side of the face passing over the two ears.

Dr. Pettigrew repeats more than once the statement that the bandages nearest to the body are always the coarsest. This is by no means invariable. I have often found fine cloth in direct contact with the body and layers of very various textures from this to the surface. In many, the linen was of the same texture all the way through.

Very few of the head bandages were continued over the shoulders except those closest to the body and occasionally those on the surface. In the whole mummies examined the limbs had been wrapped independently at first, then the head had been wrapped, and then the swathes of the body were applied. This is in accordance with the ritual. The fingers

¹ This is mentioned in the Papyrus of Ani, Pl. VIII, l. 26.

were swathed with linen from Saïs. On the left hand there should have been traced the figure of Hepi. The bandage of this hand is consecrated to Isis of Koptos, and the envelope was to be of six layers, with the figure of Isis, of Rā, and of Āmsu externally. That of the right hand bore the image of Nephthys, and was enveloped in twelve folds of bandages marked with the images of Rā, of Āāh, and of Isis and Nephthys. The bandages of the right arm are named those of Harmerui, of Āmsu-Āāh, and of Sept-Har, and all the bandages are consecrated to Har-hut. The feet had the toes also bandaged, but not separately, and it is directed that two jackals are to be drawn facing each other on two pieces of cloth. These bandages are the bandages of Horus, lord of Hebennu for the left leg, and that of Anubis for the right leg.

The other bandages of the body, the bandage of Het-Āāh, made of the fine linen of Sent, the wrappings of Nehamtera and Ahai made of the linen of Panopolis, and the bandage of the royal house made of the linen of Hanes, I cannot identify. The shroud which enwraps the body was called the wrapping of Meh, a marvellous texture of Hebennu, a wrapping of linen from Edfou. The

mātait like its Coptic derivative , was probably in the first instance a girdle for the loins, or an abdominal bandage, although used for bandages in general as for the ear-swathe.

The methods described in the ritual were, however, not strictly carried out in any of my specimens, and there are in each case special peculiarities in the number and arrangement of the folds too numerous to specify. In one a wide cloth was wrapped round the head and gathered into a knot on the back of the neck. This may be one of the four large pieces, which the ritual ordains for the occiput. It is not often that the method of reversal so usually practised in surgical bandaging to make the successive folds lie evenly is used on the limbs, but I have twice seen it. The several folds were applied wet and smeared with adhesive material. I have been able to extract from them some of the *Κόμμι* or gum Arabic which Herodotus mentions as employed to fasten them, and

which was derived from the *āsh* or acacia tree of the

Upper Nile. The surface must have been soft when these cloths were applied, for the texture of the cloth is impressed on the skin, which is indented by the crumples of the bandages.

In general the skill of the Uiti was exercised in making the surface of the bandages as smooth as possible, and it is probable

that each of these bandagers followed his individual taste in the process. With the deeper layers little care is taken to prevent crumpling, especially at the places where they cross, as on the nape or below the chin. The surface bandages lie evenly.

The ears are sometimes bandaged flat on the side of the head, but most commonly the folds of the bandage of Thoth pass alternately in front and behind the ear. There is in some cases an additional bandage applied over all vertically covering the ear completely. This, which was a double headed roller, is called "the completed." Sometimes a plug of cloth is forced into the fossa of the concha and the pinna bent forward over it.

The nostrils are commonly stuffed with a small horseshoe-shaped plug of linen, one end of which is driven up each. It is well known from the description of Herodotus that the brain was usually extracted through the nostril. This was done with a hook, which the Greek historian tells us was of iron. Bronze hooks have been found, which may also have been employed for the purpose. Chabas¹ figures a hook of three teeth of this metal, and there is an apparatus whose ideograph is well known, and which has the phonetic value *kes* , which may have been used. Chabas also figures a knife seven cm. long, shaped like an

animal's thigh, which was made of *baā*, presumed to be iron. An instrument of this shape occurs in the symbolic representation of the ceremony of opening the mouth of the deceased in the tomb of Seti I, but there it is represented of monstrous size. It is named *Meskhen*, and is said to have been of iron. A similar instrument is also named *Khopesh*.²

Extraction of the brain through the nose has been performed in 56 per cent. of my skulls. In five per cent. it has been done through the left nostril, in three per cent. through the right, in the others the septum was broken. In two the perforator had been driven through the basisphenoid, in one the brain had been extracted through the roof of the orbit. In some the membranes had been torn out with the brain, in others they remained; in general the operation was imperfectly done. In a few specimens bandages were driven up into the cranial cavity, but in general it was only the preserving material which had been inserted. I drew four yards of bandage out of one nose. In

¹ "Études sur l'Antiquité Historique," p. 79.

² "Devéria, Mélanges d'Archéologie Égyptienne," 1 fasc., p. 2. Schiaparelli, vol. i, p. 105. Other unknown implements are named *Tuaur* and *Tuniŕot*, *Ami* and *Neterti*.

The necessary closure of the mouth in the process of swathing was probably the occasion of an important subsequent portion of

the funeral ritual, the "Ceremonial

There are other bandages mentioned in the Papyri which I cannot identify, two called

𓏏	𓂡	𓃐	𓂡	𓎶	𓎷

"those"

the *fi*. The *afu* or "fourfold linen" is

unable to identify the *sneb* mentioned in an inscription

ter." In an inscription in the Louvre Anubis is represented holding two long bandages, and saying

the head of a wrinkled, toothless old woman of extremely witch-like appearance, I was surprised to find that there was a considerable amount of hair of a lightish colour on the head under the bandages. On the application of warm water all this at once became detached and the locks proved to have been gummed on the surface of the head, which was bald and bare. One would like to have known something of the history of this prototype of Pope's "Narcissa." One lady had large masses of fair coloured hair much resembling in colour that resulting from the action of hydrogen peroxide. Another had a thick crop of moderately long black hair.

Whiskers and beard were usually shaven. I have only twice found anything like a distinct beard and moustache. Only one head was genuinely woolly like that of a negro; in many the hair was dark reddish brown, probably the result of the action of time and reagents. In many of the oldest heads the flesh had been removed from the skull and the bone carefully bandaged. The hair, when long, was usually cut squarely across the forehead, and there is often a median division. The wigs, which were probably worn during life, were not left on the heads, and in only one were the locks plaited. I did not find in any a trace of the conventional chin beard which in the monuments characterises men and the male gods, and which was, as the representations of it show, an artificial appendage tied on.

Summing up this detailed account of the mode of preparation, one is forced to the conclusion that the ritual method of enwrapping of the later time, as described in the papyri so often quoted, was only one of many ways in which the heads were enwrapped, and probably embodied a later tradition which had not been fully elaborated in the times before the dates of these papyri, or which, at least, was only used in all its details in a comparatively small number of cases, by the officials of the

or "house of the bandages."¹

DISCUSSION.

Dr. GARSON said, in reference to the use of coarse cloth next the body which Prof. Macalister had mentioned he had met with sometimes in Egyptian mummies, it was not improbable that it was used designedly for the purpose of allowing a greater quantity of preserving medium to come in contact with the body than would be the case if fine texture cloth were used, as the interstices between

¹ None of my specimens showed the elaborate patterns of body bandaging like those found by Mr. Petrie at Hawara (p. 14). Since this Paper was printed I have received Dr. Budge's excellent book "The Mummy" (Cambridge, 1893), and Forrer's beautifully illustrated "Gräber von Achmim" (Strasburg, 1891), both of which contain additional information.

the threads of the coarse mummy cloth are larger than in the fine varieties.

As regards the removal of the brain through the nostril. This procedure was not practised in the earlier times, as in a series of twenty-three specimens of Egyptian mummies of the 4th Dynasty which he had examined, obtained by Mr. Flinders Petrie from Medum, in not a single instance had the brain been removed.

The removal and preparation of the scalp and its subsequent replacement, mentioned in the paper, is interesting from the fact that this procedure is followed in a part of the world very remote from Egypt, namely, in Mallicollo Island, one of the New Hebrides group.

Mr. STOPES confirmed Professor Flower's wish that Professor Macalister might visit Egypt, as notwithstanding the many observers who had already examined and reported upon that country, it would be a material benefit to Anthropology generally to have such skilled and searching criticism as would doubtless be given by him. When in Egypt, he (the speaker) had been struck when observing the remarkable differences in the linen that enwrapped the mummy cats at Siout, the apsis and other mummies at Sakkara, and the great diversity of the qualities of the linen so profusely scattered on the desert at Thebes and at the tombs of the kings in the valley of Bab-el-Moulouk. It did not seem that the quality or fineness of the linen was a reliable index to the status of the mummy when in life. The fact that in some of the mummies of the very early dynasties, linen of such exceeding fineness was employed, was indicative not only of the high development to which weaving had at that time attained, but of the great length of time needed for such development in the art. Such wonderful workmanship needed generation after generation of skilful workers. Practically there has been little or no improvement in the quality of some linen manufactures for upwards of 4,000 years.

DESCRIPTION of TWO SKULLS from NAGYR.

By W. LAURENCE H. DUCKWORTH, B.A., Scholar of Jesus College, Cambridge.

To the Cambridge University Collection there have recently been added two skulls from the capital of Nagyr, a small state in Central Asia.¹ By the kindness of Prof. Macalister I am enabled to give the following description of them :—

The skulls are numbered 1204 and 1205 respectively, in the Cambridge catalogue, the measurements which were made with

¹ The skulls were obtained by W. M. Conway, Esq., during his late mountaineering expedition in the Hindu-Kush district.