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Historical Article

Ear, Nose and Throat in Ancient Egypt

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Part I

Nothing new under the sun (Solomon)[1]
And left the vivid air signed with their honour
(Stephen Spender)[2]

The Egyptian civilization is one of the oldest in history, if not the first. The history of Ancient Egypt is divided into 30 dynasties, the last dynasty ended with the invasion of Egypt by Alexander the Great in 332 BC. This classification is proposed by Manethon in 280 BC. The Egyptian civilization was renowned for its scientific and artistic achievements. The great monuments it left behind are its living evidence. Medicine was no exception and mummification stands out as the most famous achievement in that field.

A short resumé of the history of Ancient Egypt and the 30 dynasties is of relevance:

1. Pre-dynastic period before 3200 BC: the Egyptian calendar begins with July 19th 4241 BC. Egypt was divided into a kingdom in Upper Egypt and another in Lower Egypt.
2. Old Kingdom 3200 to 2270 BC: This period began by Menes uniting Upper and Lower Egypt to form one kingdom at 3200 BC. The period of the first two dynasties is known as the Archaic or Protodynastic period. In this period the Egyptian alphabet was invented also the papyrus, the pen (brush) and ink and thus a literary class emerged among whom the physicians sprang. Following the Archaic period was the Pyramid period, 2780–2270 BC which comprised the third, fourth, fifth and sixth dynasties when the Egyptian civilization reached its zenith.
3. First Intermediate Period: seventh to tenth dynasties (2270 to 2100 BC). During that period the central government was weakened and the country was invaded from Asia.
4. Middle Kingdom between eleventh to twelfth dynasty (2100 to 1700 BC) when at the beginning of that period prosperity was prevalent in the land but at its end the central government was broken down and the country was again invaded from the east.
5. Second Intermediate Period or Hyksos Period (1700 to 1555 BC): thirteenth to seventeenth dynasty when the Egyptians rebelled against the Hyksos who were expelled by Ahmose I.
6. New Kingdom (1555 to 712 BC): eighteenth to twenty-fourth dynasty. Ahmose I started the eighteenth dynasty, the country was wealthy and the art and craft are well demonstrated in the finds of the tomb of Tut-Ankh-Amon. At the late part of that period, Egypt was ruled by Libyans and Ethiopians.
7. Late Egyptian (Late Dynastic) period (712 to 332 BC). The end of this period marks the beginning of the Graeco-Roman period that started with the invasion of Egypt by Alexander the Great. Twenty-fifth and twenty-sixth dynasties were mostly under Ethiopians, but the twenty-sixth dynasty (633 to 525 BC) was a period of prosperity which was ended by the Persian invasion of Egypt in 525 BC. The period 525 to 332 BC is known as the Persian Domination Period which was ended by the invasion of Alexander the Great. The Graeco-Roman Period (332 BC–641 AD) ended with Egypt becoming a province of the Empire of the Caliphs (Kamal, 1967). Table I summarizes the different periods of Ancient Egypt, it is of note that different authors may give different dates.

Doctors in Ancient Egypt

Homer (c. 900 BC) describes the Egyptian doctors in the *Odyssey* thus: 'For the fertile soil of Egypt is most rich in herbs, many of which are wholesome in solution, though many are poisonous. In medical knowledge the Egyptian leaves the rest of the world behind. He is a true son of Paeon the Healer'.

The Greeks used to go to Egypt to study medicine and there is enough evidence to show that Hippocrates (460–

TABLE I
ANCIENT EGYPTIAN HISTORY

Pre-dynastic period	Before 3200 BC	Pre-dynastic
Old Kingdom	3200–2270 BC	Dynasties 1–6
First Intermediate Period	2270–2100 BC	Dynasties 7–10
Middle Kingdom	2100–1700 BC	Dynasties 11–12
Second Intermediate Period	1700–1555 BC	Dynasties 13–17
New Kingdom	1555–712 BC	Dynasties 18–24
Late Dynastic Period	712–332 BC	Dynasties 25–30
Graeco-Roman	332 BC–641 AD	

[1]Ecclesiastics 1,9.
[2]Stephen Spender (b. 1909), *Collected Poems* (1928–1985), Faber and Faber, London, 1985, p. 30. The poem is entitled 'The Truly Great'.

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TABLE II
MEDICAL HEIRARCHY IN ANCIENT EGYPT

Ancient Egyptian Title	Todays Equivalent
Physician	Generalist
Chief physician	Specialist
Medical Inspector	District Medical Officer
Director of Medicine	Regional Medical Officer
Chief of Physicians (of north and/or south)	Chief Medical Officer
Chief Physician of the Palace of life	Minister of Health
ULTIMATE RESPONSIBILITY TO:	
Vizier (Politician)	Prime Minister

TABLE III
DOCTORS AND THEIR AIDS IN ANCIENT EGYPT

General	Specialists	Aids
Physician for the Public	Eye	Nurses
Physician for the Palace	Dentists	Masseurs
Physician to Foreign Lands	Enternist (Belly)	Manicurists
Physician assigned to: Army, Fleet, Miners, etc.	Proctologist	Hairdressers
	Gynaecologists	Bandagists
	Head doctors	Embalmers
	Surgeons	

375 BC) was much influenced by the Ancient Egyptian writings when he wrote his treatise. The god Thoth was called the first physician and the first surgeon. A doctor in Ancient Egypt was named *Sinw* in Coptic is written ⲥⲉⲛⲓ [3] (CENI) and it is worth mentioning that the word medicine derives its origin from *Sinw*.[4] The symbol for doctor was  and this comprised a scalpel (or lancet), a container for medicines and a seated man. It is thus appropriate to say that physicians should rest assured that the word 'medicine' does not mean them exclusively but it encompasses the surgeons as well! A lady doctor is *Sinw.t.* (*t* is the feminine sign). The first lady doctor in history is Peseshet, VI Dynasty (Pahor, 1992). There were physicians for the public and physicians for the Royal Court, *Sinw pr-c3*, this may be for the King and/or Queen, as well as royal household and employees of the palace. Some of the *Sinw pr-c3* also had the title of 'Physicians delegated to Foreign Lands'. They would be sent by the King of Egypt on request of rulers of other countries who used to ask the King to send an entrusted Physician from Egypt, the land of medicine at the time, for treating their illnesses. Ebbell was of the opinion that the surgeons were *Sekhmet Sinw*, though Grapow doubted that designation (Ghalioungui, 1983).

There were also spiritual doctors, *Sa.u*, who were mostly priests (a kind of psychiatrist). The highest rank among the hierarchy of doctors was Chief of Physicians of the North, of the South, of the North and South or of the South and North (of the country as a whole): *wr sinw mhw-smˁ*, and Master Physicians *hry-sinw*. The highest rank among physicians was responsible to the Vizier, a politician, who was next to the Monarch. Table II illustrates the Medical Hierarchy in Ancient Egypt and its present day equivalent.

There were different grades of doctors in Ancient Egypt thus there was the ordinary *Sinw* who was a physician, *Wrsinw* who was a Chief Physician, the *Sahsinw* who was a Medical Inspector, *Imj-ra sinw* who was a Director of Medicine (Overseer) and *Hrp-sinw* who was the Commander (Controller, Master) of Medicine (Jonchkeere, 1958).

Physicians were assisted by aides, nurses, masseurs and bandagists (Jonckheere, 1958, Ghalioungui, 1983). Some would have their own text books as the 'book of the Bandagists'.

Among the doctors in Ancient Egypt were specialists and it is worth recounting the words of Herodotus (Euterpe II, 84) 'The art of medicine thus divided amongst them: each physician applies himself to only one disease, and not more. All places abound in physicians; some physicians are for the eyes, *others for the head*,[5] others for the teeth and others for the parts about the belly and others for internal disorders'. It is quite obvious that Herodotus took this point of specialization too far as there were also general practitioners. One of the most famous specialities was ophthalmology and an occulist was known as *sinw ir.tj*, as blindness was not uncommon in Ancient Egypt being caused by trachoma which was prevalent then, as nowadays.

There were internists, gynaecologists, but there were also some vague specialities such as 'guardian of the anus', considered as proctologists. There were lady doctors as well (Ghalioungui, 1983).

There were also doctors for the cemeteries. In the Middle Kingdom appeared a physician assigned to the troops. In the New Kingdom appeared a title of 'Chief Physician of the Palace of Life' which seems to be mostly an administrative position—a kind of Minister of Health. There were also dentists and makers of teeth.

There were physicians on the boats sailed by Ancient Egyptians on the high seas. Groups of labourers, e.g. miners had their own doctors.

There are some authorities who believe that the priests of Sekhmet (an Ancient Egyptian goddess) were surgeons, but Grapow threw doubt on this idea (Ghalioungui, 1983). There were no ENT surgeons as such but there were 'Head Doctors', supposedly including those who dealt with the nose and throat (Wright, 1902; Hamoir and Van Den Eeckhaut, 1981) and ears. Ni-Ankh-Sekhmet is supposed to have been the first rhinologist in history (Stevenson and Guthrie, 1949). Table III illustrates the different types of doctors in Ancient Egypt.

In Ancient Egypt there was no money economy; barter and services were an alternative. Diodorus (1, 82, 3) mentioned that in Egypt many people had free medical care—a sort of National Health Service! Temple physicians served the general public. Many physicians were salaried by the state or private persons but private medicine flourished after some time. Some physicians attained great wealth and this can be evidenced from ancient writings and also by the splendour of their tombs. To physicians was ascribed the duties of veterinaries; supervising cattle and possibly healing them. The Kahun papyrus deals in part with veterinary medicine. Pharmacists were a separate profession.

Papyri

Our knowledge of the nature of medicine in Ancient

[3] or ⲥⲓⲛⲓ.

[4] The prefix ⲙⲉⲧ (Met) to form a noun thus ⲙⲉⲧⲥⲉⲛⲓ or ⲙⲉⲧⲥⲓⲛⲓ (Metceni), the art or science of medicine.

[5] Italics by the author.

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Egypt is contrived mostly from the medical papyri which outlived the mighty hand of time to reach us nowadays. Most of these papyri are fragmented, but they do give a reasonable idea of how medicine was at that time. These papyri have the name of those who discovered them or the places they were or are found in. The most famous of them are Ebers', Edwin Smith's, Kahun's and Hearst's (see Table IV). The Berlin Papyrus (c. 1300 BC, nineteenth dynasty) contains a few paragraphs on diseases of the ear.

The Edwin Smith Papyrus (c. 1600 BC) resembles the Hippocratic treatises suggesting a long foreground to Greek medicine (Garrison, 1929). At its outset it deals with the heart and arteries and possibly the counting of the pulse is mentioned. Though there then was no apparatus to accurately measure time, it is possible that the physician counted the pulse of the patient against his own, thus recognizing whether the pulse is normal, slow or rapid.

There are 48 clinical cases of surgical importance mentioned in topographical order of the organs affected starting with the head, which itself contains 27 cases:

Skull, overlying soft tissue, brain	Cases 1–10
Nose	Cases 11–14
Maxillary region	Cases 15–17
Temporal region	Cases 18–22
Ears, mandible, lips and chin	Cases 23–27
Throat, neck, cervical vertebrae	Cases 28–33

The script includes sound anatomical, physiological, diagnostic and prognostic information. Some of the treatments prescribed still hold true till our present day such as reduction of a dislocated jaw and reduction of fractures of the clavicle.

The following therapeutic accessories are mentioned in the papyrus:

1. Dressings for wounds:
   a) Lint (*ftt*) is of vegetable origin: it can be used dry to absorb secretions (on throat, Edwin Smith, case 28) or impregnated with medicaments for local application (in ear, Ebers 91, 767).
   b) Linen: made of flax, is used in different forms (*v.i.*).
2. Sutures (Edwin Smith, case 10).
3. Splints: 3 types (possibly 4) are described:
   a) brace of wood padded with linen (Edwin Smith, case 7) inserted into the mouth to help feeding the patient (*v.i.*).
   b) splint made of linen (Edwin Smith, case 35, fractured clavicle);
   c) stiff post-like roll of linen (Edwin Smith, cases 11 and 12).
   d) It is possible that cartonnage was used, similar to our plaster of paris to splint fractures, also made of linen.
4. Cautery: either by means of the fire-drill or with a heated scalpel.

Breasted (1930) attributes the Edwin Smith papyrus to Imhotep, the Vizier, physician, architect and High Priest of Heliopolis, who built the first pyramid (Step Pyramid) for King Zoser (Third Dynasty, c. 2800 BC). Imhotep was also known as a sage, scribe and astronomer. He was later ranked as full god and accepted as the deity of medicine (Harry, 1926). He was identified with Aesculapius (Sobhy, 1949). It is also believed that the Berlin medical papyrus and much of the Ebers papyrus, as the Edwin Smith papyrus, are copies of an original written by Imhotep (Ghaliongui, 1973).

The Ebers papyrus (c. 1550 BC), the longest and only complete one of all the papyri, deals with 250 clinical pictures in 887 paragraphs which include leprosy, anasarca, heart disease (causing oedema or faintness), with sections on the nose,ears, tongue, gums and teeth (Kamal, 1964). It is of interest that the sections on the nose and ear follow each other (90–92, 761–770). The circulation of the blood was mentioned in this Papyrus well before the time of Harvey (1578–1657) and percussion was also mentioned as a method of diagnosis more than 30 centuries before Auenbrugger (1722–1809). It is considered to be the only surviving book of the so-called Hermetic Books. Clement of Alexandria (AD 200) recorded that the Egyptian Priests possessed 42 books which contained the sum of human knowledge. These books were called by the Greeks the 'Hermetic Books', because their authorship was ascribed to the god Hermes: being the Greek name for the God Thoth, the Ancient Egyptian god of the Healing Art. It is thought that either Athotis (c. 3200 BC) or Imhotep (*v.s.*) could have written these books (Bryan, 1930).

Other sources

Beside the medical papyri, our knowledge about the state of medicine in Ancient Egypt is derived from:

1. Other papyri, writings, chronicles, documents referring to medical conditions and the practice of medicine. Such references prove the existence of medical writings since the first and second dynasties.
2. Tomb paintings and writings.
3. Statues, especially those depicting pathological conditions.
4. Instruments, appliances, *etc.*

TABLE IV
THE MAIN MEDICAL PAPYRI

Name	Period	Location	Condition	Contents
1. Kahun	1900 BC	London	Fragmentary	Women's diseases
2. Edwin Smith	1600 BC	New York	Unfinished (17 columns—4 on verso)	Surgical (48 cases)
3. Ebers	1550 BC	Leipzig	Complete (108 columns)	Medical
4. Hearst	1550 BC	Berkley	Incomplete (18 columns)	Practitioner's recipe book
5. Erman	1550 BC	Berlin	9 columns—6 on verso	Charms for child and care of infants
6. London	1350 BC	London	Fragmentary (19 columns)	Recipe book
7. Berlin	1350 BC	Berlin	21 columns—3 on verso	Recipes
8. Chester Beatty	1200 BC	London	Incomplete	Oral diseases

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5. Human remains:
   a) Mummies
   b) Bones

The word mummy is derived from Latin 'mumia' which refers to bitumen, a material dark in colour. 'mumia' itself may be derived from the arabic word for mummy: مومياء *Mümiyā*.

Bedside diagnosis

Kindness and care were the maxims adopted by the ancient physicians when approaching their patient. We read in Ebers (40, 200): 'Go to him (i.e. the patient) and do not abandon him'. In Edwin Smith (case 7) that of the patient suffering from tetanus, it ends 'Undertake him, do not desert him, in view of the exhaustion'.

The consultation involved taking detailed history, asking the patient and observing his reaction: 'if thou ask of him concerning his malady and he speak not to thee . . . '.

The general appearance of the patient and his nutritional state are noted: '(a patient) whose body shrinks' (Ebers, 39, 197), or 'he turned deathly pale' (Ebers, 39, 198). Also the physician noticed special signs as facial palsy (Edwin Smith, case 7), squint (Edwin Smith, case 8), nystagmus (Ebers, 99, 855) and ptosis (Ebers, 62, 408).

The physician uses his nose as well, e.g. a wound on the skull smells like 'the urine of sheep' (Edwin Smith, case 7) breath of patient compared to 'a latrin' (Ebers, 37, 190).

Feeling of the pulse was emphasized. Palpation of masses was meticulous and recorded in detail e.g. fluctuation (Ebers, 107, 867), sebaceous cyst with punctum (Ebers, 107, 869 and 870). A case of aneurysm is described thus (Ebers, 108, 872): ' . . . a swelling of vessels . . . and thou findest that it is hemispherical (?) and grows under they fingers on every going (i.e. pulsation of the heart), but if it is separated from its body, it cannot on account of that become big and not give out (i.e. diminish), then thou shalt say concerning it: it is a swelling of a vessel . . . It is vessels that cause it,and it arises through injury to a vessel'.

Cirsoid aneurysm or A–V fistula is described (Ebers, 108, 873): ' . . . if thou examinest a swelling of vessels on the leather layers of any limbs and its appearance is growing on account of serpentining of the serpentry and they have formed many knots . . . it is swelling of vessels . . . that jumps (i.e. pulsates) in the midst of these limbs' (108 Ebbell, 1937).

The temperature of a part was noted (Ebers, 36, 189), crepitations in fractures felt (Edwin Smith, cases 17, 24 and 44), pulsation of brain perceived (Edwin Smith, case 6). The physician also observes the reaction of the patient on palpating the offending site (Edwin Smith, case 20): 'if thou examinest a man having a wound in his temple, penetrating to the bone, (and) perforating his temporal bone . . . if thou pullest thy fingers on the mouth of that would (and) he shudder exceedingly'.

Percussion was resorted to (Ebers, 36, 189 and 106, 864).

The physician also carries out some clinical tests as asking the patient to look to both shoulders and to the chest to test neck movement (Edwin Smith, case 30), inability to close the mouth was noted (Edwin Smith, case 25).

The physician would resort to 'laboratory tests' for fertility, pregnancy, and to know the sex of an unborn child (Riad, 1965).

Causation of 'disease'

Egyptians assumed that man was born healthy, and that every disease has a cause. These causes can be visible or occult, internal or external (Ghalioungui, 1984):

a) Exogenous causes: overeating, drunkenness, air, worms and insects.
b) Endogenous causes: *whdw* originates from a putrid process in the intestines and can circulate in the body, thus the practice of using purgatives. However, the appearance of *whdw* is related to external factors as food, and *aaa* which some authorities suggest as bilharziasis. Other such materials as the *whdw* were *st.t*: mucous, *n.wt*: bile.

In their physiology, they believed in the presence of 'conduits' that carry blood and humour, blockage of these conduits leads to flooding and droughts in the body with resulting illness. Agents causing disease can enter through natural openings in the body, and can similarly, leave the body.

They also believed in occult causes, spirits and demons. Psychological causes were well recognized as cause of 'dis-ease'.

Wounds

The edges of a clean-cut wound were brought together either with adhesive tape (Edwin Smith, case 10—eyebrow, and case 27—chin) or stitching[6] (Edwin Smith, case 23—ear, and case 26—upper lip). Other wounds were not sutured, but kept open. Fresh meat was applied on the first day as an efficient haemostatic and mechanical agent, as we use muscle grafts nowadays! In the following days, the ancient surgeon used astringents, herbs and honey, the latter being hygroscopic (*v.i.*). They also applied sour or mouldy bread to wounds (Ebers, 70, 522), the antibiotic of their time. Further, they applied a special mud which has been shown to contain tetracyclines.

They recognized granulation tissue and that at times was encouraged and others discouraged (71, Ebell, 1937).

Human bites were dealt with (Ebers, 64, 432–435) as their potential dangers were recognized then as now (Kirkpatrick and Wise, 1986). Though no specific anatomical area is mentioned in the section on human bites, yet, it is very likely that some were seen by the 'Head Doctors'. The author has seen three cases of human bites in his 'modern' clinical practice: two to the ears (auricles) and one to the nose (tip).[7]

Materia medica

Caution should be experienced when analyzing the Ancient Egyptian pharmacopoeae as a large number of the drugs used then cannot today be identified for certain. The names of those translated should not be taken literally e.g. it is possible that fly's blood (Ebers, 104, 857 and 858) or fly's dirt (Ebers, 92, 782), refer to plants, i.e. are nicknames for vegetable drugs (Ghalioungui, 1973).

Medicines were tested and past experience highlighted, an example is the statement (Kahun papyrus, 33): 'Cure is obtained millions of times in similar conditions' (Sweha, 1985).

[6]First time in history a mention of 'stitching' a wound was described (Breasted, 1930). However, Ebbell translated the text as 'stappling' still the first ever to be mentioned.

[7]For epidemiology of human bite see Marr *et al.*, 1979.

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Drugs included mineral, vegetable and animal products. Some of these drugs had active ingredients and thus a real usefulness e.g. liver for night blindness (Ebers, 57, 351). Honey was used extensively on wounds and as part of other remedies. Honey as a wound dressing can be beneficial as it inhibits growth of micro-organisms and is hygroscopic thus attracting an abundant secretion of leucocytes and antibodies (Bergman *et al.*, 1983). Onion juice is known to have bactericidal effect (Brooks, 1986; Manniche, 1989). Egyptian onion is known to have plenty of juice (onion on wounds in Ebers, 70, 519). Onion juice was used in the ear after being warmed (Abdel Rahman, 1939). Also garlic juice was used locally in cases of discharging ears (Sweha, 1981[8]). The systemic beneficial effects of garlic were discussed in a recent editorial in the *British Medical Journal* (Mansell and Reckless, 1991). Garlic was used by the Ancient Egyptian doctor.

Medicines were used generally or locally. Local application depended on the site or organ treated and condition dealt with. Thus, in ear disease powders or liquids were used, also remedies impregnated in lint or linen. Gargles were given in conditions affecting the mouth.

Directions for the production and administration of prescriptions were documented. Measurements were mentioned always in capacity even for dried material, the ordinary measure of capacity was 4.785 litres, the standard measurement was a 1/320, about 15 cc. i.e. a tablespoonful.

Incantations and spells were of common usage, but obviously it was meant, at least in part, to deal with the psychology of the patient, especially if the case was hopeless and unlikely to respond to known remedies. An example of a foetid nose (ozaena) was given when first date-wine is recommended, but this is followed by an incantation; the ancient way of our present day reassurance! Inhalations were known as in prescription 46, Berlin Paprus.

It is worth mentioning that the word 'chemistry' is derived from KHMI[9] (KEMI), the name by which the Ancient Egyptians called their country. It is also thought that the word 'pharmacy' is derived either from pharmaki, an Ancient Egyptian word meaning 'that procures security', or alternatively is a compound of Coptic phahri (medicament) and Ancient Egyptian Haki (magic).

Linen

Flax used to be cultivated in Egypt from the very early times as fabrics were found in Neolithic, Bardarian, Predynastic and First Dynasty periods, and there is still flax cultivation in Egypt till now. Though Egypt is famous nowadays for cotton, this latter commodity was not cultivated until relatively recently when Mohamed Ali Pasha, ruler of Egypt, introduced it at the beginning of the 19th century. The linen produced varied in texture from the finest silk-like gauze to a canvas-like coarseness, this is evident in the specimens seen in different museums of the world that house any sizeable Egyptian collection. In the British Museum in London is a complaint of one embalmer against suppliers who supplied him with a different type of linen to that which he had agreed upon. It is also known that there were different taxes for the different types.

Those who have seen a mummy must have found a good example of the Egyptian embalmers mastery in the art of applying and arranging bandages. The same skill was still available for the benefit of patients who were wounded. Bandages were used to cover and keep in place the medicaments described or as a mechanical support for healing broken bones. One type of bandage was made by the embalmers for the surgeons use (case 9, Edwin Smith), others were made by the surgeon himself (case 7, Edwin Smith).

Linen was also used in small pieces as swabs to clean (cases 11, 12 and 22, Edwin Smith) and at times impregnated with medicaments and used locally.

Some splints were made of linen. Adhesive plaster was also made of linen (case 10, Edwin Smith); these were used in pairs and made to bring the edges of a wound together. Linen was also used to make nets to hold injured ears in place, supposedly similar to nets we use today for holding dressings to ears; also strips made of linen were used if an injured ear proceeded to necrosis (41, Ebbell, 1937).

Linseed was used medicinally either applied externally on abscesses and local inflammatory conditions or internally as linseed tea for cough.

Surgical instruments

The following are some of the surgical instruments identified in texts and exhibits:

I Knives:

Different types of knives were used for different purposes, some were straight, some had curves or points.

Khept—used in case of otorrhoea (Ebers, 91, 767) *Shas* and *Das*— for myiasis (Ebers, 108, 875) A reed was used at times to make an incision (Ebers, 108, 876).

II Forceps:

Were straight or curved, some with toothed ends, some with a sliding ring to secure a firm grip (Kamal, 1922).

III Cautery:

Was used to treat aneurysms (Ebers, 108, 872). A heat drill was used to make holes in abscesses of the mandible.

IV Thorn to pierce blisters (Ebers, 69, 504).

V Swabs on sticks were used; linen was wound round ends of reeds (Fig. 1), possibly to clean clots.

A graphic representation of instrument s (Fig. 2) is seen on a wall engraving in Kom-Ombo Temple, built by Ptolemy V (2nd Century BC). A collection of scalpels (Fig. 3) and forceps (Fig. 4) are present in the Egyptian Museum, Cairo (E.M.).

Anaesthesia

Sedative drugs like opium and hyoscyamus were known. Dioscordes (V, 158) and Pliny (XXXVI, N, 2) relate that the round stone of Memphis (marble) was applied with vinegar to the skin area as an anaesthetic. It is thought that the carbonic acid formed anaesthetized the skin (Ghalioungui, 1973; Basuni, 1979).

[8]Dr Fawzi Sweha, formerly Director of History of Medicine Museum, Sakakkini, Cairo. Lecturer and author on Ancient Egyptian medicine.

[9] KHMIE Saidic dialect— ϪHMI Bohairic— KHMI Fayyumic.

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FIG. 1

Linen wrapped round end of reed used as swab—E.M. (courtesy of Dr Khakil Messiha)*

*Dr Khalil Messiha. Lecturer and author on Ancient Egyptian medicine. Founder member and vice-president of Imhotep Scientific Society.

Ears

I. *Anatomy*

a) The tympanic membrane:

It is generally believed that Hippocrates (460–375 BC) was the first to mention the tympanic membrane (Stevenson and Guthrie, 1949). However, we find the mention of the tympanic membrane in Ancient Egyptian medical writings, 'The ear that contains inside the tympanic membrane would be deaf from the eye vessels' (Grapow)[10]; though Ebbell's translation reads differently. Bilateral tympanic membrane perforations were found in a 2,600-year-old mummy (Lynn and Benitez, 1974; Benitez and Lynn, 1975).

b) The auricle:

In a stele from the Temple of Amanhotep II (1448–1420 BC) in Saqqara, the ear shows the incisura (Fig. 5) which is an important anatomical land-mark when operating on ears through an endaural incision (in order to avoid incising the cartilage). This stele is known as 'The ear-tablet of May'. Beside the ear relief is a small figure of the god Horakhty in the form of a hawk on a high pedestal. Below is the name of May who offered the stele. This stele is one of several 'ear-tablets' (Hassan, 1949). Another ear tablet shows the 'incisura' (Fig. 6) though less elaborately. A further two of such ear-tablets are shown (Figs. 7 & 8). Figure 7 is of the ear-tablet of Hwy, the god Hor-em-akhet between the ears and below is the inscription: 'Made by Hwy'. Figure 8 is of a single large high relief of a right ear with two falcons beneath wearing the Double Crown (of Upper and Lower Egypt).

c) The Eustachian tubes and internal auditory meati:

It is generally believed that Aristotle was the first to mention the Eustachian tube, and that this was in goats. However, in Ebers Papyrus (100, 845, f) we read: 'There are four vessels to his two ears together with the ear canal, namely two on his right side and two on his left side. The breath of life enters into the right ear, and the breath of death enters into the left side' (Ebbell, 1937). However, Kamal (1964) believed the canals referred to are the external and internal auditory meati. Rowling (1986) believed them to refer to the carotid arteries and internal jugular veins. A similar statement to that of Ebers Papyrus is found in the Berlin Papyrus (recipe 163). Resin is found in the internal auditory canals of mummies (Benitz and Lynn, 1975).

II *Physiology*

The relationship between hearing and speech was known, thus in Ebers Papyrus (99, 854, 3): 'When he is deaf, his mouth cannot be opened (i.e. he cannot speak)' (Ebbell, 1937)

III *Bat ears*

Bat ears were recognized, Khnum-Nakht's carved head shows bat ears whereas that of his brother Nekht-Ankh shows normal auricles (Neave, 1979).

IV *Ear Piercing*

Ear piercing was practised in Ancient Egypt and in some mummies the holes are large and drawn by the weight of the earring.

V *Deafness*

This was attributed to diseases of vessels (Ebers, 99, 854, c.).

FIG. 2

Graphic representation of surgical instruments, including: knives, a drill, a saw, pincers, hooks and shears, Kom-Ombo Temple.

[10]Hermann Grapow (1885–1967), a famous Egyptologist, student of Adolf Erman and teacher of many Egyptologists, some still alive (Pahor Labib, b. 1905). He contributed to the knowledge of medicine in Ancient Egypt helped by his brother, a physician.

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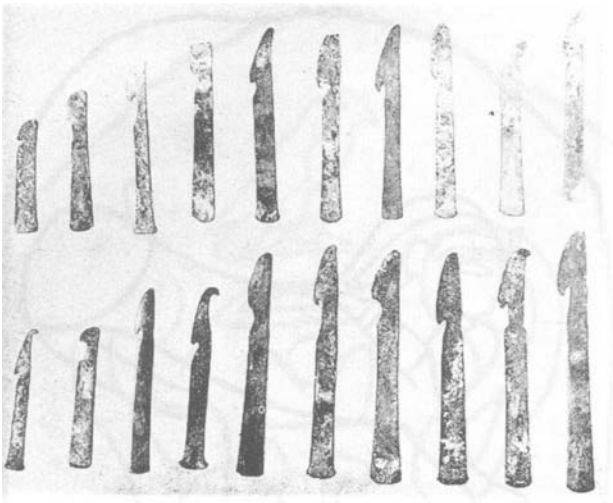

FIG. 3
Collection of scalpels, E.M.

A remedy was to apply to the deaf ear red ochre,[11] juice of tamarix, which are ground fine with fresh balanites oil (Ebers, 91, 764). In the Berlin Papyrus, prescription 200, is for poor hearing, it reads: 'Remedy to expel dullness in ear: ink (plant) 1, celery 1, bread of offering ?1, ox-bile 1, make into a pellet and put into the ear'.[12] Another translation is 'Remedy to expel pressure in ear', (perhaps Ménières *v.i.*).

A further ear-tablet (*v.i.*) is one which may indicate an attempt to 'quantify' deafness! In this Stela (Fig. 9) above the Sphinx is the inscription 'Hor-em-akhet, the Great God, hears'. Above the kneeling man is inscribed 'Made by the clever Scribe Mer'.

There are 31 ears, 15 on the right and 16 on the left side. The reason for dedicating these tablets can be as a general prayer and thus the ears are the ears of the god. Alternatively, the tablets were dedicated by deaf people asking the god to help, thus the ears are of the patients. The second theory is based on the view that the Temple was mainly for deaf patients who ask the gods for help. On the basis of the latter theory, a reasonable explanation would be sought for the tablet of Fig. 9 with the asymmetry in the ears, presented by the '*clever*[13] scribe Mer', that of 'quantifying' deafness. It is of interest to read in Lyden Papyrus (Col. X): ' . . . a pure child that has been tested in his ears before'.

VI *Secretory Otitis media*

Flu was known in Ancient Egypt and in Ebers Papyrus (Ebers, 90, 763) we read 'Flow out, those who breakest bones, destroyest the skull digest in the bone marrow and makest ill the seven holes in the head'.[14] Thus here is a description of 'flu' with sinusitis thus affecting the eyes and also affecting the ears with the possibility of secretory otitis media. Basuni (1979) attributes these symptoms to referred pain. If this is a description of 'secretory otitis media' then it ante-dates that of Hippocrates (Pahor, 1978b) by more than a thousand years.

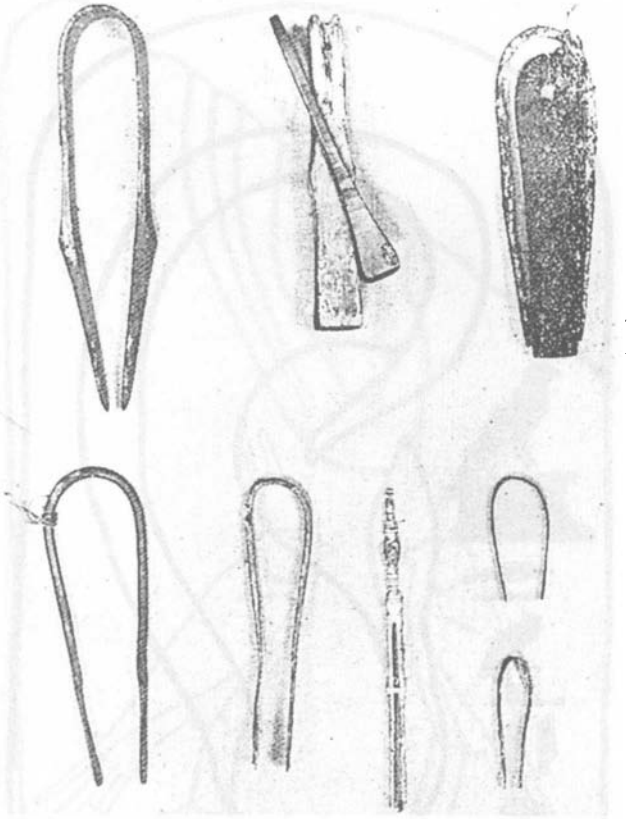

FIG. 4
Collection of forceps, E.M.

The relationship between secretory otitis media and cholesteatoma is well-known. The presence of cholesteatoma in some ancient Egyptian skulls (*v.i.*) is a further possibility of the presence of secretory otitis media in that period of antiquity.

Furthermore, skulls with destruction due to tumours of the nasopharynx, and cleft palate were recorded from Ancient Egypt. Secretory otitis media is a possible complication in such cases.

VII *Earache*

Three prescriptions in Berlin Papyrus are for earaches (201, 202 and 203): 201 reads: 'Another remedy for lancinating pain in the ears, melilotus,[15] make into ointment with ladanum.[16] Put in ear.' Prescriptions 202 and 203 recommend other treatment. Prescription 200 is for 'pressure in ear'; is this Ménières (*v.i.*)?

Several pathological conditions which can lead to referred earache has been described in Ancient Egyptian remains, i.e. tooth abscess, oro-antral fistula (*v.i.*), tempero-mandibular joint pathology, and elongated styloid process (*v.i.*).

The Papyrus Brugsch aptly describes cases of otitis as a 'fire in the heart of the ear' (Weir, 1990).

VIII *Discharging ear*

This was recorded as a result of acute otitis media (Ber-

[11]Red ochre is the hydrated oxide of iron.
[12]Another translation: 'on the ear'.
[13]Italics by the author.
[14]In Ebells translation this incantation is for foetid nose (ozaena) and meant for son of foetid nose (polypus?), still the fact stands that the ears are affected. The seven holes in the head are the eyes, nares, ears and mouth (Lefebvre, 1956).

[15]Melilotus is a kind of clover secreting a syrup.
[16]Ladanum is a resin extracted from cistus villosus (also called cistus ladeniferus), a Mediterranean shrub that was imported to Egypt (Lefebvre, 1956).

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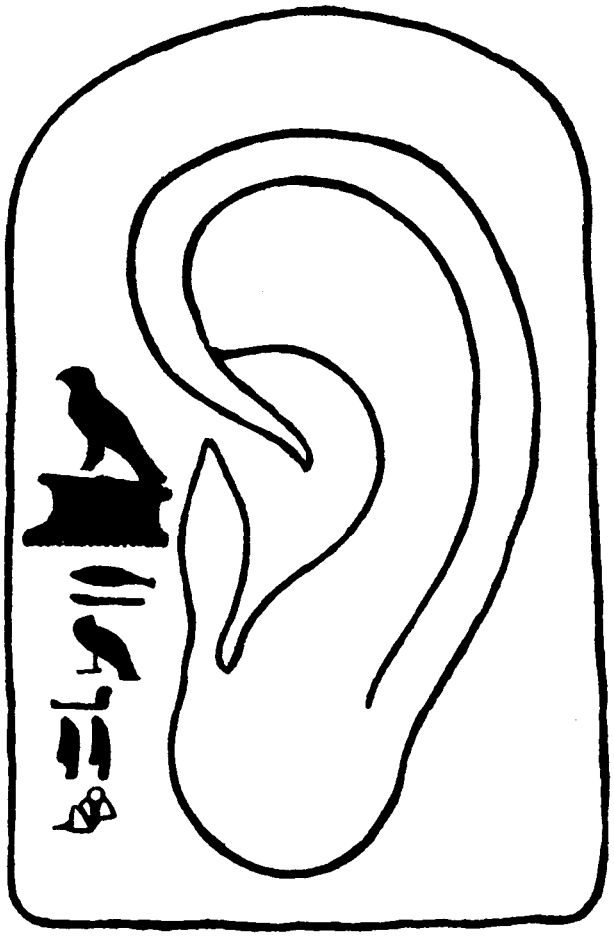

FIG. 5
Ear tablet showing incisura, Sphinx Temple, Giza.

lin Papyrus, 201, 202, 203) or chronic suppurative otitis media (Ebers Papyrus, 91, 765, 767; 92, 769 and 770).

In the Lyden Papyrus (verso, col. IV) is a prescription for watery discharge from the ear. It recommends 'salt, heat with good wine' applied to the ear for four days (Griffith and Thompson, 1974). It is of interest that in this prescription alcohol is applied locally to a discharging ear, a treatment still practised in our present day.

The management of an inflammed ear is also described in Ebers, Papyrus 91, 766: 'Another to treat the ear: thou shalt treat it with cold remedies let it not be hot. If the (ear-) canal is painful; thou shalt prepare for it: chip of malchite, is ground and applied thereto for four days; afterwards thou shalt prepare for it: seed-wool,[17] oil ⅔, honey ⅓ is applied to it many times. If its opening discharges, then thou shalt prepare for it powder to dry a wound: juice of acacia, juice of zizphus, fruit of willow,[18] crumin, are ground and given for it; if meanwhile it grows fatty (xerotic) then thou shalt prepare for it remedies against dryness of wounds: head of shrewmouse, *mendr* of a goat, shell of tortoise, thyme (?), are dusted on it very often'.

Thus, it is apparent that the pathology of the ear changes and the treatment changes accordingly. It is worth noting that the physician ends by recommending using the

[17]Grapow translation: wick.
[18]Willow contain Salicyl, an antiseptic (Manniche, 1989).

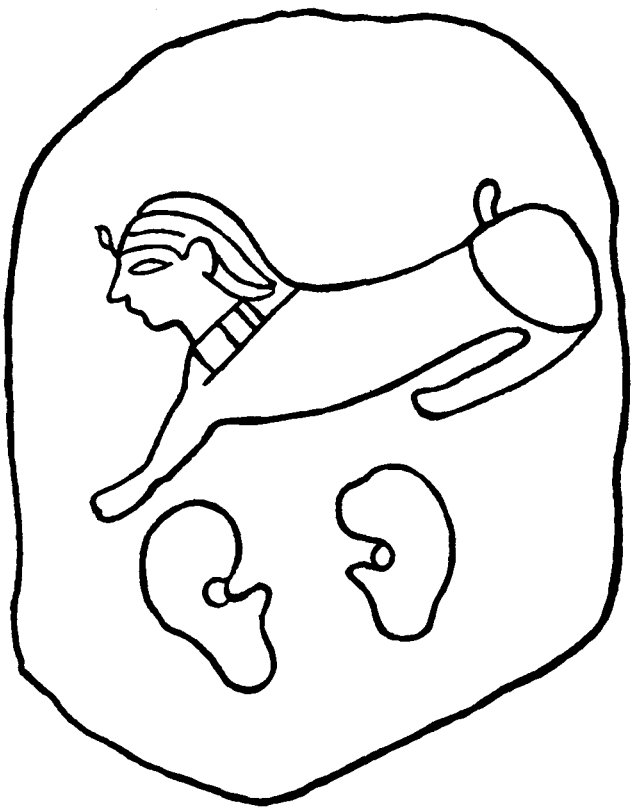

FIG. 6
Ear tablet showing incisura, Sphinx Temple, Giza

remedies 'very often'! Not dissimilar to our present day practice with some ear cases!

The same prescription carries on:

'Thou shalt do similarly as for a finger which is broken and whose bone-marrow flows to the ground, this is the treatment of an ear which is split on the vault, but which does not fall to the ground; thou shalt prepare for it a knotted net of flax and tie it up therewith and sap of sycamore, so that it (i.e. the ear) fastens to his blood,[19] oil and honey not being applied to it. Thou shalt cut one side of it in order that its blood may come down on one side. Let it not suppurate at all. Now when thou has perceived that it has grown together, then thou shalt prepare for it, oil, wax, are melted and (it) is bandaged therewith, not applying too much. Thou shalt apply it the same as (to) every effluency from its splitting. If it passes on to decay (necrosis), then thou shalt prepare for it a string of linen, tied on the back of his head'. We notice in the above description that a net is used to hold the ear in place and healing by primary intention is encouraged, though generally speaking secondary intention was the norm encouraged in wound healing.

In Ebers 91, 767 we read: 'What is done to treat effluency which is sent out from an ear: if it (i.e. the ear) exudes from its interior like *ka* (dirt) of effluency, because it flows over with humour like paste-water, then thou shalt go round it with a *khept* (knife) to the limits of all that decays in it, thou shalt prepare for it: oil, honey, seed-wool are placed within it and applied as a fillet of linen and (it) is bandaged therewith, until it is healed'.

In the aforementioned case is the first ever description

[19]Is this using auto-fibrin!

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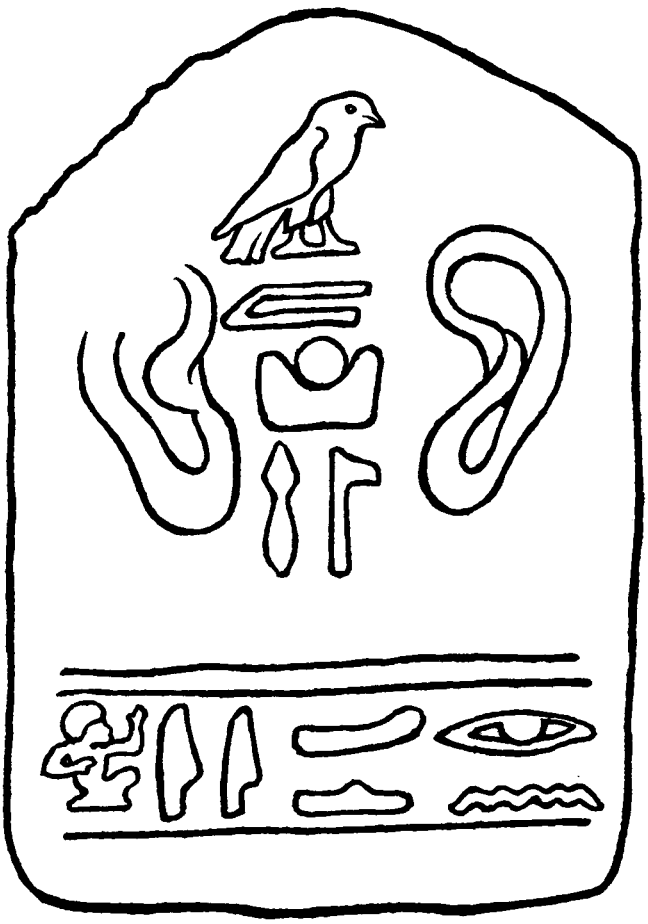

FIG. 7
Ear tablet of Hwy, Sphinx Temple, Giza.

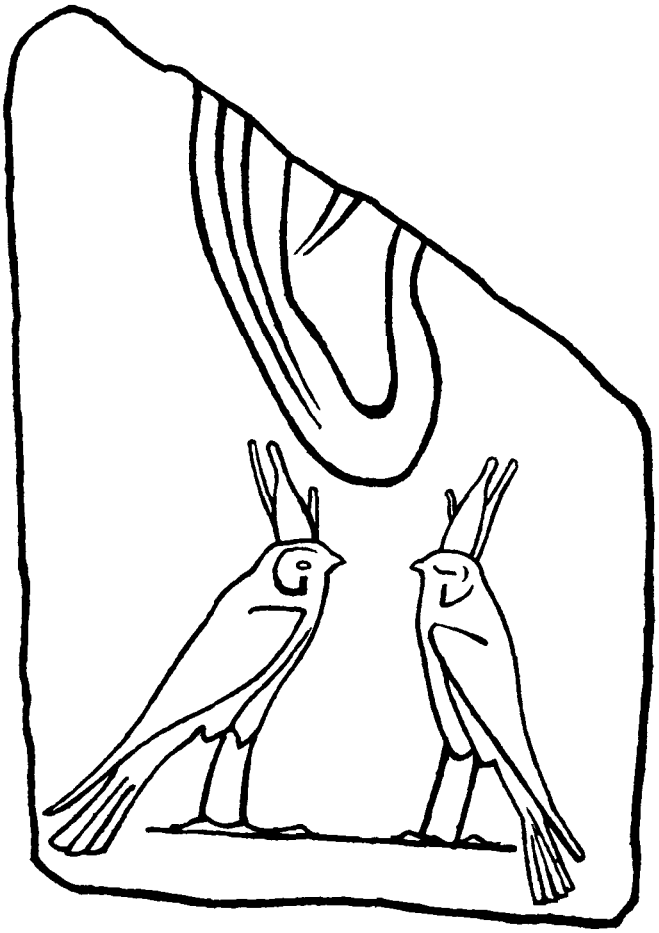

FIG. 8
Ear tablet, Sphinx Temple, Giza.

of an ear incision and operation. This description is reminiscent of necrotizing otitis externa as the word 'decay' is used and it also refers to the 'interior of ear' rather than 'the mastoid'.' It is worth mentioning that diabetes (Ebers, 39, 197),[20] kidney diseases and other debilitating conditions were present in Ancient Egypt. However, some tried to explain the procedure referred to above (Ebers, 767) as a mastoid operation.

The skull of King Tut-Ankh-Amon shows a scar behind the left mastoid. At some stage it was thought that he had a mastoid operation and that the cause of his death was possibly an intra-cranial complication of the mastoid infection. It was Professor R. G. Harrison[21] who showed that King Tut-Ankh-Amon had a fractured skull at the site of the scar. It is thus apparent that King Tut-Ankh-Amon was assassinated and died from a blow to the head.[22]

Histological examination of a temporal bone of the skull, thought to be from the XIII Dynasty, showed sclerotic changes in the mastoid process indicating otitis media (Horne *et al.*, 1976).

[20]That this case may be diabetes is suggested by H. Kamal, Ancient Egyptian Medicine, Volume III, p. 256, 1964.

[21]The late Professor R. G. Harrison, F.R.S., M.D., D.Sc., was Professor of Anatomy, Liverpool.

[22]There was political turmoil at the time of King Tut-Ankh-Amon. He died at the age of 16–18 years, c. 1375 BC. Other theories for his early death are TB infection or poisoning. He was the son-in-law of King Akhenaten (*v.i.*), XVIIIth Dynasty.

IX *Cholesteatoma*

Discharging ears were known and treatment prescribed (*v.s.*). Skull specimens with destruction of the mastoid bone are recorded (El-Batrawy, 1935; Leek, 1986). El-Batrawy described two cases, the first of an adult man with infection of the left mastoid and a fistula above the auditory meatus (possibly a zygomatic abscess). The other was of an adult male with a left jugular fossa opening to the tympanum by an inflammatory process. Leek's case is of a male with a mastoid fistula in the lower part of the left mastoid process (possibly Bezolds' abscess). All these skulls display some of the earliest records of complications of cholesteatoma.

X *Facial palsy*

An Egyptian mummy (c. 5th–3rd Century BC) with left facial palsy was described by Ruffer (1921); also *v.i.*

XI *Perichondritis*

There is no mention of perichondritis as such, but the Ancient Egyptians must have recognized it as in treating a cut in the ear it is recommended 'Let it (i.e. the ear) not suppurate at all' (Ebers, 91, 866). Thus healing by primary intention was encouraged whereas, in the same papyrus in the part dealing with wounds (Ebers, 70), healing by secondary intention was aimed to: 'Remedy for a wound the first day: grease of ox—or ox-beef—until it (i.e. the wound) suppurates' (Ebers, 70, 522).

XII *Injury to the ear*

In Edwin Smith papyrus, cases 21–23 were injuries

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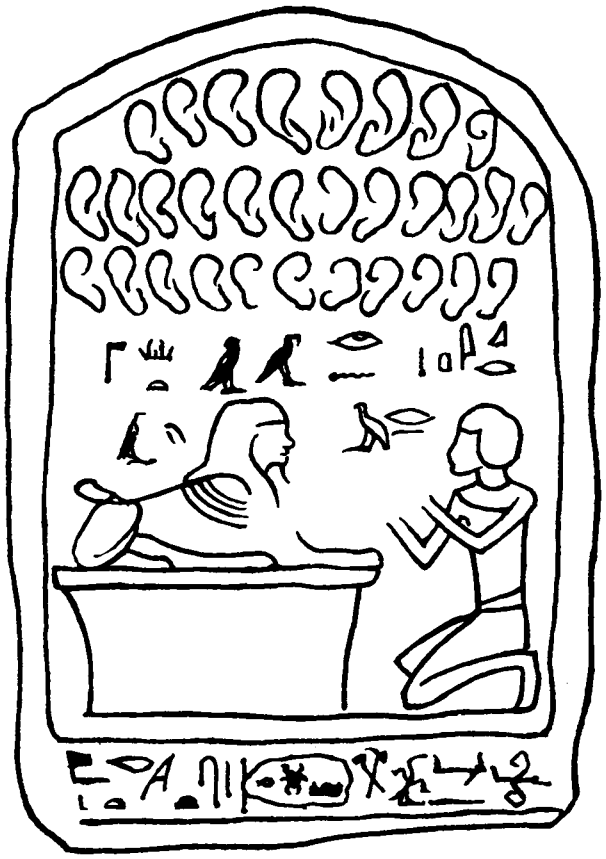

FIG. 9
Stele of Mer, Sphinx Temple, Giza.

involving the ear (Breasted, 1930). These cases illustrates a far advanced practical medical knowledge and present a fascinating insight into the otological practices in that remote epoch. Cases 18–22 deal with injuries to the temple.

Case 21 reads: 'If thou examinest a man having a split in his temple, shouldst thou find a swelling protruding on the outside of that split, which he discharges blood from his nostril and from his one ear having that split (and) it is painful when he hears speech because of it. Thou shouldst say concerning him: 'One having a split in his *gm*' (temple), while he discharges blood from his nostril and his ear having that injury. An ailment with which I will contend'. Thou shouldst put him at his mooring stakes,[23] until thou knowest he has reached a decisive point'.

In the commentary on this case the ancient writer continued: 'Until thou knowest whether he will die or he will live; for he is (a case of) an ailment with which I will contend'.

The anatomical area *gm*' is described by the ancient writer thus: 'means the region thereof between the corner of his eye and the orifice of the ear at the end of his mandible'.

Case 22 reads thus: 'if thou examinest a man having a smash in his temple, thou shouldst place thy thumb upon his chin (and) thy finger upon the end of his ramus, so that the blood will flow from his two nostrils (and)from the interior of his ear having that smash. Cleanse (it) from his with a swab of linen[24] until thou seest its fragments (of bone) in the interior of his ear. If thou callest to him (and) he is speechless (and) cannot speak, thou shouldst say concerning him: 'One having a smash in his temple; he discharges blood from his two nostrils and from his ear; he is speechless, (and) he suffers with stiffness in his neck. An ailment not to be treated'.

Stiffness of the neck was tested by asking the patient to look at his shoulders and his chest (Edwin Smith, case 3), not dissimilar to our present day practice!

Case 23 is the only case in Edwin Smith Papyrus which is an injury exclusively to the ear.

Case 23, a wound in the auricle, it reads thus: 'If thou examinest a man having a wound in his ear, cutting through its flesh, the injury being in the lower part of his ear, (and) confined to the flesh, though shouldst draw (it) together for him with stitching behind the hollow of his ear. Thou shouldst say concerning him: 'One having a wound in his ear, cutting through its flesh. An ailment which I will treat'. If thou findest the stitching of that wound loose (and) sticking in the two lips of his wound, thou shouldst make for him stiff rolls of linen (and) pad the back of his ear therewith. Thou shouldst treat it afterwards (with) grease, honey (and) lint every day until he recovers.'

There are a number of described injuries to the head that also involved the ear (cases, 4, 5, 7, 8, 13, 17 and 18).

Some mummies and skulls show injuries to the mastoid. The mummy of Seqenenre[25] Tao (*v.i.*—Fig. 25), beside the multiple facial injuries, had evidence of a spike or spear being driven into the left side of the head below the ear smashing the left mastoid process, left occipital condyle and part of the foramen magnum (Kamal, 1967).

XIII *Human bites*

Four treatments are prescribed in Ebers papyrus for human bites (64, 432–435), though not specifically to the ear. The ear is an easy 'target' for human bites, (the author has seen two such cases in his clinical practice).

XIV *'Hyperacusis'*

Is described following injury to temporal area thus: 'If thou examinest a man having a split in his temple, . . . (and) it is painful when he hears speech, because of it', (Edwin Smith Papyrus, case 21).

XV *Noise deafness*

Pliny the Elder (AD 77) wrote that inhabitants of the region of the Cataracts of the Nile became deaf with noise, though Francis Bacon was sceptical of such a statement (Stephens, 1974). It is more probable that because of the background noise,[26] people tended to shout and thus the erroneous impression of deafness (Pahor, 1979). It is possible, however, that occupational deafness was a hazard in Ancient Egypt to certain workers in noisy atmos-

[23]Is explained at the end of Case 3 thus: 'As for Moor (him) at his mooring stakes', it means putting him on his customary diet without administering to him a prescription. This statement is an archaic idiom, the oldest idiom known!

[24]Same was used to clean nostrils (cases 11 and 12—Edwin Smith papyrus).

[25]Sometimes wrongly written Sekenenre.

[26]Even presently, the area of the Cataracts is still noisy in spite of the slower flow of the Nile due to 'recent' dams upstream (both the Aswan Dam and the High Dam).

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pheres e.g. metal workers as in copper hammering (Ramazzini, 1705).

XVI *Foreign bodies*

An arrowhead in the region of the left mastoid was demonstrated by Pahl (1986) in a mummy head kept in Tübingen.

XVII *'An onion in your ear'*

Onions were found beneath or in the ears of some mummies (Abdel-Rahman, 1939; Manniche, 1989). Onions were also placed in the thorax, pelvis and near the eyes of mummies.

XVIII *Ear prosthesis*

Ear protheses were found, possibly used in cases when an ear was lost in battle or fight (Ghalioungui,[27] 1984)

XIX *Caloric reaction!*

It seems they were aware of caloric reaction as we read in Ebers Papyrus (19, 766) in the section on ears: 'Another to treat the ear: Thou shalt treat it with cold remedies, let it not be hot' (*v.s.*)

It is of note that they did not know of ice, and there is no snow in Egypt.

XX *Mummification*

Wax of honey was used to cover the ears, nose, mouth and openings produced in the process of mummification (Gabbra, 1950).

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NB: Part II will be published in the September issue and Part III in October. The references will appear completely at the end of Part III and reprints will be available for the complete paper.

[27]The late Professor Paul Ghalioungui was president of the XXIXth International Congress of the History of Medicine, Cairo, 1984.