

The art of medicine

The art of healing in ancient Egypt: a scientific reappraisal

The ancient Egyptians developed one of the earliest recorded systems of medical treatment. Over the past 100 years, knowledge and appraisal of these procedures have been largely based on evidence provided by twelve documents inscribed on papyrus: the so-called medical papyri. One manuscript is written in Egyptian hieroglyphs, whereas the others are in the Hieratic script, a cursive form of hieroglyphs. The papyri date between about 1820 BCE and 250 ACE, although some may be copies of earlier works. Most were acquired by modern owners in private sales during the late 19th and early 20th centuries, and perhaps originated from temple libraries, doctors' houses or tombs, or town archives.

Egyptian hieroglyphs were first deciphered by the French Egyptologist J F Champollion in the early 19th century, and this led to translations of the previously inaccessible literature of ancient Egypt. Translations of the medical papyri have shown that each deals with a variety of subjects, with some material repeated in more than one document. These compilations cover remedies to treat symptoms of a range of illnesses and physical conditions, although some also discuss the Egyptian notion of the cardiovascular system. One—the Edwin Smith papyrus—is notable for its structured approach, being based on a series of case studies that each includes a title, instruction on the examination of the patient, diagnosis and prognosis, and recommended treatment. The translations have led scholars to conclude that Egyptian medical practice included two main strands: "rational" treatments based on so-called scientific principles and observation of the patient, and "irrational" methods that involved magico-religious beliefs and relied on the use of amulets, incantations, and rites to drive out the unseen and supernatural agents presumed to cause some diseases. Although this contemporary separation and distinction of approaches would have been meaningless to the ancient Egyptians, scholarship has hitherto attributed a predominantly magic-based medical system to ancient Egypt, while according the discovery of rational medicine to the Greeks in the 5th century BCE.

The Egyptian papyri are, however, a limited and problematic source. Known examples represent only a small proportion of similar, undiscovered works that presumably once spanned 3000 years of civilisation. Also, modern translators have encountered particular problems with the vocabulary of these documents. Usually, identification of words and terms found in one text are independently attested by their use in other inscriptions, but some words in the medical papyri are unique and cannot be confirmed elsewhere. Therefore, some of these translations remain speculative. Difficulties posed by the papyri have persuaded Egyptologists to consider other evidence that might verify or correct the perspective provided by the literary texts, expand

our knowledge of ancient Egyptian medicine and pharmacy, and provide a more accurate assessment of their legacy. Alongside the papyri, there is a wealth of other evidence from ancient Egypt: mummified and skeletal remains; plant, animal, and mineral ingredients used in medicine; temples and tombs; and artifacts such as stelae (tombstones) inscribed with autobiographies of medical practitioners, statuary and amulets associated with healing, and some surgical instruments. Multidisciplinary research on such source material is yielding new insights into the occurrence of disease and treatment methods in ancient Egypt.

Anatomical and radiological studies on skeletal and mummified remains provide extensive information relating to disease in the teeth and the skeleton; these techniques have also revealed healed fractures and amputation sites, confirming that the Egyptians did successful surgery. It is noteworthy that, at least in some cases, there was no apparent difference in the quality of treatment and care afforded to different social classes. Research on two artificial great toes associated with mummies suggests that, in each case, the prosthesis was probably worn during the owner's lifetime; if their functionality is confirmed by a current biomechanical assessment of replicas of the toes, then these pieces could be the earliest surviving intravitral limb prostheses. Since the early 20th century, Egyptologists and dentists have debated the existence of an operative dental profession. Although the medical papyri contain some prescriptions for dental problems, neither literature nor skeletal material provides convincing evidence of professional, interventional dental treatment. Samples of tissue, bone, hair, and teeth taken from mummies can now be examined using a range of techniques that include histology, immunocytochemistry, enzyme-linked immunosorbent assay, and DNA analysis. Such diagnostic tools have helped identify diseases in the mummies; it has even been possible to amplify and sequence ancient *Schistosoma* DNA fragments in the remains of a disease-causing parasite found in a 2000-year-old mummy.

Some diseases were treated with pharmaceutical remedies listed in the medical papyri, but until recently, the therapeutic efficacy of many of these prescriptions has been doubted. About 2000 remedies recorded in the medical papyri provide details of the ingredients, method of preparation, dose, and route of administration. Ingredients were sourced from within Egypt, or from trade with the Near East, Africa, and southern Mediterranean lands. Difficulties with translating the names of some ingredients mean that the identification of about 30% of them have been disputed. Archaeobotany and phytogeography have recently been used to re-evaluate these prescriptions and their therapeutic efficacy and given more credible identifications for 284 ingredients.



Temple of Hathor, Denderah by David Roberts in Egypt and Nubia (1846–49) by David Roberts and William Brockedon

The prescriptions in the medical papyri are presented in sufficient detail to make them reproducible today. Current research confirms that from at least 1820 BCE, the Egyptians prepared and delivered drugs, and from 1550 BCE precise measurements were introduced for prescribing each drug. Indeed, 50% of the drug sources used by the ancient Egyptians remain in use today, although many are now synthesised. Also, a first attempt to estimate the pharmaceutical value of these remedies has shown that 64% are therapeutically effective, and that, although some treatments still relied on the power of magic, most were based on rational protocols and standards. Analytical scrutiny of seemingly irrational treatments, such as the use of crocodile excrement as a contraceptive and the recipe to anoint the head of a migraine sufferer with part of a catfish, may ultimately lend some support to the Egyptians' view of them as effective cures.

Analytical techniques such as gas chromatography-mass spectrometry and liquid chromatography-mass spectrometry have added yet another dimension. They have been used to investigate whether the blue lotus flower (*Nymphaea caerulea*) was used as a narcotic or aphrodisiac; to examine samples of hair and scalp tissue from mummies for physical evidence of preparations described in the papyri to treat baldness and greying hair; and to identify the botanical and geographical origins of resins and unguents so that ancient trade routes of medicinal and other ingredients can be established.

Archaeological excavation has revealed how some temples had a reputation as centres of healing. The Egyptologist Francois Daumas identified as a sanatorium the brick building excavated in the enclosure of the Temple of Hathor at Denderah. Here, water drawn from the temple's Sacred Lake and believed to have curative properties, was used to bathe patients. The sanatorium had a series of small, dark cells where patients were prepared for the "Therapeutic Dream",

when a trance-like state was induced by use of lamps, burning perfumed wood, and sacred songs, so that the sufferer could approach the gods and seek healing. Archaeological evidence has shown that part of a temple at Deir el-Bahri was also used as a healing centre. Both sites date to the later periods of ancient Egyptian history, contemporary with temples in Greece where similar treatments were pursued. However, inscriptional evidence confirms that these healing procedures were already used in Egypt at least a 1000 years earlier.

Paul Ghalioungui suggested in 1963 that the Egyptians "were the first in History to dare look at the other side of the abyss that separates magic from science". Nonetheless, he and later writers generally regarded the Egyptian medical system as a mixture of rational and irrational treatments, largely reliant upon magico-religious procedures. Now, based on a review of the evidence provided by multidisciplinary studies, it seems that, although the medical practitioners followed several approaches to healing, the prevalence and influence of "irrational" treatments were probably less important than previously supposed. From an early date, doctors certainly had the knowledge and skills to provide rational and effective treatment for their patients. Nevertheless, magico-religious practices undoubtedly continued throughout the millennia; and, in the absence of an effective rational remedy, the Egyptians could always resort to magic, as in the following incantation to cure the common cold:

"Flow out, fetid nose, flow out, son of fetid nose! Flow out, you who break bones, destroy the skull and make ill the seven holes of the head!"

Papyrus Ebers 763

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Further reading

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