Egyptian Medicine.¹

By WARREN R. DAWSON.

IF we wish to go back to the very beginnings of the great science of medicine that to-day can almost achieve miracles in the prevention and cure of disease, it is to Egypt that we must turn, for the Egyptian medical books are by many centuries the oldest scientific writings that have survived the ravages of time. Our knowledge of Egyptian medicine is derived from a series of papyri, the oldest of which dates from the Middle Kingdom, although all of them are clearly derived from much more ancient prototypes. These papyri for the most part are miscellaneous collections of prescriptions and incantations for the cure of diseases of many kinds, and they contain but little information to enlighten us on Egyptian conceptions of anatomy and physiology.

The ancient practice of mummification, which began probably so early as the time of the First Dynasty, has had an enormous influence on the growth of anatomical knowledge, for the complex manipulations to which the body of an Egyptian was subjected in the course of its embalming afforded opportunities for many centuries for its practitioners to become acquainted with the nature and mutual positions of the internal organs of the body—opportunities that were denied to all peoples who inhumed or cremated their dead. Mummification, involving as it did the removal and handling of the internal organs of the body, provided the first opportunities for observations on comparative anatomy, for the Egyptians did not fail to perceive the essential identity between the organs of the human body and those of animals, the latter long familiar from the time-honoured custom of cutting up animals for sacrifice and food. The effects of these observations are seen in the fact that the Egyptians had a very extensive anatomical vocabulary. They were able to distinguish and name a great many organs of the body that a more primitive and less enlightened people would have grouped together or failed to perceive. They were consequently able to localise many diseases and ailments, since they knew the positions and general character of the internal organs.

Of all the viscera the heart was regarded as the most important. The Egyptians apparently attached no importance to the brain, but the heart was regarded as the seat of life and consciousness and of the emotions. It was further recognised as being the centre of a complex series of 'vessels', although the Egyptians failed entirely to understand the vascular system and the nerves and muscles; yet they understood the pulse and diagnosed any irregularities of its beat as being caused by affections of the heart. It is further significant that the heart was always carefully left in its place in the thorax, attached to its great vessels, when all the other viscera, both of the chest and the abdomen, were removed in the process of embalming. The presence of the heart was believed to be as important to a mummy as it was to a living man.

The Egyptians shared with many other primitive peoples the belief that death and disease are unnatural and abnormal. Disease had a cause that was impalpable and invisible, and it was generally laid at the door of supernatural influence. The paramount belief that illness was due to possession is clearly expressed in the Egyptian papyri. Many of the diseases are expressly stated to be "the assaults of a god, the assaults of a goddess, of a dead man or a dead woman,

of an enemy, male or female", etc. In the papyri the idea of possession is evident from the fact that the diseases are often treated as if personified, and they are addressed and harangued by the magician. The titles of the prescriptions clearly embody the same idea, for we find, instead of the simple phrase "prescription for curing" such and such a disease, the words "prescription for banishing", "driving out", "expelling", or "terrifying" the disease.

There cannot be the slightest doubt that Egyptian medicine had its origin in magic, and that magic never lost its hold upon medicine, even when the latter was becoming more and more rational. The earliest doctors were magicians and the earliest forms of treatment were magical rites. Some of these rites were merely oral; the magician recited a spell and bade the possessing devil to be gone. Others combined with the oral rite a manual rite, in which the spoken formula was recited to the accompaniment of some gesture or manipulation. Spells were recited over amulets, and the amulets were then placed upon the affected part. Sometimes, again, the recitation was made over some herb or mixture of substances, which, when charged with magical power, was administered to the patient either as an external or internal medicine. Thus arose the practice of giving the patient a prescription of drugs, often nauseous in character, the primary object of which was not so much to relieve the sufferer as to expel the demon of disease.

It is characteristic of the magician that he should have more than one string to his bow: if one remedy should fail, another may succeed, and consequently the papyri are full of alternative prescriptions for the same disease. Their very multiplicity is a confession of their purely arbitrary and unscientific character; but it often happened that some of the prescriptions really did contain elements that were appropriate and rational, and these consequently would tend to supersede their worthless fellows, and, as a result, the magician who could compound effective medicines was most in request. Such magicians were, in fact, no longer magicians, but physicians.

It will thus be seen that, through a long process of more or less ineffectual experimenting, the Egyptians groped their way towards a rational pharmacopoeia, and this, combined with their knowledge of anatomy, crude and unscientific as it was, enabled them to prepare prescriptions for the treatment of disease seated in various localised parts of the body centuries before other nations, that lacked such knowledge, were able even to begin to understand medicine. The other nations of antiquity borrowed from the Egyptians, ready-made, the foundations of their medical knowledge, and the early medical literature of many other countries, not excepting Greece, bears abundant testimony to the debt owed to Egypt.

Wounds and injuries were regarded by the Egyptians in quite a different light from sickness and disease. The cause of the latter was invisible and unknown and attributed to supernatural influence, whilst the former's axe or other human energy was the easily perceived cause of the former. Wounds were consequently treated by rational means, and with their treatment, surgery came into being. Gradually, the morbid conditions that were often revealed by wounds were observed in cases where no wounds had been inflicted, such as in cases of boils and suppurating sores, and thus rational surgical methods were adopted for the treatment of these cases. Many of the passages that describe the treatment of wounds and diseases

¹ Paper read at a reception to the president, committee, and members of the Egypt Exploration Society, held at the Wellcome Historical Medical Museum, on Nov. 11.

that had some obvious external manifestation are strikingly rational and thorough, but although rationalism and experience were enabling scientific medicine to free itself from the shackles of magic, the latter nevertheless continued, and it is by no means extinct to-day. Even when he treated disease by rational therapeutic methods, the physician could never forget that his art originated in various attempts to coax, charm, or forcibly expel the demon of disease from its involuntary host.

It is the fashion amongst students of medical history to despise Egyptian medicine as fantastic and absurd. It must not be forgotten, however, that through the thirty centuries or so that preceded the birth of scientific thought in Greece, Egypt had painfully laid the foundation upon which later investigators were

to build. Throughout the jumble of magic and sorcery that plays so large a part in Egyptian medicine, a careful study of the texts reveals a modicum of correctly observed truth—the very foundations of medical science. If Egypt cannot compete with Greece in scientific knowledge and thought, she at least inaugurated what others have developed, and the time-honoured custom of mummification familiarised the popular mind for thirty centuries with the idea of cutting the dead human body, and the Greek anatomists in the time of the Ptolemies were able to begin, in Egypt, the systematic dissection of the human body, which popular prejudice forbade in all other parts of the world. Without anatomy, the scientific practice of medicine could never have been possible: civilisation and humanity owe an enormous debt to Egypt.

Origin of the Bird Fauna of the Arctic.

AN attempt to solve the problem of the origin of the bird fauna of the arctic has recently been made by Prof. A. Tougarinov ("The origin of Arctic Fauna", *Priroda*, No. 7-8, 654-680, Leningrad, 1929).

The total number of species nesting in the arctic zone is about 180, or 240 if one includes the sub-species. These can be divided into the following zoogeographical groups:

(1) The group with circumpolar distribution, comprising 26 purely arctic species, which do not nest farther south. It is interesting to note that there exists a distinct systematic affinity between some of these species and those inhabiting more southerly regions. Thus, the arctic *Buteo lagopus* is closely related to *B. hemilasius*, which inhabits Central Asia and is not found farther north than the southern regions of the Siberian steppes. Many other such examples might be quoted.

(2) The Atlantic group, consisting of 16 species, out of which 7 are truly arctic, nesting on the coast-line of the Atlantic ocean. These species are found throughout the European coasts of the Atlantic, up to the regions which are subject to the influence of the Gulf Stream, Franz-Joseph Land, Spitsbergen, Iceland, Greenland, as well as the eastern coasts of arctic America.

(3) The European-Siberian group consisting of 15 truly arctic species, which are found throughout the tundras of Europe and western Siberia so far east as Taimyr. As a general rule, these species hibernate in the Mediterranean region, not farther east than the Aral Sea.

(4) The Eastern-Siberian group, which consists of 23 arctic species and is spread throughout the tundras and islands of the Polar Sea, from the Taimyr Peninsula up to the Kalyma River. Here again there is an affinity with more southerly Asiatic species. Thus, *Leucosticte brunneinucha* living in the tundras of Yakutia belongs to the genus well represented in the mountainous regions of Central Asia. Again, *Sarcorgeranus leucogeranus* found in the tundras of Yana and Kalyma is sporadically distributed throughout the South Siberian, Mongolian and Kirgiz steppes. Even more striking is the close systematic affinity between the arctic species belonging to the East Siberian group and those inhabiting the nearctic, for out of their total number of 23, 11 species are found in North America.

(5) The Tchukotsk Peninsula group, possessing a rich and varied arctic fauna. There are 34 truly arctic species alone, out of which 12 are found also in Alaska, and another 15 in Alaska and America. The bird fauna of the Tchukotsk Peninsula bears a close resemblance to that of the neighbouring regions of

America. On the other hand, one is struck by the dissimilarity between the arctic bird faunas of eastern Siberia and that found west of Chaunsk Bay; however, it is somewhat difficult to decide whether the Tchukotsk group belongs to the palaearctic or nearctic zoogeographical region.

(6) The bird fauna of the coast-line and the islands of the Bering Sea deserves to be placed in a separate group. It is distinguished by the presence of numerous representatives of the family *Alcidae*, eight species of which are found in that region. Another characteristic of this fauna is its endemic character—there are 9 truly polar species which are not found outside the coast-line and the islands of the Bering Sea (for example, *Sterna aleutica*, *Erolia ptilonemesis*, *Leucosticte griseinucha*, *Philacte canagica*, etc.).

(7) The Alaskan group, which spreads so far east as the Mackenzie River, is distinguished by its great variety; it included 66 species and forms, out of which 36 can be considered as truly arctic. The American species predominate and 22 species and sub-species are endemic.

(8) The American arctic group inhabiting the region from Mackenzie River up to Baffin Land and Labrador. Out of 45 species nesting there, 30 are truly arctic. The majority of these are found in Alaska, 3 species belong to the Atlantic group, another 3 can be considered as endemics of Baffin Land, and one, *Microptalama himantopus*, has so far been found only in the Canadian tundras.

(9) The Greenland group, which besides the circumpolar species possesses 12 arctic ones. Of these, the majority belong to the European-Atlantic group, while the nearctic is represented by *Chen nivalis* and *Limónites fuscicollis*. There are no endemics.

The above facts permit the following conclusions:

The bird fauna inhabiting the arctic region of eastern Siberia has apparently been derived from Central Asia. The fauna of the European-Siberian part of the Palaearctic is not closely connected with that of the Atlantic region, but has a distinct systematic affinity with the fauna of eastern Siberia (for example, *Erolia*, *Branta*, *Limosa*). It can be considered, therefore, that the tundras of western Siberia and Europe are inhabited by immigrants from the East. Many American species are found in European Siberia, and although some Siberian species are found in America, they are not so numerous and have spread only so far as western Alaska.

The region of the Bering Sea, which includes the Tchukotsk Peninsula and Alaska, is inhabited by a peculiar fauna of its own, possessing numerous ancient forms. Its water fauna is original and its land fauna is connected with that of America. It is probable,