



A ROUND TABLE ON SCIENCE ,
LETTER AND ART

NIC'S CORNER

FROM THE STARS TO THE MIND



A HIDDEN TREASURE, OUR BRAIN

"I will find where truth is hid" (Shak)

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A quick glance through medical history over the last six thousand years shows that - surprisingly - the brain's functions were completely unknown to our ancestors, until medicine started to become "scientific" in 570 b.C. During the course of its complex evolution man's brain has grown from 600-800 mg at the time of Homo habilis, to 1000-11000 mg of Homo erectus, up to the 1300- 1500 mg of today's Homo sapiens. (1) This expansion has been accompanied by far-reaching structural changes; its functions have become more complex and its sectorial specialisation has increased; there are more neurons dealing with intellectual functions and they are much better integrated. All this, in brief, has made our cognitive activities more efficient and effective. Throughout this whole period man has had unlimited opportunities to observe and study himself, those like him and his surrounding world. He has had many a chance to interpret Nature's mysteries, to build up theories, draw conclusions - often ephemeral - but the "human machine" continues to arouse surprise, curiosity and wonder.

It has taken a real effort, intuition, a spirit of observation, creativity and faith to grasp an understanding of the complex mechanisms of life. Yet we still wonder that it has taken us so long to understand certain phenomena that looked simple enough and to classify them in their rightful place in the order of events.

The brain's workings are one of these cases. Past civilisations overlooked it completely, until a great philosopher glimpsed and described its role, with astounding intuition and imagination.

CHINA, FROM THE GREAT HERBAL TO ACUPUNCTURE

While the old pharaohs were devoted to the construction of pyramids, the old Chinese emperors cultivated the study of medicine. According to the emperor Shen Nung, who is believed to have founded medicine and agriculture in the year 2800 b.C. the universe was created by elimination of the chaos and setting up of the order, based upon the two opposite poles "Yang" and "Yin".

The "Yang" being the positive, the "Yin" the negative element. Male, heaven, light, strength, against female, earth, moon, weakness...

The old Chinese achieved remarkable heights in the life sciences, developing a sophisticated medicine based upon the use of herbs and acupuncture.

Their knowledge of anatomy was rather modest, probably because Confucius prohibited to touch the human body which was considered to be holy. For instance, the old Chinese ladies during a medical visitation did not undress but they showed their painful points on a small statue of jade.

In the book of medicine of the emperor Huang Ti (2698 b.C.) is written:

... the heart is the king, the lungs are the ministers, the liver is the general, the gall-bladder is the attorney, the spleen is the steward taking care of the five senses...

The three burning cavities: the thorax, the abdomen and the pelvis will eliminate the wastes...

A rather picturesque way of interpreting physiology without any mention of the brain!

(2)

VEDIC MEDICINE, THE TOP IN SURGERY IN THE PAST

Hindu medicine began in 1500 b.C. with the invasion of Punjab and the start of the Vedic period.

The old Hindu physicians excelled in surgery, although they were rather weak in anatomy, because the dissection of corpses was forbidden by their religion. (3) They developed a good knowledge of blood circulation, believing that the heart was the centre of life, but they almost know nothing about the function of the brain. They understood that there is a relationship between moskitos' bites and malaria as well as between rats and plague.

They anticipated by far other civilizations in surgery. The reconstruction of the nose, by means of rhinoplasty, was very frequent and advanced. As a matter of fact, adultery was punished with the amputation of the nose.

MEDICINE IN MESOPOTAMIA

Long before Abrahams birth, a great civilization flourished in Mesopotamia before the Universal Deluge.

Medical texts of particular importance were often written on cuneiform tablets which have been recovered and deciphered. So we know that: u... The blood was believed to generate all of the vital functions, the liver to collect the blood and to be the centre of the fundamental facts of life. .. U (2)

EGYPT: A MEDICINE FOR INITIATES

The old Egyptian priests had an excellent knowledge of various illnesses of the heart, abdomen, eyes, urinary and gall bladder. They already described angina pectoris, as well as various kinds of tumors. Concomitantly, they developed various drug remedies in different presentations, almost the same as those we have today, such as: suppositories, tablets, ointments, plasters, solutions for inhalation, clismas... The most popular remedies were based on opium, honey, beer, garlic, onions, olive oil, ricinus oil, hemlock, yeast, linus seeds. Obviously the use of these drug remedies had to be accompanied by magic words and ritual practices.

The Egyptians were probably the first to adopt the concept of specialization in medicine. According to Herodotos many physicians practiced in the valley of Nile: eye-physicians, head-physicians, dentists, GI-physicians as well as physicians specialized in unhidden illnesses. (4)

Contrary to the Assyrians and Babylonians, who believed the liver to be the motion centre of life, the old Egyptians attributed great importance to respiration. They recognized the heart being the circulation centre ... However, they believed that circulation would be regulated by respiration... (5)

Skull trepanation was current practice aiming at releasing the evil spirits from the body; nevertheless the old Egyptians did not realize the brain being the site of our mind.

GREECE: THE BIRTH-PLACE OF SCIENTIFIC MEDICINE

During the golden period of the old Greece, physicians gave up consulting the stars and pronouncing magic words. In 570 b.C. Alcmeon denied that the heart was the site of sensations and intelligence, stating that our mind resides in the brain where 011 sensations converged. Alcmeon investigated the causes of functional disturbances after brain injuries and provided an explanation of sleep and death, still valid nowadays. As a matter of fact, he stated the sleep befalls you when the \ blood flows out of the brain and death occurs when the flux out ends irreversibly. (2,3)

Successively, Erophylos of the Medical School of Alexandria - Egypt, investigated the anatomy of the brain and bone marrow, he distinguished between nerves, tendons and blood vessels. He discovered that nerves lead movements and their centre resided in the brain. Finally he saw in the skull the membranes protecting the brain; he described the cerebellum, the meninges and the ventricles...

How was this dramatic progress possible at once?

According to Galeno, Erophylos was the first who dared to dissect human corpses and may be to plunge the bistoury into the body of leaving people. (6)

PRECOLOMBIAN CIVILIZATIONS

In Precolombian America the Maya and Incas civilisations followed strictly theurgic medical practices. However, they had a range of medicinal plants and remedies, many of which subsequently reached Europe after the discovery of the American continent. Many still play a direct or indirect role in the "medicine cupboards" of the West.

The Mayas had a good knowledge of anatomy and physiology, especially the male and female genital apparata. They considered the heart the centre of life, and believed that vita l spirits circulated freely in the veins, pulsating to show they were there . (7)

And the brain remained a hidden treasure!

From the 3rd century b.C. until the end of the 18th century - for more than two thousand years - experts in medicine maintained that the brain's task was to receive messages from the ears, eyes, nose and tongue and combine them in the anterior ventricle to form a "sensus communis", meaning literally "common sense". It was believed that messages took the form of vital humors, which were converted to animal spirits inside the brain. These humors gave rise to ideas and imagination in the anterior ventricle, to thought and judgement in the median ventricle and to memory in the posterior ventricle...

These "myths" only perished at the turn of the 18th century, under the impact of rapid development of the natural sciences, the results of experimental research and the birth of electrophysiology of the nervous system. (8)

Almost 2400 years elapsed since the discovery of the brain by Alcmeon. Nevertheless we still say in English:

to learn by heart,

or in French:

apprendre par coeur.

The roots of our culture dwell very deeply and we still define the heart as the most important site:

the site of affections or sensibilities, such as love, hate, joy, grief, courage and pleasure;

the site of understanding or will;

the better or lovier part of our being;

the spring of all our actions and purposes;

the site of moral life and character;

the moral affections and character itself. (9)

It's time to rediscover our hidden treasure, our brain!

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