

Galen the Physician (129-200 AD)

by S. Haag

One of the greatest and most influential of later Greco-Roman scientists was a man from Pergamum in Asia Minor born about five hundred years after Aristotle during the reign of the Roman emperor Hadrian. His name was Galen, and his extraordinary output of writings on anatomy, physiology and medical treatment would guide physicians all over Europe until the nineteenth century.

Galen's father was an architect and a rich enough one to give young Galen nothing but the best. The future physician was an only child who preferred studying to the usual games of childhood, and who was apparently already the author of three books by the start of his teenage years. In Pergamum there was an Asclepieion or temple to the god of healing, Asclepius, and when Galen's father had a dream which urged him to have his bright young heir taught the art of medicine, Galen began his studies there. At twenty, he needed the ancient equivalent of postgraduate study, so he travelled first to Smyrna and Corinth and then to Alexandria, working with the best doctors and teachers available.

After a dozen years or so of medical studies, Galen returned to Pergamum, itself a city of great scholarly repute and the origin of charta pergamena, parchment, developed for the use of its university researchers when their jealous counterparts in Alexandria had caused the papyrus export trade to dry up. But on his return to his hometown Galen did not become a professor and take in students. He went to work as the attending physician and surgeon in the Pergamene gladiatorial school. There he learned, no doubt in the most dramatic way, all the differences between the surgical treatment of seriously wounded men and his earlier anatomical dissection and study of dead pigs, goats or even apes. Despite his enormous output

of books on medical topics, his interest in philosophy continued too, as he tells us in one of his books, and it was as a philosopher-physician that he went to Rome in the early 160's AD.

In Rome Galen soon established himself as the outstanding medical researcher of his era. He gave public demonstrations of surgery and dissection which were soon attended by well known intellectuals as well as advisers and ministers of the emperor Marcus Aurelius (himself a leading Stoic philosopher). A return to Pergamum, apparently in disgust at the competitive rivalries in Rome, was short because Galen was summoned in 168 to join Marcus and his heir, Commodus, as the imperial physician. After an unfortunate season of attendance on the legions on campaign (Marcus and Commodus having returned to Rome when the soldiers contracted the plague) Galen managed to refuse the imperial invitation to campaign in Germany and stayed in Rome as Commodus' personal doctor. There he remained, as far as we know, for the remaining thirty odd years of his life, still working and conducting his research. One scholar has estimated his publications as close to four million words of which the extant two-thirds fills twenty-two substantial volumes.

Galen's understanding of human anatomy, physiology and medical history was extensive. His approach was developed from a return to the teachings of Hippocrates, the greatest Greek doctor who had worked six hundred years earlier. To modern understanding, Galen's work reveals an extraordinary mixture of experience, knowledge, good sense, ignorance and misconception.

Almost all ancient medical opinion, including Galen's, was founded on the humoral theory. This taught that there were four fluids in the body whose condition and balance were the source of good and bad health: blood, yellow bile, black bile and phlegm. Each was associated with one organ (the heart, the gall bladder or liver, the spleen and the pituitary body or brain respectively). A surplus of any of these four produced or perhaps resulted from disease, so that bleeding, purging, starving, or a course of emetics were all approved treatments in an attempt to restore the balance of good health.

However, Galen's theories suggested that there was much more to it yet. Three *pneumata* or "spirits" were also essential in the human body. The "natural spirit" worked in the liver to produce venous blood from food by a process called the second coction, the first coction (digestion) having already taken place in the stomach with the assistance of black bile from the spleen. (The third coction would follow, turning the venous blood into tissues.)

The "vital spirit" was found in the heart, where its beating combined with the arterial pulse and the breath in the lungs heated and vitalised the blood. It was the heart which produced the innate heat of the body, and which, to ensure that the body's healthy balance was not disturbed, needed the cooling effect of the "physical/animal spirit" produced in the brain.

Galen's humoral and pneumatic theories seemed to account for the visible bodily intakes (food, air) and outputs (urine, feces, mucus, blood, etc.) quite effectively. Treatment of all diseases was invariably to be directed towards rebalancing the humours and regulating the innate heat of the organism.

In contrast with this ingenious, elegant and we now think completely erroneous theory was Galen's comprehension of and experience with physical injury. Naturally working with gladiators and soldiers on campaign ensured ample experience of wounds, fractures and all kinds of accidental injuries and dislocations. Galen's anatomical books and his teaching and treatment methods in cases of injury are often excellent examples of what a skilled and dispassionate surgeon could do as a result of extensive experience in the field. He understood the need for and developed such techniques as cleaning and suturing wounds or replacement, traction and splinting fractures. We now know that the use of wine on wounds has good antiseptic effects and that cleanliness in dressing injuries will prevent many cases of subsequent infection, so that Galen's recommendations must have helped many who were wounded to recover completely.

Such was Galen's influence on all later medical theory and practice that for fifteen hundred years his books were regarded as the last and most authoritative work on medicine and surgery by most doctors. It was Galen's choice of terminology which remained the standard in all later dissection and discussion, a fact which made all later medical training at least a little less prone to errors. Indeed, Galen's name is still used for one of the important nerves in the throat which controls the laryngeal musculature.

The greatest drawback to later physicians' reliance on Galen as the pinnacle of ancient medical teaching was probably their acceptance of the humoral theory and, much more seriously, their reliance on the treatment which went along with the theory: bloodletting, purging and emesis. It's sad to think of how many thousands of human beings who when already suffering from sickness or injury were fatally further weakened and even tortured by such "treatment". In many cases there can be no doubt that the treatment was what killed them. Had Hippocrates' other recommendations for treatment been followed more dutifully, and supportive nursing and close observation to encourage Nature to heal the ailing organism been the preferred medical line, fewer would have learned the appallingly hard way the truth of Martial's comment, "Dr. Symmachus, I wasn't sick until you and all your students had worked me over!"