

**THE DISCOVERY OF THE NATURE OF
THE SPLEEN, FROM AN
INVESTIGATION OF THE LATERAL
HOMOLOGIES OF THE LIVER,
STOMACH, AND INTESTINAL CANAL**

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The discovery of the nature of the spleen, from an investigation of the lateral homologies of the liver, stomach, and intestinal canal by Henry R. Silvester

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"A Contribution to the Science of Teratology," etc.



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MDCCLXX.

165. g 16.

"Thine eyes did see my substance, yet being imperfect; and
in thy book all my members were written, which in continuance
were fashioned, when as yet there was none of them."

Ps. cxxxix, 16.

“Ἐχει δ' ὁ ἄνθρωπος καὶ τὸ ἄνω καὶ τὸ κάτω, καὶ πρῶσθια καὶ ὀπίσθια, καὶ δεξία καὶ ἀριστερά. τὰ μὲν οὖν δεξία καὶ ἀριστερά ὁμοία σχεδὸν ἐν τοῖς μέρεσι καὶ ταῦτα πάντα, πλὴν ἀσθενέστερα τὰ ἀριστερά.”

ARISTOT.

ON THE NATURE OF THE SPLEEN.

THE anatomy and physiology of the spleen have engaged the attention of philosophers from the days of Hippocrates down to the present time ; there are, indeed, few parts of the human body on which more has been written than on the spleen, and none where the result has been more unsatisfactory. It becomes us, then, to approach this subject with due consideration. Haller, in beginning his observations, very sensibly admonishes his readers that “he is plunging into the region of mere conjecture, darker than in the case of any other viscus.” A short historical recapitulation of the various theories respecting its functions will introduce us to some of the obscurities which require to be elucidated. It will, however, be unnecessary to dwell upon a vast number of hypotheses ; for part of them are entirely destitute of anything like proof, and others are contradicted by experiment.

The most ancient opinion concerning the use of the spleen in the animal economy is that found in the writings attributed to Hippocrates, and is connected with the famous doctrine of the four humors (Hippocrates, 4th Book, *De Morb.*, tom. ii, page 325, ed. Kühn) τῷ μὲν δὲ αἵματι ἢ καρδίῃ πηγὴ ἐστὶ τῷ δὲ φλέγματι ἢ κεφαλῇ τῷ δὲ ὕδατι ὁ σπλήν. τῇ δὲ χολῇ τὸ χωρίον τὸ ἐπὶ τῷ ἥπατι αὐταὶ αἱ τέσσαρες τουτέοισιν εἶσι πηγὰι ἄνευ τῆς κοιλίης. The heart is the source of the blood, the head of the pituita, the spleen of the water, and the liver of the bile. The water was attracted by the spleen from the fluids received into the stomach, φημὶ δὲ ἐπὴν ὁ ἄνθρωπος πίνῃ πλέον ἔλκειν εἰς ἑαυτὸν ἐκ τῆς κοιλίης τοῦ ὕδατος καὶ τὸ σῶμα καὶ τὸν σπλήνα. (*Ibid.*, p. 333.) In modern times, Charles Estièrres

supposed the vasa brevia distended with blood to be ducts proceeding from the spleen to the stomach, carrying fluid from one organ to the other. This opinion was soon afterwards set aside by the accurate observations of Vesalius, (*Opera omnia Anatomica*, Lugdun. Batav., 1725, pp. 437 to 440); and Sir Everard Home revived the old theory of Hippocrates, and made the spleen to receive a great portion of our drink from the cardiac extremity of the stomach. It was supposed to be transmitted directly from the stomach to the spleen by some unknown channel. This idea, however, after a series of experiments with coloured fluids, etc., he subsequently abandoned.

In another part of the Hippocratic collection (*De loc. in Hom.*, tom. ii, page 130) it is said that *τοῖσι γὰρ αὐτοῖσις ὅτε ὀσλήν θάλλει καὶ τὸ σῶμα φθίνει*—those persons whose spleen is large have their bodies meagre—and which gave rise to the well-known comparison of Trajan, who said that the imperial treasury was like the spleen, because when that was rich the people were impoverished. “*Namque ut ceteras omittam, Pompeia Plotina, incredibile dictu est, quanto auxerit gloriam Trajani; cujus procuratores cum provincias calumniis agitent, adeo et unus ex iis diceretur locupletium quemque ita convenire, Quare habes? alter unde habes? tertius, Pone, quod habes; illa conjugem corripuit; atque increpans quod laudis suæ esset incuriosus, talem reddidit, ut postea exactiones improbas detestans, fiscum lienem vocaret, quod eo crescente, artus reliqui tabescunt.*” (Sexti Aurelii Victoris, epitom., cap. xlii, sec. 21.) The probable explanation of the observation, which has been confirmed in modern times, that the spleen is large when the stomach is filled with fluid, is to be found in the circumstance that the circulation through the spleen is liable to be obstructed by a congested condition of the portal system.

The symmetrical arrangement of the external organs of the body must be obvious to the most superficial observer. Symmetry expresses a fact; namely, that one half of an animal is usually an exact reversed copy of the other. The internal organs, also, are symmetrical. The term *azygos* (*ἄζυγος*) is applied by anatomical writers to certain parts of the body, which, being situated in or near the mesial line, appear singly and not symmetrically,

or in pairs. This term, however (strictly speaking), is incorrectly applied; for each of these organs is composed of parts that were originally double or symmetrical, and which have coalesced in the middle line so completely as to appear single.

The celebrated Greek philosopher Aristotle draws attention to this arrangement of the animal body in his treatise *De Animalibus Historia*, lib. i, cap. xv: "Ἐχει δ' ὁ ἄνθρωπος καὶ τὸ ἄνω καὶ τὸ κάτω, καὶ πρόσθια καὶ ὀπίσθια, καὶ δεξία καὶ ἀριστερά. τὰ μὲν οὖν δεξία καὶ ἀριστερά ὅμοια σχεδὸν ἐν τοῖς μέρεσι καὶ ταῦτα πάντα, πλὴν ἀσθενέστερα τὰ ἀριστερά. Man, however, has the parts of his body distinguished as the superior and inferior, the anterior and posterior, and the right and left. The right and the left parts, therefore, are similar and nearly the same, except that the left parts are less developed; and in *De Partibus Animalium*, lib. iii, cap. vii, Aristotle says: "κατὰ δὲ τὸ ἥπαρ καὶ τὸν σπλῆνα δικαιῶν ἂν τις ἀπορήσειεν· τούτου δ' αἴτιον ὅτι ἐν μὲν τοῖς ἐξ ἀνάγκης ἔχουσι σπλῆνα δόξειεν ἂν οἷον νόθον εἶναι ἥπαρ ἢ σπλῆν." With respect, however, to the liver and spleen, it may be justly doubted whether they are bilateral or not, the cause of which is that in those animals that necessarily have the spleen, it may appear that the spleen itself is, as it were, a spurious liver. Again, in lib. iii, cap. iv, he says: "Ἡπαρ—ἔχει δ' ὡσπερ ἀντιζυγον ἐν τοῖς μάλιστα ἀπηκριβωμένοις τὸν σπλῆνα. The liver—but in the most accurately formed animals it has the spleen, as it were, opposite to it. If, then, the spleen is symmetrical with the liver, why is there any need of discussion about it? Why is this not conclusive evidence that the spleen is the undeveloped liver of the left side of the body, and if it is the undeveloped liver of the left side, may it not be supposed to assist in the function of the liver—namely, the secretion of bile? These questions, amongst others, will require our attention further on.

With regard to the function of the spleen, Aristotle says that "It is not an organ necessary for all animals, and that it assists the liver in performing the function of digestion; that the spleen attracts from the stomach the superfluous and excrementitious humours (chyle) and concocts them."

Plato, in the *Timæus*, makes mention of the spleen, and

says: "On this account, when certain impurities are produced about the liver through bodily disease, then the spleen, purifying these by its rarity, receives them into itself, from its being a hollow and bloodless contexture."

Diocles of Caristus, who flourished a little time after Aristotle, confirmed the statements which his predecessor had advanced. A period of repose ensued for several centuries, until two celebrated anatomists arose in the Alexandrian school who, favoured by the permission of Ptolemy Lagus, the first of the Egyptian princes, with diligent research elaborately dissected the human body. These were the celebrated Herophilus, and Erasistratus, the pupil of Chrysippus, his contemporary, and were the means of giving to anatomy the rank of a true science. It is surprising that so eminent an anatomist as Erasistratus, notwithstanding these advantages, and while confessing that nature does nothing without a reason, should, nevertheless, consider the spleen to be a useless organ, an opinion adopted also by Rufus Ephesius, and apparently by Pliny, who says that runners used to have their spleen removed in order to increase their speed. The followers of Erasistratus dissented from this opinion of their master, and said that the spleen first prepared the chyle, which the liver afterwards turned into blood.

The opinion of Galen was that the humour called black bile is secreted by the spleen in the same way as the yellow bile is secreted by the liver, and it was from the supposed accumulation of this humour that persons affected with melancholy were believed to suffer. "Galen's opinions received universal assent, not only from the physiologists of his time and the Arabians, Avicenna, etc., but prevailed throughout the ages of darkness and barbarism, and were even defended by those anatomists who lived in the commencement of the sixteenth century at a time when science and literature were again revived, and when the intellectual powers became again roused after a repose of more than a thousand years" (Gray).

In the works of Aretæus, there is no fresh addition to our knowledge of the anatomy of the spleen; but his opinion, which is held in a modified form even at the present day, is that the spleen is nourished by black blood, of which it is the receptacle, and that, when it is

diseased, this fluid is not elaborated by it, but is taken into the general circulation. He, in effect, separates the function of the spleen from that of the liver, and regards the spleen as a blood-gland.

Serenus Samonicus seems to consider the spleen as the organ of mirth, and that after its removal a person never laughed.

“Splen tumidus nocet, et risum tamen addit ineptum,
Ut mihi Sardois videtur proximus herbis,
Irrita quæ miseris permiscet gaudia fatiæ.
Dicitur exsectus faciles auferre cachinnos,
Perpetuoque sero frontem præstare severam.”

It seems, at first sight, strange that, as the organ was considered to be the seat of mirth and laughter, the words *spleen*, *spleenful*, *splenetic*, etc., should be commonly used now to signify exactly the contrary state of mind. This opinion has probably arisen, first, from the spleen having been supposed to secrete the black bile, *μέλαινα χολή*, whence the word melancholy is derived; and secondly, from its having been considered as one of the causes of melancholy when “he doth not his duty in purging the liver as he ought, either too great or too little in drawing too much blood sometimes to it, and not expelling it” (see Burton’s *Anatomy of Melancholy*, part i, sec. 2, men. v, sec. 4, and elsewhere). Oribasius, Alexander Trallianus, Paulus Ægineta, Joannes Actuarius, Haly Abbas, Theophilus Protospatharius, and Meletius agree with Galen concerning the functions of the spleen. According to Avicenna, the spleen by its vascularity imparts warmth to the stomach. Hofman mentions that some of the Arabic writers considered the office of the spleen to be to cool and refresh the heart. In other ancient writers, as, for example, St. Ambrose (*Hexæm.* lib. vi, sec. 71), “we find a slight modification of Galen’s opinion; viz., that the spleen is placed near the liver in order to draw away the useless part of the aliment, and so, after retaining that which is necessary for its support, to transfer the purified and subtle remainder through the liver to the blood.” (See *Penny Cyclopædia*.)

Joh. Guinterius follows Galen’s description—“corpus hujus visceris, quod parenchyma vocant, rarum et laxum est spongiæ modo, ut facilius crassos humores et *ἰσχυρὰ* alliciat.”