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HEROPHILUS AND ERASISTRATUS:
A BIBLIOGRAPHICAL DEMONSTRATION

IN THE

*Library of the Faculty of Physicians and Surgeons of Glasgow,
16th March, 1893.*



BY

JAMES FINLAYSON, M.D.,

HONORARY LIBRARIAN TO THE FACULTY OF PHYSICIANS AND SURGEONS, GLASGOW;
PHYSICIAN TO THE GLASGOW WESTERN INFIRMARY, AND TO THE
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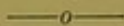
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HEROPHILUS AND ERASISTRATUS:

*A BIBLIOGRAPHICAL DEMONSTRATION.**



AT our former bibliographical demonstrations the various works of the authors discussed were brought before you; but how is such a demonstration to be conducted in this case, when not a single work of either of our authors has come down to us? On the table before you there is a collection of the various works in which fragments of Herophilus and Erasistratus are preserved, or in which references to their works and their opinions have been traced. First in size, and also in importance, are the twenty volumes of Galen; next come Cælius Aurelianus, Rufus the Ephesian, Soranus the Ephesian, Dioscorides, and Aetius. These are all medical writers. On the other side of the table are placed the works of classical authors who were not physicians; one or two of these are represented on the table by MS. extracts, to save the trouble of bringing from the University Library large volumes containing but slight references to the business we have on hand. Amongst these classical authors we have Celsus, Pliny, Plutarch, and Aulus Gellius, as the chief; then Sextus Empiricus, Stobæus, the Emperor Julian, Macrobius, Athenæus,

* In the preparation of this paper I am much indebted to Dr. Barclay Ness, Dr. A. W. Russell, Dr. J. H. Carslaw, Dr. Jones, and some others, for writing out extracts, making and comparing translations, looking up references, &c.

Diogenes Laertius, Suidas, and Strabo. Tertullian, the early Christian writer, may also be included in this list. These are the original sources from which all our information as to the the two great physicians is derived. I have placed on a separate table various books referring to our authors, including general works on medical history and biography, and special memoirs or articles on the subjects dealt with.

THE ALEXANDRIAN SCHOOL.

The first question to be dealt with is—Why are Herophilus and Erasistratus so constantly named together, both by ancient and modern authors? It is because they were the founders of the great Alexandrian School of Anatomy and Medicine, and flourished there about the same time. The Alexandrian School of Literature, Philosophy, and Science, founded and fostered by the Ptolemies, has been termed “The First University,”* and in a sense it was so. A “university,” as its name implies, is a collective body of teachers and students; in Alexandria this coalition was favoured by the inducements offered to leading men, in all departments of knowledge, to settle there, and by the collections in the libraries and museums which the genius of Aristotle had incited his pupils to bring together.

Egyptian medical papyri,	.	16th to 12th century B.C.
Hippocrates,	.	460-357 B.C.
Aristotle,	.	384-322 B.C.
City of Alexandria founded,	.	332 B.C.
Ptolemy Soter,	.	reigned 323-285 B.C.
Herophilus (Ἡρόφιλος),	{	In Alexandria, and flourished about
Erasistratus (Ερασίστρατος),		
Euclid,		
Septuagint Version of Hebrew Scriptures from		280 B.C.
Seleucus Nicator, King of Syria, died about		280 B.C.

* See a short interesting sketch in the *Westminster Review* for September, 1892, entitled “The First University,” by Mr. V. E. Johnson.

Celsus, the medical writer,	about Christian era.
Pliny (the author of <i>Historia Naturalis</i>),	23-79 A.D.
Dioscorides,	second century A.D.
Rufus Ephesius, lived in reign of Trajan,	98-117 A.D.
Soranus Ephesius, lived in reign of Trajan and Hadrian,	98-138 A.D.
Aulus Gellius, lived in reign of Hadrian, Antoninus, and Marcus Aurelius,	117-180 A.D.
Galen,	128 or 130-200 A.D.
Tertullian, one of earliest Christian writers,	160-240 A.D.
Cælius Aurelianus,	4th century A.D.
Aetius,	5th or 6th century A.D.

I have drawn up a table with various dates to guide our ideas of the authors and times to be dealt with to-night. The first entry refers to the subject of our last demonstration, when facsimiles of the medical papyri of the ancient Egyptians were shown.* The oldest of these goes back to the 15th or 16th century before Christ. In view of these and other records of ancient Egyptian learning, we may hesitate to admit the claim of the Alexandrian School to be regarded as "The First University." In Thebes and in Memphis, for one or two thousand years before the time of the Ptolemies, there were great centres of learning in the colleges of the priests: the medical papyri indicate this themselves, but in other departments, where the difficulties were less formidable, the learning of these ancient colleges is perhaps more conspicuous. In the case of Alexandria, however, with its libraries and museums, accessible to students of all classes and nationalities, with anatomists practising dissection of the human body and supplying names still current in our text-books, and with Euclid laying down his propositions very much as they are still taught in our schools, we may fairly admit that it was the first *modern* university. The story of this school is given in the work I show you: "*Histoire de l'école d'Alexandrie*, par M. J. Matter, 2^e édition," 2 vols., Paris, 1884. Only a small portion of this work (pp. 19-41) is taken up with the *medical*

* Reported in *British Medical Journal*, 8th April, 1893.

school. This portion of the subject is dealt with in another book, which I have been unable to procure—viz., Beck (Christian Fried. Hen.), "*De schola medicorum Alexandrina commentatio*," 36 pp., 4to., Lips., 1810. Kühn also, in his *Opuscula Academica Medica, et Philologica*, Lipsiæ, 1828, Tom. II, has an important article, "*Scholæ Medicæ Alexandrinæ Historia*"; but, unfortunately, it is only a fragment, as "*pars prima*" seems to be all which has appeared. So far as it goes it has great value. In the treatises on the History of Medicine by Le Clerc, Sprengel, Haeser, Bouillet, and others, the Alexandrian School is pretty fully discussed.

Was Herophilus or Erasistratus the older? When named together, we sometimes hear of Herophilus and Erasistratus, sometimes of Erasistratus and Herophilus. The question arises which was the earlier in Alexandria? or which was the older? In his academical discourse just mentioned, Kühn takes up this question pretty fully, stating the contradictory views which have been advanced, and indicating the arguments which are adduced in support of them. It seems beyond dispute that they both flourished in the time of Ptolemy Soter, but it is possible that, although of nearly the same age, one may have been there before the other. Perhaps the bare statement of Kühn's opinion, given at the end of his paper, may suffice for us at present. He says, "I entirely agree with those who consider Herophilus the older. The reasons which moved me to adopt this opinion I will explain on a future occasion." But unfortunately the sequel appears never to have been published. So far as I can judge, we may say that it is probable that Herophilus had already begun his original work before Erasistratus; that it is quite possible that they were associated with each other in certain anatomical inquiries; and that it is quite certain that, when Erasistratus was well advanced in years, he withdrew from practice and devoted himself to anatomical studies, which led him to correct not merely many of the opinions of Herophilus, but many of his own earlier conclusions. By this return to anatomical work in his later years, the interval between

Herophilus and Erasistratus is perhaps made to look greater than it would otherwise have been.

CHARGE OF HUMAN VIVISECTION AGAINST HEROPHILUS AND
ERASISTRATUS.

The names of Herophilus and Erasistratus are often coupled also in another connection—namely, in the grave charge of their dissecting living men. The charge seems to rest entirely on the authority of Celsus and of Tertullian. The latter uses, as is his wont, such violent language, that if it stood alone it might almost be ignored, as it carries with it the suggestion of exaggeration and animus. He says (*De Anima*, cap. x):—

“Herophilus, that Physician, or Butcher [*aut lanius*], who dissected six hundred persons in order that he might scrutinise nature: who hated man in order that he might gain knowledge: I know not whether he explored, clearly, all the internal parts of man: for death itself would change them from their state when alive, and, in his hands, not a simple death, but one leading to error from the very process of cutting up.”

In another passage (*De Anima*, cap. xxv), referring to methods of forcible delivery which involved the death of the infant, either in the process or before it was begun, he singles out Herophilus, from amongst others whom he names, as “the dissector of adults also,” and he contrasts him, apparently, with “the milder Soranus” (*et majorum prosector Herophilus, et mitior ipse Soranus*).

Very different in tone, but equally clear as to the nature of the accusation, is the passage in Celsus:—

“As pains and various other disorders attack the internal parts they believe no person can apply proper remedies to those which he is ignorant of: and, therefore, that it is necessary to dissect dead bodies and examine their viscera and intestines, and that Herophilus and Erasistratus had taken far the best method for attaining that knowledge, who procured criminals out of prison, by royal per-

mission, and dissecting them alive contemplated, while they were even breathing, the parts which nature had before concealed, considering their position, colour, figure, size, order, hardness, softness, smoothness, and asperity; and that it is by no means cruel, as most people represent it, by the tortures of a few guilty, to search after remedies for the whole innocent race of mankind in all ages" (Lib. I, Proœm).

After stating the opposite views and balancing the arguments, as was his custom, he sums up in favour of dissecting the dead, and against dissecting the living: "*Incidere autem vivorum corpora, et crudele et supervacuum est: mortuorum discentibus necessarium.*"

The ingenuity of medical critics has been exerted to the utmost in trying to break down these definite charges. It has been pointed out that neither of them proceeds from medical men; and the authority of Quintilian (*Inst. Orat.*, xii, 1, "Mediocri vir ingenio") has been invoked to disparage Celsus as a writer. Further, it has been shown that Herophilus and Erasistratus undoubtedly practised dissection of human bodies in Alexandria (*Galen*, Kühn's edition, Tom. II, p. 895; Tom. V, p. 603); that this was quite an innovation, and a practice likely to excite, from its novelty, much adverse sentiment; that later and even modern experience shows how prejudice against dissection excites false rumours and calumnies; that the practice of human dissection seems, even in the time of Galen, to have been almost limited to Alexandrian students; that through the fostering care of Ptolemy the anatomists there may, indeed, have been favoured with the bodies of criminals, but only after the executioner had done his official work, and that this fact might readily give rise to the scandal. All this is plausible enough, and quite probable, but not very conclusive. Even less conclusive is the argument based on the ignorance of these great anatomists as to the arteries containing blood—a point which one might imagine could have been cleared up by vivisection; but as this error continued till the time of Galen, notwithstanding the dissection of living animals, this argument may

be put aside. More weight must be attached to the argument based on the silence of all the physicians whose works have survived, by none of whom, apparently, is human vivisection hinted at; but more particularly is the silence of Galen important, as he was himself a skilled anatomist, and amongst his voluminous writings there is a special book, now lost—*De vivorum anatome*. As an anatomist he had, usually, to content himself with pigs, monkeys, and other animals, only getting occasional chances of studying human anatomy; but he refers repeatedly to human dissections by Herophilus and Erasistratus. If Galen had *approved* of human vivisection, as he did of dissecting the human body after death, he could scarcely have failed to refer to the practice of it by the great Alexandrian anatomists, if he had regarded the rumours current in the time of Celsus, and continued to the time of Tertullian, as anything more than vulgar reports. If, on the other hand, he *disapproved* of human vivisection, one can scarcely think of his missing a chance of casting it up against either or both of these great anatomists, as it is evident from his writings that he had no warm side to Erasistratus in particular. As Dr. Greenhill* says, the silence of Galen on this matter is the strongest argument against the clear and calm statement of Celsus. Cocchi (*De usu artis anatomice Oratio*, Florentiæ, 1761) marshals the arguments against the credibility of the charge

* "Perhaps the strongest argument against the truth of the story is derived from the silence of Galen, who so expressly mentions his dissecting human bodies. It is curious, too, that the same accusation is brought against Archigenes, and Galen himself, by one of the later commentators on Hippocrates (Joannes Alexandrinus, in Dietz's *Scholia in Hippocr. et Gal.*, Tom. II, p. 216), from which it would almost seem that the story was applied to Herophilus, Erasistratus, Archigenes, or Galen, quite at random: for, without stronger and more positive evidence, we are hardly called upon to believe it of them all. It may be noticed that Galen's lost work, *Περὶ τῆς ἐπὶ τῶν ζώοντων Ἀνατομῆς*, *De vivorum dissectione* (Galen, *De ordine librorum suorum*, Tom. XIX, p. 55), related to the vivisection of animals and not of man" (Dr. Greenhill, review of Marx's Herophilus, *Brit. and Foreign Med. Review*, vol. xv, 1843, p. 109, footnote).

with much ability and at great length; but a dispassionate perusal of his pleadings fails to show anything stronger than is indicated above.

Both Herophilus and Erasistratus left ardent disciples behind them, constituting the rival schools of the *Herophilites* and the *Erasistrateans*, who continued to dispute, and to hold sway between them, till after the time of Galen, whose authority soon became supreme. But I do not enter on this subject.

Ἡρόφιλος; Ἡρόφιλος; HEROPHILUS; EROPHILUS; TROPHILUS;
HIEROPHILUS (?).

With the above variations, this great anatomist is named in different passages. The mere absence of the aspirate, whether in Greek or Latin, need not surprise us as a variation. The name Τρόφιλος occurs in Stobaeus in connection with a saying quoted there as the answer of a physician; this will be subsequently given in full. It is now supposed, with great probability, that the letter T has been substituted for H in the process of copying, as no physician is known to us under the name of "Trophilus," and the one referred to in the passage was evidently regarded as a great authority.

The last name in the above list is more doubtfully received as applying to our great anatomist, although it is admitted that a variation from *Herophilus* to *Hierophilus* is a very likely error to be made by the copyist.

AGNODICE AS A PUPIL OF HIEROPHILUS.

It is generally supposed that it was another physician named Hierophilus, and not the Alexandrian anatomist, who is referred to in the amusing tale narrated by Hyginus,* which rests apparently on his authority alone. It shows that the lady-medical question is an old one:—

* C. Julii Hygini, Augusti Liberti, *Fabularum Liber*. Lugduni, 1608, Fab. 274, p. 52.

"The ancients had no midwives; and so many women, from their natural modesty, actually died; for the Athenians had a law prohibiting women and slaves from studying medicine. But a certain girl, named Agnodice, desired to learn medicine, so cutting off her hair, and assuming male attire, she betook herself to one Hierophilus (*cuidam Hierophilo*) for instruction. After she had learnt the art, hearing that a woman was in labour, she went to her and was proceeding to examine her (*ab inferiore parte veniebat*); but the woman believing that Agnodice was a man, was unwilling to be treated by a male, whereupon she divulged her sex (*illa, tunica sublata, ostendebat se foeminam esse*), and proceeded to the relief of the patient. But the physicians, finding that they were now no longer admitted to the female patients, began to accuse Agnodice, saying that the patients' morals were being corrupted, the patients merely simulating illness. When, therefore, the judges of the Areopagus assembled, they began to condemn Agnodice; to them, in defence, she divulged her sex (*tunica, &c.*). But the physicians began to accuse her more strongly than ever for violating the laws, whereupon the leading women came to the council, and said to the judges, 'Oh men! you are not husbands, but enemies: because you condemn her, who has brought health and safety to us.' Then the Athenians changed the law, so that free-born women might learn medicine."

Although the tale is accepted by Dr. Marx as applying to Hierophilus of Alexandria, this is not admitted by Dr. Greenhill, or by Fabricius, or by Le Clerc. Dr. Greenhill suggests that "*Cuidam Hierophilo*" is not a likely phrase to be used in naming the renowned anatomist—that the story (if true at all) seems to refer to a much more remote period than 300 B.C., and that it has not been shown to be probable that Hierophilus was at Athens, or Agnodice at Alexandria.

BIRTHPLACE AND TEACHER.

Herophilus was born in Chalcedon in Bithynia, as testified by various authorities (see *Galen*, Kühn's edition, Tom. XIV, p. 683); but, apparently from the similarity of the Greek word for Carthage, he is represented in one passage in Galen as a Carthaginian (*Καρχηδονίῳ* instead of *Χαλκηδονίῳ*; see

Galen, Kühn's edition, Tom. III, p. 21). His teacher was Praxagoras, a celebrated physician in Cos,* so that Herophilus, through him, inherited the traditions of that great school made famous by Hippocrates. In passing, I may refer to a pretty elaborate account of Praxagoras of Cos, given by Kühn in his *Opuscula Academica Medica, et Philologica*, Tom. II, "Commentatio de Praxagora Coo," I, II, III, pp. 128-149. In this series of papers much information and many references are given.

MEMOIR ON HEROPHILUS BY MARX.

The bibliographical difficulties attending the study of the life and writings of Herophilus have been practically overcome by the labours of Marx. There is a little treatise, which I show you in German, entitled "HEROPHILUS: Ein Beitrag zur Geschichte der Medicin von Dr. K. F. H. Marx:" Carlsruhe und Baden, 1838. The first 55 pages give an account of the great Alexandrian Anatomist and his works, with every authority and source of information referred to in notes: these notes consist of 47 pages, and they contain not mere references, but actual passages quoted from Galen and other authors where the fragments are preserved. In this way, we have the whole subject put before us with great fulness and compactness. Another form of the work, subsequently published, is in Latin: but I have not been able to get a copy to show you: the title runs "De Herophili Celeberrimi Medici Vita Scriptis atque in Medicina meritis, Auctore Car. Frid. Hen. Marx:" Gottingæ, 1840, 4to, pp. 60. We have the advantage of an interesting review of this from the pen of Dr. Greenhill in the *British and Foreign Medical Review*, vol. xv, 1843; there is also the article on "Herophilus" by the same author in *Smith's Dictionary of Biography and Mythology*, so that we have in English a very good account of Marx's book with the results of his inquiry, and a few additions and criticisms by the reviewer.

* Galen, Kühn's edition, Tom. X, p. 28.

HEROPHILUS AS A PHILOSOPHER AND DIALECTICIAN.

Hippocrates is credited with having separated Medicine from Philosophy, of which it had, up till his time, formed a part: but in the stately introduction to the Aphorisms, and in the whole tenor of his writings, one can never forget that Hippocrates himself was a philosopher. Even in the time of Galen, 500 years later, we find this great medical genius, versed in logic, writing many philosophical treatises, and, above all, writing a special book entitled, "The best Physician also a Philosopher" ("Ὅτι ἄριστος ἰατρὸς καὶ φιλόσοφος").

Herophilus was doubtless well entitled to this name also. In one passage preserved by Stobæus we find an utterance of profound wisdom which is as applicable to us, after 2,000 years, as in his own time:—

"Herophilus (Trophilus), the physician, being asked who was the most perfect physician, replied, He who can discriminate between what is possible and what is impossible." *

Another short passage preserved by Sextus Empiricus from the treatise on "Dietetics" by Herophilus, although rather difficult to translate nicely, shows great elegance in expressing his views on the importance of health. It reminds one slightly of the motto of the Faculty in whose library we are met—"Non vivere sed valere vita." † The passage, as given by Sextus Empiricus, may be rendered thus:—

"Herophilus says in the *Dietetics* that Science has no display and Art no glory, that Strength is incapable of effort, Wealth useless, and Eloquence powerless, if Health be wanting." ‡

* *Stobæi Sententiæ*, Gesner's edition, Basileæ, 1549, De Medicis, Sermo C, p. 549: Τρόφιλος ἰατρὸς ἐρωτηθεὶς τίς ἂν γένοιτο τέλειος ἰατρός, ὁ τὰ δυνατὰ, ἔφη, καὶ τὰ μὴ δυνατὰ δυνάμενος διαγινώσκειν.

† Martial's *Epigrams*, vi, 70.

‡ Sextus Empiricus, *Adversus Ethicos*, Lib. xi, § 50: Ἡρόφιλος δὲ ἐν τῷ Διαιτητικῷ καὶ σοφίαν φησὶν ἀνεπίδεικτον καὶ τέχνην ἄδηλον καὶ ἰσχὺν ἀναγώνιστον καὶ πλοῦτον ἀχρεῖον καὶ λόγον ἀδύνατον, ὑγείας ἀπούσης.

humoro-pathological view as to causes (one of his works): general blood-letting: ligature.

“DIETETICS (one of his works).—Value of health: about ways of living: about the power of foods: gymnastics.

“SEMEIOLOGY.—Importance of the study of semeiology: fore-knowledge and fore-telling: commentary on the Prognostics of Hippocrates (one of his works): the passage of worms: investigations on the pulse (one of his works): distinction from cardiac palpitation: variations of pulse as regards amplitude, speed, and rhythm: reasons for the strong pulse: large, full, narrow, quick, ant-like, regular, irregular, jerky, double beating (dicrotic), undulating, and worm-like pulse: On the rhythm of the pulse (one of his works?): Intervals, pauses, times, measures of the pulse: Behaviour of pulse in different stages of life.

“PHARMACOLOGY.—Medical remedies as a whole: efficacy of remedies: necessary knowledge as to their mode of action: classification: preference for those from vegetable kingdom: administration of large doses of the root of green hellebore: compound remedies.

“SPECIAL PATHOLOGY AND THERAPEUTICS.—Examination of patients: cures (one of his works): cause of sudden death: death from the extraction of a tooth: different kinds of paralysis: tremor: spasm: tetanus: on the eyes (one of his works): nyctalopia: bloody-flux: treatment of hæmoptysis by salt.

“SURGERY.—Reduction of dislocations: healing of ulcers: difficulty in healing round ulcers.

“MIDWIFERY.—Instruction: os uteri in pregnant and non-pregnant condition: death of the fœtus.”

For an account of the anatomical discoveries and the medical views of Herophilus, the works of Haller, Sprengel, and Le Clerc may be consulted.

WORKS OF HEROPHILUS ACCORDING TO DR. MARX.

“The titles of his written works from which individual passages are quoted, or otherwise mentioned by the Ancients, are the following:—

"1. ON CAUSES: probably a comprehensive etiological work which explained the anatomical and physiological causes of diseases, along with remarks on their treatment, from personal observation. From this, not long ago, an important fragment was published by Antonio Cocchi, from a written Commentary of Apollonius of Citium (a contemporary of Mithridates) on a work of Hippocrates on *The Joints*, which commentary is to be found in the collection of Greek Surgeons in the medical library of S. Lorenzo in Florence. This fragment is interesting both on account of its contents and because it gives a sample of the statements and style of writing of Herophilus. I shall give it afterwards,* in full, along with the collection of the fragmentary writings of our author still extant, and previously known to me (Cocchi: '*Dell' Anatomia*,' Firenze, 1745).

"2. ANATOMY: in all probability the principal work of Herophilus; the 2nd and 3rd books of this, indeed several large parts, are quoted from by Galen, and he has certainly made constant use of it in his work on '*The Practice of Anatomy*.'—(*Galen*, Kühn's edition, Tom. II, p. 571; Tom. IV, p. 596).

"3. INQUIRIES ON THE PULSE: of this Galen mentions the 1st and 3rd books, opposes many of the theories contained in it, and refers to a work of his own thereon, either not published or no longer in existence.—(*Galen*, Kühn's edition, Tom. VIII, pp. 716, 724, 956; Tom. IX, p. 279).

"The Tarentine Heraklides had also composed a refutation.

"The passage on *Rhythms* formed, it is supposed, a special part of the general teaching of Herophilus on the Pulse.

"4. CURES: the first book of this is mentioned by Cælius Aurelianus, who probably got a large part of his treatise from it (Cælius Aurel., *Morb. Chron.*, Lib. ii, cap. xiii). He also used specially to mention the fact, in the case of many diseases, if he found nothing about them in Herophilus.

"Probably the work mentioned here is the same which Galen mentions under the name '*Therapeutic Treatises*,' in which the discourse is on the use of Medicines.

"5. COMMENTARY ON THE PROGNOSTICS OF HIPPOCRATES: this work consisted in part of explanations, and in part of statements of

* It is subsequently given and referred to in this paper also.

opinions which were opposed to those of the old master.—(*Galen*, Kühn's edition, Tom. XVIII B, pp. 16, 29).

"6. ON THE EYES: a work which, treated as is supposed of these organs anatomically, pathologically, and therapeutically.—(*Aetius*: *Tetrab.* 7; or *Quat.* 2, *Serm.* 3).

"7. DIETETICS: of this a beautiful passage has been preserved (*Sextus Empiricus*, *Adversus Ethicos*, § 50).^{*} Possibly it is this which may have come down to us from Herophilus under the title 'On the manner of living and the virtue of nourishing food,' and is still in existence, in manuscript, in the Imperial Library in Vienna.

"8. EXPLANATIONS OF SEEMINGLY AMBIGUOUS EXPRESSIONS OF HIPPOCRATES: this treatise is mentioned by Galen.—(*Galen*, Kühn's edition, Tom. XIX, p. 64).

"Erotian, in his explanation of Hippocratic words, cites in the preface several Herophilites (whom he distinguishes from the Empirics, for instance Philinus) who had furnished him with these explanations. Herophilus himself he names later on under a word signifying 'to be anxious,' and which he had wrongly interpreted 'to be confused.'

"9. COMMENTARY ON THE APHORISMS OF HIPPOCRATES: this work is not met with among the Ancients; we find it, however, recorded as extant in the collection of MSS. in the Ambrosian Library in Mailand (Montfaucon, *Biblioth. Bibliothecarum Manuscript. Nova*, Paris, 1739, Tom. I, p. 498)."

In addition to the above, Dr. Greenhill (*Brit. and For. Med. Review*, vol. xv, 1843, p. 110) gives other two works of Herophilus mentioned by Soranus (*De arte obstetrica morbisque mulierum*)—viz., *Contra Opiniones Vulgares*, and *De Arte Obstetricia* (Dietz, edition of Soranus in Greek, 1838, cap. viii, p. 21, and cap. xlviii, xciii, pp. 100, 211; see also Ermerins' edition of Soranus, with Latin translation and Greek text, 1869, p. 29 and pp. 192, 267).

* Already quoted in this paper.

EXTRACTS FROM HEROPHILUS.

Several extracts have been preserved by Galen and others. The following description of the liver is selected as a specimen of his anatomy; both it and the passage on the pulse are from Galen. The third extract, on dislocation of the hip-joint, is preserved by Apollonius, but some think it is really by one of the followers of Herophilus named "Hegetor," and not by Herophilus himself:—

Herophilus on the Liver (Marx, p. 29; *Galen*, Kühn's edition, Tom. II, p. 570).—"The liver of man is very considerable, and large in comparison with that of other animals of similar size. Where the diaphragm comes in contact with it, it is elevated and smooth, but where it comes in contact with the stomach and its vault, it is bent inwards and uneven. It has the form of a cleft where the umbilical vein enters it in the fœtus. It is not alike in all: in breadth, length, thickness and height, in number of lobes, in ruggedness in front where it is thickest, in the protuberances on its circumference where it gets thinner, it varies in different individuals. In some it has no lobes, but is quite round and even, in others it has two, in others three, and in many even four."

Herophilus on the Pulse (Marx, p. 40; *Galen*, Kühn's edition, Tom. VIII, p. 498).—"The pulse," so teaches Herophilus, "is a dynamic oscillation, which arises out of the natural action of the heart and of the arteries, and is quite different, in kind, from the movements which might have their origin in other systems, appearing as trembling and spasm, to which even the heart, with its vessels, might also be subject."

Herophilus (or Hegetor?) on Dislocation of the Hip-joint and the Ligamentum Teres (Marx, p. 53).—"Why is there not another method tried for the head of the femur besides those which, up till now, have failed; one in which, when it had been dislocated, it would, when reduced, afterwards remain firm? For we generally follow the analogy of the dislocations in the jaw-bone and the shoulder joint, which, when reduced, remain in position: as also in the case of the elbow, knee, and fingers, indeed of almost all the joints which are liable to become dislocated. The Surgeons,

too, have no reason to give why, with this particular joint, the setting will not hold. They might have known it, however, from the Anatomy, for it happens that in the head of the femur there is a ligament which is inserted in the middle of the hollow of the joint. As long as this ligament remains entire, the thigh-bone cannot fall out of joint. If, however, this is torn asunder, it cannot unite, and without such a union, then the joint cannot be retained in its former position. As the reason for this is thus clear, one should, in this case, refrain from trying to set the dislocated thigh, and not tire oneself out with fruitless attempts."

This fragment, quoted by Apollonius, is interesting not merely on account of its reference to the *ligamentum teres*, but also because, as already stated, it has been adduced as proof that the work *On Causes* was written by Herophilus, who is supposed to be referred to in an introductory paragraph, under the name of the "LEADER" of the Herophilites, and stated to be the author of this work. The Greek word ἡγῆτωρ means "leader;" but there seems to be no indication anywhere else of Herophilus being spoken of under this special name, while there is one of the Herophilites actually named ἡγῆτωρ and referred to by Galen (Kühn, Tom. VIII, p. 955). Dr. Greenhill considers, therefore, that this word should be regarded as a proper name, and not translated as "leader;" it is actually printed in the passages quoted by Marx in capital letters (for what that is worth). M. Littré (*Œuvres d'Hippocrate*, Tome I, p. 94) also takes this view. As Dr. Greenhill says in his article (*British and Foreign Medical Review*, vol. xv, 1843) that he had been unable to obtain a copy of Cocchi's *Dell' Anatomia Discorso*, Firenze, 1745, to compare with a passage presumed to be the same quoted by Dietz (*Scholia in Hippocr. et Galen.*, 1834), I took the trouble to compare them in the Hunterian Library of the Glasgow University, and I found it was the same. In addition to the passage quoted in Greek by Dr. Marx, in the German edition of his work on Herophilus, there is the following sentence given by Cocchi, both in Greek and Latin; the latter rendering

is here given with the Greek word translated as "dux" introduced in brackets:—

"In hisce non solum dux (ὁ ΗΓΗΤΩΡ) aberravit sed & eos qui medicinæ dant operam diversos egit, & Hippocratis dicta nequaquam est assecutus, & simul a rebus minime cum proposito congruentibus argumentationem ineptiorem constituit."

TORCULAR—CALAMUS SCRIPTORIUS—DUODENUM—LACTEALS.

Nothing has served to preserve the memory of Herophilus so much as the name by which the conflux of the sinuses at the occipital protuberance is still known—the *Torcular Herophili*. The Greek ληνός, transmitted to us by Galen from Herophilus, has been translated into Latin as "torcular" (see Kühn's edition, Tom. III, p. 708; Tom. II, p. 712; see also Daremberg's translation, Tome I, p. 581). It has been regarded as doubtful, from Galen's accounts of it, what the ληνός really was; at least Vesalius* was not clear about it, and Marx and Greenhill† confess their inability to solve the problem. The following paragraph from Hyrtl's *Onomatologia Anatomica* (Wien, 1880, p. 552) is an important contribution to the discussion of the meaning of the "Torcular Herophili":—

"A very ancient and, in spite of its vague signification, a carefully preserved word in anatomy, in all ages, is the *Torcular Herophili*—(die Aderpresse) the vein-press. The two places in Galen, which have to do with the *Torcular*, are distinct enough, so that it cannot be doubted which sinus of the dura mater was indicated by this striking name. As all translators and interpreters of Galen have not been clear upon this point, we shall reproduce these passages.

* Vesalius, *De corporis humani Fabrica*, Lib. III, cap. xiv, "according to Galen it is left ambiguous whether the Greeks at first so named the meeting of the first and second sinuses of the dura mater from which the third and fourth proceed: or whether, indeed, they meant the end of the fourth sinus of the dura mater opposite the testes cerebri and stretching into the ventricles."

† *British and Foreign Medical Review*, vol. xv, 1843, p. 111.

They run *—‘You will endeavour to insert the scalpel as far as the vertex, where two veins meet one another, the region which Herophilus named *Torcular* (ληνός):’ and †—‘The meninges, however, meeting in the vertex of the head, where they are about to double (our *Processus durae matris*), at a certain empty place (εἰς χώραν τινα κενήν), like a cistern (οἶον δεξαμενήν), which Herophilus, on that very account, is wont to call the *Torcular* (ληνός), thence, just as from a summit, send streams to all the parts lying under.’ These words can only be understood as meaning that the *Torcular* corresponds to the confluence of the *sinus falciformis* (longitudinal sinus) with the two *transversi* (lateral) and the *sinus perpendicularis* (straight sinus) in the middle of the posterior border of the *tentorium cerebelli*. This confluence of several sinuses is also named *sinus confluens*, or more properly, *Confluens sinuum*. It is to the *sinus perpendicularis* (straight sinus) alone, as it was understood by Winslow, Haller, and Mayer,‡ that these words are not altogether applicable—still less to the *Vena magna Galeni* as it is interpreted by Rosenmüller.§ Even the single stumbling-block ‘*in vertice*’ disappears, however, if one considers that Galen investigated the brains of animals only, and that in them this place of union of the blood-channels appears pushed much more towards the vertex-region of the head than is the case in man; for the cerebellum of animals lies not under but behind the cerebrum, and is on this account called by Galen, *Pariencephalis*. In man it would have required to be called *Hypencephalis*.

“Herophilus, 300 years before Christ, was already affected with the fatal mania of anatomists for decorating the organs of the human body with figurative names. The ληνός is to be classed with his *calamus scriptorius*, his *dodecadactylon*, his *prostata*. To express a hollow space in the dura mater, the Greek had at his command

* “Scalpellum adigere conaberis adusque verticem, ubi venae duae invicem congregiuntur, quam regionem Herophilus torcular (ληνός) nominavit.—(*Administrationes anat.*, Lib. IX, Cap. i, ad finem).

† “Coeuntes autem in vertice capitis meningis duplicaturae in locum quemdam vacuum (εἰς χώραν τινα κενήν), quasi cisternam (οἶον δεξαμενήν), quem Herophilus, ob id ipsum, torcular (ληνός) solet nominare, inde velut ab arce quadam, omnibus subjectis partibus rivos mittunt.”—(*De usu partium*, Lib. ix, Cap. 6).

‡ *Beschreibung der Blutgefässe*, p. 204.

§ *Compendium anat.*, p. 198.

plenty of other words. But no; a ληνός, and nothing else, must be chosen: and that word means a tub, a trough, a coop, a coffin, a wine-press, a kneading-trough, a cattle watering-place, and also, according to Hesychius, a hollow carriage seat, while it could have been applied by Herophilus only in the sense of a reservoir. Herophilus could not have been thinking of the pressing of grapes in the wine-press, for the blood is not, in the ληνός, pressed out, but is merely collected there as in a reservoir (*locus vacuus*), in order to be supplied (according to Galen's doctrine) from that source to the *pia mater* and thence to the brain. To translate ληνός by 'vein-press,' instead of by 'reservoir,' is, therefore, quite absurd. *Obstupui, steteruntque comae*, when I came across a 'vein-screw,' in Heuermann, because a wine-press is worked with screws! and that is also implied in the Latin *Torcular*, from *torqueo*, to turn.*

"The Greek ληνός was distorted by R. Columbus into the French *Linon*. The ληχηνείον, quoted in Pierer from Galen, is known neither in Galen nor in any other Greek anatomist. Pierer's anatomical colleagues were not, on the whole, Grecian philologists. They omit all the accents, even those which represent letters of the alphabet. Probably their ληχηνείον is altogether wrongly written and thus unintelligible. I can connect (it) only with λείχος, as place of rest and — nest.

"The *Torcular* was, according to the views of the ancient physicians, a much more important sinus than all the others, and on that account the others received no special names. The *torcular*, as a sinus situated in the middle line, and without a fellow, had to receive the blood which was brought into the skull by both *venae jugulares internae*, and sent through the two *sinus transversi* into the torcular as a central depôt, from which, through the remaining sinuses, and the veins proceeding from them, it was delivered to the brain and its membranes. That is the purport of Galen's doctrine.

* "*Torcular* (also *torculum*) means according to Varro and Pliny, the wine- and oil-press. By means of a considerable pressure, obtained by screwing down, it squeezed out all the juice which remained in the skins and stalks of the grapes (*pes vinaceorum*) and in the pulp of the olives (*sampsæ*), after these had had their fluid contents removed by the preceding operation of treading. Details as to the construction of the *torcularia*, with illustrations, may be found in Anthony Rich, *Römische Alterthümer*, 636-640."

What we call *sinus duræ matris*, Galen knew only as *Rivi* or *Ductus sanguinis* (ὀχτροί and ἀγωγοί). Only once did I find them quoted as (ἐκροαί) effluvia. The Latin barbarians translated these words by *Plateæ* (streets) and by the altogether barbarian *Palmentum*, with which *Pavimentum* (as paved street) is incorporated."

The *Calamus scriptorius* was described by Herophilus, and received this name from him under circumstances which are somewhat interesting. At my last lecture I had occasion to speak of the method pursued in writing on papyrus, and I told you this was done by means of a reed or "calamus," shaped not unlike our own pens, a very different instrument, therefore, from the Roman *stilus*; Galen tells us that in naming the part thus, Herophilus was using a comparison with an instrument which he would be seeing in daily use in Alexandria (Kühn's edition, Tom. II, p. 731).*

The *Duodenum* was also described by Herophilus, and named by him δωδεκαδάκτυλος. Galen says "that part of the intestine which Herophilus calls δωδεκαδάκτυλος ἔκφυσις, for so he names the first part of the intestine before it is rolled into folds" (Kühn's edition, Tom. II, p. 780). It was so called from its being twelve finger-breadths long in those animals in which it was first described. The German *Zwölffingerdarm* and our Latin term *duodenum* indicate the same idea, but the latter is regarded as rather a barbarous word.

The *Prostate* gland was first so named by Herophilus, as Galen tells us (Kühn's edition, Tom. IV, p. 190; † Daremberg's translation, Tome II, p. 118).

The recognition of the *Lacteals* is regarded as one of his discoveries, although Erasistratus seems to have been more elaborate in his observation of them (*Galen*, Kühn's edition,

* " . . . et potissimum in Alexandria sic calamos quibus scribimus scalptant, ubi Herophilum egisse, quum dissecaret, hinc nimirum est colligere, quod imaginis similitudine adductus sic appellaverit."

† " . . . ac primus quidem Herophilus prostatas glandulosos appellavit." (ἀδενοειδείς προστάτας.)

Tom. III, p. 335 *; Daremberg's translation, Tome I, pp. 332, 333 †).

HEROPHILUS AND PHARMACY.‡

Scribonius Largus, in the opening sentence of the epistle, at the beginning of his work, states that Herophilus says medicines were to be regarded as a "divine gift." § According to Pliny, he went to extreme lengths in vaunting their powers:—

"Herophilus, the renowned physician, was of this mind, and gave it out in his ordinary speech, That some hearbs there were which were effectuell and did much good if a man or woman chanced but to tread upon them under their feet." He further quotes "a notable and famous apothegme or speech of Herophylus, who was wont to say that Ellebore was like unto a valiant and hardy captaine: for when (quoth he) it hath stirred all the humors within the body, itself issueth forth first and maketh way before them." || In another passage Pliny says, "As for Herophylus, although he was the first that went more exquisitely to work and brought in a more subtile and fine method of Physick, yet none esteemed better of simples than hee." He adds, "In the end al their Physicke proved nothing but words and bibble babbles: for beleieve me, his schollers and disciples thought it more for their ease and pleasure to sit close in the schooles and heare their doctours out of the chair discourse of the points of

* " . . . ut enim et Herophilus dicebat, in glandulosa quaedam corpora desinunt hae venae, quae caeterae omnes sursum ad portas referuntur."

† "Car ainsi que le disait Hérophile, ces veines aboutissent à des corps glanduleux (*glandes lymphatiques du mésentère*), tandis que toutes les autres remontent aux *portes* du foie."

‡ Berendes (*Die Pharmacie bei der alten Culturvölkern*, Halle, 1891, p. 248) gives but a meagre reference to Herophilus.

§ "Inter maximos quondam habitus Medicos Herophilus, Cai Juli Calliste, fertur dixisse, medicamenta divinum munus esse." Scribonius Largus, *Compositiones Medicae*, edition by Rhodius; Patavi, 1655, p. 1.

|| Pliny, *Natural History*, Holland's translation, Book XXV, chap. v, p. 219.

Physicke, than to go a simpling into the desarts and forrests to seeke and gather herbs at all seasons of the yere." *

Celsus, in the beginning of his fifth book, *De Re Medica*, referring to medicines, says—

"Their efficacy was still more extolled by Herophilus and his followers: insomuch that they attempted to cure no distemper without them." †

In the writings of Galen, we have a prescription of Herophilus, preserved in full, under the name of Ἡροφίλου χλωρόν (Kühn's edition, Tom. XII, p. 843).

Ἐρασίστρατος; ERASISTRATUS—BIBLIOGRAPHICAL
REFERENCES.

Our bibliographical difficulties cleared away for us by the memoir of Marx, in the case of Herophilus, would no doubt have been very much simplified, as regards Erasistratus, if the following dissertation had not stopped short at its first part: Joannes Fridericus Hieronymus, *Dissertatio Inauguralis Historico-Medica exhibens Erasistrati Erasistrateorumque Historiam*, Jena, 1790. In this dissertation the author gives a long list of references to various writers who deal more or less with Erasistratus. Many of these references when looked up are found, of course, to be very meagre; but the list is an important source of information, and as the dissertation seems to exist in very few of our medical libraries, I have thought it well to append it in a note. ‡ In the case of such a

* Pliny, *Natural History*, Holland's translation, Book XXVI, chap. ii, p. 242.

† Grieve's translation, new edition, Edinburgh, 1814, p. 186.

‡ The following are the references regarding Erasistratus, given by Hieronymus in his Inaugural Dissertation:—

Otto Brunnfelsius, *Catalogus Illustrum medicorum sive de primis medicinae scriptoribus*, Argent., 1530, p. 13. Wolfgang. Justus, *Chronologia sive temporum supputatio omnium illustrium medicorum*, Francof., 1556, p. 37 seq. Paschal. Gallus, *Bibliotheca medica*, Basil. 1590, p. 90. Petr. Castellanus, *Vitae Illustrum medicorum, qui toto orbe ad haec usque tempora floruerunt*, Antverp. 1618, p. 70, et 71. Jo. Neander, *Antiquissimae et nobilissimae medicinae natalitia, sectae earumque placita*, Brem.,

multitude of references, one is apt to be bewildered; it may, therefore, be useful to name the works which have seemed to me most helpful:—Greenhill, *Smith's Dictionary of Biography*, Art. "Erasistratus;" Eloy, *Dictionnaire Historique de la Médecine*, 4 vols., 1778; Dechambre, *Dictionnaire Encyclopédique des Sciences Médicales*; J. H. Schulzius, *Historia Medicinæ*, Lipsiæ, 1728; Haller, *Bibliotheca Med. Pract.*, Basil. 1776; the works of Le Clerc, Sprengel, and Haeser, on the History of Medicine, are also most useful.

1623, p. 57 seq. Christ. Jo. Lange, *Histor. Med.*, p. 10; Opp. P. I, Lips., 1704. Hermann. Conringius, *Introductio in universam artem medicam*, Hal., 1726, p. 46, 89, 153. Dan. Clericus, *Histoire de la Médecine*, à Gen., 1696, p. 627; Erasistratum ὡς ἐν παρόδῳ nominat, magis in ed. 1702; P. II, p. 7, seq. et copiose in ed. Amst. MDCCXXIII, II P., Liv. I, chap. i-viii, p. 289-339. Phil. Jac. Hartmannus, *Origines anat.*, p. 68, recus. in *Fascicul. Dissert. ad Hist. medic. spectant.* edit Kurella, Berol., 1754. Jo. Conr. Barchusen, *Historia Medicinæ*, Amstel., 1710, p. 50 et 51, 227, seq. Jo. Gottl. Astius, *Diatrise historico-litteraria*, Lips., 1715, p. 11. A. O. Goelicke, *Historia Anatomiae nova aequæ ac antiqua*, Halæ, 1713, p. 22 et 24, seq.; *Historia Medicinæ universalis*, Francofurti cis Viadrum MDCCXXI, p. 875-946; et *Introductio in historiam litterariam Anatomies*, Francof., 1738, p. 56, seq. Dan. Vinckius, *Amoenitat. philologico-medicae*, Traject. ad Rhen., 1730, p. 314, seq. Jo. Henr. Schulze, *Diss. Academ. sistens historiae anatomicae specimen secundum*, Altorf., 1723, p. 18, seq.; *Historia medicinæ*, Lipsiæ, MDCCXXVIII, p. 386, seq.; et *Compendium Historiæ medicinæ*, Hal., 1741, p. 216, seq. G. Stolle, *Anleitung zur Historie der Medicinischen Gelahrheit: in dreyen Theilen*, Jena, 1731, p. 21-24, 397, 503, 524, 681, 760. Polycarp. Frid. Schacherus, *Diss. hist. crit. de honoribus medicorum apud veteres*, Lips., 1732, p. 30. Christ. Guil. Kestnerus, *Medicinisches Gelehrten-Lexicon*, Jena, 1740, p. 275; et *Kurzer Begriff der Historie der medicin. Gelahrheit*, Halle, 1743, p. 118. James, *Discorso istorico del Sig. Dottore James sopra la Medicina tradotto dalla Lingua Inglese*, in Venez., 1752, p. 149, seq. Ge. Mathias, *Conspectus Historæ Medicorum chronologicus*, Gotting., 1761, p. 7. Hermannus Boerhaave, *Methodus studii Medici emaculata et access. locuplet. ab A. ab Haller*, Amstel., 1751, pp. 313, 329, 495, 577, 677, 818. Albertus Hallerus, *Bibliotheca Botanica*, Tom. I, Tiguri, 1771, p. 52; *Bibliotheca Anatomica*, Tom. I, Tiguri, 1774, p. 56, seq.; *Bibliotheca Chirurgica*, Tom. I, Bernæ, 1774, p. 17, seq.; *Bibliotheca Practica*, Tom. I, Bernæ, 1776, p. 117, seq. Godofred. Bened. Schmiedlein, *Primæ Lineæ Historiæ Medicinæ universalis*, Lips., 1777, Sect. II, p. 30. N. F. I. Eloy, *Dictionnaire historique de la Médecine ancienne et moderne*, Tom. II, à Mons, 1778, p. 145. Hen. Frid.

BIRTHPLACE—PARENTAGE—TEACHERS—DATE.

Erasistratus was born in Iulis, in Ceos (Κέως), an island in the Aegean.* On account of the resemblance of the names, errors have arisen as between it and the islands of Cos and Chios. Thus, in Stobaeus and Galen† we find "Erasistratus Chius." By the Emperor Julian he is styled the "Samian physician,"‡ in connection with the story of the cure of Antiochus, to be narrated shortly; but this designation seems to arise from his burial place being at Mycale, opposite Samos.

According to Pliny,§ he was the nephew of Aristotle—his Delius, *Synopsis Introductionis in Medicinam universam ejusque Historiam litterariam*, Erlang., 1779, p. 15. Jo. Frid. Blumenbachius, *Introductio in Historiam Medicinae litterariam*, Gotting., 1786, p. 42. Lassus, *Historisch-kritische Abhandlung der von den alten sowohl als neuern in der Anatomie gemachten Entdeckungen*, I. Theil, Bonn, 1787, p. 7, seq. Guil. Blackius, *Entwurf einer Geschichte der Arzneywissenschaft und Wundarzneykunst*, Lemgo, 1789, p. 71, seq.

In addition to the above, Hieronymus refers very specially to Jo. Baptista Vulpinus, *Haemophobiae triumphum sive Erasistratum vindicatum, ubi veterum phlebotomiae ad trutinam revocantur*, Lugd., 1697; Mauritius Hoffmann, *Disput. de sanguinis missionis, sive venae sectionis necessitate contra Erasistratum atque Helmontium ejus osiores* (vide Stolle, *Anleitung*, quoted above).

I may add other two, although I have not seen them either:—Luc. A. Porzio or Portius, *Erasistratus, sive de sanguinis missione*: this is also contained in his *Opera*, Neapoli, 1736. Fried. H. Schwarz, *Herophilus und Erasistratus: eine historische Parallele*, Markbreit, 1826.

Dr. J. G. Fisher's article on "Herophilus and Erasistratus," in the *Annals of Anatomy and Surgery*, July and August, 1881, could not be procured till this paper was completed, but it is well worthy of notice.

* Strabo, *Geographica*, Paris, 1853, p. 417, "Ceas": "Iulis patria fuit Simonidis poetae lyrici et Bacchylidis qui fuit ejus consobrinus: postea Erasistratus medicus et de Peripateticis philosophis Aristo, Bionis Borysthenitae imitator, ibi nati sunt."

† 'Ερασίστρατος ὁ χῖος, Gesner's edition, Basil., 1549; Sermo VII, p. 90. Galen, Kühn's edition, Tom. XIV, p. 683.

‡ Julian, *Misopogon: Opera*: Parisiis, 1630, pp. 72, 73: "Magna ibi quaestio medico Samio proposita."

§ Pliny, *Natural History*, "Aristotle's sister's son," Book XXIX, chap. iv; Holland's translation, vol. ii, p. 344, London, 1634.

sister's son; but this is not confirmed by any other writer, and, indeed, there is a clear statement by others that he was the son of Cretoxena and Cleombrotus.*

Three special teachers are named for him. First, Chrysippus of Cnidus.† Cnidus was a rival school to that of Cos, and we can understand that the rivalry of these schools may have affected the relationships of Erasistratus and Herophilus, as the latter was a disciple of Praxagoras of Cos, and this may also account for the antagonism of their respective followers. As Hippocrates belonged to a rival school, Erasistratus no doubt felt himself freer to differ from the Hippocratic teaching than many others. The second teacher named is Metrodorus,‡ who was the third husband of Pythias, the daughter of Aristotle; in this way the name of Erasistratus is brought into relationship with that of Aristotle. The third is Theophrastus,§ who is referred to as a possible or probable teacher of Erasistratus.

There can be little doubt that Erasistratus, as well as Herophilus, flourished in Alexandria in the time of Ptolemy Soter; but the following story of the cure of Antiochus, when in love with Stratonice, seems to fix some date *prior* to 280 B.C. (when Seleucus died) as a time in his life when he had already become famous as a physician.

* Suidas, *Lexicon*, edition by Bernhardt, Halis, 1852 (under his name): "Erasistratus, Iulietes ex Iuliade Cei insulae urbe assertus igitur ut Ceus, filius Cretoxenae, Medii medici sororis et Cleombroti."

† Diogenes Laertius: *De vitis dogmatis et apothegmatis clarorum philosophorum libri decem*. Huebner's edition, Lipsiae, 1828, vol. ii, p. 222; CHRYSIPPUS: "Fuit autem et alius Chrysippus Cnidius medicus, a quo Erasistratus testatur multa didicisse."

‡ Sextus Empiricus, *Opera*, edition by Fabricius, Lipsiae, 1841: *Adversus Grammaticos*, Lib. I, cap. xii, p. 258: "Pythias autem, filia Aristotelis, nupsit tribus viris . . . tertio autem Metrodoro medico Chrysippi Cnidii discipulo, praeceptori Erasistrati."

§ Diogenes Laertius, *op. cit.*, vol. i, p. 353. Theophrastus: "Sunt qui dicant Erasistratum medicum hujus fuisse auditorem et veri simile est." See also *Theophrasti Eresii, Graece et Latine, Opera Omnia*, edition by Heinsius, Lugd. Bat. 1613, where this life is prefixed.

ERASISTRATUS AND THE DIAGNOSIS OF LOVE.

When discussing Galen's works on a previous occasion, I brought under your notice his recognition of the illness of the wife of Justus as being due to love (Kühn's edition, Tom. XIV, p. 630); Galen, in that passage, refers to a somewhat similar diagnosis made by Erasistratus, which is evidently the celebrated one narrated by various authors. I give the account as contained in Plutarch's Life of Demetrius (Langhorne's translation):—

“He [Demetrius] was informed too that his daughter, who had been married to Seleucus, was now wife to Antiochus, the son of that prince, and declared queen of the barbarous nations in Upper Asia. Antiochus was violently enamoured of the young Stratonice, though she had a son by his father. His condition was extremely unhappy. He made the greatest efforts to conquer his passion, but they were of no avail. At last, considering that his desires were of the most extravagant kind, that there was no prospect of satisfaction for them, and that the succours of reason entirely failed, he resolved, in his despair, to rid himself of life, and bring it gradually to a period, by neglecting all care of his person and abstaining from food; for this purpose he made sickness his pretence. His physician, Erasistratus, easily discovered that his distemper was love; but it was difficult to conjecture who was the object. In order to find it out, he spent whole days in his chamber; and whenever any beautiful person of either sex entered it, he observed with great attention, not only his looks, but every part and motion of the body which corresponds most with the passions of the soul. When others entered he was entirely unaffected, but when Stratonice came in, as she often did, either alone or with Seleucus, he shewed all the symptoms described by Sappho, the faltering voice, the burning blush, the tumultuous pulse, and at length, the passion overcoming his spirits, a *delirium* and mortal paleness.

“Erasistratus concluded from these tokens that the prince was in love with Stratonice, and perceived that he intended to carry the secret with him to the grave. He saw the difficulty of breaking the matter to Seleucus; yet depending upon the affection which

the king had for his son, he ventured one day to tell him 'that the young man's disorder was love, but love for which there was no remedy.' The king, quite astonished, said, 'How! love for which there was no remedy!' 'It is certainly so,' answered Erasistratus, 'for he is in love with my wife.' 'What, Erasistratus!' said the king, 'would you, who are my friend, refuse to give up your wife to my son when you see us in danger of losing our only hope?' 'Nay, would you do such a thing,' answered the physician, 'though you are his father, if he was in love with Stratonice?' 'O my friend,' replied Seleucus, 'how happy should I be, if either God or man could remove his affections thither! I would give up my kingdom, so I could but keep Antiochus.' He pronounced these words with so much emotion, and such a profusion of tears, that Erasistratus took him by the hand, and said, 'Then there is no need of Erasistratus. You, sir, who are a father, a husband, and a king, will be the best physician too for your family.' Upon this Seleucus summoned the people to meet in full assembly, and told them it was his will and pleasure that Antiochus should intermarry with Stratonice, and that they should be declared King and Queen of the Upper Provinces."

This story is given by so many authorities that we may conclude that it is essentially true, particularly as the marriage of Antiochus and Stratonice is authenticated in other ways. Curiously enough, however, some very similar stories are reported regarding other physicians.

For the cure of the young prince Erasistratus is reported by Pliny to have received a fee of 100 talents (*Hist. Nat.*, Lib. XXIX, cap. i), which is calculated as amounting to nearly £25,000 sterling. Another passage in Pliny (Lib. VII, cap. xxxvii) records a fee to Cleombrotus of the same amount, but it is supposed that this is simply an error, and that Erasistratus is the name really intended.

FAME OF ERASISTRATUS.

The fame of Erasistratus not only in Alexandria, but throughout the civilised world, seems to have been very

great. The fame of Herophilus was perhaps chiefly based on anatomical studies, but Erasistratus, although apparently going beyond his contemporary in this direction, particularly in his later years, had an overwhelming reputation as a physician and a practitioner, as being one who did not hesitate to upturn old deeply-rooted ideas, even when these had the sanction of Hippocrates himself. We can easily gather from the numerous references to him in the writings of Galen, from the books written by Galen against the views of Erasistratus on the subject of bleeding, and from various commentaries on his writings by Galen which we know are lost, that even up to the end of the second century A.D. the name of Erasistratus was the foremost in medicine.* The fierce conflicts of Galen with Erasistratus and the Erasistrateans, and the sarcasm and contempt which he pours on their views, indicate how potent was the influence of the name of Erasistratus. Tertullian also, who died about 40 years after Galen, gives us a glimpse of this. He says (*Apologeticus*, cap. iii):—

“Are not the Stoics and Academics so called also from the places in which they associated and stationed themselves? and are not physicians named from Erasistratus, and grammarians from Aristarchus, cooks even from Apicius?”

Probably the reference here is to the “Erasistratei,” or followers of Erasistratus, with whom Galen had to contend so hotly. The reputation of Erasistratus extended to the time of the Arabian physicians. Lucien Leclerc,† in enumerating the authors cited by Rhazes, says of Erasistratus—

* We have still two books of Galen’s “*De venae sectione adversus Erasistratum*” and “*De venae sectione adversus Erasistrateos Romae degentes*.” Amongst the lost works of Galen’s were also “*De Erasistrati Anatome*, Libri III;” “*Περὶ τῶν Ἐρασιστράτου θεραπευτικῶν*,” “*In primum librum Erasistrati de febris*, Libri III:” and “*De Erasistrati curandi ratione*, Libri V.” (see lost works quoted by Ackermann in the preface to Kühn’s edition of Galen, or in the second edition of Fabricius, *Bibliotheca Graeca*, 1746).

† *Histoire de la Médecine Arabe*, Paris, 1876, Tome I, p. 263.

“We find him cited several times, for example in connection with abscess and paralysis of the liver. He is even mentioned as the author of a book on anatomy. His name is sometimes so badly written that the Latin translation takes it for ‘Aristotle:’ but as the reading ‘Erasistratus’ is forced on us in some of the cases, we have adopted it in all.”

In Daremberg’s edition of *Rufus Ephesius*, amongst the extracts from Rhazes, at the end, we find reference to “*Medicina Harsistratis*,” which the editor renders as Erasistratus.

The latest contribution we have to the medical history of the time immediately preceding that of Galen is in a recently acquired “Medical papyrus in the British Museum,” an account of which is given by Mr. F. G. Kenyon in the *Classical Review* for June, 1892. Mr. Kenyon says (p. 238)—“Reference is made to the rival views of Herophilus and Erasistratus, the writer preferring the former: indeed, a considerable portion of this section is occupied with refutations of the Erasistratean school of medical science.”

This suggests the serious disadvantage we labour under, inasmuch as it is always unfortunate to depend for information as to a man’s views on the representations of his opponents. This is notably the case here; for Galen is, by far, our most important source of information, and, at the same time, the most uncompromising antagonist of Erasistratus.

Under these circumstances, it may be well to begin with a *favourable* reviewer of Erasistratus and his opinions; in the following interesting sketches from Aulus Gellius, of old times and old opinions, we seem to see him as a bold reformer of anatomical and physiological doctrines and an ingenious theorist also.

ERASISTRATUS ON THE CAUSE AND PREVENTION OF HUNGER.

“At Rome I passed whole days with Favorinus: he held me by the charm of his conversation. Wherever he went I followed him, as if enchained by his eloquence. Thus he carried everything before

him by his delightful discourse. One day he went to visit some one who was ill, and I entered with him: he conversed in Greek for a long time with the physicians who were there in attendance. 'One need not wonder,' he said, 'if an enforced fast of three days leads to a loss of appetite, although at first the person is tormented by hunger. Erasistratus was very near the truth when he said, that the cause of hunger is in the fibres of the intestine, of the belly, and of the stomach, being empty and gaping. If they are filled with food, or on the other hand contracted by a long fast, then the place for receiving the food being either filled or contracted, the desire for it is extinguished.' He added that Erasistratus said that the Scythians were in the habit of fastening themselves tightly round the belly with bands when they had to endure hunger for a long time, persuaded that, in this way, they could extinguish the desire for food. Favorinus told us also many other things, always with much affability. Subsequently, when by chance I read the work of Erasistratus *De Divisionibus*, Book I (*Διαρίσεων*), I found in it the following passage, which I had heard from the mouth of Favorinus:—'I think that a firm contraction of the belly renders a long abstinence easy. Those who expose themselves voluntarily to long fasts suffer hunger at first, and then they cease to do so.' A little farther on we read, 'The Scythians have a custom, when they must abstain a long time from food, to tie the belly with bandages: they think hunger will then torment them less. In fact, when the belly is full, why should one have no appetite? because there is no void. But when it is contracted there is, equally, no void either.' Erasistratus speaks in the same work of a violent and unbearable hunger, which the Greeks call *Boulimos* and *Boupeina*; he says that it is more commonly felt when there is great cold than on fine days. For the rest, he confesses that he does not know the reason. Here is the passage:—'We do not as yet know, and the matter requires further investigation, why in this case, and in the case of others suffering hunger, this affection is more common when it is cold than when the weather is mild.'—(*Noctes Atticæ*, Lib. XIV, cap. iii.)

ERASISTRATUS ON THE FUNCTIONS OF THE EPIGLOTTIS AND THE
PASSAGE FOR FOOD AND DRINK.

Aulus Gellius writes:—

“Plutarch and other learned writers have said that the great physician Erasistratus blamed Plato for having stated that drinks run down into the lung and moisten it, and then, filtering through the pores, escape into the bladder. The author of this erroneous opinion (as Erasistratus regards it) is the poet Alcæus, who said in one of his poems, *Moisten the lungs with wine: the sun begins his journey.*

“According to Erasistratus two separate channels take origin in our fauces. The one serves for the passage of food and drink which go down into the stomach, where they pass into that part of the belly called in Greek *ἡ κάτω κοιλία*, where they are softened and digested. Then the solid fæces go to the bowel called *colon*; the moist portions pass through the kidneys and go to the bladder. The other channel is called in Greek *tracheia arteria*: by it the air which we breathe descends from the mouth to the lung, and it ascends again, by the same channel, to the mouth and the nostrils. The same channel serves also for the passage of the voice. It might be feared that fluids or foods, instead of going to the stomach, might go astray into this channel by which we breathe in and out, and so block the respiratory passage. But nature has provided against this: there is placed at the two openings what is called the epiglottis, a sort of barrier which shuts and opens by turns. While we eat or drink the *epiglottis* shuts and protects the *trachea*, preventing anything from slipping into this channel for the breath of life. Thanks to this precaution of nature no liquid enters the lung. Such is the statement of Erasistratus against Plato. Plutarch informs us, in his *Convivialia*, that the opinion of Plato originated with Hippocrates, and that it was shared by Philistion of Locri, and by Dioxippus, the follower of Hippocrates, both celebrated physicians of antiquity. They maintained that the function of the *epiglottis* was not to arrest the passage of all liquids into the *trachea*, seeing that liquids are both useful and necessary for the lung, which requires to be nourished and moistened. The *epiglottis*, they say, serves as an arbiter and moderator, being

charged with the duty of rejecting or admitting, according to the needs of the organism. No doubt, it does not permit foods to engulf themselves in the *trachea*; it refuses them entrance there, to send them on to the stomach. But it divides the fluids between the stomach and the lung. Moreover, what it selects for the lung it does not allow to pass rapidly, all at once: but opposing its moveable barrier, it only permits them to enter, little by little, almost insensibly. All the rest it turns aside to the channel which leads to the stomach."—(*Noctes Atticæ*, Lib. XVII, cap. xi).

ANATOMICAL WORK.

Erasistratus pursued anatomy with such enthusiasm that in his later years, when he had withdrawn from practice, he resumed anatomical studies, and made many fresh discoveries, correcting the errors of his earlier views.* In particular, he described the lacteals† more fully than Herophilus had done; and he pursued the anatomy of the human brain. For details as to his discoveries, the works of Haller, Sprengel, and Le Clerc may be consulted.

SAYINGS OF ERASISTRATUS.

The following saying of Erasistratus is preserved by Stobæus:‡—"Fulness and corruption are the principal causes of disease."

Somewhat similar is the statement made by Plutarch:§ "Erasistratus held that disease arises from undue quantity of food, and from indigestion and putrefaction, and that moderate and sufficient diet leads to health."

In another place, Plutarch|| quotes Erasistratus as terming

* *Galen*, Kühn's edition, Tom. V, p. 602: "At quum senex esset jam et vacaret solis artis speculationibus, exactiores moliebatur dissectiones."

† *Galen*, Kühn's edition, Tom. II, p. 649; Tom. IV, p. 718.

‡ *Stobæus*, Gesner's edition, Sermo XCVIII, "*De Morbis*," p. 540: *πλήθος καὶ διαφθορὰ πάντων αἰτιῶν*.

§ Plutarch, *De Placitis Philosophorum*, Lib. V.

|| Plutarch, *Quæst. Convivialium*, Lib. IV, quæst. i.

medicines "the hands of the gods"; he goes on to condemn the unnatural medicinal compounds made up of minerals, herbs, and products of earth and sea, all mixed up into one mass.

Like Galen, we find Erasistratus impressed with the adaptations of means to ends in nature. In a passage of Plutarch's *De Amore prolis* (iii) this is argued, with the addition: * "And, as Erasistratus says, Nature does nothing that is useless or worthless."

VENESECTON *versus* LIGATURES—PHARMACY.

From the story of Antiochus and Stratonice we can see at once that Erasistratus was a man of the greatest shrewdness. Very probably, in his observation of medical practice, he had early become alive to the evils resulting from the abuse of venesection. It is as an opponent of bleeding that we hear of him so constantly from Galen, who, indeed, wrote a book "against" him in this respect, and another against his followers in Rome; in both of these he gives various quotations from the writings of Erasistratus. Instead of venesection, Erasistratus, and others, practised the use of ligatures to the limbs. This controversy comes up again and again in the writings of Galen. Referring to some opponents whom he flattered himself he had routed in argument, Galen adds, "However, they at last ended by taking refuge in Erasistratus, stating that it was shown by him in his first book on *Loss of Blood*, that it was better to apply ligatures than to bleed." †

The opposition of Erasistratus to venesection does not seem to have been so extreme as generally alleged, if we may trust a statement of Caelius Aurelianus, from which it appears that Erasistratus *did* advise the bleeding of patients. ‡

* " . . . ut ait Erasistratus nihil habeat otiosum aut frivolum." Compare *Galen*, Kühn's edition, Tom. IV, p. 722.

† *Galen*, Kühn's edition, Tom. II, p. 190.

‡ Caelius Aurelianus, *Morb. Chron.*, Lib. II, cap. xiii: "Si quidem [at quidem] Erasistratus phlebotomari praecepit patientes."

As already indicated, in one of his sayings, Erasistratus took what we would regard, now-a-days, as sensible views regarding the prevention of disorders by care in diet; and he equally approached modern views in condemning the miscellaneous compounds which culminated in the awful medicinal mixtures described by Galen under the name of "Theriaca." Probably, from seeing the abuse of opium, Pliny* tells us that he and Diagoras "condemned it altogether as a most deadly thing, and would not allow that it should be so much as injected or infused into the body by way of clyster, for they held it no better than poison and otherwise hurtful to the eies."

As regards purgatives and clysters, it was no doubt against the current abuse of them that Erasistratus protested, for Caelius Aurelianus tells us that although writing against them, he himself used them.†

The Pharmacy of Erasistratus is referred to by Berendes in his book "*Die Pharmacie bei der alten Culturvölkern*" (1891), but only in a few lines.

In Celsus we find a prescription spoken of as "Aut Erasistrati compositio aut Cratonis"‡ and another "Quae ad auctorem Erasistrati refertur."§ One very similar to the last is quoted by Galen as "Compositio Erasistrati."||

With regard to the views of Erasistratus on Fevers, and other medical questions, the works of Le Clerc and Sprengel must be referred to.

* Pliny, *Natural History*, Book XX, chap. xix, Holland's translation, vol. ii, p. 68.

† Caelius Aurelianus, *Morb. acut.*, Lib. III, cap. xvii: "Temere Erasistratus secundo libro de ventre scribens culpans copiam atque acrimoniam clysterum, ab antiquis ordinatam, ipse quoque utitur clystere ex nitro atque sale."

‡ Celsus, *De re medica*, Lib. VI, cap. xviii.

§ Celsus, *De re medica*, Lib. VI, cap. vii.

|| Galen, Kühn's edition, Tom. XII, p. 735.

SURGERY—DENTISTRY.

The invention of the catheter, for emptying the bladder, is attributed to him by Galen,* who describes it as resembling in shape the "Roman Sigma"—S.

If somewhat antagonistic to heroic methods in medical practice, as regards bleeding and energetic purgation and narcotism, when we come to surgery, we cannot complain of his timidity! Caelius Aurelianus tells us that "in patients with hepatic disease, Erasistratus laid bare the liver by incisions through the skin and membranes, and applied remedies to the diseased part."†

On the other hand, in dental operations, he alleges (apparently with some humour) that only loose teeth should be extracted, and that this was indicated by lead instruments, incapable of transmitting any great force, being shown in the temple of Apollo at Delphos.‡ When we imagine the agony likely to be inflicted by the dental instruments and operations of his time, we may perhaps be inclined to adopt his views!

DEATH AND PLACE OF BURIAL.

His death is thus recorded by Stobaeus.§ "Erasistratus of Chios, when aged, was affected with an intractable ulcer of his foot: *Ah, well!* he said, *I remember my Country*, and

* *Galen*, Kühn's edition, Tom. XIV, p. 751.

† Caelius Aurelianus: *Morb. Chron.*, Lib. III, cap. iv: "Erasistratus autem in jecoris praecidens superpositas jecoris cutes atque membranam utitur medicaminibus, quae ipsum jecur late amplectantur, tum ventrem deducit."

‡ Caelius Aurelianus, *Morb. Chron.*, Lib. II, cap. iv: "Nam Erasistratus plumbeum inquit odontagogum quod nos dentiducum dicere poterimus, apud Delphum in Apollinis templo ostentationis causa propositum, quo demonstratur, oportere eos dentes auferri qui sint faciles, vel mobilitate laxati, vel quibus sufficiat plumbei ferramenti conamen ad summum."

§ *Stobaeus*, Gesner's edition, Sermo VII, "De Fortitudine," p. 91.

drinking off hemlock, he died." According to Suidas,* he was buried in Mycale, in the neighbourhood of Samos.

WORKS OF ERASISTRATUS.

The works of Erasistratus have entirely perished, and it is even difficult to make a satisfactory list of them, although there are many references to them, especially in Galen and Caelius Aurelianus: one is referred to by Athenaeus, and some are said to be quoted by Rhazes. It is not always clear whether a work referred to, when quoted, is a special book or only a special section of a more general work. Under these circumstances I give one or two lists, showing the evidence so far as given, but without any special sifting of the references. I have not been able to find any proof adduced for the work on Cookery quoted by Hahn. The three last entries in Haller's list seem rather vague as regards his authorities (probably from errors in printing in the case of the first of the three); the second last is found in Caelius Aurelianus, *Morb. Chron.*, Lib. II, cap. i; the last, *de Summa*, does not seem clear.

Books of Erasistratus, and References to them, cited by Haller
(*Bibl. Med. Pract.*, Tom. I, Basil. 1776).

Περὶ τῆς κατὰ ὅλον πραγματείας (Athen., L. XV).

De re medica, L. IX (Suidas I).

De divisionibus (Galen. *adversus Erasistrateos*).

Librum adversariorum, in quo suas adnotationes recensebat.

De rejectione sanguinis, quem puto etiam esse *l. de educatione sanguinis* (Galen. *adversus Erasistrateos*, et *de libris suis*, L. IV, c. 6).

De ventre (L. III, Cael. *tard.* L. IV, c. 3; *Acut.* II. c. 31 L. II. *tard.*)

De febribus (L. I, Galen. *caus. procatar. Comm.* in L. I, *de*

* Suidas, *Lexicon*, "Erasistratus": "Sepultus est juxta montem Mycalen e regione Sami."

vict. acut. Cael. *tard.*, L. IV, c. 6. *Acut.*, L. III. c. 17, Gal., *adv. Erasistr.*)

De causis (Dioscor. *theriac. praef.*)

Contra Medicos Coos (Ita Clericus, non vero satis novi, an proprio libro, an alio, in eos medicos dixerit).

Salutarium preceptorum LL. (L. II, Cael. *tard.* L. II, c. 7 *Acut.*, L. III, c. 21).

De tuenda valetudine (L. I, ap. Galen. *plethor.*, c. 6).

De medicamentis & venenis (Dioscor. L. V., c. 18).

L. *de singulorum morborum curatione* (Galen. *comm.* III, in L. I, *de vict. acut.*)

L. *Anatomicorum de singulis passionibus* idem forte liber (Cael., *acut.* L. III, c. 4).

De podagra (Cael. *tard.*, L. V, c. 2).

De hydrope (Cael. *tard.*, L. V, c. 8). Query, Lib. III, cap. 8.

De vulneribus (Galen. *advers. Erasistr.*)

De consuetudine (Galen. c.)

De paralyysi (Ib.) See reference, last page.

L. *de summa* citat Rhazeus.

Books of Erasistratus according to Schulzius (Historia Medicinæ, p. 401).

De rejectione sanguinis; De febribus; De affectibus alii; De virium resolutionibus; De podagra; De salutaribus; De divisionibus; De vulneribus.

Books of Erasistratus according to Hahn (Art. "Erasistratus," *Dict. Encyclop. des Sciences Médicales*).

1. Καθ' ὅλου λόγοι (The whole of Medicine).

2. Περὶ πυρετῶν (On Fevers).

3. Περὶ τῶν διαίρέσεων (On Anatomy; and also Special cases of disease).

4. Ὑγιαινά (Health: salutaria precepta).

5. Περὶ τῶν κατὰ τὴν κοιλίαν παθῶν (On Diseases of the Abdomen).

6. Περὶ αἵματος ἀναγωγῆς (On Loss of Blood).
7. Περὶ τῶν παρέσεων (On Paralysis).
8. Περὶ ποδάγρας (Gout).
9. Περὶ δυνάμεων καὶ θανασίμων (On Medicines and Poisons).
10. Ὀψαρτυτικόν (Cookery).
11. *De Hydrope*. (On Dropsy).



