

HISTORICAL AND BIBLIOGRAPHICAL NOTES.

A SERIES OF SKETCHES OF THE LIVES, TIMES AND WORKS OF THE OLD
MASTERS OF ANATOMY AND SURGERY.

By GEORGE JACKSON FISHER, M. D.

XVI.—AURELIUS CORNELIUS CELSUS.

B. C. 25—A. D. 40 (?).



ELSUS the Roman—Celsus the elegant Latin medical writer, the Cicero of Medicine—flourished during the latter part of the reign of the emperor Augustus, and during the entire reign of Tiberius. There is some uncertainty both as to the precise time of his birth and also of his death. There is likewise a question as to the place of his nativity. Columella and Quintilian both speak of him as a Roman, while others have claimed that he was a native of Verona. The weight of evidence is in favor of his being a Roman, for we find Celsus himself when giving a Greek name for any disease, and is to add the Roman, often uses this expression, "*our countrymen call it ;*" "*in our language it is,*" etc.

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His first name is generally written Aurelius; it is, however, occasionally given as Aulus, while in most of the ancient manuscripts the initials only are used, thus A. C. C. D. M. L. VIII, which are understood to be, Aurelii Cornelii Celsi De Medica Lib. VIII.

Celsus is by no means an uncommon name in classical biography. More than a dozen different persons of this name are met with in ancient history. While it is not essential to this sketch that each of these individuals should be identified, yet it may prove interesting to many of my readers to have them briefly designated, since some writers have occasioned no small amount of confusion, when speaking of Celsus the physician, by referring facts to him which pertained to several different persons of the same name. I. Albino-vanus Celsus was the secretary of Tiberius Claudius Nero, and a friend of Horace, to whom the latter addressed one of his epistles. II. Appuleius Celsus, a physician of Centuripa, in Sicily, who was the tutor of Scribonius Largus, who therefore lived about the beginning of the first century. III. Julius Celsus, a tribune of the city-cohort, was condemned to death under Tiberius. IV. Aur. Corn. Celsus, the subject of this sketch. V. Juventius Celsus, a Roman jurist who flourished in the second half of the first century. VI. P. Juventius Celsus, A. D. 67-130, a Roman jurist, son of the preceding. He was a very distinguished lawyer, a celebrated writer on jurisprudence, and was twice consul. He was both counsel and friend of the Emperor Hadrian. VII. P. Marius Celsus, consul under Nero in the year A. D. 62. On the death of Nero, A. D. 68, he joined Galba, of whom he was one of the ablest and most faithful supporters. He subsequently served Otho with the same fidelity, and afterwards Vitellius took him into the consulship. VIII. Papius Celsus appears as a surname of the Papia gens on some coins of the republican period. IX. L. Publicius

Celsus, consul under Trajan in A. D. 113. He was so highly esteemed by the emperor that he had a statue erected to his honor. Being a personal enemy to Hadrian, this emperor had him put to death, A. D. 117. X. Celsus, an epicurian, a friend of Lucian. He is supposed to have been the author of an attack on Christianity, to which Origen wrote a famous reply. XI. T. Cornelius Celsus, A. D. 265, one of the thirty tyrants enumerated by Trebellius Pollio. XII. Arruntius Celsus, an ancient commentator on Terence (about A. D. 350.) XIII. Celsus, a Greek rhetorician, a pupil of Libanius. XIV. Julius Celsus, a scholar in Constantinople in the seventh century.

Unfortunately our information concerning Celsus, the author of the celebrated eight books on medicine, is so imperfect and meagre, that doubts have been entertained as to his having been in reality a physician and surgeon. By some it has been claimed that he was not a practitioner of these arts; that he had merely studied them as branches of general science, as was frequently done by some of the Greek philosophers. This doubt has received support by the manner in which he is referred to by some ancient writers, as well as from the fact that Pliny failed to enumerate him among the physicians of Rome in his brief historical sketch of medicine, in the twenty-ninth book of his Natural History. The latter circumstance I shall consider of no account, since Pliny for the most part seems to speak very disparagingly of the medical profession, and refers chiefly to those whom he desires to censure. In the fifth chapter of this book, however, Pliny says: "I pass over in silence many physicians of the very highest celebrity," and it is quite reasonable to presume that Celsus was included among this number. Any person who has attentively read the work "De Medicina" of Celsus must have been fully convinced that the writer was not a mere compiler, and that this work is not the pro-

duct of one who had studied the various subjects embraced in it as a mere part of the culture required for a finished general education. It abounds in matters of the most practical character, and furnishes abundant proof that the writer was not only an actual practitioner and one of ample experience, but also one of careful observation, and possessed of sound judgment. Celsus was evidently familiar with the phenomena of disease, as well as with the effects of remedies upon the human body; and though it is probable that he cultivated other branches of science and literature, and did not devote his time exclusively to the healing art, it is equally probable that he described what he had personally observed and recommended in the way of treatment, what his own experience had sanctioned.

Celsus is said to have written treatises on agriculture, military tactics, architecture, philosophy, rhetoric, and several other branches of literature, all of which have perished by the lapse of time, excepting his famous treatise *on medicine*, in eight books. This is one of the most precious monuments of antiquity. It is an extremely concise, methodic and complete compendium of all that relates to ancient medicine down to the time in which it was written. In surgery it is greatly in advance of the chirurgical writings of Hippocrates, and of all subsequent authors for a period of five hundred years.

These surgical books have always been highly prized. Hieronymus Fabricius ab Acquapendente, in the middle of the sixteenth century, expresses his appreciation of them in the following enthusiastic outburst: "Celsus! admirable in all things, whom I peruse day and night."

The medical and surgical writings of Celsus, as now presented to us by the labor of many learned scholars, are believed to be very pure and complete as well as genuine. In that age in which a great emulation was excited in the

effort to procure all the works of celebrated writers, through the cupidity of librarians and dealers in manuscripts, the titles of works were often changed, and often even the text was adulterated and interpolated without detection. Rhodiginus (*Antiq. Lect.*) speaking of such depredations having been committed on the works of Celsus, exclaims indignantly, "they have mangled or sophisticated those sacred records, which crime ought to be deemed a sacrilege, and should be expiated by retributive atonement proportioned to the deed."

All of the editions of Celsus printed in the fifteenth and sixteenth centuries abound with numberless and very gross errors. In 1657, Vander Linden, a very learned Dutch scholar, published an edition in which he made a vast number of corrections. In the dedication he says: "Who would imagine, that after the diligent labors of so many illustrious men, as Egnatius, Cæsarius, Constantine, Stephens, Pautinus, Ronseus and Rubens, I should have corrections to make in more than two thousand places."

The first translation into English was made by Dr. James Grieve (8°, *London*, 1756) from Vander Linden's or Almeloveen's edition. Grieve complains of the imperfections in the above edition, and speaks of his corrections made from manuscripts and previous versions. In 1831, Dr. Alex. Lee translated Celsus into English, from Targa's edition (1769), which was far more correct than Almeloveen's.

The first edition ever set in type was printed in Florence, in a small folio, in 1478. The second edition was among the earliest books printed at Milan, 1481, also in small folio. These editions are of the utmost rarity. There were but four or five editions printed in the fifteenth century, all of which are very scarce. There were not less than twenty-seven editions in the sixteenth, ten in the seventeenth, and twenty-six in the eighteenth century, and nearly as many have been issued in the present century.

These numerous editions attest the exalted estimation in which this ancient author has always been and is still held by the medical and surgical profession. His fame will continue to live and well deserves immortality.

Alas! I am sorry to admit that Celsus, as well as all of the ancient medical writers, finds but few readers in our own country. The rage for novelty, the utilitarian spirit, the so-called progressive impulse—in itself commendable—which closes the doors upon them, ignores the past, and looks with pitiful contempt upon all ancient medical literature, in my humble opinion, is not quite as commendable, and since there has been no encouragement for the issuance of American editions, none have ever appeared of any of the inestimable medical works of antiquity.

For many years past Celsus has been employed in Great Britain as the test of Latin scholarship and of a respectable and liberal education by which medical candidates are tried. For the adoption of this classical writer there are two excellent reasons—first, that students shall become familiar with the purest and most elegant example of Latinity as written and spoken in the Augustan age; and, as a second consideration, that they should acquire a knowledge of the state of the healing art as it existed in ancient times; and, also, incidentally, cultivate a taste for such antiquarian pursuits. Ronsseus, in his edition of Celsus, speaks thus of his style: “We should prefer his Latin to his medicine, for he has deservedly obtained the highest station in Roman literature by his work, so that the study of medicine may now recommend itself to the man of genius in the sweetest strains of eloquence.”

I will proceed to give a brief review of the contents of the Celsian treatises on medicine.

The work of Celsus commences with a brief but carefully considered sketch of the origin, early development, and

progress of medicine, including the peculiar tenets of the two rival sects, the Dogmatic and the Empiric, into which the medical profession of his day was divided. The first and second books are devoted to general considerations on diet, therapeutics, and pathology. The third and fourth books are on special diseases and their medical treatment. The fifth book is chiefly occupied with an account of various pharmaceutical agents employed in the treatment of disease. Some of the last chapters of Book V and the whole of Book VI relate to special diseases and their treatment. Books VII and VIII are exclusively surgical.

It would be interesting and instructive to note the numerous matters of importance which are more or less fully treated upon in all the eight books of Celsus. To do this, however, would require a long series of articles, amounting to a fair-sized volume. I shall, therefore, content myself with a mere glance at the books from the first to the sixth, and with a more particular examination of the seventh and eighth books, as they relate directly to the subjects to which this "series of sketches" is devoted, and which necessarily includes Celsus as one of the celebrated Old Masters of Surgery.

[To be Continued.]

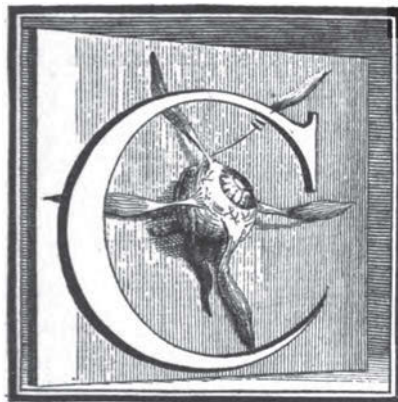
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ELSUS was not a practical anatomist; his writings on this subject are very meager and brief. They are chiefly contained in the first chapter of Book IV, under the head, "Of the internal parts of the human body"; and in Book VIII, Cap. I, which is entitled, "The Form and situation of Bones." It will be interesting to note, as we pass through his works, the extent and character of his descriptive anatomy.

That a knowledge of anatomy was regarded as essential to the physician and surgeon in the time of Celsus, we find satisfactory evidence in the preface of his work. In speaking of the emulators of Asclepiades, he says: "Since pains and various kinds of diseases may arise in the internal parts, they consider no one capable of applying the proper remedies to those parts of which he may be ignorant; hence, the

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necessity of dissecting the bodies of the dead, and examining very minutely their viscera and intestines." Then follows his account of "the plan adopted by Herophilus and Erasistratus"—viz.: the dissection of living criminals, "obtained by royal edict out of prison" for that purpose. I will not repeat the quotation of this paragraph, which the reader will find in my sketch of Herophilus and Erasistratus (*ANNALS OF ANATOMY AND SURGERY*, vol. iv, p. 35, July, 1881). Following this quotation, I stated that Celsus wrote approvingly of this atrocious practice. A more careful and extended reading of the preface proves that I was in error as to his personal views concerning this mode of obtaining anatomical knowledge. Celsus was obviously not very much in favor of practical anatomy, even when studied from the cadaver in the dissecting room. In another section he says: "But, indeed, those things of which we have spoken are only superfluous, but that which remains is even cruel; to lay open the abdomen and præcordia of living men, and that science, which presides over the health of mankind, is not only made the instrument of death, but that of the most atrocious; especially when some of these things, which are sought after with so much cruelty, cannot be known at all, whilst others may be examined even without any violence; for the color, smoothness, softness, hardness, and such like, are not the same in a wounded body as they were in a sound; because, even in bodies that have received no violence, yet these qualities are often changed by fear, grief, hunger, indigestion, lassitude, and a thousand other trifling affections; and it is much more probable that, the internal parts being very tender and never exposed, even the light itself might effect a change by severe wounding and laceration. Nor can anything be more absurd than to suppose the part to be the same in a dying man, nay, already dead, as it is in a living person; the abdomen may be laid open,

it is true, even while the man is breathing (which does not strictly bear on the case), but as soon as the knife has approached the præcordia, and the transverse septum is divided, which separates the superior from the inferior (which the Greeks call diaphragm), the man immediately expires: consequently the præcordia and all the viscera present the same appearance to the slaughtering physician as those of a dead person, not such as they were while he lived; therefore, the only object attained by the physician is that of murdering a man cruelly, not that he can ever ascertain their nature and functions as we have them in life; yet, if there may be very interesting phenomena to be subjected to the view, in the man as yet breathing, practitioners have frequent opportunities of meeting them by accidents; for sometimes the gladiator in the arena, a soldier in the field, or a traveler intercepted by banditti, is wounded in such a manner as to display some of the interior parts, and so other parts in other persons: thus the prudent physician discovers their structure, relative position, arrangement, figure, and the like, not by perpetrating murders, but endeavoring to restore health, and learns that by compassion, which others have discovered by unrelenting cruelty. And for these reasons (I consider it) unnecessary to lacerate even the dead, which, though not cruel, yet it may be disgusting, since most things are found very different in dead bodies; even the dressing of wounds themselves may show all that can be discovered in the living."

At the close of his preface, Celsus speaks much more decidedly of the value and necessity of practical anatomy. "I think, certainly, medicine ought to be rational, but to be directed by evident causes, all the latent being rejected, not from the contemplation of the artist, but from the art itself. And to dissect the bodies of living animals is both cruel and superfluous; but the examination of dead subjects is imper-

atively necessary on students, for they ought to know the position and order of the parts, which are demonstrated with greater facility in dead bodies than in a living and wounded man. As for the rest, practice itself will point out such things, which can only be learned on the living, by the dressing of the wounded more slowly, but a little more tenderly." (Lee's translation, v. i., pp. 23, 24.) This last sentence is rendered more clearly by Greive (Ed. 1756, pp. 20, 21), as follows: "But, as for other things, which can only be observed in living bodies, practice itself will discover them in the cure of the wounded, somewhat more slowly, but with more tenderness."

The first chapter of book fourth is entirely devoted to the anatomy "of the internal parts of the human body." It contains brief descriptions of the trachea, lungs, heart, diaphragm, liver, spleen, kidneys, bladder and urethra, stomach and intestines, and of the omentum.

The osteology of Celsus is quite complete and remarkably accurate. It must have been written from a direct examination and study of the entire human skeleton. It will be found in the first chapter of book eighth. He describes all the principal sutures of the head with admirable precision. Nearly every bone in the body is described. The twenty-four vertebræ are divided into three classes: seven cervical, twelve dorsal, and five lumbar. The peculiarities of the atlas and of the vertebra dentata are carefully noted and made to explain the forward, backward, and rotary movements of the head upon the spinal column. The following is an example of his descriptions: "The third vertebra has eminences by which it is connected with the next inferior one. All the others are articulated with those below by processes inclining downwards, and by corresponding depressions which they have on each side they receive the superior ones, and are secured by many ligaments on each

side, and an abundance of inter-articular cartilage. And thus a moderate degree of flexion is readily given to a man as he stands erect, and is as readily counteracted when the necessity of his operations require him to bend."

Thus he goes on to describe the several bones of the body and to indicate their functions. The muscles and ligaments are only mentioned in a general way, no attempt being made to use special names for any of them. In these anatomical chapters we meet the same names of parts which are employed at the present time, the students of to-day are repeating the technical terms which were familiar to the students in the first century, and in some instances to those of the Alexandrian school, several centuries previous to the Christian era. Celsus frequently gives the names which the Greek anatomists had already applied to the different structures of the body. Diaphragm, peritoneum omentum, jejunum, pylorus, ureter, zygoma, vertebra, femur, and cartilage, are among the terms alluded to.

Besides the chapters on anatomy already mentioned, we find descriptions of organs, more or less complete, in connection with special surgical operations required to be made on those parts. There will be found an account of the eye (Lib. vii., cap. 7), when discoursing upon cataract and its treatment by operation.

Before proceeding to make some quotations from this chapter I will furnish the reader with what Celsus considered to be the necessary qualifications of a surgeon (Lib. vii., Prefat.):

"A surgeon ought to be young, or at least not far advanced in years; to have a firm, steady hand, and never liable to tremble; to be no less dextrous with the left than with the right; to have an accurate and penetrating sight; an intrepidity of mind sufficient to bear up against the shrieks of his patient, yet compassionate to him whom he has

undertaken to cure ; he should neither hasten more than the case requires, nor cut less than is necessary ; but, to effect his purpose in every case, as if he were immovable by the importunities of his patient."

Concerning cataract, Celsus tells us : " when recent, it is frequently removed by medicines ; but, when it has become chronic, it requires a manual operation, which may be among the most delicate in surgery. Before I treat of this operation, it is necessary that I should give a short description of the nature of the eye itself, the knowledge of which, as it is of importance in several other parts, has an especial reference to this."

His description of the structure of the eye, his account of cataract, and his directions for the performance of the operation of couching, are all so remarkably good, and so extremely interesting, in view of the fact that eighteen and a half centuries have elapsed since they were written, that I feel justified in quoting all that he has written concerning them. I am certain that my readers who are not familiar with the works of Celsus will enjoy these extracts far more than they would a mere analysis of his opinion and practice. I will abstain from lengthy commentaries and comparisons of ancient knowledge, opinions, and methods with those of the present time, as the reader will readily observe all these points for himself :

" Now the eye has two external coats, the exterior of which is called by the Greeks, *keratœides*. This, where it forms the white of the eye, is pretty thick, near the pupil it becomes thinner. The interior tunic is united to this in the centre, where the pupil is ; it is concave with a small aperture ; round the pupil it is thin, but this coat is thicker a little distance from it ; and this is named by the Greeks, *choroides*. These two tunics surround the internal part of the eye, and unite again posteri-

orly, where they become thinner, pass through a foramen, which is between the bones, to a membrane of the brain, and are there united to it. Directly under these, opposite to the pupil, there is a void space ; then, below that again is an exceedingly fine membrane, which Herophilus named Arachnoides. The middle part of this is hollow, and in this cavity a substance is contained, which, from its resemblance to glass, the Greeks call Hyaloides. This substance is neither liquid nor solid, but a concreted humor, from the color of which that of the pupil is either black or grey, although the external coat be entirely white. This is enclosed by a small membrane, which proceeds from the internal part of the eye. Immediately under these is a drop of humor resembling the white of an egg, from which proceeds the faculty of vision ; by the Greeks it is called Chrystalloides.

“ Now, the humor beneath the two tunics, where I have described the vacuum to be, becomes concrete (*or opaque*) either by disease or from a blow ; this gradually becomes indurated, and opposes the interior faculty of vision. There are several species of this disease ; some are curable and others resist every remedy. For if the cataract be small, immovable, of the color of sea-water, or of polished iron, and admit of some sensation of light at its side, there is hope. If it be large, if the black part of the eye be altered from its natural configuration to any other, if the color of the cataract be azure, or like gold, if it glide backwards and forwards, it is scarcely ever cured.

“ It is generally worse in proportion to the severity of the disease from which it has arisen, or from severe head-ache, or from a violent blow. Neither is old age a proper time for a cure ; for, independent of any new disease, the vision is then dull ; nor even childhood ; but the middle age between these. Neither is a very small eye, nor one that is

hollow fit for the operation. There is also a state of maturity at which the cataract itself arrives. Therefore, we must wait until it appears to be no longer fluid, but to have concreted with a certain degree of hardness.

“ Previous to the operation, the patient ought to be put on a spare diet, to drink nothing but water for three days, and the day previous, to abstain from everything. After these preparations, he is to be seated in a light place, with his face towards the light in such a manner that the physician may sit opposite to him, a little more elevated ; but an assistant should stand behind the patient that he may hold his head immovable, for by a slight motion the sight may be lost for ever. Besides, the eye to be operated on must be held more steady by applying wool on the other eye, and binding it on.

“ Now, the left eye must be operated on by the right hand; and the right eye with the left hand. Then a sharp-pointed needle, perhaps not too slender, is to be directed straight through the two external tunics, at the intermediate point between the pupil and the temporal canthus of the eye, opposite the centre of the cataract, care being taken to wound no vein. It should not be introduced with timidity, because it enters a void space ; for a person of very moderate skill cannot but know when he has touched it, as there is no longer any resistance to the instrument. When it has reached the part, the needle is to be inclined towards the cataract itself, and gently moved up and down there (*or rotated*), and the operator ought to depress gradually below the region of the pupil ; when it has passed the pupil it should be pressed a little more forcibly, that it may sink to the inferior part. If it remain there, the operation is completed ; if it rises again it must be more cut with the same needle, and divided into several pieces, which, being in separate portions are not only more easily concealed, but

obstruct vision less. After this the operator must withdraw his needle in a straight direction, and the white of an egg spread upon wool, laid on it, and over that something to restrain inflammation, and so bound up.

“Afterwards, there is necessity for rest, abstinence, mild unctuous medicines, and food (which will be given sufficiently soon the next day), at first liquid, lest the jaws be too much occupied; when the inflammation has subsided, he may take such food as I have ordered in wounds. To which it must be added, that the patient's drink must necessarily be water for a considerable time.”

This is certainly a very remarkable and an extremely delicate surgical operation to have been performed in so remote a period of antiquity. The instructions for the performance of the operation, which are laid down by Celsus, are a model of simplicity, conciseness, and accuracy. It is impossible to contemplate the skill of the Roman surgeon of the first century of our era without emotions of astonishment and admiration.

[To be Continued.]

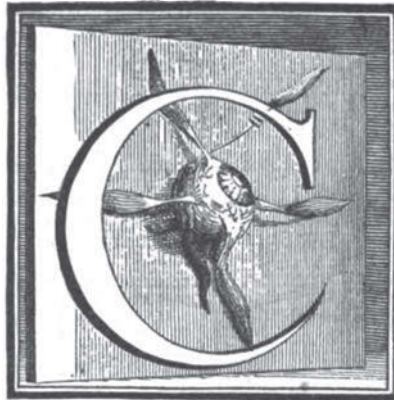
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ELSUS flourished at a period of very progressive activity in the development of the healing art. He gives us the names of a number of the most distinguished improvers, discoverers, and surgical authors, who were either his contemporaries or immediate predecessors. "Now

this branch, though it be the most ancient, yet it was cultivated more by Hippocrates, the father of all medicine, than by his predecessors. Afterwards being separated from the other parts, it commenced to have its own distinct professors, and received considerable improvements in Egypt, as well as elsewhere, principally from Philoxenus, who had treated of surgery most carefully in several volumes. Gorgias also, and Sostratus, Heron, and the two Apollonii, and Ammonius Alexandrinus, and many other celebrated

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men, have each of them contributed by their researches in surgery. And at Rome also, professors of no mediocre ability, and particularly of late, Tryphon the father, and Euelpistus the son of Phleges, and Meges the most learned of them all, as it would appear from his writings, having changed some things for the better, have made considerable additions to this art."

Where now are the voluminous surgical contributions of Philoxenus, of Meges, and of the others to which Celsus refers? Not a fragment of these writings has survived the wreck of nearly a score of centuries.

It is impossible to over-estimate the value of the works of Celsus; works so rich in accurate delineations of disease, so replete with judicious observations, and so abounding in practical suggestions. By the aid of these precious treatises we are enabled to take a retrospective leap over the vast intervening gulf of time embraced in the entire Christian Era, to walk the streets of imperial Rome with this elegant scholar and experienced surgeon and witness the practice of the ancient masters of our art as it was in the days of the Emperors Augustus and Tiberius.

Is it not a profitable and also an exceedingly pleasant diversion to turn aside now and then from the labors and care of the present busy hour of life to contemplate the activities of the past, and glance over the long period of time, during which our present system of scientific knowledge has been slowly evolving? The reader must pardon my love and enthusiasm for the old masters of anatomy and surgery, and be gentle and patient with me as I carefully brush away the dust and mold from some of the antiquarian bibliographical treasures, and quote examples from their ample pages, and sing praises to the memory, the genius, and the worthy labors of the fathers of physic.

It will be remembered that the whole science and art of

physic, previous to the epoch of Celsus, was divided into three parts. The professors of the first part, Diætice, endeavored to cure by diet, exclusive of medicine; the Pharmaceutice, by medicines, and the third, the Chirugice, by manual operations. Celsus was a conservative and treated of all these methods of cure, devoting nearly an equal amount of attention to each of them.

While every portion of his eight books abound in interest, and furnish us with a clear insight of ancient medical practice, I am free to admit that my admiration is especially excited by the chirurgical books, wherein we are informed of the variety, number and excellence of the practical methods, ingenious devices, and ample resources which were employed by the surgeons in the first century.

I will introduce a few examples of ancient surgery from the works of Celsus. He has written quite fully on the genito-urinary organs; circumcision; the use of the catheter; external urethrotomy for the extraction of calculi, vesical lithotomy, etc. In treating of drawing off the urine, he says: "For this purpose, then, brazen catheters are made; and that they may serve in all cases, both large and small, the surgeon should keep by him three for males and two for females. The largest male catheter should be fifteen fingers' breadth in length; the next, twelve; and the smallest, nine. The largest female catheter should be nine fingers' breadth in length; and the smallest, six. Now these ought to be slightly curved, but the male catheters, more particularly so, and very smooth, and neither too stout nor too slender."

Celsus gives admirable directions for the introduction of the catheter.

Such catheters have been found among the ruins of Pompeii, where they were entombed soon after the death of Celsus, along with uterine speculums and other surgical instru-

ments, which are now to be seen in the Pompeian Museum in Naples.

When a stone becomes impacted in the urethra and cannot be extracted "with an ear-probe, or with the instrument with which they extract the stone in lithotomy," he directs that the prepuce be drawn forward and ligated, an incision made on a line with the urethra over the calculus, on the removal of which the integument being permitted to retract the opening is closed and the urine follows the natural channel, and thus a fistula is avoided. Is not this an example of consummate skill?

The Celsian operation for stone in the bladder, famous in the annals of surgery, is worthy of detailed account, and must therefore be reserved for a special chapter.

[To be Continued.]

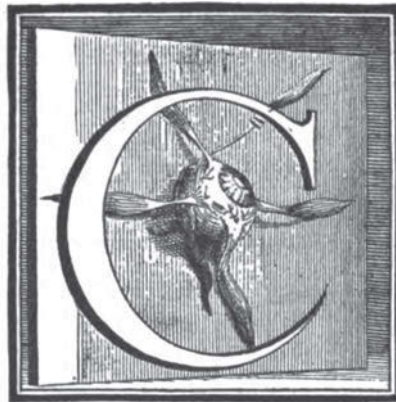
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CELSUS describes an operation for stone in the bladder which has ever been famous in the annals of surgery as the Celsian method, being more frequently referred to in such works than any and all other operations of ancient times. It is the earliest account of the mode of performing lithotomy, which we possess. The operation of cutting for stone in the bladder is, however, referred to, but forbidden to be done by surgeons, in the Oath of Hippocrates. The Celsian method is known as "cutting on the gripe," and this mode of operation was followed exclusively for sixteen hundred years, when other methods were introduced, as the reader may see in my sketch of "Germain Colot and other old lithotomists." Chapter

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twenty-six, of book seven, of Celsus, is quite lengthy, and is entirely taken up with an account of this operation; from it I will quote a portion of the directions for the performance of lithotomy.

"A strong and intelligent person, being seated on a high stool, lays hold of the patient in a supine posture, with his back towards him, and his hips being placed on his knees, with his legs drawn backwards; he orders the patient to seize his own hams with his hands, and to draw them towards his body with all his power, and at the same time he secures them in that position. But if the patient be rather powerful, two able men must sit behind him on two contiguous seats; and both their seats and their legs next each other must be tied together to prevent their being drawn apart. Then he is placed on the knees of the two in the same manner, and the one, according as he sits, lays hold of his left leg, and the other of his right, and at the same time the patient himself draws up his hams.

"But whether one or two persons hold him, they are to lean their breasts over his shoulders. Whence it happens that the sinus above the pubes, between the ilia, is rendered free from any wrinkles, and the bladder being compressed into a small space, the stone may be seized more easily. Besides these, two strong persons should be placed, one on each side of the assistants who hold the boy, to prevent either the one or both from giving way.

"Then the physician, having carefully pared his nails, introduces his index and middle fingers of the left hand, first the one gently, afterwards the other into the anus, and places the finger of his right hand lightly on the lower part of the abdomen; lest his fingers on each side at once should press too much on the stone, and injure the bladder. And this must not be done rashly, as in most cases; but so that it may be done with as much safety as possible; for an in-

jury of the bladder produces convulsion, and endangers life.

“ First of all the stone must be sought for about the neck of the bladder ; and when found there is expelled with very little trouble. For this reason I have already stated that the operation should not be undertaken, unless this were ascertained by its peculiar symptoms. But if it be not there, or if it have receded, the fingers are to be extended to the fundus of the bladder, and the right hand gradually advanced beyond it.

“ When the stone is found, as it must necessarily fall into the surgeon's hand, it should be drawn out the more cautiously, lest it being small and smooth it might escape, that is, to avoid irritating the bladder too often. Therefore, the right hand is always to be kept beyond the calculus, and the fingers of the left force it downwards till it come to the neck, into which, if it be oblong, it must be forced so as to come out endwise ; if flat, it must come out in a transverse direction ; if square, so as to rest on two angles ; if it be larger at one end, so that the smaller may pass first. In a round one it is evident from its figure that it is of no consequence, unless it be smoother in one part than in another, then the smooth part should advance first.

“ When it has been brought into that position just described, a lunated incision must be made through the integuments immediately over and extending to the neck of the bladder, near the anus, with the horns a little inclined towards the ischia ; then a second incision is to be made in a transverse form in the convex part of the wound, so as to open the neck of the bladder freely, that the urethra may be laid open, and the wound should be a little larger than the calculus. For those who dread a fistula, which is termed in this part Koruada by the Greeks, make too small an opening, and are afterwards reduced to the same inconvenience,

with still greater danger, because the stone, when it is brought away with force, will make a passage unless it find one; and this is even more pernicious if the shape or asperity of the stone contribute anything to it, whence both an hæmorrhage and convulsions may ensue. But though a person escape these, this fistula will be much larger, when the neck is lacerated, than it would have been if cut.

“The incision being now made, the calculus comes into view, the color of which is not of any consequence. The stone, if small, may be propelled forward from one part and taken by the fingers from another; if of considerable dimensions a crotchet (*uncus*), made expressly for this purpose, is to be introduced to it, and applied to its upper surface. This instrument is thin at its extremity, and beat out in the form of a semicircle, broad and blunt; smooth exteriorly, where it comes in contact with the body; rough on the inside, where it touches the stone.

“This crotchet should be of moderate length, for when short it has not the power of extracting the stone. When it has been introduced, and the stone seized, it should be inclined to each side, that it may appear certain whether the stone be held fast; if it has been grasped, it moves simultaneously with it. And there is a necessity for this, because when the crotchet is being withdrawn, the stone may escape inwards, and then the crotchet might seize on the edges of the wound and lacerate it. The danger incident to this I have just stated above.

“When it is evident that the stone is safely grasped, a triple motion is to be employed almost at the same moment, from side to side, and then outwards, yet so that it may be done gently, and the stone drawn a little at first; this being done, the crotchet (*the handle*) is to be elevated, that it may be further within the bladder, and bring out the stone with greater facility. But if, by chance, the stone should

be seized partially superiorly, it should be grasped laterally.

“This, then, is the most simple method of treatment. But a variety of circumstances requires some further observations; for there are some calculi not only rough, but also prickly, which indeed glide into the neck of the bladder, and are extracted without danger. But if they are within the bladder, it is neither safe to seek them nor draw them forwards, because when they wound it, they bring on convulsions and death; and more especially if any point is fixed in the bladder, and throw it into spasmodic wrinkles in the act of extraction.

“Now a stone is discovered to be in the neck of the bladder, by the difficulty of voiding the urine, and that it is spinous when the urine is rendered bloody, and this is particularly to be ascertained by the fingers; neither is the operation to be attempted until this be confirmed. Even then the fingers must be introduced very gently, lest they may wound the bladder by moving it forward violently; then the incision must be made. In this operation many surgeons have made use of the knife. Meges maintains that the knife is inconvenient, because it is too weak, and might encounter some prominence of the stone, and after having divided the flesh above it would not cut where it was concave, which would render a second incision necessary. For this reason he invented a straight instrument with a broad back (*rounded*) at its upper part, and semicircular and sharp at its lower extremity.

“This instrument being held between his fore and middle fingers, and his thumb being placed on it, he pressed it so that he cut whatever part of the stone might be prominent together with the flesh, by which means he succeeded in making a sufficient opening at once. But by whatever method the incision has been effected in the neck, a rough

stone ought to be extracted gently; no force ought to be applied for the sake of expedition.

“ Now a sandy stone is easily discovered, both before the operation, from the discharge of sandy urine, and in the operation itself; because it makes but a faint resistance to the fingers, and that not equally, and besides it is apt to slide away. Besides urine that brings off with it something resembling small scales, indicates the stone to be soft, and that it is composed of several small ones, loosely held together. All these are to be brought away by alternating the position of the fingers gently, so that they may not injure the bladder, leaving no residuary fragments to impede the subsequent cure. Any of these that come into view must be extracted with the fingers, or by the crotchet.

“ But if there be several calculi, they ought to be extracted separately; with this exception, that if any very minute stone remain, it may be better to leave it: for it is difficult to find it in the bladder, and when found, it quickly escapes. Thus the bladder becomes injured by a long search, and mortal inflammations are brought on, in-somuch that persons who have not been cut have died from a long and fruitless irritation of the bladder by the fingers. Add to this, that a small stone is subsequently moved forwards by the urine, and then drops out.

“ But if at any time the stone is so large that it cannot be extracted, without lacerating the neck of the bladder, it must be split. The author of this invention was Ammonius, who, on that account, obtained the cognomen of Lithotomus, *the stone-cutter*. It is done in this manner: A crotchet is introduced to the calculus so as to hold it fast while being struck, lest it should recoil backwards; then an iron instrument, of moderate thickness, with a thin edge, but not sharp, is to be employed, and being applied to the stone, and struck at the other extremity, splits it, great care

being taken that neither the instrument itself, nor any fragment of stone should injure any part.

“ Now, these operations are performed in the same manner on females; concerning which a few peculiarities must be mentioned. For in them the scalpel would be superfluous, where the calculus is small; because it is forced by the urine into the neck of the bladder, which is both shorter and more elastic than in the male. Therefore it frequently drops out of itself; but even if it adhere at the farther extremity, which is more contracted, yet it may be extracted without any harm by the above mentioned crotchet. But in larger calculi the same method of treatment will be necessary.

“ However, in a virgin the fingers should be introduced per anum as in a male, in a woman per vaginam. Again, in a virgin, the incision must be made below the left lip of the pudendum; but in a married woman between the meatus urinarius and the os pubis, and the incision must be in a transverse direction in both cases. Neither need we be alarmed at a considerable hæmorrhage in a female.”

After giving the above minute directions for the performance of lithotomy, he lays down rules, with equal care, for the subsequent treatment of the patient. He advises the careful washing out of the bladder with warm water, by the aid of an “ ear-syringe,” the use of lint and warm oil; of wool, to protect from cold, and at the same time deprecates the use of poultices, particularly on account of their weight and pressure.

Chapter twenty-seven, of book seven, is entirely devoted to “ Gangrene after lithotomy, and the mode of treatment.” I have already quoted so much from Celsus on lithotomy that I must refrain from making any more excerpts, however interesting they may be, and content myself with referring

the interested reader directly to the work. It will have been observed that Celsus speaks of "the boy," as if men were never operated upon for stone; indeed, in the commencement of the chapter, he expressly states that the operation of lithotomy "is not to be tried at all seasons, nor in every age, nor in every case, but in Spring alone; and only between the ages of nine and fourteen; and also when the case is so urgent that it can neither be overcome by medicines, nor protracted, and that the patient must die if the operation is prolonged. Not but a rash operation now and then succeeds, but because it more frequently fails." He thus expresses his extreme conservatism: "Precipitation in this operation would be incompatible with the danger inseparable from it."

There is no portion of the works of Celsus which can be read without interest and profit. Every chapter deals with some practical problem in medicine or surgery. The eleventh chapter of the second book is entirely on the subject of cupping. This operation was resorted to for direct local depletion, and also as a means of derivation. He describes two kinds of cupping instruments; one for dry, and the other for wet cupping. The *cucurbital* for the former use was made of horn, the large open end having been applied to the body, the air was exhausted through an opening at the small end of the horn, by suction with the mouth, then the little orifice was immediately closed with wax, whereupon adhesion took place. The cup for direct bleeding was made of brass, being open only at one end, into which burning lint was thrown, and its mouth applied to the part which had previously been scarified with a lancet. Celsus tells us that any other material may be employed for making either of these instruments, adding, that if nothing else can be had, a small cup, or a narrow-mouthed pipkin will answer the purpose.

Blood-letting by venesection is treated of very fully in chapter tenth, of book second. This entire chapter is taken up with this subject, and is well worthy of perusal. He tells us that the ancients, (ancients to Celsus), never bled young persons, or pregnant women. That experience had convinced modern practitioners that such precepts were fallacious, that the physician must be governed by the condition of the patient, and by various considerations, which he lays down in detail.

It is very evident that the ligation of blood vessels was practiced in the first century, if, indeed, it was not even then an old operation. In the nineteenth chapter of the seventh book of Celsus, we find the following language. "As many veins" (he often uses the terms, veins and arteries, indiscriminately) "may appear to run in every direction, the smaller ones may be cut off at once, but previous to this, the larger ones are to be tied with a long thread, lest a dangerous hæmorrhage ensue." Farther on we find, "The testicle being now disengaged, is to be brought down gently through the wound itself with its veins, arteries, and spermatic cord: and care must be taken that no blood descend into the scrotum, lest it should coagulate in any part there. This will be prevented, if the physician shall have provided ligatures for tying the veins, and the ends by which their extremities are secured must hang out of the wound; and when suppuration comes on, they will fall out without any pain." There are also other places in his works where the ligation of blood vessels is advised as a means of arresting hæmorrhage. Thus it is seen that many centuries before Ambroise Paré was born the ligature was in common use.

Celsus describes two modes of treating fistula in ano, [Chap. IV., Book VII.]. One method is by ligature, which is to be tightened twice daily, and renewed every third day to prevent its becoming putrid, until the part embraced in the liga-

ture is entirely cut through. This he says, is without pain, the patient being able to be about, as usual. The other mode is for those who are in greater haste to be cured, and consists in the use of the knife. Space will not permit the details given by Celsus.

The method of performing paracentesis abdominis in dropsical persons is given in chapter fifteen of book seven. The place to be punctured is first spoken of, some selecting a point below and to the left of the umbilicus; while others have perforated the navel itself. Some cauterize the skin before making the incision. He cautions against dividing a vessel in making the incision, the instrument must pass through the membrane which bounds the abdominal cavity, "then a leaden or brazen pipe is to be inserted into it, with its lips either curved outward, or surrounded with a ring about the centre, to prevent its slipping into the abdominal cavity. The portion to be introduced should be a little longer than that without, in order that it may pass beyond the inner membrane. By this means the fluid is to be drawn off: and when the major part of it has been discharged, the canula is to be closed with a bit of linen: and this is to be left in the wound, if the opening had not been previously cauterized. Then on the subsequent days about a hemina should be drawn off each time, whilst any trace of water remains. Some even withdraw the canula, although the wound had not been previously cauterized, and bind a wet sponge over the wound: next day they introduce the pipe again, which the recent wound will permit, by being drawn a little apart; so that if any fluid remain, it may be discharged: they are satisfied when this is done twice."

Among the many Celsian operations which the limits of this article will not permit me to describe in detail, I must refer the reader to those for the extraction of weapons out of the body, including arrows and leaden bullets, by means

of forceps, and other instruments (B. 7, C. 5). Also to the extraction of teeth with forceps; and of filling the cavities of teeth with lead (B. 7, C. 12). To the extraction of polypi from the nasal cavities (B. 7, C. 10). The extirpation of the tonsils, and of the uvula (B. 7, C. 12). Operations for atresia vaginæ (B. 7, C. 28). Turning in delivery of the foetus (B. 7, C. 29). Operations for the restoration of parts, including the ears, lips and nose (B. 7, C. 9). Amputation (B. 5, C. 26). Trephining (B. 8, C. 3). The treatment of serpent bites, and of hydrophobia (B. 5, C. 27). The refracture of bones united with much deformity, and also of the rubbing together of the ends of ununited bones, in cases of false joint (B. 8, C. 10).

After such a list of important surgical operations as we here find treated of by Celsus, who in our profession can be so utterly indifferent to the history of our science and art, as not to desire to study the works of the old masters of anatomy and surgery?

It is no easy matter for me to lay down my pen and submit to the stern necessity of limited space; and still more painful is the reflection that I may already have far exceeded the circumscribed limits which the demand for antiquarian medical literature, at the present time, would willingly have allotted to these sketches.

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