

THE STRANGE HISTORIES OF SOME ANATOMICAL TERMS

by

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NAKED-EYE human anatomy employs some five thousand technical terms. The wretched student is still urged to acquire about half that number though an overdue attempt is being made to reduce his burden. How many or how few of these words of *The Art* the medical man carries with him into practice no one can say. My own guess is that they amount to under a thousand, but even that is a considerable vocabulary. Here I shall not discuss any term that is not in general medical use. To give any meaning to what I have to say, I must remind the reader of a few outstanding facts in the general history of our anatomical terminology.

For the major parts of the body, and especially the external parts, we use mostly the ordinary colloquial English terms. Most of these are traceable to Teutonic, and all of them to Indo-European roots; such are leg, thigh, shoulder, belly, breast, heart, lung, liver, bladder. These also are butchers' terms. For technical discussion of most of these parts, and of all those parts revealed only by delicate dissection, we use a nomenclature of very complex origin but basically Greek. This, for practical purposes, means the vocabulary of Galen (A.D. 130–200) the bulk of whose anatomical works far surpass those of all the other anatomical writers that have come down to us from antiquity. Galen practised in Rome and was most active under the great philosopher-emperor, Marcus Aurelius (reigned 161–80) whom he attended personally. He must have spoken Latin fluently but, like his master, wrote in Greek which was both his mother tongue and the common language of learning in his day. The Galenic anatomical terms that we use are transliterated or translated into Latin. In either case they have often been yet further changed by being anglicized.

Galen was an ardent anatomist but had very seldom (some think never) dissected a human body. His detailed anatomical descriptions are mostly of apes; Barbary apes or, perhaps more frequently, Rhesus monkeys. The latter were available in numbers as pets in ancient Rome. Galen had never even heard of an anthropoid ape. The anatomy of certain parts of the Rhesus monkey, and notably of the arm, is astonishingly like that of man. This Galen knew well and he knew, too, of many respects in which simian anatomy differs from human. He often calls attention to such difference. His anatomical knowledge was fairly adequate for the surgical practice of his day.

Galen had plenty of students and frequently lectured and demonstrated to them on anatomical matters. Unfortunately, and for political reasons which we cannot discuss here, he had no anatomical successors. Thus, after his death, his surgical methods were progressively less exactly followed and were forgotten

after the Western Empire fell in 476. They lingered in the Eastern Empire for another century or two.

On the fall of the Western Empire there ensued some seven centuries during which anatomical knowledge was absent from the West. In that period Islam arose and spread afar, mostly at the expense of the Eastern or Byzantine Empire. In a vast area Arabic soon became the learned language and before long also the colloquial tongue. Galen's anatomical works were translated into Arabic although there was no dissection in the Arabic-speaking world or, at this period, in the Greek-speaking world, and many Greek anatomical terms were transliterated into Arabic. Galen's works were copied and annotated both in Greek and Arabic until the fifteenth century but neither Greek nor Arabic literature yields any evidence of practical anatomical knowledge in all this long period.

In the twelfth and thirteenth centuries Galen's anatomy came back to the West in Latin translations from the Arabic, much as it had come to the East in Arabic translation from the Greek. Thus the Arabic-Latin versions were third hand when they reached the West. Some of these Arabic-Latin translations had also passed through Syriac and/or Hebrew on their way into Arabic and were thus fourth or fifth hand when they reached the West. However, the now disfigured anatomical terms became accepted in Western Europe in their latinized forms and some even passed into the vernacular and were thus fifth or sixth hand.

In the fourteenth century the practice of dissection of the human body began again in the West. This time it appeared in the Universities. The process was not one of research but was undertaken simply to aid in memorizing the Arabic-Latin versions of Galen's anatomical works. Bologna University was the pioneer in this type of dissection. It was soon followed by the other North Italian universities, notably Padua and Ferrara, and then by Montpellier, Paris, and a few German and Spanish universities. For academic purposes the nomenclature used was that of Arabic-Latin, in which considerable traces of the original Greek forms had survived. This Arabic-Latin is a special lingo of which dictionaries have been attempted.

In the late fifteenth and early sixteenth century came 'the Revival of Learning'. With more accurate knowledge of Greek, there came a revived knowledge of Galen's anatomy. The 'Renaissance' of Greek anatomical works was, however, considerably later than the Renaissance of Greek literary and philosophical works. The scholars of the West developed a violent dislike to what they regarded as the barbarous Latin drawn from the Arabic. Their attitude is well represented by the old limerick:

There was an old fellow of Gweek
Who believed in compulsory Greek,
As, from being at college
He'd no other knowledge,
The reason is not far to seek.

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The classical scholars applied themselves to purifying the anatomical vocabulary of all Arabic 'corruption'. Their work was remarkably complete. The second and improved edition of the work *On the Fabric of the Human Body* (1555) by Vesalius (1513–64), the 'father of modern anatomy', shows that they had almost succeeded. Almost, but not quite. A very few words of Arabic origin survive in our scientific anatomical vocabulary to this day. Of one or two of these I shall presently speak. Here I have space to treat of only nine anatomical oddities. I have selected terms which illustrate the history of the subject together with a few other curious points, in a very long and complex story.

(1) CLAVICLE, CLAVICULA is an easy one on which to open. The word means, of course, a little key. It is a Latin translation of the Greek *kleidion*, diminutive of *kleis*. No one would now think of comparing the clavicle to a key. In fact, however, that bone bears a striking resemblance, both in shape and size, to the latch-key of a Greek house. Its lock worked on a different principle to ours. *Kleis* and *kleidion* occur in the Hippocratic *On joints* but *clavicula* is not a classical Latin term for the collar bone. How it got into the medieval Latin vocabulary I do not know but it is found in medieval French and sixteenth-century English.

(2) AMNION. Galen and his older contemporary, Rufus of Ephesus (*fl. c.* A.D. 150), have the form *amnios*. This I believe to be more correct, though the dictionary maker, Julius Pollux (A.D. 134–92, see No. 7) prefers *amnion*. Amnion would mean a little lamb (diminutive of *amnos*) or else a vessel to hold the blood of a sacrificial victim. Both are irrelevant to the nature and function of the amnion. Rufus of Ephesus in a treatise *On anatomical terms*, has a passage which seems to give the clue to its origin. In translation it runs:

The foetus is enclosed in two membranes of which one is thin and called *amnios* by Empedocles. From this [that is from this usage of Empedocles] Eileithyia, goddess of childbirth, has been nicknamed *Amnias*, rather than from the harbour in Crete.

Julius Pollux also refers the term to Empedocles. Of the works of Empedocles (*c.* 500–430 B.C.) only a few fragments survive but we know that he dissected animals. He flourished some 600 years before Rufus—about as long as Chaucer was before us.

At about the time when Rufus was writing—say A.D. 160—Pausanias was compiling a guide-book to the Greek world. Among the sites at Athens, there was, he tells us 'a temple of Eileithyia who is said to have come to Delos to help Latona in the pangs of childbirth. The Cretans believe Eileithyia was born at Amnisus in the land of Knossos.' She was a goddess popular in the eastern Mediterranean from very early times and was specially connected with Knossos in Crete. Homer's *Odyssey* of perhaps 800 B.C. relates stories that had long been legendary. He says

Crete is in the midst of the sea and therein are men past counting. They speak different tongues, Cretan, Cydonian, Dorian and *Pelasgian*. Among their cities is great Knossos where Minos reigned. There I saw Odysseus, for the force of the wind had brought him as he was making for Troy. So he anchored at Amnisus where is the cave of Eileithyia [abbreviated].

Birth goddesses were common in Cretan cults and evidently this birth goddess was worshipped at Amnisus or Amnias, the port of Knossos. The mention of Pelasgians here is also interesting. The Pelasgi were early inhabitants of Greek lands and the Greeks came to use the term Pelasgians as we do Aborigines. It is thus in keeping that Homer should name them among the motley inhabitants of Crete. But for us the point is that this very ancient birth goddess bears a place-name, the meaning of which—like that of many place-names in Greece as in Britain—goes back beyond our ken. But with the hints from Rufus, Pausanias, Julius Pollux, Empedocles and Homer we may reasonably believe that the word *amnios* comes from a civilization already ancient in Homer's time. Of that culture, the Minotaur, the Labyrinth, and Ariadne and her guiding thread are legendary reflections. Yet she of Amnisus, in her nickname *amnion*, still presides over the miracle of birth and her nickname is familiar to every midwife.

(3) *NUCHA* in *Ligamentum nuchae* looks like a Greek word but it is, in fact, Arabic. It was taken over by the early medieval translators from Arabic into Latin. The Renaissance purifiers thought that these translators had taken it from the Greek and they therefore let it remain. It was, as it were, protectively coloured. Arabic *nukha* means the spinal cord and especially the upper end, the *medulla oblongata*. It thus becomes applied to the neck itself, hence French *nuque*. *Ligamentum nuchae* is thus half Latin, half Arabic—a hybrid, the scholar's horror.

(4) *PITUITARY BODY* contains an element of Greek physiology that is quite erroneous and therefore, as some would think, best forgotten. *Pituita* is Latin for Greek *phlegma*. The Greeks believed that a discharge from the brain—phlegm—descended as mucus from the 'pituitary' body through the cribriform plate of the ethmoid. This is bad anatomy as well as false physiology. However, the belief persisted through the ages and came back to the West from the Arabs so that even Vesalius was trapped by it. He did see, however, that there was an anatomical misfit. He therefore invented—or saw with the eye of faith—a channel from the pituitary to the cribriform plate. Since it is more gracious to forget the lapses of a great observer I make amends by drawing attention to his own maxim on the tomb of that magnificently contemplative skeleton, *Vivitur ingenio caetera mortis erunt*, which may be freely rendered 'He lives by his genius—the rest may be forgotten.'

(5) *AORTA* has had a very curious early history. It is straightforward Greek and in the form *aortē* is found both in Aristotle's *Historia animalium* (c. 350 B.C.) and in the Hippocratic *De corde* (c. 400 B.C.) in the sense of the vessels attached to the heart. The word seems to be used in these works in a collective sense. It passed into Arabic as *awurti* and in the Arabic-Latin versions as *aorta* with such variants as *adhorti*, *adorsi*, *orithi*, etc. So far all is relatively simple.

It is the remoter pre-Aristotelian and even pre-Hippocratic history of the word that is surprising. The verb associated with it is, in its archaic form, *aorteō*, a lengthened form of *aeirō*, meaning originally, 'I lift up', 'I raise on high'. *Aortēr* is used in the *Odyssey* for a knapsack that hung from the shoulders or as

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its strap, or again as a sword belt and yet again in the Hippocratic *De Morbis* (? 350 B.C.) for the lobes of the lung. The ultimate origin is probably a butcher's term for the thoracic viscera pulled out, after removing the ribs, by the trachea and oesophagus and so comparable to a knapsack. It was what modern butchers call 'the pluck'.

The narrowing of this to mean what Galen—and we following him—mean by *aorta* is less strained than might be thought. The Greeks had no classical language from which to draw technical terms. They therefore often made a term technical by giving a colloquial expression a strained sense, thus drawing attention to its special use. Thus, for example, *pankreas* means simply 'all flesh', a term which might be applied to many other organs. This is what has happened with their term for 'the pluck' or 'knapsack' but it happened long before the Greek anatomical vocabulary was regularized. It is sometimes forgotten that Greek science endured for longer than has modern science. Thus, for anatomy, from Empedocles to Galen is 650 years. Counting from 1958 this would take us back many years before Chaucer. The Greek language of Galen had thus just as long for development of its anatomical vocabulary as ours has had.

(6) **BASILIC VEIN.** The word looks as though it must be related to the Greek *basilikos* 'royal', or perhaps *basilica* a particular kind of public building. But why a royal or a basilican vein? I do not know; nor does anyone else. No reference to the name has been traced in any Greek writer. It is not an Arabic word but its first known occurrence is in an Arabic work of the ninth century by Ali ibn Abbas (=Haly Abbas) which relies on an Arabic version of Galen who, however, did not use the word. Nevertheless, in this Arabic text *al-basiliq* means what we call the basilic vein. This work of Ali was translated into Latin at Antioch in 1127 by an Italian, Stephen of Pisa. Antioch was then a Pisan enclave and trading post. Ever since Stephen's work, *basilica* has remained firmly embedded in the anatomical vocabulary. Like *nucha* it escaped the Renaissance purifiers and for a similar reason. Had they known its Arabic source they would have swatted it.

(7) **ATLAS** is peculiarly appropriate for the first cervical vertebra. It supports the skull, as the Titan, *Atlas*, supported the globe of the world in the legends of Homer and Hesiod. Nevertheless it is hardly an ancient term. It does indeed occur as a word for a vertebra in the *Onomasticon* of Julius Pollux (A.D. 134–92), a contemporary of Galen, but Galen does not use it. The *Onomasticon*—which is simply Greek for 'vocabulary'—was dedicated to the Emperor Commodus, the degenerate son and heir of Marcus Aurelius and patient of Galen. It is therefore noteworthy that Galen does not mention Pollux or his work and gives the atlas no special name but calls it 'the first vertebra'. Commodus reigned A.D. 180–92 so that the *Onomasticon* must have been written between these dates.

The *Onomasticon* remained unknown in the West or by the Arabs for 1,300 years. It was rediscovered by Western scholars at the end of the fifteenth century. It consists of a series of lists of words arranged according to the subjects to which they are related. Attached to these words are short explanations, often with quotations from ancient authors. One of these lists is of anatomical terms

and in this the name *atlas* is given not to the first but to the seventh cervical vertebra. From this list the anatomists of the sixteenth century often drew words to replace Arabist terms, then current with us. Pollux thus became the source of many anatomical terms that are still in use. Among them is *amnion* (see above) which, though used by Galen, probably did not appear in a Galenic printed text until 1528. *Atlas* first appeared in a printed text by the humanist scholar, Georgio Valla (1430–99) *On the parts of the human body* which was issued posthumously at Venice in 1501. As the work of Julius Pollux was not printed till 1502, Valla must have used a manuscript copy of it. As interpreter of Julius Pollux, Valla was a fertile source of modern anatomical terms. Among them are *carpus* and *metacarpus*, *cremaster*, *diaphragm*, *epiglottis* (in the modern sense), *mesentery*, *olecranon*, *omoplatum* for scapula (French *omoplate*), *poples* and *popliteal*, *psaos*, *pylorus*, *sura* and *surae*, *thenar* and *hypothenar*, *xiphoid* and *zygoma*.

As regards the use of the term *atlas* after Valla: by 1523 the Bolognese anatomist, Jacopo Berengario da Carpi, had sensibly decided that it was better applied to the first than to the seventh cervical vertebra. And so, with a few defections by later anatomists—Vesalius among them—it has since remained.

(8) **RECTUM** is an abbreviation for *Intestinum rectum*, a Latin term which occurs in Celsus (c. A.D. 30). His work, however, is a translation of a lost Greek original. Celsus, unknown in the Middle Ages, was recovered only in the fifteenth century (first edition, Florence 1478). Nevertheless, the term *rectum* was used in the Latin translation of the Arabic work of Ali ibn Abbas (1127, see No. 6) and was adopted in later medieval anatomical writings. It gradually displaced the usual medieval term *longaon* (from a vulgar Latin word *longanum*). *Rectum* was, moreover, used by the Renaissance Latin translators to render Galen's *apeuthysmenon enteron* (= 'stretched' or 'straightened intestine').

But the trouble about the term *rectum* is that this structure is very far from straight. It is indeed obviously, closely and completely curved. *Rectus* applies well to the various rectus muscles but is quite inappropriate for the lower intestinal tract. The explanation is that Galen (and perhaps other anatomists) was describing not the human rectum but that of a Rhesus monkey which is remarkably straight.

(9) **CAROTIDS**. The word must have been familiar in the Alexandrian medical school since it is used by Celsus (c. A.D. 30, see No. 8). It was probably introduced at Alexandria by Erasistratus (c. 250 B.C.). Rufus of Ephesus (c. A.D. 150) derives it from *karoein* 'to send to sleep' or 'stupefy' and it is found in that sense in the Hippocratic *On joints* (c. 400 B.C.). *Karōsis* is a general Greek term for torpor or profound sleep. Galen speaks repeatedly of the *karotides*. There was, he says, a view, derived from Erasistratus, that pressure on these carotids caused unconsciousness and a condition called *apoplexis*, but he (Galen) on the basis of repeated experiment, denies this (*De usu respirationis*, Chapter 5). However, Galen was probably using ungulates, which he much preferred to apes for experimental purposes. Ungulates have a rich collateral blood-supply to the brain through an extensive system of vertebral vessels and can therefore endure obliterative pressure on the carotids.

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The number of names given to the carotids in the Middle Ages is legion. Among them are *subetales*, *soporales*, *soporiferae sphragites* and *phagotides* (Valla, see No. 7), *apostolicae* (? for *apoplecticae*), *longales*, *decolationis* (Albertus Magnus 'quia, si constringuntur, accidit strangulatio') and many others and variants on these, but mostly involving the idea of unconsciousness.

I do not know through whom the term carotid first entered the Latin vocabulary of the humanist anatomists but Jacobus Sylvius (1478–1555) used it in his lectures. Andrea Alpago of Padua (c. 1440–1521), last and one of the greatest Arabic-Latin interpreters, used the word *carotid* in his posthumously printed version of the *Canon* of Avicenna (Venice, Giunta, 1527). Vesalius must have heard it in his Paris period (1533–6), if not before. In his *Tabulae sex* (Venice, 1538) he has a very characteristic passage as follows:

Arteriae karotides, that is the sleep producers, *apoplecticae*, *subeticae*, *hanirdamim*.

Apoplexy is Greek for 'a striking down': *Subeticae* is transliterated Arabic, meaning 'stupefying' and had been in the medieval anatomical vocabulary since the twelfth century. *Hanirdamim* is spelt in Hebrew letters and is Arabic for 'the stupefied [ones]' being from a root which occurs in Psalm lxxvi. 6, and Daniel viii. 18. In both of these places the Revised Version translates 'in a deep sleep'. Vesalius knew nothing of either Arabic or Hebrew, not even the phonetic value of the letters, and the passage was doubtless written for him by a Jewish assistant. This spurious learning is the last weakness of a great mind.