

Anatomical Terms: towards Development of Terminologies (terminogenesis). Head to head discussion

Professors Bernard John Moxham¹ (BJM) and Pierre Sprumont² (PS)

¹Cardiff School of Biosciences, Cardiff University, Museum Avenue, Cardiff CF10 3AX, Wales, United Kingdom,

²Department of Medicine - Anatomy, University of Fribourg, Route Albert-Gockel 1, Fribourg, Switzerland

BJM: Pierre, this is a very erudite, scholarly account of the development of anatomical terminology. I want now to consider some of the conceptual issues that you have raised. Admittedly, we will have to indulge in speculation since we cannot enter the minds of the ancients and we see matters only through contemporary eyes. Furthermore, no doubt we will be swopping backwards and forwards between ancient and modern times. Nevertheless, we can debate some matters that I think deserve further consideration. From time to time you have used the phrase “evolution of anatomical terminologies”. In biological terms, evolution has, through natural selection and the dismissal of unwanted features, led to the appearance of more refined and complex organisms. However, it seems to me that our terminologies have “grown up like Topsy” (from the novel “*Uncle Tom's Cabin*” by Harriet Beecher Stowe) and thus without control or intent. There is an English joke that is worth recounting here: A couple were driving their car in the countryside and got lost. On seeing a farm labourer in a field they asked him to direct them towards London. He replied: “Well, if I were you, sirs, I wouldn't be starting from here!” So, if we were now devising anatomical terminologies we would NOT be starting from here, mixing up Greek and

Latin and other ancient languages, using some terms that indicate location while others suggest shape or function.

PS: You are right. Biological evolution starts from nothing (or nearly nothing) and evolves into an organism, whereas anatomical terminologies start from anatomical objects, or entities, and goes to words. And when you say words, you start by using those that you know. The first anatomical entities that were named were those that were seen from outside of the body. Then bodies were opened and new entities were discovered without words to name them. Egyptian, Greek, then later Latin, languages “created” words that were used first by butchers and magicians, NOT by medicine men, even though these were so to say specialised magicians. It is most unfortunate that we could never listen to these words at the root of terminologies. But, as you say, they were more butchers' technical terms than elaborate anatomical words.

BJM: Of course we cannot start devising the terminologies *de novo*. More's the pity! If we could, I would certainly propose that our terminologies should concentrate on functionality. That said, I certainly believe that the terminology groups within the IFAA (International Federation of Associations of Anatomists) should be a little more radical. I agree on the decision to remove eponyms but I would also advocate that we change terms that relate to “moral” or “political” considerations that no longer pertain in contemporary society. I'm thinking of the term pudenda (with a derivation relating to

Corresponding author: Bernard Moxham B.Sc., B.D.S., PhD, FHEA, FRSB, Hon FAS, FSAE. Emeritus Professor of Anatomy. 1Cardiff School of Biosciences, Cardiff University, Museum Avenue, Cardiff CF10 3AX, Wales, United Kingdom. Email: moxham@cf.ac.uk

Submitted: 25 May, 2016. Accepted: 7 June, 2016.

“shame”) should be changed, and from a recent survey I’ve conducted amongst both medical students and professional anatomists there was much agreement on this course of action. But, getting back to the main point, while we cannot but help using the terminologies we have grown used to, we should nevertheless acknowledge their deficiencies. Furthermore, I am about to publish a study where I asked medical students about their attitudes towards the importance/relevance of knowing Greek and Latin for their medical education. Unsurprisingly, the 1st Year students were positive about the importance, but surprisingly the final year students were very negative. From discussions with the students, I conclude that, as they come more and more into contact with patients, so their medical language gets more simplified and the use of the vernacular increases. I should add here that this is happening as laypersons seem to be increasing their knowledge about bodily structures and function. To conclude my point, we have a drift in the historical development of anatomical terminologies that proceeds from the unknown to the overly complex. Now, although I don’t have a crystal ball to predict the future with any accuracy, I foresee that, with democratic political changes, increased knowledge from non-specialists and the pressures of ‘consumerism’, medical and anatomical terminologies will come more into focus and might require more radical change.

PS: First point: it is true that our current terminologies reflect the moral attitudes of our predecessors but, to speak frankly, I do not care much about what they mean now, and I am not against trying to replace them by new “more neutral” terms. Yet, I am not sure that the newly found terms would not also be politically conceptualised. And I am curious to see how they will be accepted by their locutors. Furthermore, I am extremely interested in knowing which anatomical terms, apart from pudendus and pudendalis, are morally orientated or machismo-impressed. A quick look at the names in the chapters of “Genital Systems” in TA and TH did not reveal anything to my tired eyes! Getting back to Rufos (my pleasure), I tried to evaluate the importance of male gender domination that he expresses. He very often uses the same terms, like many authors of his time, for female and male genital organs – spermatic vessels for example – since he thought that both men and women produced ‘sperm’. Yet, he obviously employed specific terms for the uterus or the tubes, or the prostate (term introduced by Herophilos) about which he notes that women do not possess that organ. The influence of Christian moralism on anatomical terminology dealing with sexuality is more obvious. Dear Rufos called the genitals ‘αἰδοῖον’, which for him meant ‘modest’, using as we do the same word for male and female genitals. The Latin authors translated ‘modest’ into ‘pudenda’, which still is more cultural than moralist, although it gave

‘shameful = honteux’ in French and French-derived languages.

Second point: the first purpose of contemporary medical terminologies is not to communicate with the patients. They rather want to unify the designation of anatomical entities in order to avoid dangerous mistakes while communicating in the vernacular with the patients at a time when everybody travels without necessarily speaking the language of the place where they go to. A single “non-vernacular” term is therefore needed, whose vernacular translations are multiple but all referring to the very same term. These “non-vernacular” Latin terms should supply a basis for a multilingual database. It is important to know that the “neutral language” may not be an actual vernacular, although many people believe (especially in the US) that English, being universal, should be that language. The French did the same during the 19th century... The drift is there but it must drift from a common base. The focus on a common language is there, and the language will be digital.

BJM: Thanks for alerting me to the fact that the only ‘morally orientated’ terms you could find relate to pudenda. Well, to my mind this makes it even more deplorable and necessary to change this anomalous and pejorative term. This is especially the case since the dictionary definition of pudenda is ‘a person’s external genitals, especially a woman’s’ and therefore sexist as well as being morally unjustified in contemporary society. That said, we now seem to be close to having a profound disagreement; words may be grammatically neutral (in some languages) but are never politically neutral and we should be sensitive to this matter. In particular, the words were devised by male anatomists and took account of their status and the social mores of the time. In today’s terms, anatomy is male-centred and is in danger of ‘institutionalizing’ sexism within the discipline. Let’s develop this political aspect a little further before moving on to other considerations. You have rightly highlighted in your article some aspects about linguistic development. We usually take the “common-sense” view that language is meant to enable communication. But communication with whom and can language obfuscate as well as communicate? Historians and political theorists have pointed out that tradesmen (where are the tradeswomen?) formed grouping or unions or professions to protect their trade and that such groupings would use specially chosen language (or jargon) to glorify their status and/or to keep their trades protected and away from the “uninitiated”. The names of organs used in anatomy and medicine disdains the vernacular in favour of more obscure terms from ancient languages. This undoubtedly can aid more accurate descriptions but has the disadvantage of obfuscation amongst the uninitiated.

PS: Words should be neutral but languages are not, since they are spoken by women and men. I

think that I heard somewhere that women and men were spoken about by identical words in Japanese but I am not sure. If that is true, it would be interesting to know how the Japanese have buried their male chauvinism under neutral words. Anyway, your hypothesis is that vocabulary is used to obfuscate while communicating. Linguists, male and female, are the only persons who can give an answer to this hypothesis. My viewpoint is that words can be neutral: why a female cat, house or panther but a male dog, ship and rat in French? In German, word genders are quite different (I am always mixing them) and the same word, as *See*, can have two genders and two meanings. It is really a matter of language. I am ready to accept the idea that politicians, trade people, physicians, etc. have used jargon to shadow their professional expressions and descriptions. If we accept the idea that "neutral thus Latin" terms are used to provide to anatomical databases an alphanumeric base, then every vernacular locally-validated translation can use a "neutral" word to call an anatomical entity, and eventually change the translation in agreement with local usages, good or bad.

BJM: Returning to your earlier message, and your second point, I won't say much about a universal language (it should of course be the language of heaven... i.e. Welsh!!!). Joking aside, it seems sensible to me that Latin should be the chosen language for anatomical terminologies from the point of view of having cultural and geopolitical neutrality but I think that attempting to hold one's position against 'consumerism' by stating that "the first purpose of contemporary medical terminologies is not to communicate with the patients" is ultimately like King Canute believing he could turn round the sea's tides! The experience we are having in the U.K. about the professional status of medicine and its responsibilities towards the community is both worrying and instructive with regard to these matters. I'm no supporter of 'consumerism' but when I see a horse I call it a horse and not an elephant! Yes indeed I would concede that gender in a grammatical sense is a complicated linguistic issue but, given the drive to sexual equality, we cannot merely give absolution and pass by without comment. Incidentally, it is not my hypothesis that "vocabulary is used to obfuscate while communicating" but that "vocabulary can be used to obfuscate... listen to any politician talking! Anyway, let's agree to differ and pass on to other matters. In the Bible it is written "In the beginning was the Word....."; I beg to disagree, at least in part and in relation to contemporary practice. "In the beginning was the Word but now it's the Image....." Contemporary anatomy is iconophillic (in love with images). The earliest anatomical texts were without images, but eventually the eye overtook the ear and images appeared and dominated. The first images were very primitive and inaccurate (correlating with inaccurate

descriptions and terminologies) but gradually the images became more realistic and detailed. I put it to you for consideration that the concentration on the Word by groups dealing with terminologies is a little out of step with modern practice and such groups might be accused of just reinforcing the earliest, verbal, stage of anatomy's development at the expense of more modern concerns. I can hear you say that it's neither one nor the other but both... and so it is but to date the anatomical terminologies remain word-based (as shown by the published terminologies from the IFAA). You mentioned earlier that words were going to give way to numbers as we developed digitised anatomics. This was of course never foreseen by our forebears, so what do you see are the advantages and disadvantages?

PS: Looking at an official administrative document in my possession I note that the State of Fribourg undertook, more than 15 years ago, to reduce the influence of male words in the official denominations of professionals. I do not think that we dissent on the matter of words, nor on the partial replacement of these by images. And when I say that alphanumeric anatomical terms do not intrinsically differ from numbers, I am speaking of the core of the data bases or knowledge bases that are sitting inside our computers prior to (hopefully) being disseminated in the Internet. The actual task of FIPAT is to agree on the "dictionary of anatomical entities" (and more recently on their "grammar") that constitutes the very centres of those nascent "neo-lists" of terms. That is why it is so important to agree on the definitions of the terms. The official Latin terms are the theoretically invariable etiquettes attached to the specific anatomical entities - cells, organelles, organs, systems, molecules - and from which also vernacular translations are performed. These etiquettes are the traditional visible forms to which we are accustomed, if we learned them in Latin, and which every validated translation must refer to. This is what I meant when I said that, in principle, they were not designed for *direct* communication. Yet, the hidden numbers will always remain translated by our machine-to-human interfaces in term of readable words or of descriptive images that will allow communication of their meaning. There is no advantage or disadvantage: computers are like pens or printing presses, or tongues (remember Aesop?). Furthermore, when you say that we are becoming iconophillic (I love that word), you are right. The icons that we love are to be completely realistic to mean a reality, even when they graphically symbolise in 2D an anatomical 3D-fact. If you consult them through the Internet, they are nothing else than a numeric entity that, as a term, symbolises an anatomical structure. Nevertheless, my old classical acquired culture tends to persuade me to remain at the same time accurate in anatomy and correct in Latin wording. In Istanbul, I was the only

one to oppose transforming my good old *cupides* of heart into *foliola*, a direct translation from the English leaflets. I also know that the Latin terms still are a means of communication in many countries. FIPAT (Federative International Programme for Anatomical Terminology) and IFAA must thus be very strict in identifying anatomical entities and giving them an understandable Latin etiquette. Fortunately, the Latin language enjoys the existence of neutral forms (like *larynx* or *pharynx*, etc.) but its traditional use of gendered forms tend sometimes to be either male-dominated or morally ill-oriented.

BJM: I certainly agree with much of what you say here, so I want to shift ground and go back into history to ask you if, during your enquiries and investigations, you came upon the earliest use of eponyms. While I suspect that you'll say this is a relatively modern event, I'd like to get your response before developing a theme buzzing round my head!

PS: The parent of all eponyms certainly was *Torcular Herophili* coined in Latin from the descriptive Greek term *ληνός* (wine-press), which was introduced by Herophilos when he discovered the *confluens sinuum*. Then Rufos repeatedly speaks of the more or less correct words that different peoples use to designate a structure. He also quotes synonyms used by authors such as Homer. It is true that eponyms multiplied much later. I would say that they accompanied the development of dissection when newly discovered structures were given the name of the anatomist or surgeon who isolated or showed them. Some eponyms from the 16th and 17th centuries became universal and are still in use in some parts of the world, at least by anatomists. Think of *Bauhin* (a Swiss!), *Eustachio* and *Fallopio* (two Italians), *Highmore* and *Glisson* (two Englishmen), and many German and French people, invaded the medical literature during the 18th and 19th centuries. Although I accept that some of these eponyms still are globally known, I observe that most of them directly depend on the language where they were born and frequently differ from each other for designing the same entity. This is why they should be kept in the data bases, if possible with an explanatory notice.

BJM: Having already worried about terms that are not descriptive and scientific, it seems to me that eponymous labelling of anatomical structures also falls under the heading of being 'cultural' and ultimately, perhaps idealistically, unworthy. My objections are twofold. First, we keep teaching our students to be detached and objective, to avoid hyperbole, and to avoid the 'cult of the personality' in science. And yet, eponyms persist in contradiction to these principles. Second, let's give *Eustachio* the benefit of the doubt in discovering the pharyngotympanic tube but, if he hadn't discovered this tube, it most certainly would have been discovered by another so the name is interesting

historically but not scientifically. Correct me if I'm wrong, but haven't the terminology group within the IFAA discarded eponyms? Of course, I appreciate that it is difficult to ask anatomists and clinicians to relearn their 'language' and discard eponyms but a start has to be made sometime.

PS: Let me come back to the "anatomics" (a term that David Brynmor Thomas proposed several years ago, but which is registered by an implant-making Company). In fact, terminological digitisation is practised by FIPAT by means of a Subcommittee of geeks. Does it mean that words are going to disappear? I hope not. FIPAT's goal is to identify the morphological entities – whatever their dimension – by giving them a name. Most of these entities were named when they were discovered long ago. New names are given [1] when new entities are discovered because of technological (PET-scan, atomic-force or tunnel microscopes, etc.) or surgical (operating robots, fibre-optic instruments, etc.) progress, and [2] when existing terminological classifications appear to be wrong because of new findings. While doing this, FIPAT coins, or more often validates, unique terms that unequivocally cover singular entities.

The question that you raise is to know whether or not FIPAT is entitled to correct those moral or political faults that were at the origin of several old terms. My immediate answer is yes, of course. FIPAT had already suppressed, at least in anatomy, the urogenital system that, for supposedly subconscious reasons, linking two functional systems that possess only a ± 10 cm-long segment in common and, to add insult to inaccuracy, in males only. Thereby removing the dirty blot of genital anatomy. The same Committee had also inverted the ordering of the genital systems, moving from a traditional male-chauvinistic to a politically correct hierarchy. And I would strongly support any proposal to correct every still existing morally unacceptable term.

Interestingly, the question of eponyms is comparable with that of "bad names". Eponyms unethically give to an anatomical entity the name of its describer in a given language. It would be unethical to keep that name for a globally known entity. It is really a moral matter. FIPAT (before that FICAT) had already coined new names for globally known eponyms by transforming the former proper name into a new common name, *schwannocyte(us)* instead of *Schwann cell*, or *neuron purkinjense* instead of *Purkinje cell*, for instance. However, *Purkyně* and *Schwann* belonged to the anatomical world heritage from the 19th century. The naming of real new terms must be descriptive and/or functional by definition. In this respect, FIPAT must have the last word.

BJM: Perhaps it is time to sum up and say where we agree and where we must agree to disagree... We would agree, I think, that we need to understand something about the historical development

of anatomical terminologies to understand where we are now even if we disagree that our terminologies are rather anarchic, jargon-ridden, sometimes unscientific and, in democratic terms, often incomprehensible to the uninitiated and thus helping to perpetuate the separation of healthcare professions from their layperson clients. That said, we agree that terms should be descriptive and/or functional and that it is important to have universally approved terms and thus to have 'neutrality' by insisting on using classical Latin in order to diminish the potential for anarchy and to avoid 'linguistic imperialism' by employing a contemporary language. [As an aside, we are dealing here with paradoxes; but nothing's ever perfect!] This is further complicated by anatomists and clinicians too often not employing the same terms (with clinicians in particular seeming to be over fond of eponyms). Overall, for the sake of the discussion, I have purposely taken an idealistic (perhaps even ideological) approach to draw out your thoughts. I think, however, that we both recognise the need to be practical and we would agree that we are where we are, even if we would wish that "we shouldn't be starting from here!.