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A linguistic clarification for four key anatomical terms

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Abstract. This brief note aims to offer some historical and methodological clarification on four key anatomical words (anatomy, dissection, autopsy and prosection) which are often used incorrectly by students and members of the public when referring to human anatomy. The origin, meaning and – for the most important ones – correct pronunciation of the words is given as well as recommendations on how to use them correctly.

Keywords: anatomy, education, history, teaching, review.

INTRODUCTION AND AIM

Human anatomy represents the angular stone on which the edifice of biomedical knowledge is erected. Despite various historical attempts at downsizing its importance, above all its practical component represented by human cadaveric dissection, the discipline is still considered a solid and indispensable step in biology, pharmacy, and medicine students worldwide [1].

A great confusion, nevertheless, appears to exist in the exact use of terms connected with this discipline, both at the students' level, in the general public and in the press.

This realization derives from the authors' personal experience dealing with teaching, examining, and popularizing aspects of the anatomical discipline, or closely related fields such as biological anthropology, bioarchaeology, palaeopathology, etc. at the university level. For this reason, the goal of this brief note is to offer a summary of the origin and exact meaning and preferred uses of the following nouns: *anatomy*; *dissection*; *autopsy*; *prosection*. Before delving into the specific aspects of these words, in Fig. 1 a historical overview is offered of their use approximately in the last five centuries (AD 1500–2019) using the

Google Books Ngram Viewer website, from which, besides the predominance of the word anatomy (reasonably used also in other non-medical contexts) the word *dissection* has become more commonly used than *autopsy* from the second half of the 20th century.

MATERIALS AND METHODS

This concise review adopts a historical approach and explores the etymology, development and use of the words *anatomy*; *dissection*; *autopsy*; *prosection*. Finally, for each term, it offers paedagogical suggestions on when it is best to adopt such words and what wrong used should be avoided by students.

ETYMOLOGY AND CORRECT USE OF THE SELECTED WORDS

Anatomy

It comes from the ancient Greek noun ἀνατομή originating in turn from the verb ἀνατέμνω, literally “I cut up”, composed of ἀνά (“up”) and τέμνω (“I cut”) [2]. In Latin it was ultimately translated as *anatomia* with the stress being laid upon the antepenult syllable, thus being pronounced as /a.na'to.mi.a/, whereas in Italian it became *anatomia*, /a.na.to'mi.a/ (stress on the penult syllable), in English *anatomy* /ə'næt.ə.mi/ still on the antepenult (the word consisting of four syllables in that language instead of five as in Latin or Italian), in French *anatomie*, in German *Anatomie*, with both languages stressing the last syllable instead. The Latinate word *anatomy* now made so popular in the English-speaking-world by Henry Gray's *Anatomy* textbook [3] appears to have entered the English language through its Old French counterpart *anatomie* during the Middle Ages. During the late 14th century AD anatomy primarily meant the “study or knowledge of the structure and function of the human body”, which, as it was understood in those days, could only be attained through dissection. It can be well understood how it represented the discipline, while around the beginning of the 15th century it also started to indicate the “anatomical structure”, that is the very object of the scientific enquiry represented by the word [4].

Subsequently, in Shakespeare's day the word anatomy also counted as a synonym for other related words such as *dissection* (see the above reasons), *mummy* (originally meaning the substance covering embalmed bodies, then such preserved corpses in their entirety), *skeleton* (only a part of the whole human anatomical structure). From the 17th century on it once again indicated primarily the

study or science of the structure of bodies [4]. Both English and Italian versions of the word were often spelt as *natomy* or *notomia* as a result of a linguistic phenomenon known as apheresis (in English the initial ‘an’ also being mistaken for the indeterminate article). Of note, Mondino de' Liuzzi (1275-1326) celebrated masterpiece featured another variant of it, *Anothomia* [5].

It can thus be concluded that the word *anatomy* both indicates the scientific discipline and its subject. Biomedical students are, nonetheless, advised to think of it simply as an abbreviation of *human anatomy*, in that another, much broader branch of this discipline studies not only the bodies of anatomically modern *Homo sapiens*, yet also the remaining members of the animal kingdom and the evolutionary processes at the basis of modernly observed morphologies, thus being referred to as *comparative anatomy*. Students should also recall how their study of human anatomy can be further divided into *macroscopic* and *microscopic* human anatomy and how the former can be studied both *topographically* or *systematically*, depending if their focus be on all the anatomical structures present in a certain bodily district or, on the contrary, on all the structures forming a system throughout the human body.

Dissection

It comes from the Mediaeval Latin word *dissectio*, originating in turn from the union of the praefix *dis-* indicating a separation and the verb *secare*, “to cut”, hence “to cut in pieces” [6]. As it can be immediately seen, this word is very close to aforesaid verb ἀνατέμνω, from which the very word *anatomy* was shown to stem. Nevertheless, it appears to have made its appearance much later than the word anatomy, meaning the scientific opening of the human body – or of animal bodies – for an anatomical study or, more generally, in relation to medicine and its branches. In the latter sense, it can be related to pathologic anatomy and forensic medicine. It reached the English language in the late 16th century AD deriving from the French word *dissection* or possibly directly from the Latin original. From the mid-17th century on, it also developed a more abstract meaning and can thus also be related to the critical examination of things. From *dissection* derives the word *dissector*, that is the person, a scientist, an instructor, or a student, performing the act of dissecting a body [7].

Students of anatomy are advised to refer to *anatomical dissection* when they play an active part in the process, that is when they themselves, under the guidance of experienced teachers and tutors, *dissect* a cadaver in order to perfect their knowledge of its inner structures.

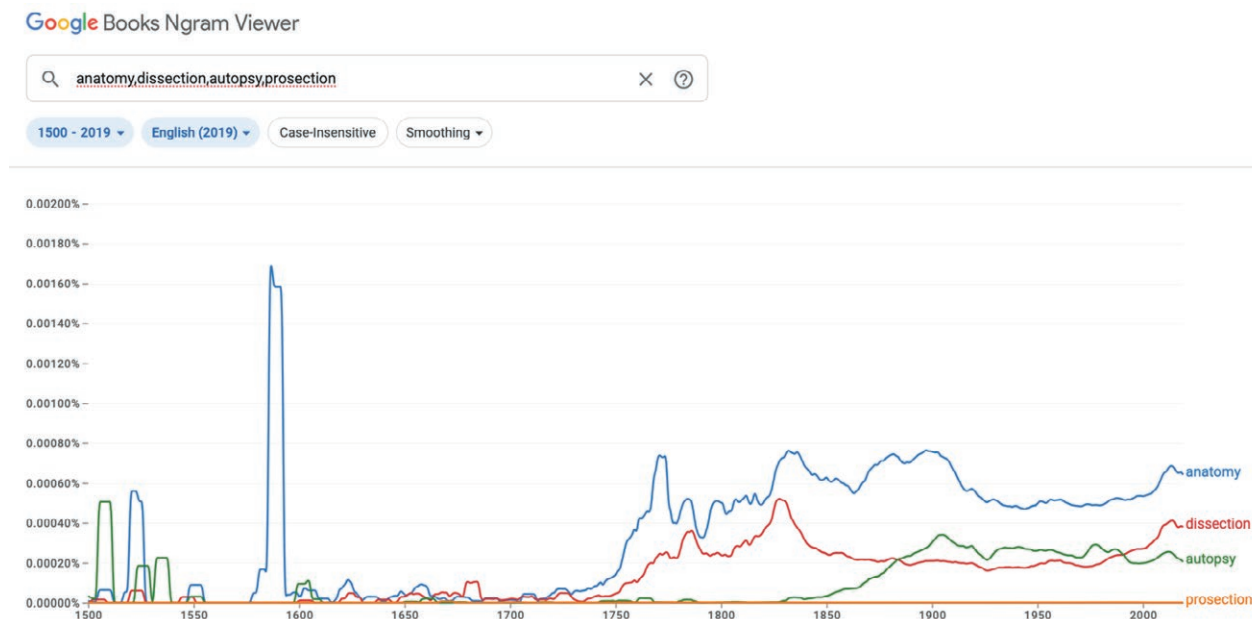


Figure 1. Historical use of the four discussed words from 1500 to 2019, based on books published in the English language. Image generated with *Google Books Ngram Viewer* (online at: <https://books.google.com/ngrams/>).

Dissection should not be confused with prosection, which will be discussed later.

Autopsy

This word, in English (/ˈɔːtɒpsiː/) as well as in other European languages, derives from the neo-Latin word *autopsia* (stress on the penult syllable, /awˈto.psi.a/), which in turns stems from the Greek αὐτοψία, literally meaning “to act of seeing with one’s own eyes”, originating from the union of the words αὐτός (“self”) and ὄψις (“sight”) [8, 9]. Herodotus of Halicarnassus’s (484-430/420 BC) method of inspecting and annotating foreign customs and physical traits is considered an early form of *autopsia* applied to ethnographical matters [10].

Originally, it meant the mere act of seeing anything (i.e. not necessarily a cadaver) with one’s one eyes. When referring to medicine it could meaning the examination of a patient as opposed to the anamnestic collections of information; on the contrary, when referring to a corpse, it did not necessarily include the act of “sectioning a body”. Expressions like *autopsia cadaverica* would emerge only much later (ca. 18th century AD) and could be substituted by other expressions such as *postmortem examination* or *necropsy/necrotomy* [11].

Students of anatomy should know that autopsy does represent a major aspect of the study of the human body in that its structures should not only been passively

memorized but actively observed by them with an investigative attitude, in order to learn them properly. Nonetheless, they should be aware that an autopsy does not always represent a physical dissection of cadavers nor is it limited to forensic aspects.

Prosection

It derives from the Latin *prosectio* (*pro-* “before” + *sectio* “a cutting”). Its earliest known use in English dates back to the 1890s [12]. It refers to the dissection of a cadaver for teaching purposes by an experienced anatomist so that students may observe and touch structures of the human body. They may both observe the anatomist while dissecting a cadaver and examine his preparations later. This represents a valid complement to what can otherwise be learnt from books or theoretical classes [13].

It should, however, be underlined that in such a practice, the students’ role is much more passive than in the actual dissections as seen above. For this reason, anatomy students should not refer to prosection-based curricular activities as dissection-based studies.

CONCLUSIONS

The above-described words have been related to their etymology and use throughout history, highlight-

ing what potential errors students can make when referring to them inappropriately. This is not merely a linguistic aspect – yet still very relevant in educated biomedical students – but also something that can have an impact on their understanding of their curricular steps and play a role in their setting goals as learners and determine their expectations.

REFERENCES

1. Papa V., Varotto E., Vaccarezza M., Ballestriero R., Tafuri D., Galassi F.M. (2020) The Teaching of Anatomy Throughout the Centuries: from Herophilus to Plastination. *Medicina Historica* 3(2):69-77.
2. Pearce J.M. (2009) Henry Gray's Anatomy. *Clin Anat.* 22(3):291-295. doi: 10.1002/ca.20775.
3. Pianigiani O. (1907, first edition) *Vocabolario Etimologico della Lingua Italiana*, online version: <https://www.etimo.it/?term=anatomia&find=Cerca>
4. Online Etymology Dictionary: <https://www.etymonline.com/word/anatomy>
5. Crivellato E., Ribatti D. (2006) Mondino de' Liuzzi and his *Anothomia*: a milestone in the development of modern anatomy. *Clin Anat.*19(7):581-587. doi: 10.1002/ca.20308.
6. Pianigiani O. (1907, first edition) *Vocabolario Etimologico della Lingua Italiana*, online version: <https://www.etimo.it/?term=dissezione&find=Cerca>
7. Online Etymology Dictionary: https://www.etymonline.com/word/dissection#etymonline_v_11493
8. Pianigiani O. (1907, first edition) *Vocabolario Etimologico della Lingua Italiana*, online version: <https://www.etimo.it/?term=autopsia>
9. Online Etymology Dictionary: https://www.etymonline.com/word/autopsy#etymonline_v_18984
10. Figueira T.J., Soares C. (2022) *Ethnicity and identity in Herodotus*. Routledge, London.
11. Foster J. (2023) The “autopsy” enigma: etymology, related terms and unambiguous alternatives. *Forensic Sci Med Pathol.* 2023 [Epub ahead of print]. doi: 10.1007/s12024-023-00729-9.
12. Online Etymology Dictionary: https://www.oed.com/dictionary/prosection_n?tl=true
13. Anderson D. (ed.) *Dorland's Illustrated Medical Dictionary*. (2007) 30th ed. *sub voce*: “Prosection”. Saunders, Philadelphia, Pa.