

Short Articles

A NOTE ON THE ANATOMICAL ACCESSUS OF THE MIDDLE AGES

by

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IN COMMENTING on the classical authors the medieval commentators very often used a formal introduction setting out a number of topics to be treated in the commentary upon the text. This *accessus ad auctores* has been discussed by Quain,¹ who lists a wide variety of branches of study in which the *accessus* was used; the only significant omission from this list is medicine. Medical examples, however, have been pointed out by Temkin,² and the topic as a whole has been dealt with in medicine by Cunningham.³ It is the purpose of this note to draw the attention of historians to the use of a form of *accessus* in anatomy and to make some tentative suggestions about the relationship between the *accessus* and the beginning of human dissection in the West.

The *accessus* is traced back by Quain to Ammonius, the fifth-century commentator on Aristotle. Ammonius was a mathematician, astronomer, philosopher, rhetorician, and grammarian: like Aristotle, he did not write anything on medicine, and the medical use of the *accessus* was borrowed from these other fields of study. The philosophers used the format of the *accessus* more rigorously than the rhetoricians, grammarians, and lawyers, and from the examples given below, it appears that the medical use of the form was even more flexible. The “school” of Ammonius includes all those who were interested in Aristotle from the fifth to seventh centuries, and it was, then, as a means of understanding Aristotle that the *accessus* developed. (At this point it should also be noted that the late classical and early medieval commentators gave much attention to the *Categories*⁴ of Aristotle. The results of this are suggested below.)

The medical *accessus* was an elaboration of the last of ten questions which were considered mandatory by the philosophers in an introduction to any work of Aristotle.

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¹ E. A. Quain, ‘The medieval *accessus ad auctores*’, *Traditio*, 1945, 3: 215–264. I am grateful to Dr. A. R. Cunningham of the Wellcome Unit for the History of Medicine, Cambridge, for bringing Quain’s article to my attention and for valuable discussions on the topic of the *accessus*.

² O. Temkin, ‘Studies in late Alexandrian medicine. 1: Alexandrian commentaries on Galen’s *De sectis ad introducendos*’, *Bull. Hist. Med.*, 1935, 3: 405–430.

³ A. R. Cunningham, ‘Two legacies of the later Alexandrian school: the preliminary questions in commentaries; the theory/practice division of medicine’, *Proceedings of the second International Conference on the Comparative History of Medicine, East and West*, Tokyo (in press).

⁴ Boethius, an important figure in the transmission of the *accessus* technique, included it in his commentary on Porphyry’s introduction to Aristotle’s *Categories*. See Cunningham, *op. cit.*, note 3 above.

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These ten questions were:

1. The names and number of the philosophical sects.
2. The division of the works of Aristotle.
3. The works to be read first in studying Aristotle.
4. What is Aristotle's purpose in his philosophy?
5. How can the modern reader achieve this purpose?
6. The character of Aristotle's work.
7. Why Aristotle chose to be so obscure in his exposition.
8. The proper attitude of an Aristotelian commentator.
9. The proper attitude of an Aristotelian reader.
10. How many items, and what kind of items, should be considered in the introduction to the works of Aristotle, and for what reasons?

It is clear that these ten topics or questions are those that need to be raised by whoever wished to understand Aristotle's philosophy as a whole, and their formulation into a rigid programme suggests an institutional background of teaching and learning, two important points when the anatomical *accessus* comes to be discussed. The topics of the medieval *accessus*, developed from the last of these Aristotelian questions, can be listed as:

1. The life of the author;
2. the title of the work;
3. the intention of the writer;
4. the matter of the work;
5. the use of the work;
6. to what part of philosophy the work belongs.

The *accessus* became popular by the twelfth century and was represented in most parts of the school curriculum. Quain quotes from Conrad of Hirschau, who gives us the only known theoretical discussion of the form: in Conrad's case it is clear that it is a technique for elementary students, and he has two rather different forms of the *accessus* for ancient and for modern authors. For ancient authors one must know also the order of the books composing the work and their number, the character of the work, and an explanation of it, while the *matter* of the work, the *intention* of the author and the philosophical relations of the work are transferred to the list that relates to modern authors. The list *as a whole* therefore contains at least three of the topics that had been included in the original list of ten questions that related only to Aristotle's works. The *accessus* form was clearly flexible, accommodating new authors and new teaching circumstances. Most important for our point of view, the list for *modern* authors (in Conrad's account) includes the final cause of the work, a topic taken from the Aristotelian apparatus of fourfold causality.

One of the first appearances of the *accessus* in the medical literature is in John of Alexandria's commentary on the Hippocratic *Epidemics*,⁵ where he gives some, but by no means all of the topics listed above. (He does not discuss his use of the form, but simply follows the rote, which suggests that this was the customary practice.)

⁵ C. D. Pritchett (editor), *Johannis Alexandrini Commentaria in sextum librum Hippocratis Epidemiarum*, Leiden, Brill, 1975, pp. 1–6.

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For the purposes of this note, we may call this list of topics the “literary *accessus*” to distinguish it from two further types discussed below. The first and fundamentally important of these other two types is the “anatomical *accessus*” which John of Alexandria uses in his commentary of Galen’s *De sectis*. Now, *De sectis* is Galen’s account of the different medical sects of his day and the arguments that arose between them; one of the most important of these arguments was whether a knowledge of anatomy was unnecessary and the process of dissection disgusting, as the Empirics said, or fundamental to a knowledge of how the body worked, as the Rationalists claimed. Moreover, there were those who claimed that vivisection was an invaluable aid to understanding the body’s *function*, not merely its morphology. *De sectis* was the first book to be studied in the post-classical Alexandrian medical curriculum,⁶ and so, apart from its complexity, it posed special problems for the inexperienced reader, and as a result it attracted much commentary.

John of Alexandria’s commentary reflects all this.⁷ His purpose is to make the work intelligible in as short a time as necessary (since life is short and the art is long) and he repeatedly refers to his task of making the task of learning easier for his listeners. In his proemium John discusses the nature of art, and points out that medicine, like carpentry, has both the material with which to work (the human body and wood respectively) and the finished product (health and a door or window). The proemium ends with eight items of a conventional literary *accessus* directed to *De sectis*. In the first comment John links these two ideas, the *accessus* and “art” by considering under the *accessus* topic “order of exposition” Galen’s opening of chapter 1 where the subject matter and the purpose of medicine (the body and health) are discussed. John elaborates this into a complete scheme of Aristotelian causality, with a material, efficient, formal, and final cause. Aristotelian causality could be used to examine more than a single topic of the *accessus*, and was used later to replace the *accessus* by serving the same purpose, i.e. the examination of an entire work.

In his eleventh commentary, arising in the middle of Galen’s fifth chapter, where Galen is discussing the reasoning with which the Empiricists and Dogmatists argue against and for anatomy, John says there are two kinds of anatomy (*artificiosa incisio*): of the living and of the dead. The anatomy of the living is vivisection, which Celsus tells us was defended by extreme Rationalists on the basis of the benefit accruing to medicine and the health of future generations, and in vivisection, says John, we must distinguish between Operation and Necessity, that is, some organs have an operative Faculty and others do not, but are necessary adjuncts of the Faculty of the other: this can only be seen in the living body. In the dead body anatomy is concerned with six *occasione*s:

1. The number of the organs (two kidneys, for example, or one liver).
2. The character of the part (whether bony, fibrous, or cartilaginous).
3. The position of the part (the liver on the right, the spleen on the left).
4. Size (the liver is larger than the kidneys or heart).
5. Shape (*scema*: the liver is concave interiorly, like the moon).
6. Anatomical relations (the liver is connected to the gall bladder at a certain point).

⁶ A. Z. Iskandar, ‘An attempted reconstruction of the late Alexandrian medical curriculum’, *Med. Hist.*, 1976, 20: 235–258.

⁷ Galen, *Primum Galeni volumen quarta impressio ornatissima . . .*, Pavia, 1515, f.vir.

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John has sided with the Rationalists and decided that anatomy is necessary to medicine: he has therefore to teach it in a convenient way, and to do so he has produced an *accessus* type of rote that applies to each of the body's organs in turn. He was in the same position as other teachers who were seeking a way into complex texts on their students' behalf, but he was faced with a complex description of a *body* rather than a reasoned text. Although the anatomy he is discussing was that of the Rationalists who in Alexandria at least dissected the human body, John's immediate sources are of course textual, and he is using a literary scholastic technique. It is a technique that seems to go back directly to Aristotle, rather than by way of the more normal form of *accessus*, for the six *occasiones* of the anatomy of the dead are very close to Aristotle's *Categories*, the source, as we have said, of much post-classical commentatorial interest. The categories may be summarized as follows:

1. Substance.
2. Quantity. Discrete quantity (as opposed to continuous) is number; comparable to the first of the anatomical *occasiones*.
3. Quality. The "character" of the second of the anatomical *occasiones* is a sub-category within Aristotle's third. Perhaps an additional *rationale* was that the anatomical "qualities" are reducible to the elementary qualities of the "similar" parts (e.g. bone, "fibre", and cartilage) of which the organs are composed. Aristotle's "quality" also includes "shape", and the fifth anatomical *occasio*.
4. Place. Aristotle deals with this category simply, with the example "in the Lyceum"⁸ which has obvious anatomical counterparts: the third *occasio*.
5. Relation. Aristotle is principally concerned with the necessary relation of the greater and smaller, and to judge by John of Alexandria's example, this also seems to be what was meant by the fourth of the anatomical *occasiones*, "size". Relation for Aristotle also included "position" in relation to other things, so that we may compare this category also to the last of the *occasiones*.

These categories are not in Aristotle's order, which has been changed for convenience of comparison. The categories also include "time", which can have no counterpart in the anatomy of the dead, and "action" and "affection". If, like later commentators, we take John of Alexandria's two topics from the anatomy of the living as an extension of his anatomical *occasiones*, then we have his "necessity" and "operation" both as equivalent to Aristotle's "action". Later commentators added to John's list a last "affection", no doubt directly from Aristotle, but considered in a medical context: *passiones*, which came to be a vehicle for discussion of pathology. The two final things we need to note about the comparison between these two lists is first that Aristotle's category of "substance" is not represented, because largely inapplicable, in the list of *occasiones*; and second, that the last *occasio*, anatomical relations, although sharing something with Aristotle's "position", recalls more strongly the "to what part of philosophy it relates" topic of the literary and philosophical *accessus*. In general the styles and details of the *accessus* were flexible and interchangeable, and later commentators added to the list of *occasiones*, in first place, the name of the part. This had parallels both with the "title of the work" and "author" categories which were second and first on the literary *accessus* list, and with the etymological

⁸ *Categories*, 11b. See also the discussion by G. E. R. Lloyd, *Aristotle: the growth and structure of his thought*, Cambridge University Press, 1968, p. 113.

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interest in anatomy of writers such as Varro and Isidore, which was taken up by the medieval encyclopedists and anatomical writers.

So far, then, we have distinguished three formal sets of questions of the *accessus* type which were designed to be asked of different kinds of texts and which were related and ultimately derived from Aristotle and his early commentators: the literary or philosophical *accessus*, the categorical or anatomical, and the causality *accessus*. These three forms came to be known by writers on medicine and anatomy in the Western middle ages during a period when the study of anatomy changed from being purely literary to the practical study of animal anatomy and then to human dissection. The earliest anatomical writings of the West were compilations and translations, and probably the most important translation was Constantine's *Pantegni*, a version of the *Liber regius* of Haly Abbas. Constantine prefixed a literary *accessus* to his work, but the influence of this is not felt in the first accounts of animal dissection in the West, the Salernitan "demonstrations". The *Anatomia porci* is an uncomplicated account of the dissection of a pig in about 1150, depending partly on the *Pantegni* but also showing evidence of a survival of some as yet unknown Greek source. Later demonstrations show a much more scholastic approach, but rely on no further sources of information. The whole group of demonstrations suggests an active programme of assimilating new sources of knowledge with the old by means of dissection in an institutional framework of teaching.⁹

Despite a new translation of the *Liber regius* by Stephen of Antioch,¹⁰ in 1127, the idea of using a formal rote of questions in relation to anatomy does not seem to have occurred again until *human* dissection began in the second half of the thirteenth century. The *accessus* then used was the categorical-anatomical, taken from John of Alexandria's commentary on *De sectis*. In other words the *literary* device of exploring, explaining, and teaching a difficult and perhaps previously unknown book was transferred to the *physical* dissection, explanation, and memorizing of the human body. Apart from other advantages this *accessus ad corpus*, as we might call it, was useful training in preparation to observe as much as possible in a rapidly decomposing body.

Both the use of this kind of *accessus* and human dissection seem to have begun in the circle of Taddeo Alderotti. His pupil Mondino¹¹ took the *accessus* directly from John of Alexandria, and followed the *occasiones* for every organ in the body. To the six original *occasiones* he added the two derived from vivisection (necessity and operation) and ninth "disease", which it was the purpose of his (surgical) anatomy to uncover, Bertruccio's pupil Guy de Chauliac following suit.¹² His book formed the basis of later anatomy teaching and commenting, at least in Italy.

⁹ The texts of the Salernitan demonstrations are given by G. W. Corner, *Anatomical texts of the earlier middle ages*, Washington, Carnegie Institute, 1927. See also Y. V. O'Neill, 'Another look at the "Anatomia Porci"', *Viator*, 1970, 1: 115–124.

¹⁰ Printed as Haly Abbas, *Liber totius medicinae* . . ., Lyons, 1523.

¹¹ Mondino's *Anathomia* has been translated by C. Singer, in J. Ketham, *The fasciculus de medicina* (Venice 1493) edited by Charles Singer, part 1, Florence, R. Lier, 1925. It is also worthwhile following Mondino's text in Berengario da Carpi's commentary, because Berengario makes useful criticisms and discusses the use of the *accessus* as taken from John of Alexandria and the propriety of adding more *occasiones* from vivisection, and a ninth, "disease". Berengario da Carpi, *Commentaria cum amplissimis additionibus super anatomia Mundini*, Bologna, 1521, ff. vr., xxxv.

¹² Berengario da Carpi tells us that it was Guy who first added *aegritudines* that were suffered by

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Another early dissector was William of Saliceto,¹³ whose surgical anatomy text of 1275 expressly rejects scholastic principles (and therefore the *accessus*) but whose practice of dissection may owe something to Taddeo. Bartolomeo da Varignana, who refers to post-mortem examinations, and Henri de Mondeville, who performed human dissections in teaching, were also pupils of Taddeo. Taddeo himself used both the causality and philosophical *accessus* in his commentary on the *Isagoge* of Joannitius;¹⁴ perhaps somewhere he uses also the categorical-anatomical, for he must have known of John of Alexandria's commentary on *De sectis*. Gentile da Foligna was another of Taddeo's pupils, and had read or heard Mondino: Gentile refers¹⁵ to the use of the *accessus* in his own commentary on the *Ars parva*, and mentions John of Alexandria's use of the different kinds of *accessus* in commenting on the *Epidemics* and on *De sectis*. Gentile mentions also its use by Haly Abbas, that is, the *accessus* of Constantine or the sequence of topics of the *Liber regius*; Gentile describes all three as causality *accessus*, but in fact none of them is. His discussion, nevertheless, is of the *accessus* in general, and perhaps he had in mind that form of it favoured (so it appears from his own words)¹⁶ by his teacher Taddeo, the causality form. As a medical Aristotelian, Taddeo was concerned to relate medicine to the rest of natural philosophy and to justify its study; and he was caught up in the institutionalization of his subject in Bologna. This last detail poses a minor problem for Siraisi¹⁷ in looking for its significance in intellectual history or the history of science. There is one possible answer to this problem which is of the greatest significance: the possibility that these circumstances led to the introduction of human dissection. Taddeo and his circle had to justify the importance of their subject in the face of opposition from the old-established legal faculty of Bologna; they defended its status as a science and as an art; they analysed its ancient texts with the care and scholastic techniques that were used on legal texts (the legal *accessus* has a long history) and as an Aristotelian Taddeo seemed to favour the causality *accessus* and could hardly have been ignorant of the categorical form; the categorical *accessus* was an ideal form to borrow from literary sources for use in a real situation, that of human dissection, a practice which in the form of the post-mortem examination had almost certainly already begun in the legal faculty; only within the discipline of the (newly) institutionalized medical

the various parts, and that Mondino adopted this suggestion. Da Carpi also held that Mondino's list of *occasione*s had been wrongly set up by the printers of the early editions. For Guy de Chauliac see for example B. Wallner, 'The Middle English translation of Guy de Chauliac's anatomy', *Lunds Universitets Arsskrift* N.F. Ard. 1, 1964, 56, which includes the text of a Latin MS.

¹³ William of Saliceto, *Cirurgia*, Piacenza, 1476. A facsimile of a MS. has been produced by G. Caturegli, *L'anatomia di Guglielmo da Saliceto*, Pisa, Giardini, 1969. William's book is dedicated to Taddeo Alderotti's son-in-law, and we may guess at some communication between Taddeo and William.

¹⁴ Thaddeus Florentinus (Taddeo Alderotti), *Expositiones in . . . subtilissimum Joannitii Isagogarum libellum*, Venice, 1527, ff. 343r–344r.

¹⁵ 'Gentilis fulginatis medici clarissimi expositio & quaestiones subtilissimae super primo libro microtechni Galeni', in Turisanus Florentinus, *Plusquam commentum in parvam Galeni artem*, Venice, 1557, f.221v.

¹⁶ "de mea consuetudine in primo cuiuslibet libri perquirro": Taddeo, op. cit., note 14 above, fol. 343r.

¹⁷ N. G. Siraisi, 'Taddeo Alderotti and Bartolomeo da Varignana on the nature of medical learning', *Isis*, 1977, 68: 27–39.

teaching could the unnatural practice of cutting up the body of a dead person flourish; theoretical considerations taken from Galen and Aristotle urged that anatomy was the fundamental medical study, and that dissection was the proper way to reveal to the sense of observation the structure of the body; this teaching need had been felt in the professional but less theoretical medical school of Salerno, and had been answered by dissecting the pig, but to be of use in medicine the new teaching at Bologna had to use the human body.

At all events it is clear that interest in the *accessus* technique of analysis of texts was at its height when human dissection was first undertaken as a teaching device in a university medical faculty. Thereafter the categorical-anatomical *accessus* became a style of exposition that dominated anatomical exegesis until the sixteenth century. It was used by Niccolo Bertruccio, pupil of Mondino and teacher of Guy de Chauliac, who also used it, and it clearly became the standard mode of teaching, and was absorbed by later anatomists so thoroughly that they do not discuss the form, nor its original purpose: and the sequence of topics, although strict, is sometimes almost submerged in new discussions about morphology and function. Until Vesalius' influence had completely turned anatomy back to an older style of exposition (that of Galen, dominated by the philosophical implications of function) the categorical-anatomical *accessus* survived in a surprising range of writers, particularly in teaching texts: Benedictus,¹⁸ Guinter,¹⁹ Vasse,²⁰ Sylvius,²¹ Berengario da Carpi,²² Zerbis,²³ Achillini,²⁴ and Paré.²⁵

¹⁸ A. Benedictus, *Anatomice, sive de hystoria corporis humani, libri quinque*, Strasburg, 1528, p.6r: Benedictus uses the categorical form in the introduction.

¹⁹ J. Guinter, *Institutionum anatomicarum . . . libri quatuor*, Paris, 1536: Guinter uses the categorical form in the prefatory epistle.

²⁰ L. Vasseus, *In anatomen corporis humani tabulae quatuor*, Paris, 1540.

²¹ In agreement with most traditional anatomists, Sylvius argued that anatomy began with the fundamentals of the Aristotelian world-picture, the elements and qualities. The "similar" parts of the body are composed of these and are the simplest constituents of the body. He has in mind the two ways of teaching anatomy, the analytic and synthetic, at the opposite poles of which are the complete and functioning body, and its simplest components: this involves a whole different field of theoretical considerations, but Sylvius links it with the one discussed in this paper by assuming that the "similar" parts, when arranged in the set of relations defined as *occasiones* by John of Alexandria, become "instrumental" parts, and a further similar arrangement creates instrumental parts of the second order that have purposeful action and not merely use or quality. These remarks are contained in his extremely short introduction to his edition of *De usu partium* of Galen, Paris, 1543.

²² Da Carpi follows Mondino's use of the categorical *accessus* as a mode of exegesis throughout his work. See notes 11 and 12 above.

²³ G. de Zerbis, *Liber anathomie corporis humani*, Venice, 1502. Here the categorical *accessus* dominates the text, which is broken up into paragraphs each with a heading of one of the *occasiones*, even when inapplicable (such as the number of obviously single organs).

²⁴ A. Achillini, *Anatomical notes* (1520), in L. R. Lind, *Studies in pre-Vesalian anatomy*, Philadelphia, American Philosophical Society, 1975. Achillini discusses the use of the categorical form in his introduction in a manner similar to that of da Carpi, questioning the propriety of some of the *occasiones* and suggesting an otherwise unknown medieval source for the discussion, Francis of Piedmont.

²⁵ A. Paré, *Anatome*, for example in P. Uffenbach, *Thesaurus chirurgicae*, Frankfurt, 1610; or see Paré, *Les oeuvres*, Paris, 1579. As a surgeon, Paré did not have a regular medical education, and it seems probable that when he came to write his short text on anatomy he sought advice from a physician. The result is that he dutifully runs through all the standard, contemporary, and introductory "theory of medicine" from the "orders" of the *Ars parva* to the *occasiones* in a slightly naïve way that well reveals the educational source of these ideas.

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SUMMARY

In commenting on the classical authors the medieval writers very often used a formal introduction setting out a number of topics to be dealt with in the commentary. Recent discussions of this *accessus ad auctores* do not adequately discuss its use in relation to medical topics and in particular its use in commentaries on anatomical texts has been ignored. This note sets out three kinds of *accessus* found in medieval medical writings, the philosophical, the categorical, and the causality *accessus*. There is the interesting possibility that the *accessus* technique, designed to explore and teach a text unknown to the student, was also used to explore and teach the unknown structure of the body when human dissection came to be practised in the medieval university.