

Two Legacies of the Later Alexandrian School

The preliminary questions in commentaries; the
theory/practice division of medicine*

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Introduction

I intend in this paper to develop some comments first made forty years ago by Owsei Temkin, about the study of medicine in late Alexandria (3rd to 8th centuries), and to put them into a somewhat broader context. This context derives from the nature of my own work which in the last couple of years has concentrated on certain features of the renaissance in western Europe as it affected medicine (primarily the 16th century).

You will be aware that in the period of the renaissance there was a rediscovery of the full heritage of classical medical sources of the Greek tradition, the works that is of Hippocrates, Galen, Celsus and others, and that these texts vastly enlarged the limited number of classical sources hitherto available. The western middle ages had nevertheless had available to them a reasonable selection of the Greek texts; to a very limited extent these had been translated from Greek into Latin, but the majority came to the Latin west through Arabic versions in the 11th and 12th centuries. Together with these texts had come also several major products of Arabic scholarship in medicine, works in which Arab writers had assessed, arranged, refined, modified and amplified the Greek heritage for their own purposes. The range

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of Greek works on which these formulations had been based was greater than the range of Greek texts available in the west before the renaissance. I will return to a couple of these Arab works later. We can understand therefore how, with fresh access to the "pure founts" of Greek medical works in the late 15th and early 16th centuries, many physicians and translators saw it as their task to renovate medical knowledge and rid it of the impurities from which it had hitherto suffered. In their eyes these impurities were, naturally, the writings of the Arabs which they had been using for four hundred years, and the terminology of the translations of Greek works which had passed through Arabic on their way to Latin. Their propaganda campaign, carried on in a multitude of publications, was so successful that it was long an accepted commonplace in the history of medicine that the Arabic contribution to western medicine, where it had been more than a mere transmission, had unfortunately been a corruption. Nowadays this view is being revised, and in this paper I want to point to two features of the structure of medical writing which these reformers not only failed to eradicate but actually continued or promoted.

Two particular aspects of the renaissance have long been celebrated. One is the revival of the study of anatomy, which produced regular dissections in many universities, revised accounts of human anatomy and an advance in techniques of illustration—all of which reached its first high point in the famous work of Vesalius published in 1543. Generally enthusiasm for this effectively new subject spread across Europe from Italy even to the distant reaches of the British Isles. The second is the appearance of a real alternative approach (occurring contemporaneously with the anatomy revival), the mystical-chemical system stressing the relationship between the macrocosm and the microcosm, advocated by Paracelsus in Germany, and which rapidly found enthusiastic converts across the continent. The great majority of historical writing on the western medicine of this period concentrates on these two issues. But what we do not have is any account of what the relatively unspectacular aspects of the renaissance amounted to. It is hardly adequate to represent the renaissance in

medicine as (merely) the period when the Arabic-derived texts were thrown aside and the purer Greek originals brought into use, and when both anatomy and the mystical-chemical approach of Paracelsus came to be considered highly; for this is merely to repeat the claims of the propagandists for these causes. It is useful to recognise, then, that there was also a "main-stream" of reforming activity which preoccupied many of the most able medical minds of the period. We can go some way toward assessing their activity by asking how they succeeded (at least in their own eyes) in transforming medical knowledge. How, for instance, in practical terms did physicians and philologists go about assimilating the new knowledge? What features of it struck them as deserving greater prominence and detailed treatment and why? What, if any, institutional and curricular changes did they consider desirable in order to give expression to their revised vision of how medicine should be conceptualised and taught? What guides or reassessments did they think should be written for students? What preparatory courses in other subjects might be desirable for intending physicians? These are the sort of questions in which I have been interested. That there was a successful reform can hardly be doubted: new medical schools, with a professoriate, appear during the 16th century, new chairs in new subjects are created, the printed literature appears in great volume and in a variety of new forms, and whole subject categories such as "physiology" and "pathology" are resuscitated from classical models.

In seeking to discern the patterns and options available for the choice made in restructuring medicine in the renaissance, I have found it necessary of course to look back at the collections of the Hippocratic and Galenic works. But I have been struck by the way in which, for certain features, one needs to look back also to the Arabic writings, and beyond them to the somewhat hazy period between the death of Galen (c. 200 A.D.), and the time when Greek works began to be translated into the languages of the first Arab empire (c. 850). In these centuries the centres in which medicine continued to be studied and pursued on the classical pattern were Alexandria (till about 700 A.D.) and Byzantium (=Constantinople, c. 650—c. 1450).

Temkin has written that "early Arab medicine lies like a wedge between our knowledge of medicine in Alexandria and Constantinople¹⁾", and while they are difficult to disentangle, it is with the medical tradition from Alexandria to the Arabs that I am concerned.

Alexandria had flourished as a centre of scholarly pursuits, including medicine, in Ptolomaic times. We are concerned here only with the period known as "late Alexandria". What we know of medicine in Alexandria is somewhat sketchy, and the picture has been constructed as much from implication as from substantive documentation. But we are able to say that teaching continued there based primarily but not exclusively on the works of Galen and, through his enthusiasms, on Hippocratic works. This teaching was carried out, as far as we can determine, by teachers who were not exclusively physicians nor teachers of medicine but also taught other subjects. They are usually referred to as "iatrosophists"—a term interpreted as describing philosophers and rhetoricians while they were teaching medicine. Further, this teaching seems to have been institutionalised, i.e. located in public schools. Whenever medicine is taught in a school this necessarily has an effect on the way in which it is taught, not only in limiting the extent to which it can be taught empirically as it is practised, but also in prompting the preparation of materials which make best use of the system of lecturing, reading and, perhaps, discussion and argument. The Alexandrian school(s) held Galen and Hippocrates in high esteem, and it is to be expected that they should have tried to make the works of these great masters more manageable and approachable.

Versions of the collections of 16 books of the works of Galen that Alexandrian teachers made still survive in Arabic and are known as the *Summaria Alexandrinorum*²⁾. A similar set of Hippocratic works was also drawn up³⁾. Recently a more elaborate account of the whole Alexandrian curriculum has been assembled from the writings of an Arab of the 11th century, Ali Ibn Ridwan (=Haly, d. 1061 A.D.)⁴⁾. Although the original source of this account is not known, it reveals that the medical curriculum at Alexandria was well thought-out, that it was designed to take students through the course in a way which

introduced them to successively more complex subjects, and that it had an extensive component of Aristotelian logic. We even know the names of people who may have been members of a supposed committee which drew up these selections⁵. Some surviving individual commentaries on particular works can also be dated to this period. While the medical encyclopaedias of Oribasius, Alexander of Tralles and Aëtius of Amida (produced between the 4th and 6th centuries), seem to come from the Byzantine stream, we know that people travelled between the two schools⁶. A particular way of describing diseases seems to have been developed (giving a definition of terms and a description of the anatomy involved) at Alexandria⁷. In addition to all this it is possible that anatomy teaching took place at Alexandria (as at Constantinople):⁸ it seems to be the place of origin of the (lost) originals of the "five-figure series" of illustrations⁹, and Theophilus appears to refer to contemporary dissections in his summary of Galen's anatomy¹⁰. In sum, while precise dating is not possible, it clearly emerges that there was one or more formal schools at late Alexandria, based very largely on the legacy of Galen's writings, and seemingly united in their dedication to his brand of rationalism in medicine.

Two further points which, following Temkin, I wish to add to this list are (1) the development of a form of introduction to commentaries on medical works, which has an extraordinary persistence and (2) the introduction *ex nihilo* of a gross distinction of the whole subject of medicine, viz. into theory and practice, which is still so current a factor in western medical thinking as to be virtually unremarked. My interest in these is not limited to tracing their temporal origin, but extends to trying to ascertain, if possible, what role they fulfilled at their genesis and what purposes they continued to serve thereafter.

The accessus ad auctores

When we turn to the former of these issues, that of the form of introduction to commentaries on medical texts, it is first necessary to

establish what it is. This general form of introduction is usually referred to by the mediaeval term the *accessus ad auctores*—the approach to authoritative writers—the term preferred by the modern historian who has provided the most extensive exposition of it, E.A. Quain¹¹). The bestknown example, and perhaps the clearest, does not come from a medical writer but from Boethius, the Roman writer of the early 6th century, who planned to translate into Latin, and to harmonise, all the writings of Plato and Aristotle. Of the original works that he finished, the *Commentary* he wrote on Porphyry's *Introduction* to the *Categories* of Aristotle (i.e. Boethius' *In Isagogen Porphyrii Commenta*, written c. 509 A.D.), a major source for western knowledge of Aristotle until the 12th century, contains this form of introduction¹². The complexity of the tradition is illustrated by the fact that this is an introduction composed in Latin for a Latin translation of a Greek introduction to a Greek work of Aristotle. In this work Boethius is first asked by his supposed pupil Fabius to instruct him in the didactic matters which expositors and commentators use in order to accustom their pupils' minds to a certain aptness in learning. Boethius replies that in every exposition masters give a foretaste of six things: for they teach in advance what the *intention* of any work is, second what its *utility* or value is, third what its *order* is, fourth, if it is said to be the work of some particular author, whether it is *genuine and authentic*, fifth what is the *title* of the book...and the sixth point is to say *to which part of philosophy* the main premiss of the book should be referred. Boethius then goes on to answer these points for the work under consideration.

Quain has shown quite conclusively that the origin of the *accessus* goes back to the commentators on the logical works of Aristotle, who were often neoplatonists. The first, fragmentary, form of it he finds in Alexander Aphrodisias at Athens (teaching 198-210 A.D.), and subsequently in Porphyry (d. 304), Proclus (d. 485) and Ammonius (end 5th century). With Ammonius teaching at Alexandria, and his pupils (Olympiodorus, Simplicius and John Philoponus) can be seen formalized a list of ten questions to be asked and answered by the commentator on any work of Aristotle. Of these the tenth and last is "How many

items, and what kind of items, should be considered in the introductions to each work of Aristotle, and for what reasons?" Quain argues that the *sub-divisions* of this tenth question are the source of the *accessus* (or *didascalica*, or "the usual headings"). This is what Boethius is pursuing in the passage above, and it is the series of questions which can be found in commentators on all sorts of subjects up to the 12th century, with only slight modifications. Instances of its use in twelfth century commentaries on Latin literature, on grammar, rhetoric, dialectic, Roman law, canon law, and theological texts, are cited by Quain; all are said by him to have taken their example from the Alexandrian commentators of Aristotle, though by diverse routes, and of these the line through Boethius is important. The twelfth century thus saw the widespread extension of a "practice that had been a tradition, apparently dormant in some fields for centuries, and totally unknown in others"¹³.

It will be noted that no instance of its use in medical commentaries was mentioned by Quain. However, such examples have been pointed out by Temkin (1953)¹⁴ and Courcelle (1948)¹⁵. Temkin treats of several Alexandrian commentaries on Galen's *De sectis ad introducendos* (*On the sects to beginners*, the first work to be studied in the Alexandrian arrangement of Galenic texts), and he reveals a general eight-part series of *accessus* questions. These are the intention of the author, whether the text is authentic, its utility, to what part of medicine it pertains, what sort of title the book has, what the order of reading it is (in the series of the works of e.g. Galen), how many parts it is divided into, and finally, the kind of teaching it presents. One printed example of such an Alexandrian treatment can be found in the *Commentary on the sixth book of the "Epidemics" of Hippocrates*, attributed to John of Alexandria. This was printed in the *Articella* of 1483 (and again in 1523) where the editor, Franciscus Argillagnes de Vallencia, says that he is printing it because he could not acquire a copy of Galen's commentary on this work, but he has nevertheless printed it with the same care because he considers it not much less useful. This was never reissued after Galen's commentary was printed in 1541. In the last century Dietz presented certain items from manu-

script which again show this pattern; examples are those of Stephen of Athens and Meletius (?8th century)¹⁶). It must be noted that it is only exceptionally that writers spell out the fact that they are running through the headings of the *accessus*. The fragment of Meletius for instance, introductory to his (lost?) commentary on the *Aphorisms* of Hippocrates, deals in turn with seven of the eight heads listed above (omitting "what part of medicine?"), and discusses the issues, but it is not immediately apparent that he is answering a series of formalized questions.

From what has been said it is clear that the original use of such introductions, if it can be rightly ascribed to the Alexandrian period, owes no specific debt to the solution of problems concerned peculiarly with medicine as such or its teaching. The formula is borrowed for medicine as for other subjects from the Alexandrian commentaries on Aristotle's logical works. The borrowing does however indicate the extent to which the reading and hearing of commentaries on the classical texts was probably basic to the Alexandrian form of teaching: here medicine seems to be fully integrated into the academic structure typical of other subjects. The fact that teaching is by way of commentary is of greater immediate importance than the particular answers any writer may give to these questions.

While, then, the use of this form is far from unique to medical writings, there is a remarkable persistence of its use in medical commentaries. I present here some of the instances I have come across in commentaries on the works of Hippocrates. Its appearance in a 12th century commentary on the *Prognostics* written by *Maurus of Salerno*¹⁷) is paralleled by its appearance in other fields at this time, as mentioned by Quain. Later, *Matheolus of Perugia*, professor of medicine at Padua, follows such a scheme in his commentary on a preface to the *Aphorisms* which he wrote c. 1466; this has recently been printed from the manuscript¹⁸). Matheolus uses six questions (omitting authenticity, and the question of to which part of medicine it pertains), and acknowledges as one of his sources for doing so the *Liber regius* of Haly Abbas (Ali ibn al Abbas). Examples can be shown from the 16th century too, such as the preface on the *Aphorisms* by *Bassianus Landus*,

professor at Padua (published 1552), which he was accustomed to deliver in the medical course there¹⁹). The *progymnasmata* or “limbering-up exercises” he thought appropriate before embarking on the *Aphorisms* were a discussion of the name of the author, the sect to which he belonged, his mode of teaching, whether medicine is a true art or science (*scientia*), the title of the work, the intention of the author, the order of the teaching he used, and the place of the work among the introductory texts for medicine. Some of his other writings reveal Landus as one of those in the forefront of the renaissance reformulation of medicine along classical lines, and he clearly saw himself as a radical campaigner; nevertheless he can adopt without hesitation in the course of teaching a curricular text this (modified) formula widely used by his mediaeval predecessors. Another treatment from this century is the commentary on the *Law* of Hippocrates, written by *Rodericus a Fonseca*, professor at Pisa university (1586)²⁰. For him “ordo” (order) covers both the placing of the work among the other productions of Hippocrates and also the internal order or construction of the *Law*. These headings can be recognised even in the 18th century: *Sir Robert Sibbald’s* commentary on the *Law*, published in 1706²¹) as part of his campaign to promote medical education in Edinburgh along the lines of what he saw as the classic and best Hippocratic tradition includes such prefatory points. Of these three are readily recognisable; the author (i.e. authenticity), the title of the work, and the argument of the book. Sibbald’s fourth heading, “praise of the author” is connected with his immediate reasons for writing this work. While Sibbald’s may be an abbreviated list, the tradition from which it comes is unmistakable.

These examples are merely ones that I have come across fortuitously, and are all concerned with commentation on Hippocratic works. A full study of printed and manuscript commentaries from the 12th to the 18th century would, I suspect, show that the procedure was used on a very widespread scale. It is not necessary to assume that each author, on adopting this scheme, had made a deliberate decision to do so or had looked back to model formulations such as that of Boethius or even to John of Alexander. It is enough to assume that

they looked at the products of commentators of their own or the previous generation. Nevertheless it may be wrong to suggest that we have here only a meaningless charade thoughtlessly continued by each commentator. Certainly it is clear that the mode of teaching and exposition in the western universities continued to be largely by the use of commentaries on classical texts (especially those of Hippocrates, Galen and Avicenna) well beyond the time of the scientific revolution, and university statutes confirm this. The scheme had, it appears, after all been originally drawn up to facilitate and fully exploit this very form of teaching: in this sense it was still serving its original purpose. But it may be objected that much that was said under these headings is of the most routine and mundane kind. Yet the posing and answering of questions such as these before the exposition of a complex and obscure text does help in placing it in context (regardless of the historical source of the questions themselves), and does provide an occasion to reconsider critical questions—as for instance the questions on authenticity and on the order and mode of teaching—even if the opportunity is but rarely grasped.

For my final example in this section I want to turn to the only use of the form in the Arab tradition that I yet know of and which had an influence in the west. The 10th century writer Haly Abbas (Ali ibn al Abbas)—who must be distinguished from Ali ibn Ridwan (=Haly) mentioned above as one of our major sources for reconstructing the Alexandrian curriculum—was read in mediaeval western medical faculties in one major work. This is his *Liber regius* (= *Regalis dispositio* = *Liber totius medicinae* = *al Malaki*, etc.)²², an enormous compendium of the whole of medicine, translated by Constantine the African before 1087 A.D. and hence available at Salerno. This contains a most explicit treatment of the topics of the *accessus*. While the present work was intended to include the *whole* knowledge necessary for medicine and thus is not a commentary, it seems that Haly Abbas nevertheless felt able to adopt and use this procedure when it suited his purposes. As he writes, “our intention in this book is to publish all the things which are necessary for anyone wishing to learn the art of medicine to know and grasp, in order that he should be

skilled and perfected in them”, indeed “the books of other physicians are defective in this: it necessarily follows that this book is more useful than all the others composed about the art”. The whole of the third chapter of Book 1 is given over to “the eight gateways which are to be examined at the beginning of any book before it is read”, for these greatly help the reader to understand the matters to be read. The eight are the intention, utility, title, mode of teaching, order, author (=authenticity), division of the book and, in third place, “the excellence of the art.” The list corresponds to that of the Alexandrian medical commentaries, with the substitution of “the excellence of the art” for “to what part of medicine does it belong?”, understandable enough a substitution in such a work, given that the parts of medicine are discussed in the next chapter. Haly Abbas’ use of the *accessus* is perhaps the best illustration of how it could allow discussion of pertinent themes along lines chosen by the author. Under “order” he discusses the relative value of subjects preliminary to medicine, such as logic, arithmetic, geometry, astronomy, and music; under “mode of teaching” he tries to collate the opinions of classical writers on the teaching and discovery of science under five headings, and later writers often referred to this discussion. “Division” means in effect a contents-list of the work. Finally “author” allowed him to say something about himself, his credentials, and his occasion for writing.

There are two early major translations of this work: the one by Constantine(c. 1087) known as the *Pantegni* (= *Pantechne*=The universal art), and the one by Stephen of Antioch made in 1127²³). That by Stephen contains a preface by Stephen and Haly Abbas’ introductory chapters as described above, and it was printed in 1523. The earlier printing (1515) was of Constantine’s translation, and it bears his dedication to his Abbot, and a different version of the first three chapters of Book 1. Confusingly the 16th century editor of this version claimed the authorship of the work for Isaac Judaeus (d. 930 A.D.), and he did this partly because he believed that Constantine had shamelessly claimed the book as his own original work. It is not certain whether Constantine had in fact deliberately done so, but it is interesting for

our purposes to see how this attribution had taken place. In his dedication to his Abbot Constantine wrote that, seeing the unsatisfactory state and availability of medical texts, and deciding to write for the general good, he had set out ("disposui") the matters necessary for maintaining the health of those who are well, and for medicating the sick. This is not thus far a claim to authorship. However, when he came to his revised section of matters to be known by students he lists six, omitting "mode of teaching", "order" and "excellence" from Haly Abbas' list, and adding "to what part of doctrine?". It is in the section on authorship that Constantine can apparently be accused of deliberate fraud, for here he says "It is useful here to know the name of the author so that greater authority may be attributed to the book; the author is Constantine the African, because he is the person who has assembled it from many books". If Constantine genuinely wrote this one can understand why such a plagiaristic claim aroused such outrage. I hope we can also see how the very use of the *accessus* from could prompt such an answer when the question of authorship was to be dealt with.

Theory and practice

Western medicine today still recognizes the very large categories of "theory" and "practice". In day-to-day terms this distinction may be only at the back of the physician's mind, but nevertheless the training which he or she has received has been clearly demarcated into "preclinical" and "clinical", into a section (necessarily coming first) where he is taught by lectures and books in an academic atmosphere and a section where he is exposed to the hospital environment where medical knowledge is being exercised on patients. These categories seem to parallel (though they are not equivalent to) "theory" and "practice". It is a measure of the success which such categorisation has enjoyed, that reform schemes proposed for medical education today accept the division of teaching along these lines as an unquestioned assumption. *Of course* one needs to know basic biological and medical science first, *of course* one then needs to learn to apply this knowledge to the cure

of the sick. Nevertheless the historian of medicine cannot but be aware that this distinction does not have any necessary validity, that the categories of thinking and teaching that we use today are products of choices made in the course of the historical process. I am not however aware of anyone asking when, where and why this particular distinction was first employed, and why it has continued to be used in medicine. It certainly antedates the majority of the scientific knowledge that a modern medical student is taught, for this derives largely from developments of the last three centuries. It also antedates the 16th to 17th century readoption of some of the classical categories such as "physiology", "pathology" etc., which from their readoption were seen as subdivisions of the category of theory.

If we trace the division back we can see how renaissance writers used it when they brought out their new teaching texts which were intended to give a complete coverage of medicine: indeed many of them wrote a "Theory of medicine" and/or a "Practice" as separate works. Often they did so as holders of professorial chairs in these respective subjects. The renaissance changes in the universities led to an increase in professorial teaching and therefore to the creation of chairs in most subjects: for medicine this often gave opportunity to establish new subjects such as anatomy and botany. But the new and old medical faculties also enjoyed a more fundamental expansion of posts, thus continuing a trend toward creating professorships of Theory and Practice almost everywhere. These were now the basic and senior positions. The Italian universities had been experiencing such a development for some time. Of Padua Siraisi writes, "Possibly the separation of theory and practice in the curriculum was a result of the expansion of the medical faculty in the later fourteenth century"²⁴. Similarly one can see the teaching posts at Pavia divided in this way from c. 1450, and at Pisa from 1473²⁵. But if we look back to the classical medical works on which so many other renaissance changes were deliberately based, we can find no trace of such a division. There is none in the Hippocratic corpus: there are no pertinent references in Brasavolus' *refertissimus* index to the works of Galen (publ. 1565)²⁶. That is to say, in the extant works attributed to the two

great classical writers on medicine there is no hint that they saw this as a fundamental distinction in medicine. Galen certainly had much opportunity to say so in any of the many works he wrote directed to beginners, had he wished to²⁷), and several other ways of subdividing, conceptualising and defining the subject are put forward by him. Nor have I found any writer attributing such an opinion to either Hippocrates or Galen²⁸). On the other hand Theodore Zwinger, whose knowledge of such writings was probably unrivalled, in his "Twenty-two commentaries on Hippocrates" (1579) says, almost as an aside in one of his tables, that medicine can be divided either according to its material subject, or according to its form—"thus, *according to the Arabs*, it can be divided into the Theory of universals and the Practice of particular instances"²⁹) (my italics). For such a basic feature of the institutionalised teaching of medicine Zwinger could provide only this approximate lineage.

The title of the present paper has already indicated where I believe the practice originated, at late Alexandria. Temkin, when discussing the Alexandrian commentaries on *De sectis* by Galen, wrote about two of the manuscripts that they

"relate that some people divide medicine into two parts, whereas others divide it into five parts. The first division distinguishes between theory and practice, subdividing theory into physiology, aetiology and semeiology and practice into hygiene and therapy. The division into five parts starts immediately with physiology, aetiology, semeiology, hygiene and therapy...Both schemes hail from Greek sources. But whereas the division into five parts goes back further than the 6th century, *the distinction of theoretical and practical branches of medicine seems to have become important at that period*, as witnessed by many Greek and Latin texts"³⁰). (my italics)

Temkin suggests (following Præchter) that this division represents the arrangement of the material during the lectures³¹. Further he suggests that it may correspond to an institutional change in academic teaching: "It appears indeed to reflect the medical life of the time, when the theory of medicine was taught by the iatrosophists, while medical practice was largely in the hands of such physicians as Alexander of

Tralles, Aëtius and Paulus of Aegina whose writings are handbooks of practical medicine"³²⁾ Whether or not one need agree with this last point, the first use of the division may with confidence be associated with the institutionalised teaching of medicine at Alexandria. It seems to be irrelevant to Galen writing c. 200 A.D.; it is pertinent to the purposes of Alexandrians writing roundabout the 6th century. And it is fascinating to note that it is mentioned when these commentators deal with the *accessus* question of how many parts medicine is divided into. In the commentary by John of Alexandria on the sixth book of the *Epidemics* of Hippocrates (written c. 7th and 8th cents.)³³⁾, where he asks "To what part of philosophy should the present treatise be assigned?", he replies "We say, not to Practice, but to Theory, and to Theory above all". By John's time the division thus seems to be already a basic one. Our text of his work asks "To what part of *philosophy*" and not, as we might expect, "to what part of *medicine*." Possibly therefore, as this appears to be so direct a borrowing from the questions asked by the commentators on Aristotle's logic, one may suggest that the use of the division in the first place may be of consequence to medicine at all only because a question relevant to philosophy (as will be discussed below) is here being answered with respect to medicine. But this is only conjecture.

If we now look forward to those medical writings of the Arabs which were later known in the west, we can note the appearance of the division in three important places. One is the *Isagoge* of Johannitius³⁴⁾ (=the "Questions" of Hunayn ibn Ishaq, d. 873 A.D.), a little work attributed to Hunayn, the major translator of Greek medical writings into Arabic and Syriac. This is intended as an introduction to Galen's *Ars parva* and was read as such throughout the western middle ages. Its opening words are "Into how many parts is medicine divided? Into two parts. Which are they? Theory and Practice". This was one of the first works available for the later development of all Arabic medical thinking. Temkin well asks, though in a slightly different context, "Where in Hunain's *Questions* do the Alexandrians end and Hunain begin?"³⁵⁾

The second important occurrence of this division is in the *Liber*

regius of Haly Abbas (discussed above), written in the 10th century. The Latin version of this says "I say that medicine is divided into two divisions, one is *scientia* (=theory) and the other is *actio* (=practice)". This is directly paralleled by the way in which Haly Abbas divided the book, the first part of which is called "Theory" and the second "Practice". Constantine in his version of this is even more explicit. In discussing the divisions of the book he writes,

"The book is divided into two parts. The first part contains the knowledge of the natural things, and of the non-natural things, and of the things which are against nature. This part is called Theory. The second part contains the knowledge of preserving the healthy, and of curing the infirm by diet, drink and surgery. This is called Practice".

All this is again developed in his discussion of "the division of medicine". The first part of Haly Abbas' book was often referred to later just by the title "The Book of Theory".

The third important discussion is presented by Avicenna, writing in the early 11th century, in his *Canon of Medicine*:³⁶⁾

Medicine is the knowledge of the states of the human body in health and in decline in health; its purpose is to preserve health and to endeavour to restore it when lost. An objection may be raised that medicine is of two kinds—theoretical and practical—but by naming it 'knowledge' it has been deemed as being purely theoretical...(But) this division into theoretical and practical aspects does not mean that the physician should consider medicine as divisible into two separate parts: one to acquire abstract knowledge and the other to put that knowledge into practice. Medicine should rather be interpreted as having two sides: the theoretical which deals with the principles of medicine and the practical which describes its various applications.

In the light of these works Zwinger can perhaps be forgiven for ascribing the theory practice division to the Arabs.

Between the end of the 10th and the beginning of the 13th centuries, we know that medicine began to be taught at Salerno, Montpellier, Bologna and Paris, though we know little about any organised

schools. Kristeller³⁷⁾ has traced a development at Salerno from the 11th century use of the "compend and the collection of recipes and prescriptions to the form of the commentary, that is from practical to theoretical instruction", and he says that this

"is the first sign that the school was affected by, or contributed to, the rise of 'scholasticism'...The next step, which can be traced to the second half of the 12th century, was to base theoretical instruction in medicine not on the earlier products of Salernitan literature, but on the 'classical' works of Greek and Arabic medicine which had been translated by Constantine the African."

By the beginning of the 13th century a group of standard texts (the *articella*) had been assembled for teaching. Kristeller here suggests that the distinction between theory and practice had been established in some sort before the texts of Hunayn and Haly Abbas became available: if this is so (which I doubt) it must nevertheless be granted that the use of the division in their work must have seemed doubly attractive. And at all events we can see the use of the division becoming more marked as the teaching becomes increasingly more institutionalised: theory and practice are very attractive teaching categories³⁸⁾. When opportunity came in the 14th, 15th and 16th centuries for the expansion of the teaching positions in medicine, this division was available as the most obvious and convenient way of dividing the teaching burden, and it exactly paralleled the already-existing arrangement of the commented texts.

At this point we need to ask two questions, whose answers are closely related. What are we to make of all the earnest hand-wringing in the middle ages about the status of medicine among the sciences, and whether it is a science (*scientia*) or an art (*ars*), and whether it is theoretical or practical? Secondly, if we accept that the value of the division is in fact basically a pragmatic one related to the convenience of institutionalised teaching (as I have been arguing above), what sort of support *could* one find for it in classical sources if one felt so inclined? By formulating the questions in this way I am trying to

avoid the usual form of exposition which assumes that a given writer, on the evidence that he mentioned the issue, was committedly advocating one particular view and calling on other people to abandon theirs. For I consider that in a sense the actual answer given did not matter very much, since it had no consequences. Medicine's claim to be part of the mediæval academic world was based on *fait accompli* and not (as far as we know) on its academic practitioners ever having given a "correct" answer to whether it was an (academic) *scientia* or a (practical) *ars*.

Peter of Abano's discussion of the issue is the most celebrated. In his *Conciliator* (written c 1303 at Padua)³⁹⁾, in which he claimed to be reconciling opinions on a hundred disputable questions, one of the early *differentiae* (No. 4) is "Whether medicine is theoretical or not?" As with all the other questions Peter takes one side first (that it is not theoretical) and adduces the arguments which seem to support the case; the opposite arguments are then briefly stated; next he establishes the meaning of the terms in dispute; then he assesses and interprets the statements of authorities touching on the matter; he then resolves the issue by giving a reasoned "balanced" view; finally he suggests conclusive reasons for rejecting each of the first set of arguments that he advanced. In this extensive treatment Peter can call on the authority of Aristotle (extensively), Isidore, Hugh of Saint Victor, Averroes, Haly Abbas, Ptolemy, Boethius, Vergil, Palladius, Avicenna, Galen and al-Farabi. The impression one might receive is that each of these authorities had considered the issue; in fact probably only Avicenna had directly argued the case (as quoted above). The classical sources are very confusing, but I believe that one can isolate four related but distinct problems which are being discussed in them, arguments from each of which can be brought forward in answer to the question Peter is posing here. In conclusion I want briefly to characterise each of these problems. But first it is important to note that the frequent use by Plato and especially by Aristotle of medicine as a simile or example should not be construed as a discussion specifically about the status of medicine. When Plato is talking about politics or rhetoric, or Aristotle about metaphysics or ethics⁴⁰⁾, medicine appears

to each of them as a perfect example of what they are trying to say—about something else. We must remember that the issue at hand is: why should the subject of medicine have received an *inner* division into a theoretical part and a practical part, a division recognized to the extent that it came to be reflected in institutional structures?

The first two lines of discussion are covered by various writings on the classification of the sciences, to become a popular theme in the middle ages⁴¹. Firstly, a tradition through Diogenes Lærtius (3rd century A.D.) attributes to Plato a division of the various subject-matters of speculation into theoretical, practical and productive. As developed by Quintilian writing in the first century A.D. these classes can be illustrated respectively by astronomy, dance and painting, i.e. indicating the involvement of (1) the artist's knowledge, (2) of his knowledge and his action, (3) of his knowledge, his action and the product of his action. This is only one of several possible ways of dividing up philosophy suggested in the classical tradition, but from it we can see that there was a context with "theory" and "practice" components into which each science or art as a whole could be classed. Here then, I suggest, is the issue whether philosophy *as a whole* can be suitably divided along the lines of this particular three-fold division. An aspect of this same issue is whether *specific* sciences are to be placed in one of these categories or in another. Aristotle for instance writes "Therefore, if all thought is either practical or productive or theoretical, physics must be a theoretical science..."⁴². When medicine was discussed in this manner in mediæval classifications (along with other subjects) its placing varied.

The next area of discussion is over how the sciences are, or may be, related to, or distinguished from, each other. It was usually assumed that there is a hierarchy of the sciences, and also that their "real" relationship has implications for teaching and for the extent to which the findings of each science can be trusted. One criterion has been given above, viz. the degree of the artist's involvement. Other possible criteria included the aim of the arts, their relation to reality, or the instruments they use. One important variant, of considerable antiqui-

ty, judges arts by whether physical effort is involved or not. Those requiring physical effort were then considered "vulgar" or "sordid" (as opposed to "liberal"). It is essentially in the context of this discussion that the differentiation between art and science had its greatest importance. One can understand why medical writers were later at some pains to point out that medicine had claims to be an honourable liberal art or even a *scientia*, rather than a dishonourable mechanical art.

Thirdly there is the issue of reason v. experience. This is what Celsus mentions and what Galen deals with at length in several works, primarily in order to condemn those medical sects which insisted on the importance of one over the other for medicine, i.e. the Rationalist (Dogmatists) and the Empiricist sects respectively. Galen favoured a balance between them, considering both essential. This of course raises the question of how empirical a study medicine is. The potential parallel here with an internal theory/practice division of medicine is obvious⁴³.

The fourth issue is that of our theme: whether for teaching purposes medicine can legitimately be internally divided into theory and practice. And this apparently could not be answered in an adequate manner. So let me close this section with two scholastic attempts at resolution of this dilemma. St. Thomas Aquinas, writing c. 1255 on The division of speculative science, explains that⁴⁴

when we divide medicine into theoretical and practical, the division is not on the basis of the end (of the art of medicine). For on that basis the whole of medicine is practical since it is directed to practice. But the above division is made on the basis of whether what is studied in medicine is proximate to, or remote from practice. Thus, we call that part of medicine practical which teaches the method of healing; for instance, that these particular medicines should be given for these abscesses. On the other hand, we call that part theoretical which teaches the principles directing a man in his practice, although not immediately; for instance that there are three virtues, and that there are so many kinds of fever...(Question V, Article reply 4).

Peter of Abano, (writing c. 1303) concludes as follows:⁴⁵⁾

The physician is perfected only through two skills (*virtutes*). One of these is the skill in the universals and the canons, which is acquired from the books of medicine. The other is the skill which comes through long familiarity with medical procedures carried out on the sick and continued assiduity in these matters through long experience and seeing (many) individual bodies. And through this skill the physician can assess medicines and cure according to any body and any disposition.

Conclusions

The above essay has tried to trace back two features of presentation in the teaching of western medicine. The period to which they can be traced is the late Alexandrian period when, it seems, the teaching of post-Galenic medicine first became fully institutionalised. As subsequent stages of institutionalisation succeeded, these features were borrowed because of their convenience: medicine in the academic atmosphere continued to be based on a heritage of classical texts requiring commentation, and its subject-matter still had to be divided up in a manageable way. It was an added convenience that the primary division adopted was one which could help explain away medicine's ambiguous position: it was taught (to the future physician, the learned man of the medical profession) in the same academic place and manner as the other liberal arts and philosophies, yet its long-term goal was the physical ("vulgar") manipulation of the conditions of the sick. Until the 18th century when the practical component came to be represented increasingly by hospital experience, the division between theory and practice was very much as Avicenna had explained it. It is chronological considerations, the coincidence in timing, which has suggested these conclusions. While I am not arguing that there is any *necessary* relationship between the institutionalization of medicine and the theory/practice division, I do believe that institutionalising it "froze" certain features for as long as they continued to play a useful role.

Acknowledgements I would like to extend my warm thanks to my fellow participants in the symposium for their comments on the original paper, and especially to Professor Y. Kawakita, whom I was honoured to have as guest commentator when it was presented.

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- 2) ISKANDAR, A.Z. 1976. 'An attempted reconstruction of the late Alexandrian medical curriculum', *Medical History* 20: 235-258.
- 3) TEMKIN (note 1), (1962) p. 99; (1977) p. 205.
- 4) See ISKANDAR (note 2).
- 5) TEMKIN (note 1), (1962) p. 102 and notes 39-41; (1977) p. 208.
- 6) *Ibid.*, (1962) p. 98; (1977) p. 204.
- 7) So claims DEMAITRE, Luke 1975. 'Theory and practice in medical education at the University of Montpellier in the thirteenth and fourteenth centuries', *Journal of the History of Medicine* 30: 103-123, p. 117.
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- 28) See the note at the end of this paper.
- 29) ZWINGER, T. *Hippocratis Coi viginti duo commentarii tabulis illustrati* (Basle, 1579).
The pages are not numbered, but see the section 'Medicina Hippocratea' foot of the first page: "Forma. Sic secundum Arabes dividi potest in *Theoricam Universalium* [et] *Practicam Particularium*".
- 30) TEMKIN (note 14) (1935) p. 420; (1977) p. 189.
- 31) *Ibid.* (1935) p. 422; (1977) p. 190. See also L.G. WESTERINK, 'Philosophy and medicine in late antiquity', *Janus* 1964 51: 169-77 esp. p. 171.
- 32) *Ibid.* (1935) p. 426; (1977) p. 193.
- 33) Printed in the *Articella* (Venice, 1483). A critical edition of the Latin text has been made by C.D. PRICHET (Leiden, 1975).
- 34) Here I have followed TEMKIN's version (note 1) (1962) p. 104, (1977) p. 210. There are, however, versions of the Isagoge not in question form. A critical edition of this text is badly needed.
- 35) TEMKIN (note, 1), (1962) p. 106; (1977) p. 211.
- 36) Here I have used the English translation by M.H. SHAH, *The General Principles of Avicenna's Canon of Medicine* (Karachi, 1966), see p. 17-18.
- 37) KRISTELLER, P.O. 1945. 'The School of Salerno', *Bulletin of the History of Medicine* 17: 138-194, see esp. pp. 156-7.
- 38) The argument about the development of 'scholasticism' and its consequential promoting of the academic theory of medicine to the extent that a divorce arose between it and actual practice, has recently been countered by historians. Demaitre argues that the Montpellier masters of the 14th century "did not cease to apply medical theory to practical guidance. Conversely ... they continued to enrich their learning from actual practice". An argument on a similar theme

- has been put forward by Schipperges about the relative role of theory and practice in Arabic medicine. This issue is only tangential to my present purposes. But on these issues see Demaitre (note 7), J.M. RIDDLE 'Theory and practice in mediaeval medicine', *Viator* 1974 5: 157-84 and H. SCHIPPERGES 'Die arabische Medizin als Praxis und Theorie', *Sudhoffs Archiv* 1959 43: 317-28.
- 39) See his *Conciliator* (Venice, 1483), Diff 4.
- 40) A particularly useful discussion here is W. JAEGER, 'Aristotle's use of medicine as model of method in his Ethics', *Journal of Hellenic Studies* 1957 77: 54-61.
- 41) Here I rely on W. TATARKIEWICZ 'Classification of arts in antiquity', *Journal of the History of Ideas* 1963 24: 231-40. But compare N.H. STENECK, 'A late mediaeval Arbor Scientiarum', *Speculum* 1975 50: 245-69.
- 42) Aristotle 1025 b. 25-7.
- 43) See the note at the end of this paper.
- 44) I have used that part of Aquinas' commentary on Boethius' *De Trinitate* called 'The division and method of the sciences', as translated by A. MAURER (Toronto 1963).
- 45) See note 39.

Since presenting the above paper to the symposium I have come across the following account, nicely confirming my views on the theory/practice division. It appears in H.B. Adelman, *Marcello Malpighi and the evolution of embryology* (N. York, Cornell U.P., 5 Vols. 1966) Vol. 1, p. 208 etc. Malpighi and other 'moderns' were challenged by a Galenist to a public debate in Messina in 1665. In the event a follower of Malpighi's proposed and defended 46 theses, some of which may have been drawn up by Malpighi himself. In the very first of these the division of medicine into theory and practice was challenged as unsound. After the debate the Galenist published his supposedly conclusive defence of Galenism. On the present topic he claimed that Galen had said these two parts of medicine are to the physician like his two legs, such that if one part is lacking he must go limping. In the written counterblast that Malpighi prepared he stated that the division cannot in fact be found as a tenet of the school of Galen. and the adversary does not give his reference to Galen's own text. Malpighi writes, "I cannot find the passage in the vast mass of Galen's works" (Adelman, pp. 287-8). Malpighi says that the reference in Galen to which the adversary was in fact alluding, dealt with the distinction between

(and relative roles of) reason and experience, *not* theory and practice. Malpighi (and Adelman) refer the origin of the division of theory and practice to the Arabs.