In Aristotle's Politics (III, 11) medical men were divided into three classes: (1) craftsmen, (2) master physicians, and (3) laymen who studied medicine as a part of their general education. These three categories also represent three types of medical education which prevailed during the Middle Ages, in part as a heritage from the ancient world: viz. (1) the education of simple craftsmen by practical experience; (2) the education of the higher type of physician by formal instruction in theoretical medicine plus practical experience; and (3) the study by cultured laymen of theoretical medicine along with the liberal arts.

During the pre-medieval centuries from Augustus to Constantine, most medical men in the Roman Empire seem to have belonged to the first category. They were craftsmen of the manual-labor class; sons of ordinary practitioners following the family tradition of healing; or apprentices in a collective association; or ambitious freedmen, perhaps Greeks, the medical “murderers”, whom Pliny the Elder hated so cordially; or the valetudinarii in military hospitals; or even slave trainees on the medical staff of a villa infirmary. In any case, most practitioners were men of little or no formal education, trained almost entirely by experience. Such were the centum discipuli who accompanied the physician of the poet Martial; also the physicians of the second

* Article commandé par le Prof. G. Witt, Directeur du Vol. III.

1. For the reference to Aristotle and for other items on this period we are indebted to I. B. Drabkin, "On Medical Education in Greece and Rome", in Bulletin of the History of Medicine, XV (1944), 333-351. See also Theodore Puschmann, A History of Medical Education (London, 1896).


century whom Galen considered illiterate or worse. To be sure, Galen's opinion was prejudiced by his ideal of the physician-philosopher. A more objective attitude, more representative of public opinion is found in the advice of Archibios concerning the training of young surgeons in the first century. "Since life is short and the art long, as Hippocrates says," Archibios thought that they should concentrate, "from the very beginning on the more necessary things," such as types of dressings, use of sponges, etc. They should leave to scholars the "extraneous problems" such as "What is surgery?"; "Is it better than dietetics?" etc. "These questions are not pressing,"

Although our second category, "master physicians," constituted a minority of the profession in the Roman Empire, their importance should not be underestimated. They were "Masters of the Art," men trained in both theory and practice. Among them were the "Masters of the Craft," heads of the associations of apprentices who received a modicum of instruction in medical theory with a maximum of practical experience. This type of education approximates in some measure that of modern medical schools, with their combination of book learning, observation and apprenticeship as internes. However, according to Galen, the most advanced medical school of his day, at Alexandria, provided only limited opportunities for observation and practice. Most practical training came after formal schooling, in service as an assistant of a practicing physician.

Medical theory was taught, as in all ages, by lecture. Granted that students of the better sort were literate, education by reading was difficult. Manuscript books were so limited, and libraries so difficult of access that most book learning was transmitted by the professor's reading of a text and commenting thereon. This method of teaching became more necessary during the later centuries when the rising tide of internal disorder and barbarian invasion reduced available stores of books.

From the modern point of view Aristotle's third category, the layman's study of medicine, is interestingly unique. It is also the most important of the three as far as the Middle Ages is concerned. Throughout the centuries of Rome's greatness and decline, cultured laymen studied medicine as a non-professional subject connected with the liberal arts curriculum. This curious subordination of medicine to general education is reflected in the handbooks written and read by learned Romans. Late in the first century B.C., Varro included medicine among the nine liberal arts described in his De Disciplinis. About a half-century

later (30 A.D.), another writer, Celsus, included medicine in his survey of the principal fields of practical knowledge. Incidentally the De Medicina, the only surviving portion of his encyclopedic Artes, is by far the best handbook on the subject from Roman times. A generation after Celsus, Pliny the Elder, presented a very different survey of medicine, in his unscientifically popular compilation entitled Naturalis Historia. His medical data, unlike Celsus's, were chiefly pharmaceutical and were scattered among the sections of the books concerned with herbs, trees, animals, and stones. Pliny's mass of fact and fancy was used widely during the Middle Ages, often to the exclusion of better handbooks.

Apart from such factors, and minor variations in treatment, the compilations read by intelligent Romans presented medicine as one of the worthwhile general fields of knowledge. Roman educational institutions followed the same trend; medicine was taught as a non-professional subject, closely integrated with, and often subordinated to, the liberal arts. Evidence thereof will be presented in our survey of late Roman medical education in Gaul. This combination may be taken as an indication both of the breadth of lay education, and of the superficiality of medical science. Obviously the medical data presented by Pliny would not tax the mental powers of an educated layman. On the other hand, Celsus' De Medicina indicates the thoroughness with which a layman could master the theoretical aspects of the Graeco-Roman system of medicine. Further evidence of this ideal is found in the writings of Athenaeus and Aulus Gellius. In the first century A.D., Athenaeus wrote that, "It is desirable for all men from the time of their youth to study medicine along with their other studies." A century later, Aulus Gellius thought that it was

"shameful, not only for a physician, but for all cultivated and liberally educated men, not to know even such facts pertaining to the knowledge of our bodies as are not deep and recondite, but which nature for the purpose of maintaining our health has allowed to be evident and obvious. Therefore I devoted such spare time as I had to dipping into those books on the art of medicine which I thought were suited to instruct me."

Of our three categories of medical men, the laymen such as Aulus Gellius, Pliny and Celsus contribute the most important evidence concerning education. In numbers they were doubtless the least of the three, and probably they rendered the least medical service. On the other hand, they exerted the most lasting influence on the medical education of the Middle Ages. The idea that a liberally educated man

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5. Excerpts from Drabkin's translation, op. cit., p. 335.
7. The De Disciplinis, which is not extant, treated of grammar, logic, rhetoric, geometry, arithmetic, astrology, music, medicine and architecture.
8. The Artes treated of rhetoric, philosophy, law, military science, agriculture and medicine. The De Medicina, edited by Fritz Marx, is in Corpus Medicorum Latinarum (Leipzig, 1915), also other editions.
should know something about medicine became one of the basic principles of medieval clerical education.

There is neither a sudden nor complete break between Roman and medieval civilization, nor between Roman and medieval medical education. The fourth century, which began with Diocletian's revival of Roman imperialism and ended with Christianity triumphant, saw no changes sufficiently important to permit us to consider that era as the beginning of the Middle Ages. Medical education was not yet Christianized nor barbarized. This is most evident in the older and more completely Romanized provinces of the West, such as southern Gaul. Here medical practice and education continued their close association with the liberal arts.

At Bordeaux medicine was an integral part of the curriculum of the famous school of which Ausonius (d. 397) was justly proud 12. In verses dedicated to his fellow professors already deceased he made no distinction among "worthy teachers (doctores) whether it were history, or poetry, or eloquence... or medicine or Plato's system (of philosophy)" 13. Ausonius's Italian contemporary, Symmachus, specifically mentioned a "professor of medicine", at Bordeaux, Dusarius by name, who rightly held high rank among professeurs of the Art 14. At Bordeaux and elsewhere during the fourth century, teachers of the liberal arts, including medicine, were called either professeurs or doctores; seldom was the medieval title magistri used.

At first glance certain passages from the section of the Theodosian Code De Medicis et Professoribus seem to contradict our inclusion of teachers of medicine with teachers of the liberal arts 15. Laws granting privileges to professional men and their families mention physicians (medici and archiatri) as distinct from teachers (doctores, magistri, preceptores and professeurs) of the liberal arts (litterarium studiorum, liberalium artium, liberalium litterarum) 16. Obviously the term medicina refers to physicians, and probably to professional medical practitioners; certainly, not to teachers of medicine. Archiatri refers to the top physicians in the hierarchy of public medical service. Since medical theory was taught in the schools of rhetoric along with the liberal arts, it is our contention that teachers of medicine were included among the professeurs, doctores, magistri and preceptores. In the liberal arts schools of their day, Ausonius and Symmachus mentioned professeurs medicinae 17. They must have been eligible for the privileges mentioned in the Code, and as professeurs rather than as medicini.

From the available evidence concerning fourth-century Gaul we draw the following tentative picture of medical education in the West. Basic training in medical theory began in the liberal arts curriculum of the grammar schools, and was continued on a more intensive scale in the schools of rhetoric. Doubtless, practical medical experience came thereafter as a sort of apprenticeship under a private practitioner (medicus) or a public physician (archiater). This aspect of medical education is reflected in the provision of the Theodosian Code, by Constantine in 333, to the effect that "physicians, grammarians and other professors of literature" were exempted from certain public duties "so that they may more easily train many persons in liberal studies and in the aforesaid arts (medicina and grammar?)" 18.

Two aspects of this educational system are noteworthy; theoretical medicine was taught in the liberal arts curriculum, and advanced medical training, both theoretical and practical, was given informally without benefit of organized institutions such as schools of medicine. To be sure, in the Eastern Mediterranean Alexandria boasted a center for medical training that might justify the term school 19. But there is no evidence of such institutions in the West. The schola medicorum mentioned on an inscription of this period from the Appian Way, seems to have been a reference to the archiatri of Rome acting as an official group for certain administrative purposes 20. The Theodosian Code provided for from certain public burdens. For example, decree no. 1: "Medicos, grammaticos et professeuros allo litterarum immunes esse..." Decree no. 3, addressed "ad populum" confirms earlier exemptions in favor of medici et professeuros litterarum, xuper et magistros litterarum... and appends the explanation "...quod facultatis liberaribus studiis et memoriae artibus (i.e., medicine, etc.) multos inutituant..." Decree no. 16 concerns grammaticos, oratores, atque philosophiae preceptores nec non etiam medicos: "No. 17 concerns "artium liberariam professoribus ac praecipue medicis"; Nos. 9 and 13 concern archiatri, with a reference to their functions in the selection of new members of their organization. No. 10 provides exemptions for "medici et magistri urbis Romae"; no. 14, for "archiatri's sacri palatii, salutaris ac necessariae artis professoribus".

12. Among the secondary accounts concerning education in Gaul during this period, are the following, none of which contain details concerning the education of physicians. Theodore Haarmann, Schools of Medicine in the 13th Century (London, 1936), I, 15.
14. In two letters, Symmachus recommended Dusarius as follows: "Dusarius medicinae professor... rerum suarum Aquitanianam nonnulla praemisit..." Dusarius clarissimus vir qui inter professeurs medendi summamet summatum viret obitum locum..." Symmachus, ep. 9, 43; 11, 37; edited by O. Seeck, Monumenta Germaniae Historica, Doctores Antiquissimi (Berlin, 1877 ff.), I, part 1, pp. 249.
16. Book XIII, section 12 of the Code it entitled "De Medicis et Professoribus". It contains 19 decrees, the earliest dating from 321-4, the latest from 428. Most of them have to do with the exempting of medici or archiatrii, and professors,
of archiatri as a consortia. The schola mentioned in the inscription may have been a body of this sort. On the other hand, in the sixth century Cassiodorus mentioned schola magistri in a letter concerning physicians in Italy. See below, note 20.

21. Ausonius, op. cit., Pastr. 6, vol. I, 66. The passage reads as follows: "... maxima medicus artibus experientia". This obviously contributes nothing to our knowledge of the education of women physicians.

22. See notes 12-14, for Ausonius' and Symmachus' references to the school and professors of Bordeaux. Ausonius (op. cit., note 20) referred to these entertainments as "collegia completi". This suggests the fact that there were several of them and that he had the benefit of Euscus' agency, which gave a faint suggestion of a group of students who might be called members of a school or guild. The locale may be southern Italy or Sicily, where Euscus is known to have been active, Diocletianus Comes, 1751. 23. Theodore Puschmann, op. cit., p. 143 ff. To be sure, Puschmann stresses the practical nature of hospital training, but he gives the impression that they were teaching hospitals.

24. F. H. Duddin makes the observation that "Ambrose appears to have known something of medicine, though he emphasizes the fact that he is only an amateur, and not a professional physician". It seems obvious, from Ambrose's reference to himself as one of those who are indici yet capable of understanding something of anatomy (Hecatomeron, VI, ch. 9, section 70; in PL, vol. 14, 286), that fourth-century Italy followed the normal western trend of educating learned gentlemen in medicine by way of the liberal arts. But not in medical arts, of course, but in a distinction cut by the schools (hospitals) and monastic infirmaries (such as that at St. Gall in the ninth century) where there is evidence of specific medical treatment such as pharmacy, purging and bleeding. Sudhoff once expressed the opinion that purposeful treatment of disease in general hospitals began late in the Middle Ages with the attempts to cure syphilis. Sudhoff, Essays in the History of Medicine, edited by Fielding Garrison, with various translators (New York, 1926), p. 255.
under archiatri in the still-existing system of state-supported medical services. (3) A smattering of basic medical theory was taught in the regular liberal arts curriculum. With minor changes and regional variations, the classical Roman methods of medical education continued throughout the West, though on a much lower level of intelligence.

II

Major changes came about during the fifth century. While Roman imperial government was disintegrating and falling into the hands of Germanic chieftains, medical education was coming under the influence, even domination, of Christianity. Christian clerics, usually monastically trained, eventually replaced the state-supported professors of medicine, the municipal physicians, and the archiatri. To be sure, the ancient system persisted, especially in Italy and Gaul. In Ostrogothic Italy, as late as the first quarter of the sixth century, Theodoric’s secretary, Cassiodorus, was transmitting to the “Count of the archiatri” specific concerns ordering the education and control of young physicians. During the same century, according to Gregory of Tours’ Historia Francorum, Frankish Gaul had archiatri, court physicians, specialists in ophthalmology, and practitioners of various types, including Jews. One archiater, Reovalis of Poitiers, had been in Constantinople, where he learned how to perform operations on testicles. Another Gallic archiater had received an official communication from Cassiodorus. Such evidences led Dalton, the eminent authority on Gregory’s Historia, to the conclusion that “the study and practice of medicine was the one province of Gallic knowledge which preserved a scientific character.” This he attributed to the Roman “schools” of medicine which he believed had shared their influence into Gaul and Spain. Granting that Gaul had contacts with Italy and also Constantinople during this century, we are of the opinion that the roots of the continuing classical tradition go deeper; back to the medical men of Ausonius’ Bordeaux, or even earlier to Marseilles with its Greek heritage.

26. Viz., “... Habeantur itaque medici pro incolumitate omnium et post scholas magistrum vacent libris delectentur antiquis; nullus justius assidue legit quam qui de humana salute tractaverit...” Cassiodorus, Variae, vi, 19 (PL, vol. 69, 700).

27. For numerous pertinent references in Gregory’s works, see O. M. Dalton’s translation of Gregory of Tours, Historiae Francorum, entitled The History of the Franks by Gregory of Tours, 2 vol. (Oxford, 1927), I (introductory volume), 415 ff; also Samuel Duss, Roman Society in Gaul in the Merovingian Age (London, 1926), p. 261 f.


32. Epistulae, ix, 14 (MGH, Auctores Antiquissimi, VIII, 166). See also III, 10 and V, 14 (pp. 46 and 87).

33. See O. M. Dalton, op. cit., i, 415 ff., for a summary of the medical references in Gregory’s works.

34. Marcellus Capella, edited by F. Eysenhardt (Leipzig, 1866), ix, 891 (p. 332). The passage comes at the beginning of the last book, concerning music; viz., “... qui (Pater) Delius Medicinam suggester Architeconicanque in praeparatus adisse...”
space to medicine, as well as to other miscellaneous topics 35. In addition to including medicine in the *Etymologiae*, Isidore explained its close relationship to the basic liberal arts, and their importance in the training of physicians. His reasoning is not convincing, but it illustrates the attitude of pre-moderns on a problem that is still of concern to medical educators. Isidore’s ideas were influential, for his handbook was immensely popular throughout the Middle Ages. In the ninth century, Rabanus Maurus took over most of Isidore’s medical data in composing his handbook (*De Universo*) for clerical students 36.

There is one marked difference between the medical education of the medieval cleric and that of the Roman gentleman of Aulus Gellius’ day. The medieval cleric was trained for semi-professional practice. In the early fifth century, Jerome reminded a priest of his “duty to visit the sick “, citing the cautions of the Hippocratic Oath concerning sick-room ethics, notably chastity and secrecy 37. A century later the monastic rule of St. Benedict enjoined that “Before all things and above all things care must be taken of the sick brothers... The abbot shall take the greatest care that they suffer no neglect “. Obviously the question arises: To what extent was such “care of the sick“ medical care? Was the patient given anything more than physical comfort and spiritual encouragement? At least a partial solution to the problem can be made by determining whether clergymen were trained to render positive medical service. At Cassiodorus’ monastic school, late in the same century, they were. In a well known passage of his *Institutes*, he urged the use of classical handbooks, advising the monks to “learn the nature of herbs and diligently practice (tractate) the compounding of the various species“. If they absorbed much of the medical knowledge in the various writings on the healing art which by God’s help I have been able to procure for you in my library”, they learned considerably concerning pharmacy and general medicine 38. The same assumption holds true for other monastic centers of the West; from the fifth century onward, their libraries contained manuscript copies of classical handbooks such as were mentioned by Cassiodorus. Extant manuscripts from the early centuries contain corrections and additions that are evidences of continuing use. Contemporary chronicles make reference occasionally to clerical triumphs of practical healing, and the early

35. In *book iv* (*PL*, vol. 82, 383 ff.), immediately following the section on the seven liberal arts, medicine is dealt with; then law, chronology, religion and practical subjects such as botany and domestic utensils. Jerome, in *Ep. 53* (*PL*, vol. 22, 544), listed eight studies; the seven liberal arts and medicine.


38. Chapter 36. *De Infirmis Fratribus* (*PL*, vol. 66, 581 f.).


Germanic law codes reflect something of practical medicine 40. Remnants of classical medicine were available during these early centuries; they were read; and monks, priests, and lay *medici* applied methods of this sort in their treatment of the sick.

From about 500 to about 1000 medical education can be said to have been dominated, though not monopolized, by monks. The monasteries had in their possession most of the medical book-learning of the West, and this theoretical knowledge had some influence on the practical care of the monks in the infirmary, and of the sick and afflicted at the monastic portals. The secular clergy doubtless had less of medical book-learning and a wider scope of practice, notably in the course of their parochial visitations. The seldom mentioned, but probably numerous, lay practitioners were largely apprentice-trained. Such were the *Judaei* mentioned by Gregory of Tours 41, and the *discipuli* in the *Lex Visigothorum*, who paid fees to the *medici* from whom they learned as “servants “ (*famuli*) 42. Here we see the persistence in the early Middle Ages of Aristotle’s first class, the craftsman. In the monastic and priestly physicians there are faint traces of his second class, the physician who combined theory and practice.

From the scattered evidences available it is possible to outline very tentatively the various aspects of the educational career of an early medieval medical student. The contrast with our earlier picture of medical education in fourth-century Gaul is noteworthy. From beginning to end, medieval education was by clergymen. First came the parish school (or, in the case of a nobleman’s son, the family chaplain); here he was taught the fundamentals of religion and perhaps some music, grammar and arithmetic. Students of intellectual promise went on to a monastic or cathedral school. During the earlier centuries it was more likely to be a monastic school, such as Jarrow where Bede spent most of his life, studying, writing, and teaching. From the eleventh century onward cathedral schools became more prominent. Whatever school one attended, the liberal arts were basic. In the specific seven subjects of the trivium-quadrivium there were interspersed considerable amounts of information on history, poetry, geography, medicine, and, of course, religion. More intensive study came in later years, in some cases taught by specialists.

All of this medical education was theoretical and general. It was both broader and shallower than medical education today. Apropos of breadth, it was almost all-inclusive in subject matter and student personnel. Practically every educated person, whether lay or clerical, was exposed to at least a smattering of medical knowledge. One of Charlemagne’s capitularies ordered that “youths (infantes) be sent
to learn medicine. A few years later, in the Rhinelands, Rabanus Maurus wrote that clergymen "must not be ignorant... of the medicines for various ailments." As we shall see, the tenth- and eleventh-century sources, notably Richer of Rheims and Fulbert of Chartres, indicate that clergymen were far from "ignorant" not only of medicines but of other cures for ailments.

Medical education was as broad in subject matter as in student personnel. It went to the opposite extreme of modern highly specialized medicine. In its all-inclusiveness, it stressed both the liberal arts background and also the unity of the medical profession. The early Middle Ages made no clear distinction between physician and surgeon and pharmacist. All clergymen seem to have been trained in pharmaceutical medicine, especially herbs. Cassiodorus urged his student monks to learn how to recognize the various herbs and to compound medicines. His failure to mention surgery, diet, and other medical practices was doubtless due to the fact that, like Rabanus Maurus three centuries later, he was giving instruction to clergymen only in the fundamentals of medicine.

The person who took up this non-specialized medical study was almost sure to be a clergyman. Occasionally the sources reveal lay, Jewish, or low-born practitioners, but not in the schools. At any rate medical training began early in life; as early as 15, according to ninth- and tenth-century texts. Among the qualifications for medical students, physical traits were mentioned less often than good character. One text, the earliest known manuscript of which dates from the ninth century, lists over fifty desirable traits and almost half as many bad ones. They are as follows: graciousness, innate goodness, aptness, inclination or zeal for learning, sobriety, modesty, charm, ease as a conversationalist, conscientiousness, intelligence, vigilance, affability, adeptness in details, skill, amiability, humility, benevolence, goodwill, accumulative, sweetness, sagacity, lovable, discipline, obedience, wisdom combined with fear, diligence, respectfulness, honorableness, assurance, chastity, discretion, irreplaceability, taciturnity, good cheer, mildness, dignity, diligence, pleasant demeanor, rationality, restraint, refinement, patience, and tranquility. The undesirable traits are: offensiveness, hesitancy, timidity, turbulence, pride, scornfulness, lasciviousness, garrulity, love of women, drunkenness, lowness, fraudulence, vulgarity, criminality, disgracefulness, greed. This impossibly high standard, like the Hippocratic Oath, was apparently a summary of universal ideals, derived more from classical works than from Christian precepts. In it one notes the conspicuous absence of any emphasis on Christian piety. Nobility of character and good manners are stressed over and above medical knowledge. In short, the qualifications for the early medieval medical student were integrity, personality, and (finally) intelligence.

The importance of a liberal arts background for the serious student of medicine is obvious from our previous remarks. In the late sixth century Isidore of Seville expressed it as follows:

"It is sometimes asked why the art of medicine is not included among the other liberal disciplines. It is because they comprise single subjects, whereas medicine involves all. It is necessary for a medical man to know grammar so that he may be able to expound what he reads; also rhetoric so that he may support it with sound arguments; also dialectic so that by the exercise of reason he may investigate the cause of sickness; he should also know arithmetic so as to calculate the times and periods of the day; and geometry so that he may teach what a man should know as to different places; he should know something of music, for many things may be done for the sick by this art; last let him know astronomy by which he may calculate the stars and changes of seasons, for a physician has said that our bodies are affected by them. This is why medicine is called a second philosophy."

Of these subjects, dialectic seems to have been emphasized, whereas students often were cautioned against rhetoric lest they become overly talkative. Apparently physicians were supposed to be men of dignity and of deeds rather than words.

Education by means of actual practice, resembling modern internship, cannot be clearly proved from early medieval sources, though there are indirect traces in the texts. For example, as indicated above, early Visigothic law codes regulated the fees received by practicing physicians from their student apprentices. Furthermore, a treatise (extends as early as 900) instructed young physicians in detail as to how they must learn to take the pulse properly, even to the position of fingers on the patient's wrist, etc. Both Cassiodorus (in the sixth century) and Fulbert of Chartres (early in the eleventh) mentioned their medical assistants, and it is likely that most young doctors learned the profession thus personally associated with an experienced physician.

III

Whatever the uncertainties as to details of the medical education that has been described, it is clear that it was carried on under the influence of, if not actually in, schools. But these were not medical schools. As in

44. "Nec enim eis aliqua eorum ignorare licet... scieniam sanctarum Scripturarum... differentiam medicaminum contra varietatem aegritudinem". De Clericorum Institutione, III, 1 (PL, vol. 107, 377).
45. See above, note 39.
46. Paris, BN, lat. MS 12319, folio 14 r. For a translation and commentary on this, and other early manuscript texts, see Loren MacKINNEY, "Medical Ethics..." (op. cit.), p. 11 ff.
47. Etymologieae, IV, 13 (PL, vol. 82, 196 ff.).
48. See above, note 42.
49. Paris, BN, lat. MS 12319, folio 13 r. For a photoreproduction of folio 13 r.
50. Cassiodorus' assistants, unlike Fulbert's, were students in his school. See MacKINNEY, "Medical Ethics..." (op. cit.), fig. 3, p. 19 ff. Also see MacKINNEY, Early Medieval Medicine (op. cit.), pp. 20, 37 ff.
the case of Roman Gaul and Italy, medical education was a part of the liberal arts. But what of "The School of Salerno", variously reputed to have been the continuation of a Roman medical school, a Civitas Hippocratica, a Benedictine medical foundation, a fourfold center of Greek, Latin, Hebrew and Arabic teaching? Was it not the first scientific professional school in the West, and the first European university? An excellent critique for these extravagant traditional claims can be found in five historically substantiated factors of Salerno's medical evolution set forth by Kristeller in a recent survey of "The School of Salerno".

Salerno had (1) medical practitioners before 900. Since there were medical practitioners there may have been (2) practical instruction in medicine. There was (3) a corpus of Salernitan medical literature before 1200. By 1200 there was (4) a medical school, that is, organized teaching; and about a century later this was recognized as (5) a university. Certain modern historians have defined school or university in such a fashion as to claim earlier origins than we have given, but there are no definite evidences of an organized group of teachers of medicine at Salerno prior to the eleventh century at the very earliest.

For our purposes it is more important to describe Salernitan medical education than to quibble over definitions that might make it a school or university. No factual evidence exists for the period before the ninth century. All of the claims of ancient origins are assumptions supported only by the vaguest of circumstantial evidence. The existence of medical practitioners in the region of Salerno from the middle of the

In the ninth century onward is proved by documents which give the names of a half dozen medi ci during the period from 848 to about 1000.

Before 1000 northerners were visiting Salerno for treatment and Salernitan physicians were practicing in the North. Specifically, at about 985 a bishop of Verdun went to Salerno "causa salutis", but in vain; "he could not be healed by the medi ci". Somewhat earlier according to a monastic chronicler, a Salernitan physician was treated in a most unfriendly fashion by the physicians of the French royal court. The story was told by Richer of Rheims, himself a medical man, in his Historia, written shortly before 1000. It concerned the rivalry between "Deroldus medicus" (d. 920), the king's favorite, and quodam Salernitano medico, who was the queen's favorite. To test the two physicians, at dinner the king propounded medical questions, notably concerning dinamidia, pharmacy, botany and surgery. Deroldus, who was very erudite in the liberal arts (literarum artibus eruditus) outwitted the Salernitan who though unlettered had by reason of natural ability gained wide practical experience. For revenge he tried to poison Derold. Derold used antidotes and outpoisoned his rival.

Apart from the accuracy or inaccuracy of its details the story indicates that in the tenth century Salernitans were known in France as clever, but illiterate, practitioners. It is noteworthy that North-French clerical physicians disapproved of the practical medical craftsmanship for which medieval Salerno had been lauded in modern times. It seems likely that most educated Westerners of the early Middle Ages disapproved of Salernitanism as a threat to clericalism, to culture, and in general to the prevailing type of liberal arts education. To use a modern analogy, Salerno was a center that turned out over-specialized technicians lacking in broad cultural education. Even though Northerners continued to disapprove of Salerno, eventually they paid grudging tribute to its technological superiority.

A liberally educated clerical physician of Chartres, Rodulfus Mala Corona, after visiting Salerno (ca. 1050) reported that he found no one equal to him in the art of medicine except "a certain wise matron". The assumption that she was Trotula is gratuitous, but the tribute to a woman's speciality hints at gynecological specialization. We shall mention later a third reference by a Chartrain to Salernitan technology.

To summarize the evidence concerning Salerno before 1000, it produced medical practitioners who were widely known, and sometimes disliked, for their technical skill. So far as education is concerned, it is probable that, as in other less famous centers, practical instruction was given individually to apprentices in the craft. It is also probable that, at Salerno, such instruction was freer from clerical domination than elsewhere, in liberal arts schools where young clerics practiced the art of

52. The claims of early origin of the school are based on the interpretation of "school" as merely a group of physicians, and on the assumption that they must have trained young men in an organized group of some sort (whether legally established or no). Among the outstanding scholars who have tended to this position are Salvatore de Renzi, Collectio Salernitana, 5 vol. (Naples, 1852 fl.), I, 131 ff.; II, 771; Karl Sudhoff, "Salerno, eine Mittelalterliche Heil- und Lehrstelle am Tyrrhischen Meere", in Archiv für Geschichte der Medizin, XXI (1920), 43-92, see pp. 44, 46 f.; George Sarton, Introduction to the History of Science, 3 vol. (Baltimore, 1929 fl.), I, 725; Theodore Fuchsman, op. cit., p. 198 ff. A curious contradiction concerning early Salernitan origins occurs in Kristeller's essay (op. cit.). After asserting (p. 145) that "the second half of the tenth century may thus be considered as the date of origin of the school of Salerno", he proceeds very effectively (p. 162 ff.), to show that "the twelfth century thus marks for the school of Salerno...the gradual emergence of a regular curriculum..." and that the "legally recognized public university and an organized guild or collegium of physicians" came even later. Obviously Kristeller's assertion that Salerno was not a recognized institution of formal education. Less confusing than Kristeller's dating of origins, is the conclusion of Hastings Rashdall, in The Universities of Europe in the Middle Ages 3 vol. (rev. ed. Oxford, 1936), I, 176. Along with most critical scholars of recent years, Rashdall sees no evidence of a school until the middle of the eleventh century. This necessity the rejection of Ordores Vitalis' assertion in his Historia Ecclesiastica, III, 11 (PL, vol. 158, 260) to the effect that "in urbe Palernitana, ubi maximae medicorum scolae ab antiquo iambore habentur, feminem in medicinali arte, praeter quandam sapientem matronam, sibis paren veniretur (Rodulphi Mala Corona, in the year 1050)". Even granting that Ordores Vitalis word is reliable, it is not necessary to interpret these scolae as anything more than groups of physicians.

54. Hugo Flavius, Chronicum, 1, ann. 983 (PL, vol. 154, 196).
56. See above, note 52, for the Latin text, from Ordores Vitalis.
education at Chartres. However, practical training was not entirely lacking. Under Bishop Fulbert (d. 1028), himself a practicing pharmacist, young clerics were given informal instruction in the preparing and administering of medicines. One of the products of this practical-minded, liberal arts school was the clerical physician already mentioned, Rodulphus Malo Corona, who was reported to have known as much as the Salernitans. Throughout the eleventh, twelfth and thirteenth centuries, Chartres continued its emphasis on the liberal arts. It never attained the stature of a medical school or university.

IV

The general trend of education during the high Middle Ages (1000-1300) was two-fold; cathedral schools tended to expand into universities, and medical education became formalized. Medical schools and universities evolved along lines that suggest a compromise between the technology of Salerno and the liberal arts of Chartres. The old classical curriculum was expanded by the addition of a wealth of neo-classical, Arabic learning. Medical theory was supplemented by specific requirements of medical practice, notably in anatomy and surgery. In short, medical education freed itself from the extremes exemplified at Salerno and Chartres, and developed a curriculum suggestive of the modern balance between theory and practice. Chartres became more empirical, Salerno more scholastic.

Salerno's development during this period (1000-1300) negates the traditional claims of its unique progressiveness. The only evidence concerning Salernitan education during the eleventh century is found in certain medical texts attributed to Gariopontus and other unidentified writers. If this literature is a fair indication of the subject matter taught there, Salerno's educational record is not epoch making. There are traces of empiricism, but there is more of the classical and pseudo-classical medicine that had prevailed throughout the West during the early Middle Ages. To be sure, late in the century Constantine of Monte Cassino's translations of Greek and Arabic works appeared along with new texts on medical practice, including anatomy. These gained wide usage, and there can be little doubt that they constituted a new corpus of teaching-subjects as well as a continuation of Salernitan empiricism. But, at the same time, Salerno was emphasizing medical

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58. For a detailed analysis of Richer's education, see MacKinney, Early Medieval Medicine (op. cit.), p. 123 ff.
59. There is no apparent reason for Kristeller's reference (op. cit., p. 144) to Richer's teacher as "Erchamberius".
60. The normal divisions of medicine were diet (i.e., regimen), pharmacy and surgery. Concerning the unusual term "dinamidia", see Loren MacKinney, "Dinamidia in Medieval Medical Literature", in Isis, XXIV (1936), 400-413.
64. For bibliography of these early texts, see George Sarton, op. cit., I, 729.
65. George Sarton, op. cit., I, 769 lists the older, traditional accounts concerning Constantinus Kristeller, op. cit., p. 151 ff., and Thondike, op. cit., I, ch. XXIII, give a more critical and credible account.
theory, Aristotelian logic, and philosophy; adopting, as it were, the methodology of the liberal arts curriculum. This is shown in the increasing number of commentaries, written in the prevailing scholastic style; also in the trend toward Galen's ideal of the physician-philosopher. The late Dr. Bayon, in an article on "The Masters of Salerno and the Origins of Professional Medical Practice," cogently summarized the evidence for the twelfth-century beginnings of the school of medicine by stressing the importance of the Salernitan magistri. He called attention to "... the manner in which the doctrines of a Magister differed from the practice of a medicus, who might be a cleric or a simple lay medical adviser. The inception of academic study during the eleventh century led to a remarkable alteration, ... the scholastic method of study".

"But these teachers were singly independent Magistri...; (ca. 1150) these Magistri medicinae possibly became united in a corporate guild of teachers of medicine. Mention is made of it, under the name of curia, in the edicts of 1231 and 1240 (by Frederick II). All the documentary evidence supports this view." The same edicts set up a prerequisite of three years of logic before taking up the study of medicine, after which there must be instruction in both the theory and the practice of medicine. Thus, before Salerno gained formal recognition as a university, it had worked out a well balanced curriculum, more than ever before like that of the normal liberal arts schools of the West. As summarized by Dr. Bayon, "(Salerno's) University in the modern sense of the word, ... first originated in the fourteenth century".

Two medical schools located north of Salerno and south of Chartres are excellent illustrations of the normal, balanced medical curriculum — Bologna and Montpellier. Montpellier, like Salerno, has an uncertain origin, reconstructed by surmise and imagination. Apollo, as its founder, matches Salerno's Hippocratic tradition. Montpellier's early growth, reconstructed to suit the needs of the moment, has been an integral part of the history of medicine.

66. See Kristeller's summary of these trends: op. cit., p. 159 ff.
68. Kristeller, op. cit., p. 159 ff.; comes to similar conclusions; also, in the twelfth century there were individual teachers, but no organized school until the thirteenth century. He vigorously and convincingly combats Sudhoff's claims for the twelfth century, made in "Salerno, Montpellier and Paris um 1200", Archiv für Geschichte der Medizin, XX (1928), 51-62. See also, above, note 52, concerning Salerno.
69. The original text of the regulations is found in J. L. A. HUILLARD-Brinholles, Historia Diplomatcica Friderici Secundi (Paris, 1582) 4th ed., IV, part I, 235 ff. There is a translation and analysis in Edward Hartung, "Medical Regulations of Frederick the Second of Hohenstaufen", in Medical Life, XXI (1934), 587-601.
70. RASHDALL, op. cit., II, 120, briefly surveys the legendary origins, citing Alexandre Germain's, Histoire de la Commune de Montpellier (3 vol., Montpellier, 1879) which is the most thorough secondary source. The revisors of Rashdall's work, Fowicke and Emden, added a detailed footnote (p. 121, note 3) on the subject, and also (p. 117) recent bibliographical items, such as Stephen d'Irancy, Histoire des universités françaises et étrangères des origines à nos jours (Paris, 1933).
73. See RASHDALL, op. cit., II, 115 ff; and d'Irancy, op. cit., 110 ff. An excellent analysis of medizinische at Montpellier (and at other universities), based on the original sources and the most recent secondary works, is in an unpublished thesis by Vern Bullough, Medical Education in Western Europe during the Thirteenth and Fourteenth Centuries (University of Chicago, 1954), pp. 46 ff. (Montpellier).
74. The Latin text is in the works cited above, note 71, and also in Rashdall, op. cit., II, 122. It seems obvious that the term scolas means classes, rather than schools, of medicine. Of interest, also, is the term fistra. It refers to medicine, since elsewhere in the text there is mention of the regulation applying to "facultate fisica discipline". In some medieval texts, however, fisica or phisica is specifically related to the seven liberal arts (e.g., physica naturalis, or natural science). It seems...
watched a professor of surgery dissect a corpse; a professor of medicine read appropriate passages from a textbook, while another professor pointed out the various organs, muscles and bones.

Miniatures in late medieval manuscripts from other parts of the West provide evidence of the widespread popularity of this Bologna innovation. The statutes of the University also indicate that theoretical instruction was not neglected. They provided that candidates for medical degrees must have studied the liberal arts and have specialized in medicine for four or five years, during which time their knowledge of medical theory was tested by disputation and the delivering of lectures. Thus from the late thirteenth century onward Bologna's curriculum was noteworthy for the breadth and depth of its medical instruction.

One other medical school, at the University of Paris, will suffice to complete our survey of the prevailing non-Salernitan trend of medical education in the thirteenth century. Paris, in a sense, carried into university education the earlier liberal-arts ideal of the cathedral school of Chartres. By mid-century Paris had three well-established faculties (theology, law and medicine) in addition to the basic liberal arts faculty. Of the three superior faculties, medicine seems to have been the least important. However, by about 1270, the medical faculty had its own set of statutes which included specific requirements concerning text-
books, length of the course of study and liberal arts pre-requisites. In general the regulations of the medical faculty reflect the guiding hand of liberal arts scholasticism. Not only was it normal procedure for a student to have an M. A. degree before specializing in medicine, but the medical course was predominantly theoretical. At the same time (ca. 1270) the medical faculty took action against unlicensed practitioners, who were self-trained empiricists without theoretical schooling. There also were strict prohibitions against the practice of medicine by bachelors of medicine, apothecaries and surgeons. Early in the fourteenth century the medical faculty prosecuted a number of Parisians, including women, for practicing without having been licensed. Throughout this period the French kings and the Avignon popes supported the medical faculty in its efforts at the elimination of non-University practitioners. These continuing efforts indicate that complete enforcement of the University's educational standards was impossible. Thus the late medieval experience of the Paris medical faculty illustrates the eternal conflict between the formally educated physician and the uneducated or empirically trained practitioner. It also indicates that Paris carried on to the very end of the Middle Ages the early ideal of the subservience of medical education to the liberal arts.

As must be evident from our cursory treatment of the fourteenth and fifteenth-century history of the universities, the year 1300 virtually marks the end of this survey of medieval medical education. By that time medical education in the West had attained a relatively stable curriculum that was to carry on well into modern times. There were generally accepted curricular standards that provided for (1) a strong liberal arts background, (2) theoretical training in the principles of classical and Moslem medicine, and (3) something of practical experience along with medical theory. Whereas the early Middle Ages had emphasized medicines (especially those from herbs) as the principal factor in healing, medical education in the thirteenth-century universities gave increasing attention also to anatomy, surgery and regimen. By 1300 medical education also had attained a structural norm, the university, the organizational and regulatory elements of which reflect the new era. Medieval medicine, and medical education, had progressed from the rather primitive pseudo-classicism of its monastic-dominated period to the fairly well balanced ideal of University-controlled, theoretical and practical training. And this evolution seems to have come about with little reference to, or influence by, the traditionally famous school of Salerno.

In fact, the much applauded empiricism which Salerno is so often said to have monopolized through the early centuries, seems to have had its stronghold among the lowly practitioners, to whose education we have given little attention. Until late in the Middle Ages, almost nothing is known of the details of the apprentice-training of those who had no formal medical education. These much condemned healers of the masses, the charlatans, barbers, surgeons, apothecaries, midwives and other types of "medicine men", must have greatly outnumbered the licensed physicians. The higher levels of these unlettered folk included members of guilds (e.g., apothecaries, barbers and surgeons). There are existing evidences of such guilds before 1300 (Dante belonged to the Florentine apothecaries' guild) but no details concerning their training of apprentices. Obviously they learned the trade by the practical methods of observing and imitating the master practitioners.

Medical miniatures from late medieval manuscripts often show young men assisting at autopsies and surgical operations, or in apothecary shops wielding pestles (sometimes two at a time) in the preparation of medicines. In this relatively unexplored field of medieval medicine we have a reflection of the technical type of education which contrasts so sharply with that of the liberal arts schools. Such was the training of those who cared for the great majority of the sick in medieval times.

There is one point at which, late in the Middle Ages, the two opposing types of medical education are found working together. The universities, led by Bologna, gave recognition to the study of anatomy and surgery. We already have noted this trend at Bologna. At Paris soon after 1330 the surgeons began to imitate the methods of the medical faculty. Late in the century, after having obtained royal recognition as a faculty, they set up distinctions between bachelors and licensed masters in surgery. The teaching surgeons even adopted the long robe, to distinguish

85. Chartrum, I, 515 ff.
86. A document for the year 1382 (Chartrum, III, 81) indicated that "magistri facultatis medicinae", were "omnes magistri artibus. . . ." Apparently the M. A. degree, though not required, was common. See Rashall, op. cit., I, 435; and Bullough, op. cit., p. 70 ff., for details concerning the theoretical character of the medical course.
87. Chartrum, I, 488 ff. Especially interesting are the prohibitions of medical students prescribing medicines or even visiting patients more than once without a master physician. See also II, 149, 255, 285, 336.
88. See Pearl Kibre, "The Faculty of Medicine at Paris, Charlatanism, and Unlicensed Medical Practices in the Late Middle Ages," Bulletin of the History of Medicine, XXVII (1953), 1-20, especially 7 ff. In one of the cases described, the prosecution claimed that its authority was based on a two-hundred-year-old statute of the diocese of Paris.
89. Pierre Dubois', plan for the education of picked youths, to be sent to the Holy Land, included training in the liberal arts, then specialization for clerical service or for medicine and surgery. Even girls were to be instructed "in medicine and surgery, with other subjects prerequisite to these." See Lynn Thorndike, University Records and Life in the Middle Ages (New York, 1944), p. 138 ff., for a translation of the pertinent sections of De Recuperacione Terrae Sanctae, with an introductory explanation. The volume has other translations of texts relating to medieval medical education.
90. The increased attention to anatomy and surgery is reflected in the large number of illustrations of these subjects in late medieval manuscripts (see above, note 81, concerning miniatures). As for regimens, the late Middle Ages turned out many lavish illustrated, books with titles such as Theatrur Sanitatis, Diaeta, Taetum Sanitatis, etc.
91. There are many such miniatures in the collection of microfilms mentioned above, note 81; also in the photoreproductions, many of which are full-page color prints, in Maxime Laugier-Lavastine, Histoire générale de la médecine, de la pharmacie, de l'art dentaire et de l'art vétérinaire, 3 vol. (Paris, 1936-1949), II, pas-
92. sim (vol. I has photoreproductions from a number of Greek manuscripts).
them from the short-robed practitioners of surgery. They also belittled the lowly barbers, just as they themselves had been belittled by the physicians. To barbers they allotted certain minor operations considered degrading to surgeons. Finally, late in the fifteenth century, both barbers, and surgeons were admitted, on occasion, to medical lectures at the University, but with none of the privileges pertaining to medical students. Unlike Italy, France (and England also) clung to the rather strict segregation of physicians from surgeons, barbers, and apothecaries.

As in classical times the gulf between the manual arts and the liberal arts was difficult to bridge. It is apparent that medical education from about 1300 onward manifested more of the characteristics of modernness than of the medievalism which we have traced through the centuries. Outstanding factors are the development of specialization and institutionalization. The physician of classical and early medieval times has become the physician, the surgeon, the barber and the apothecary. Today the list of specialists is much longer. Institutionalized education at the end of the medieval period manifested itself not only in the University medical faculties but also in the regulated training of manual practitioners in the guilds of surgeons, barbers and apothecaries. The midwives seem not to have been so completely institutionalized. The two trends above mentioned were not unmixed blessings. But they were inevitable aspects of the evolution toward the more complex civilization with which we associate with progress.

92. Bullough, op. cit., p. 131 ff., has a lengthy section on the training of surgeons, barbers, apothecaries, and midwives in the late Middle Ages. Even for the medieval centuries, however, detailed evidence is very scarce.

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