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**AN
INTRODUCTION
TO
MEDICAL BIBLIOGRAPHY**

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Revised and Enlarged

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BALTIMORE COLLEGE OF
DENTAL SURGERY

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PART ONE

THE STORY

OF

MEDICAL LITERATURE

INTRODUCTION

The beginning of medicine properly rests on man's sympathy to help his fellow man, for centuries before the rise of civilization, primitive man developed what may be called a theory of disease. Even though the theory with its explanation of spirits to explain the cause of every disease was far from the truth, it nevertheless served as an explanation to the primitive mind. But in time, a few facts were learned largely by accident which man handed down to his children, and although it is generally conceded that classical Greek medicine may be correctly characterized as the mother of modern medical thought, it is significant that in contrast with primitive times, the Greeks as well as the Egyptians, Babylonians and Assyrians, began to record their experiences by impression on stones and clay tablets or by inscriptions on papyri. Thus our first medical literature came into existence.

The earliest of these records are the clay tablets of the library of King Assurbanipal and the various medical papyri of the Egyptians. The best known of which are the Ebers Papyrus and the Edwin Smith Papyrus. The Greeks, under the influence of an ideal environment, learned to study nature and therefore the natural sciences were cultivated intensively. Thus Hippocrates rationalized medicine, divorcing it from its superstitious foundation, placing it on a firm basis by maxims based on acute observations and carefully guarded deductions. In the Hippocratic Collection, Hippocrates gave to the world the bedside notes of a keen clinician searching for the truth.

With the death of Hippocrates came the rise of Macedonian power and the founding of the city of Alexandria and later its famous medical school, where Erasistratus and Herophilus searched for the truth according to the Hippocratic ideal. Rome followed Alexandria as a medical center and although Rome ruled the world politically, in the spirit of science the Greek ideal of Hippocrates lived on.

The outstanding contributions to the medical literature of Rome were the works of Celsus and Galen. There is hardly a phase of medicine that Galen did not enrich with his studies, yet injure with his theories. He was the most voluminous of all ancient writers, giving the impression that he had said the last word in every phase of medicine and it was his self assurance that established his authority for the next 1500 years.

With the passing of Galen, medicine entered that period of world history known as the Middle Ages. The preservation of medical learn-

ing during this era was due partly to the monks who patiently transcribed and stored valuable Greek treatise, establishing the principle that the care of the sick was a task of Christian love and mercy; and partly to a group of Byzantine scholars, trained in the Greek ideal, who did much the same as the monks in the west.

In Spain and "the Sicilies," a group of translators rekindled an enthusiasm for the Greek ideal, which had almost been forgotten in Western Europe, and in the 16th century the various reform movements were extended likewise to anatomy, internal medicine and surgery.

The 17th century, the period of scientific advancement, is characterized by a steady advance of medicine and by the relationship of the new philosophy to medicine as taught by Bacon, Descartes and others. Medicine was profoundly stirred by this philosophy and appropriated such parts as could best serve her, while rejecting the purely metaphysical argument.

The invention of printing had made it possible for facts to be made easily accessible, and with the tremendous amount of scientific facts that were now being discovered, came a desire to publish these new discoveries. As interest in experimentation spread, there came a natural grouping of various individuals for the purpose of exchanging ideas, performing experiments and sharing expenses relative to maintaining laboratories and libraries. These first scientific societies originated in Italy and rapidly spread to other countries. The first scientific literature in the sense of a periodical literature was the Transactions or Acta of these scientific societies. These Transactions mark the beginning of our periodical medical literature, and the growth of medical literature can be considered from then on as a special phase or specialty of medicine.

During the 17th century, the scientific periodical came into existence by way of the scientific society from the newspaper, although it was not until the following century that it reached a stabilized form. The next step in the growth of medical literature from the Transactions of the Scientific Societies and the Scientific Journals was the organization of the purely medical societies and the publication of their Transactions. One of the first medical societies to publish its Transactions was the Society of Physicians, founded by William Hunter and a group of associated physicians about the middle of the 18th century. However, the Transactions of these societies still failed to meet the needs of the medical profession, accordingly, at the beginning of the 19th century medical periodicals, which up to this time

had had a spasmodic existence, were established on a firm basis. With the founding of the Lancet in 1823, modern medical journalism was born, and thereafter, medical journals developed along the line as conceived by the founder of the Lancet, Thomas Wakley, developing into the extensive periodical literature which is our heritage of today.

Plate 2



Sample of the Edwin Smith Surgical Papyrus.
(Courtesy of the University of Chicago Press)

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THE MANUSCRIPT

Greek science had its roots in at least two of our ancient civilizations, those of Egypt and Mesopotamia. These two civilizations were remarkable in the acquisition of positive knowledge in limited spheres. It was in the field of medicine that the Egyptians left us fragments of a genuine medical science. The Babylonians, on the other hand, developed the science of astronomy to a high degree. In both of these cultures observations gathered over a long period and interpreted mathematically established a body of knowledge that was continually being tested and improved upon.

It is to the Sumerians, the original inhabitants of Mesopotamia, that we owe the origin of writing, for underlying the Sumerian civilization was a social order based on the rights of the individual protected by law. This system, due to its highly developed sense of personal property rights, with its need of records and code of laws for the protection of the individual, brought forth an evolution in writing which was a decisive factor in the development of civilization. The Sumerians obtained their idea of writing from the cylinders which they engraved with various designs to serve as personal seals. Gradually from these symbols were developed other symbols to represent words or objects, until at length, writing was perfected as a medium for the recording of speech and thought. Because their writings were recorded on clay tablets, which when baked proved almost indestructible, there was preserved an abundance of written records of the culture of the various Assyro-Babylonian empires which at intervals held sway over the Tigris-Euphrates valley.

The first mention of physicians in Assyrian literature is in the Hammurabi law code, a systematization and codification of all Babylonian laws by Hammurabi, the greatest of the Assyrian kings, who reigned from 2067-2025 B. C. In this code, which regulated precisely all phases of life and work in Babylon, it is apparent that physicians not only existed but were held in high esteem. Details of the practice of medicine are derived from the great library of clay tablets, some 30,000 fragments of which are now in the British Museum, which were collected, copied and translated by King Assurbanipal of Assyria (668-626 B. C.). The library was apparently started by Sargon (722-705 B. C.) and continued by his son, but the actual age of the tablets cannot be determined. Several hundred are concerned only with medical matters, and even the most scientific of these tablets reveal in their

phraseology their derivation from magic rites in the treatment of disease.

In contrast to the Sumerians were the Egyptians, with a dissimilar social and economic background embodying a god-king with absolute control over his subjects. Under this system there was no place for the recognition of private ownership. The earliest records of Egypt are some centuries later than the first written documents of Mesopotamia, and due to the known commercial and cultural links connecting these two countries, it is logical to assume that the Egyptians imported the art of writing from the Sumerians. Henceforth Egyptian writing played its part in the progress of Egyptian science, however with that lack of unity so characteristic of Mesopotamia. Undoubtedly it was the Egyptian concept of life, with its organization of a totalitarian state and a different set of values, that was the reason for the more sporadic advancement of Egyptian science.

The study of Egyptian science is complicated by the fact that the Egyptians wrote with pen and ink on reed-paper, a perishable material. Of all the Egyptian medical literature, which undoubtedly must have been extensive, only five long and well preserved texts are still extant. The two best known of these manuscripts are the Ebers Papyrus and the Edwin Smith Papyrus, representing the two main groups of Egyptian medical literature. The Ebers Papyrus is chiefly a collection of recipes intended for the use of the physician. The Edwin Smith Papyrus contains a collection of surgical case reports for the use of the surgeon.

The Ebers Papyrus was written about 1500 B. C., but there is abundant evidence that it was copied from various sources, some of them many centuries older. The Papyrus consists of a long roll, 12 inches in width and 68 feet in length. It is divided into what corresponds to pages, each of which is of equal size and averages 20 lines in length. For the most part it consists of a series of prescriptions for numerous ailments and diseases of a medical nature, surgery being recommended in only a few instances. The 877 prescriptions listed take the form of salves, plasters, poultices, pills, fumigations, suppositories and enemata. A few of the prescriptions are simple, but the majority are complex and one consists of 37 ingredients. A few well selected drugs, such as opium, hellebore and hyoscyamus, with some mineral and vegetable compounds such as castor oil and salts of lead and copper, are compounded with ingredients such as the blood, excreta, fats and viscera of animals. The excellent final section which treats of tumors, approaches the accurate clinical pictures painted by

Hippocrates. There is an important fact to note concerning these recipes. That is, of the 877 prescriptions, only 33 contain such ingredients as the dung of animals, and they are usually placed at the end of a group of recipes prescribed for the same ailment, which shows they were not held in great esteem by the physicians themselves, but belonged to a kind of folk medicine.

The Edwin Smith Papyrus represents that second group of Egyptian medical texts which were intended for the use of the surgeon. It is a roll a little less than 16 feet long by one foot wide, written on both sides and consisting of approximately 500 lines of handwritten cursive script, describing 48 surgical cases of injuries to the body from the head to the chest and spine, each case being presented systematically. In each of the cases described, the surgeon first examines the patient and determines the character of the injury, then, on the basis of the examination, he pronounces the diagnosis and unless the case is hopeless, proceeds with the treatment. Anticipatory of the Hippocratic maxims are the repeated instructions to the practitioner to let nature do the work. The recipes on the back of the papyrus, apparently derived from some of the earliest works of magic, bear no relation to the excellent surgical treatise on the reverse side. Some centuries later when the papyrus was copied, some of the terms were no longer intelligible and the unknown surgeon who was the copyist, found it necessary to write a commentary with each case.

Thus it can be observed from these papyri that during the first part of Egyptian history, a gradual development took place in medicine and surgery just as in every other phase of civilization, until about the time of the Middle Kingdom (2000) after which a decline set in.

Another group of Semitic people, the Hebrews, made a distinct contribution to medical science. Because of their organized sanitary code, the Hebrews were able to lead over a long period of time a nomadic existence. In the Old Testament of the Bible we learn that Moses had formulated for his people a health code, which amounted to a complete and definite system of public health rules and regulations, and to enforce it, he selected officials which would correspond to a modern public health staff. Life centered about the camp, which was wide, straight, open, roomy and well ventilated. Mandatory regulations were enforced to keep it sanitary and safeguard it against disease. The code of ritual hygiene included stern mandates in regard to touching unclean objects, the proper food to be eaten, the purifying of women after childbirth, the hygiene of the menstrual period, the

prevention of contagious diseases and the abomination of sexual perversions. The Hebrew conception of public health carried over until the Middle Ages when there was in force their regulations for the caring of lepers, and their principle of the isolation of patients and suspects of such contagious disease as plague, syphilis, scabies and phthisis.

Traditional science was continued by the various Greek tribes which began to invade continental Greece about 1200 B. C. Chief among the invading tribes were the Ionians who settled along the coast of Asia Minor from Ephesus to Halicarnassus; the Dorians, who made their way towards Crete, the Island of Cos and the opposite Peninsula of Cnidus. These tribes, due to their extensive trade relations, soon came in contact with the older civilizations of Mesopotamia and Egypt and the culture of these two countries served as the foundations of Greek science.

There was another factor that played an important part in the development of Greek science, and that was the geographical conditions which prevailed throughout the Greek peninsula. The Greek peninsula is a mountainous country cut up into numerous valleys which were ideal for the growth of the small independent city state whose political organizations were "democratic." Laws were not made by a semi-divine king but by the citizens in assembly. The gaining of an advantage depended on how well one was versed in the science of argument and logic. The Greeks soon realized that the more facts one had at his command the better one could argue. Therefore, they soon began to investigate all phenomena in order to build up a body of knowledge.

This was the beginning of speculative philosophy, a new and important element in the development of science. The Greeks were the first to attempt to explain nature in terms of everyday experience. However, in time, Greek science emphasized the rational factor at the expense of observation. They never fully developed the technique of experiment, but they were very fertile in the creation of theories.

Greek science is thought to have originated in the Greek city of Miletus in Asia Minor. There Thales (624-565 B. C.), an early philosopher, is the first man known to have offered an explanation of nature without invoking the aid of any power outside nature. This was a new thought and the Greeks enthusiastically began to rationally attempt to explain all nature's laws.

However, it remained for the Greek physicians to point the way to the true scientific method. Hippocrates (b. 460 B. C.), the father of medicine, typified the true scientist who first put the rational con-

ception to the test of experiment. This is sometimes called the "Hippocratic Method." Hippocrates was a native of the Island of Cos and from there he wandered to many parts of Greece, achieving a large following and teaching the precepts of his profession wherever he went. He and his followers actually practiced scientific medicine. They were patient observers of fact and constantly turned to verification from experience, expressed in a record of actual observations.

Hippocrates and his followers left us a large number of works known as the Hippocratic Collection, evidently written by different persons and at different dates, though who the various authors were it is not possible to determine. The "Collection" is of a rather heterogeneous character but it is most significant for the concept that it contains of the nature of science itself.

Doubt began to be instilled in the minds of many of the Greek philosophers as to the claims of physical science—and under the teachings of Socrates and his pupil Plato, man's universe was divided into the mental and the material, with the resulting confusion which continued for centuries.

The history of Greek science closes with the greatest name in Greek history, Aristotle (384-322 B. C.). Aristotle gave to science the beginnings of botany, zoology, comparative anatomy and embryology, as well as physiology. He described more than 500 kinds of animals and his biological observations remained unsurpassed for 2000 years. However, Aristotle's physical and astronomical concepts were quite different from his biological concepts, as they were not based on observation or experiment. Aristotle conceived of a different set of laws governing the heavens since they were closer to god and therefore must be more perfect. Since the laws he formulated for celestial phenomena were not based on observation or experiment, they were much inferior to his biological works, but unfortunately, it was his physical and astronomical conceptions that played such an important rôle in scientific thinking for centuries to come, while his biological works were neglected.

Following the decline of Greek science, Alexandria became the center of learning for the ancient world. After the death of Alexander the Great, Egypt came under the rule of one of his generals, Ptolemy, who, with the rulers that followed, became patrons of learning. The Museum established by these rulers was a research institution with dissecting rooms, observatories, botanical gardens and libraries. The library contained some 700,000 rolls or volumes, but was eventually destroyed during the wars of conquest which swept over Egypt.

There was this distinct difference between the science of Alexandria and that of Athens. In Alexandria, the scientists attempted to apply science for the benefit of mankind; in Greece, the practical application of science was frowned upon. Pure speculative philosophy was the ideal. Undoubtedly, the cheapness of slave labor was one of the causes for this. The greatest glory of the school of Alexandria was during the first 150 years of its existence. It was during this period that there were connected with the school two great physicians: Herophilus, the founder of systematic anatomy, and Erasistratus, the first scientific physiologists. However, after this brief period of progress the school declined, and medicine degenerated into a philosophic attempt to find a theory which would explain the cause of all disease.

When Egypt was absorbed into the Roman Empire in 50 B. C., Alexandria lost its place as the center of learning and Rome succeeded to it. Ancient Rome had produced no physician of note through all the years of her existence. The citizen had his domestic herbal and his household god for every disease, and when the Greek physician first came to Italy he was looked upon with contempt and regarded as a mercenary. However, the Romans soon came to feel that the Greek physicians were indispensable and in the degree banishing all Greeks from Rome, physicians were specifically exempted.

The earliest scientific medical work in Latin is the *De re medicina* of Aurelius Cornelius Celsus, a layman, who lived during the second century A. D., and whose work is not original, but is a translation from or a compilation from the Greek. Apparently, it is the sole remaining part of a series of encyclopedic treatises on medicine, agriculture, military hygiene and similar subjects.

The ancient period of medicine closes with the name of the physician who ranks after Hippocrates as the greatest of the Greek physicians. This was Galen (131-201 A. D.), who, notwithstanding all the good he did in the field of experimental physiology, also did a great deal of harm, for he broke down the Hippocratic method of utilizing clinical observation as the basis of medicine and substituted abstract reasoning for concrete fact. Galen was a man of great ability and real genius. He had an answer for every problem and he wrote with an assurance which gave succeeding physicians the impression that he had said the last word on every phase of medicine. His works are a gigantic encyclopedia of the knowledge of the time.

One or two facts about Roman civilization should be mentioned which later influenced medicine. The Romans had the first newspapers,

which originated in their desire to become informed of daily events. The outgrowth of this desire was the appointment by the government of officials called "Actuarii," whose duty it was to compile records of current events and to post them, in the form of "acta diurna" in public places. The writings of this period suggest that the authors must have had access to public or private collections of books or libraries of medicine and natural history, otherwise they would scarcely have written as they did. During the empire, the emperors began to found public libraries and at the height of the city's glory there were 28 public libraries in Rome alone. Since most of them have perished, it is not known how many manuscripts in them dealt with medicine, but the assumption is that there were not very many, for the Romans, as a rule, thought very little of medical literature.

Unfortunately, the Romans borrowed the results of Greek science without acquiring the method, consequently, they remained dependent on the intellectual resources of the eastern half of the empire and when the east was separated from the west, there remained in the west only a scanty store of positive knowledge. Therefore due to the Romans' ignorance of the method of science and their failure to have ever established a tradition of research, there was precluded the possibility of an education based on nature. The result was the retrogression of science for some centuries to come.

With the downfall of Rome came the period in history known as the Middle Ages. This era can be considered a period in which a new civilization was born. Classical civilization was sick, but much of it was preserved by the union of the old races with the new vigorous Germanic tribes and a vigorous new religion, Christianity. These two factors were the new elements by which a practically new civilization was created. However, this new civilization was not created in a short time, but took several centuries of assimilation before this was accomplished.

With the disintegration of the Roman Empire the people of Western Europe were left loosely organized nationally, and were without any defense against the hordes of barbarians who swarmed over the country in successive invasions. Crushed by the repeated onslaughts of the Teutonic tribes and left unprotected by the Roman Emperor in the East, the Latin people naturally turned for protection to the church, the last vestige of authority in the Western world. The invaders, having scant respect for the works of art and other evidence of Roman culture, destroyed its landmarks. Constant wars and epidemics militated against any secular interest in science and culture.

Both science and culture, therefore, found their only refuge in the monasteries of the church and these protected and well built institutions became great storehouses for the countless priceless manuscripts which were entrusted to their care.

As lay science and culture declined in the Western world, so naturally did medical knowledge, and physicians eventually became little more than quacks. Furthermore, with the advent of Christianity came a new philosophy in regard to the sick and underprivileged: Suffering was a mark of God's own blessing and the healthy could share in this blessing by caring for the sick. Partly because of this concept and partly because of the incompetent lay physicians, the duty of caring for the sick became part of the task of the religious orders, and the period of Monastic medicine thus began.

One of the first monasteries known to have assumed the nursing of the sick was the Monastery of Monte Cassino in Italy, founded by St. Benedict in 529 A. D. A little later (540 A. D.) Cassiodorus, formerly minister of education under the Emperor Theodoric, retired to Squillace, a short distance from Monte Cassino and there founded a monastery which had for its avowed purpose improvement in the care of the sick. Cassiodorus also provided medical books for the medical education of his monks that they might learn the classical art of healing.

In Spain, just as in Italy and the rest of the Western world, ancient culture fast disappeared. For two centuries the Goths brought destruction to the old civilization in Spain. During the seventh century, St. Isidore (560-636) as soon as he became Bishop of Seville, established schools for the education of both clergy and laity. St. Isidore was himself an excellent scholar and his encyclopedia of universal knowledge, the "Etymologia," epitomized the learning of all antiquity as well as that of his own time.

In England the monks also interested themselves in medicine, as is seen in the writings of the Venerable Bede's (673-735) Ecclesiastical History. He himself wrote a treatise on blood-letting and also a description of a cure of aphasia by methodic exercises. In France the minister of education under Charlemagne, Alcuin (735-804), and in Germany the monk Rabanus Maurus (776-856) busied themselves with medical writings. Pope Sylvester II (d. 1003) was the only other writer of merit during this early period in the formation of Western civilization.

These works are important as they kept alive in some measure the heritage of Greek culture; but one looks in vain for any original con-

tributions to medical science at this time. However, this was not to come until the culture of classical antiquity was reintroduced into Western Europe by the Arabs during the 10th, 11th and 12th centuries.

The Byzantine Empire lasted over 1000 years (395-1453), but its only contribution to medicine was to preserve something of the language and culture of the Greeks. The medical literature of this empire is mainly concerned with the compilations of four physicians: Oribasius (325-403), Aëtius (6th century), Alexander of Tralles (525-605), and Paul of Aegina (625-690). The church fathers also made some interesting contributions to clinical medicine. Eusebius described an epidemic in Syria in 302 A. D. and Gregory of Tours described another in 581. Nemesius, Bishop of Emesa in Syria, wrote a book entitled "The Nature of Man," which is an excellent study of physiology.

From Syria in 432 the Nestorian Christians were forced to flee because of religious differences and sought refuge in Persia. These refugee scholars established at Gondisapor a school in which translations of Greek works into Syrian and Persian were undertaken. Under the liberal-minded rulers a medical school was established, which for centuries was the most important medical school in the East. The victorious Arabs, who later captured Persia, found at Gondisapor a university where Greek culture and medicine had long been studied, and whose professors were chiefly Christians and Jews. With great zeal the Arabs began the translation of the Greek masters into Arabic and when, as the result of chaotic world conditions, more and more scholars fled to Bagdad bringing with them many Greek manuscripts, a very frenzy of translations issued. In this Eastern Caliphate, as it was called, the most famous of those translators was Hunain bin Isbaq Al-Ibadi, who is known to the Western world as Johannitius (809-873). Medicine at this medical center is chiefly concerned with the work of three great physicians: Rhazes (860-932), who gave us his "Encyclopedia" composed of nearly 250 works, Haly ben Abbas (d. 994), the author of the *Liber regius*, an authoritative work, and Avicenna (980-1037), whose Canon remained the classic textbook of medicine for 600 years.

In the Western Caliphate of Arabian conquests, which included Spain, the scientific tradition was established later than in the East. A library and academy was founded at Cordova in 970 and similar institutions sprang up at Toledo and elsewhere, until there were at least 70 libraries in Spain. The greatest physicians of the Western Caliphate were: Albucasis (1013-1106), the author of a medico-chirur-

gical treatise, Avenzoar (d. 1162), the most original writer and observer of the Arab school, and Moses Maimonides (1135-1204), whose prolific medical and literary output makes him probably the most eminent and scholarly physician of his time and for some generations to come.

During the 11th and for some centuries to follow, Arab civilization was looked upon by the scholars of the West as the source of all the learning and science of antiquity. With this viewpoint came a longing by the scholars of Europe to study under these masters. Gradually, a few students sought the centers of Arabic learning and brought back with them glowing accounts of the wisdom of Arabic culture. Thus by the middle of the 11th century, Arabic science was beginning to penetrate into the West. There were at this time two areas of contact between the European and Arabian civilizations: Spain and "The Sicilies." Conditions were similar in the two countries. Most of Spain had been captured by the Arabs and as Moslem power waned there remained behind scholars with a knowledge of both Latin and Arabic. The greatest of these translators who studied in Spain translating Arabic manuscripts into Latin were: Abelard of Bath (c. 1090-1150), Gerard of Cremona (1114-1187) and Michael the Scot (c. 1175-1235).

The Sicilian group was less active. The center of translations was undertaken at Salerno, which had been a medical center as early as the ninth century. Some element of Greek culture continued in South Italy under the suzerainty of Byzantium. Conquered by the Moslems, Salerno soon became the center of an active lay medical school. During the middle of the 11th century there came to Salerno a native of Carthage known as Constantinus Africanus (1020-1087). He began to translate the Arabic works into Latin and these translations, although crude, were still transactions of ideas rather than mere words and the physicians of Salerno began to study them eagerly. In spite of the opportunities for work and study offered at Salerno, conditions were not exactly to his liking so he soon journeyed on to Monte Cassino, where he became a monk and spent the remainder of his life translating medical works from the Arabic into Latin.

Constantin's translations had an invigorating effect on the medical school at Salerno and during the 12th century an extensive medical literature emanated from it, which became to be known centuries later as the Breslau Codex, containing at least 35 separate works.

The resulting literature can best be considered verbose and almost wholly devoid of the literary graces. The arrangement of the material

occupied the attention rather than the ideas it was supposed to convey. The ignorance of the translators frequently resulted in the distortion of the sense of the original document and in many instances terms were simply transferred rather than translated. The Western writers considered the Latin translations fit material for commentary and often expanded and annotated the works, without adding any new ideas, until the progressive elaboration of form resulted in a deterioration and "thinning-out" of the contents as the years passed.

From the mass of Arabic-Latin translations various types of literature resulted. Commentators attempted to compile only the best material from the original authors. Conciliators attempted to reconcile the differences between the contradictions in Hellenist and Arabic doctrine by dialectic means. Others served as concordors, arrangers and harmonizers of outstanding ideas. Concordances written with abbreviated keys to the contents of standard works enjoyed great popularity in the schools. A popular work at this time was the "summa," an encyclopedic textbook of medicine, written by many authors and intended for the use of students. An important feature of clinical medicine in the 14th and 15th centuries was the writing of "Consilia" or medical case-books, which consisted of clinical records from the practice of well known physicians and letters of advice, written by them to imaginary patients or else to real pupils or practitioners who had appealed to them as consultants.

In the awakening of learning which these translations began to cause, particularly when they were new, the universities played an important part. The first university with a complete corporative constitution under ecclesiastical control was the University of Paris, which became the model of most Western universities. Its professors were recruited from the Franciscan and Dominican orders, from which came such outstanding men as Roger Bacon, Albertus Magnus and St. Thomas Aquinas.

At first the church was disturbed by the philosophy as taught by this new learning that was being introduced, but under the teachings of Albertus Magnus and St. Thomas Aquinas the entire store of knowledge, both sacred and profane, was rationalized. According to St. Thomas all knowledge is derived from the same source, that is God, but is given to us through two sources: the Scriptures, including church tradition, and natural truth, as given to us by the greatest scientist of all, Aristotle. By placing the church's approval and recognition on the study of science, a great impetus was given to the advancement of science by implanting in man's mind the fact that