### Appendix Epsilon²: The Abydos Intellectual Line

Connecting brothers of Phi Kappa Psi Fraternity at Cornell University, tracing their fraternal Big Brother/Little Brother line to the tri-Founders and their Pledges . . .

Brother Frank Clarke was tapped into the Pledge Class of 1869 and studied under Oliver Wolcott Gibbs at Harvard’s Lawrence Scientific School:

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<th>Oliver Wolcott Gibbs</th>
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Below we present short biographies of the Abydos intellectual line of the Phi Kappa Psi Fraternity at Cornell University.

“Who defends the House.”
We begin with brother Frank Clarke, who was an instructor at Cornell in the University first year of operation, and eagerly sought by the Class of 1870 for membership in the House. Frank was a great guy:

- Frank Wigglesworth Clarke (1847-1931), was a chemist, born in Boston, Massachusetts 19 March 1847. He has been called the “Father of geochemistry” for his efforts in determining the composition of the Earth’s crust. Frank Wigglesworth Clarke (1847-1931) was a geological chemist. Clarke taught chemistry and physics at Howard University in Washington, D.C., 1873-1874, and at the University of Cincinnati, 1874-1883. While teaching at Howard University and the University of Cincinnati, Clarke collaborated with the Smithsonian Institution on atomic weight research.

In 1883, Clarke joined the United States Geological Survey and served as Chief Chemist until 1925. Clarke was also Honorary Curator in the Division of Mineralogy and Petrology, Department of Geology, United States National Museum, 1883-1931, where he organized the Museum's mineral and gem collection.

Brother Clarke also authored one of the first governmental reports on the teaching of science in the United States. The report was sponsored by the US Commissioner of Education in 1878 and titled: "Report on the teaching of chemistry and physics in the United States". It was printed by the Government Printing Office in Washington, DC. Clarke's stated purpose in writing the report was to "state the facts, and secondly, to point out defects and remedies--to show on the one hand what is, and on the other what ought to be" (p. 377) relative to the teaching of chemistry and physics in the United States. The report was exhaustive, spanning secondary institutions, normal schools, and more than 350 colleges and universities. It was referenced in Science, Vol. 2, No. 67. (Oct. 8, 1881), pp. 473-475.

In 1908 the first edition of Clarke's work, The Data of Geochemistry (Survey Bulletin no. 330), was published while he was the Chief Chemist at the U.S. Geological Survey. Clarke's fifth edition of this bulletin was released in 1924; the year he retired. The F.W. Clarke Award of the Geochemical Society is named after him. The mineral Clarkeite was named after him.
Professor and brother Frank Clarke, who was an instructor at Cornell in the University first year of operation, studied under Oliver Wolcott Gibbs:

- Oliver Wolcott Gibbs (Feb. 21, 1822 – Dec. 9, 1908), United States chemist, was born at New York. His father, Colonel George Gibbs, was an ardent mineralogist; the mineral gibbsite was named after him, and his collection was finally bought by Yale College. Entering Columbia College in 1837, Wolcott (he dropped the name "Oliver" at an early date) graduated in 1841, and, having assisted Robert Hare at Pennsylvania University for several months, he next entered the College of Physicians and Surgeons in New York, qualifying as a doctor of medicine in 1845.

Columbia University

Leaving America he studied in Germany with K.F. Rammelsberg, Heinrich Rose and Justus von Liebig, and in Paris with Auguste Laurent, JB Dumas, and HV Regnault, returning in 1848. In that year he became professor of chemistry at the Free Academy, now the College of the City of New York, and in 1863 he obtained the Rumford professorship in Harvard University, a post retained until his retirement in 1887 as professor emeritus.

Gibbs's researches were mainly in analytical and inorganic chemistry, the cobalt-amines, platinum metals and complex acids being especially investigated. He was an excellent teacher, and contributed many articles to scientific journals. See the Memorial Lecture by FW Clarke in the J.C.S. (1909), p. 1299.

Gibbs has been immortalized in the naming of the Gibbs features in and near Yosemite National Park. Mt. Gibbs stands 12,773 feet above sea level. Gibbs Lake is located at 9530 feet above sea level in the canyon northeast of the peak. Gibbs Lake is formed by Gibbs Creek, originating in the upper reaches of Gibbs Canyon, and drains into Lee Vining Canyon. Gibbs is also one of the few scientists recognized in the United States Capitol in Washington DC. A small statue of him is on the Amateis bronze doors. (See pp. 350 – 351 of Art in the United States Capitol, 1978, US Government Printing Office.)
Professor Oliver Wolcott Gibbs studied under Professor Justus von Leibig:

- Justus von Liebig (May 12, 1803 – April 18, 1873) was a German chemist who made major contributions to agricultural and biological chemistry, and worked on the organization of organic chemistry. He took his Ph.D. at Erlangen in 1822, and pioneered structural isomers and the development of artificial fertilizers. As a professor, he devised the modern laboratory-oriented teaching method, and for such innovations, he is regarded as one of the greatest chemistry teachers of all time.

  University of Erlangen

He is known as the "father of the fertilizer industry" for his discovery of nitrogen as an essential plant nutrient, and his formulation of the Law of the Minimum which described the effect of individual nutrients on crops.

He also developed a manufacturing process for beef extract, and founded a company, Liebig Extract of Meat Company, that later trademarked the Oxo brand beef bouillon cube. Liebig was born in Darmstadt into a middle class family. From childhood he was fascinated by chemistry and even was expelled from his grammar school for detonating an explosive device he had made at home from chemicals obtained from his father's drysaltery business. [This tale is probably apocryphal--there is no historical evidence that it occurred.] He was apprenticed to the apothecary Gottfried Pirsch (1792-1870) in Heppenheim.

Liebig attended the University of Bonn, studying under Karl Wilhelm Gottlob Kastner, a business associate of his father. When Kastner moved to the University of Erlangen, Liebig followed him and later took his doctorate from Erlangen.

Liebig did not receive the doctorate until well after he had left Erlangen, and the circumstances are clouded by a possible scandal [see Munday (1990)].

Also at Erlangen, Liebig fell in love with the poet August Graf von Platen (1796-1835) who wrote several sonnets dedicated to Liebig. He left Erlangen in March 1822, in part because of his involvement with the radical Korps Rhenania (a nationalist student organization) but also because of his hopes for more advanced chemical studies.
In autumn 1822 Liebig went to study in Paris on a grant obtained for him by Kastner from the Hessian government. He worked in the private laboratory of Joseph Louis Gay-Lussac, and was also befriended by Alexander von Humboldt and Georges Cuvier (1769-1832).

After leaving Paris, Liebig returned to Darmstadt and married Henriette Moldenhauer, the daughter of a state official. This ended Liebig's relationship with Platen.

In 1824 at the age of 21 and with Humboldt's recommendation, Liebig became a professor at the University of Giessen. He established the world's first major school of chemistry there. He received an appointment from the King of Bavaria to the University of Munich in 1852, where he remained until his death in 1873 in Munich. He became Freiherr (baron) in 1845.

He founded and edited from 1832 the journal *Annalen der Chemie*, which became the leading German-language journal of Chemistry. The volumes from his lifetime are often referenced just as *Liebigs Annalen*; and following his death the title was officially changed to *Justus Liebigs Annalen der Chemie*.

Liebig improved organic analysis with the *Kaliapparat*-- a five-bulb device that used a potassium hydroxide solution to remove the organic combustion product carbon dioxide. He downplayed the role of humus in plant nutrition and discovered that plants feed on nitrogen compounds and carbon dioxide derived from the air, as well as on minerals in the soil. One of his most recognized and far-reaching accomplishments was the invention of nitrogen-based fertilizer. Liebig believed that nitrogen must be supplied to plant roots in the form of ammonia.

Though a practical and commercial failure, his invention of fertilizer recognized the possibility of substituting chemical fertilizers for natural (animal dung, etc.) ones. He also formulated the Law of the Minimum, stating that a plant's development is limited by the one essential mineral that is in the relatively shortest supply, visualized as "Liebig's barrel". This concept is a qualitative version of the principles used to determine the application of fertilizer in modern agriculture.

He was also one of the first chemists to organize a laboratory as we know it today. His novel method of organic analysis made it possible for him to direct the analytical work of many graduate students. The vapor condensation device he popularized for his research is still known as a Liebig condenser, although it was in common use long before Liebig's research began. Liebig's students were from many of the German states as well as Britain and the United States, and they helped create an international reputation for their *Doktorvater*. 
In 1835 he invented a process for silvering that greatly improved the utility of mirrors.

Liebig's work on applying chemistry to plant and animal physiology was especially influential. At a time when many chemists such as Jöns Jakob Berzelius insisted on a hard and fast separation between the organic and inorganic, Liebig argued that "...the production of all organic substances no longer belongs just to the organism. It must be viewed as not only probable but as certain that we shall produce them in our laboratories. Sugar, salicin [aspirin], and morphine will be artificially produced." [Liebig and Woehler (1838)]

Liebig's arguments against any chemical distinction between living (physiological) and dead chemical processes proved a great inspiration to several of his students and others who were interested in materialism. Though Liebig distanced himself from the direct political implications of materialism, he tacitly supported the work of Karl Vogt (1817-1895), Jacob Moleschott (1822-1893), and Ludwig Buechner (1824-1899).

Liebig played a more direct role in reforming politics in the German states through his promotion of science-based agriculture and the publication of John Stuart Mill's Logic. Through Liebig's close friendship with the Vieweg family publishing house, he arranged for his former student Jacob Schiel (1813-1889) to translate Mill's important work for German publication. Liebig liked Mill's Logic in part because it promoted science as a means to social and political progress, but also because Mill featured several examples of Liebig's research as an ideal for the scientific method. Liebig is also credited with the notion that "searing meat seals in the juices."[2] This idea, still widely believed, is not true.

Working with Belgian engineer George Giebert, Liebig devised an efficient method of producing beef extract from carcasses. In 1865, they founded the Liebig Extract of Meat Company, marketing the extract as a cheap, nutritious alternative to real meat. Some years after Liebig's death, in 1899, the product was trademarked "Oxo".

After World War II, the University of Giessen was officially renamed after him, "Justus-Liebig-Universität Giessen". In 1953 the West German post office issued a stamp in his honor.
Justus von Leibig studied under Professor Karl Wilhelm Gottlob Kastner:

- Karl Wilhelm Gottlob Kastner (1783 - 1857) was a German chemist and natural scientist. Kastner is best known today as the teacher of chemist Justus von Liebig. Kastner received his doctorate in 1805 at Jena under the guidance of Johann Gottling and began lecturing at the University of Jena. He moved on to the University of Heidelberg and became professor at the University of Halle in 1812. In 1818 he relocated to the University of Bonn. Again he moved on, partly for political reasons, to the University of Erlangen, where he remained for the remainder of his professional life.

Liebig, who had come to Bonn to study with Kastner, followed him to Erlangen and received his doctorate in 1822. Many of Kastner's academic positions required not only the teaching of chemistry, but also mathematics, zoology, physics, mineralogy, geology, and pharmacy. He is best remembered for his work with triboluminescence and hydrogen/platinum reactions.
Professor Karl Wilhelm Gottlob Kastner was taught by Johann Friedrich August Göttling:

- Johann Friedrich August Göttling (1753-1809) was a notable German chemist. He received his Apothecary degree in 1775 at Langensalza under Johann Christian Wiegleb. Gottling developed and sold chemical assay kits and studied processes for extracting sugar from beets, to supplement his meagre university salary. He studied the chemistry of sulphur (S), arsenic (Ag), phosphorus (P), and mercury (Hg). He wrote texts on analytical chemistry and studied oxidation of organic compounds by nitric acid.

He was one of first in Germany to take a stand against the phlogiston hypothesis and for the new chemistry of Lavoisier. He was notably the teacher of Karl Wilhelm Gottlob Kastner, and is best remembered for his work with the oxidation of organics with HNO₃.
Professor Johann Friedrich August Göttling studied apothecary under Johann Christian Wiegleb at Langensalza:

- Johann Christian Wiegleb was born on 21.12.1732 in the Sachsen city of Langensalza, the son of a lawyer. In the Age of Enlightenment Wiegled helped science, particularly chemistry and pharmacy, in diverse ways to its breakthrough. As an acknowledged member of the developing chemistry scientist community, he was one of the co-founders of the new, scientifically founded pharmacy at the end of the 18th century. In Dresden, Wiegled became an apothecary after six years of training. In 1755 he returned to Langensalza and opened his own pharmacy in 1759.

Because of illness and increasing weakness he had to give up business management of his pharmacy in 1796.

Wiegled began with chemical experiments and developed theories by himself. Under the influence and support of physician Ernst Gottfried Baldinger who worked for some years in Langensalza and became an Apothecary in 1765. Wiegled then published his first chemical treatise on the theory of the „Acidum pinguis“, in 1767. A great number of further works followed such as monographs and journal themes which were printed in the first chemical-technical journal „Chemical Journal“ published by Lorenz Crell.

Historical-critical investigation of the “alchemy” was the most important and most influential contribution in that time against alchemy and for chemistry as a science. Wieglesbs exceptional and extensive activity as an author, editor and translator prove his profound knowledge of chemistry, languages, literature and history. His general recognition as chemist led to the acception in the Imperial German academy of natural researchers (Leopoldina) and the "Kurmainzische Academy of sciences for the common good“ in Erfurt in 1776.

Wiegled founded the first private chemical teaching-institution for the scientific training of druggists in 1779. More than 40 young druggists and academics from German and European countries received instruction by him particularly in chemistry. With the „Handbook of General Chemistry“ written by him arose a textbook of great importance, as well to following generations.
Two of his pupils, the later professor for chemistry and technology at the newly founded University of Berlin, Sigismund Friedrich Hermstadaedt (1760-1833) and the druggist, chemist and professor for chemistry at the University of Jena, Johann Friedrich August Göttling (1753-1809) also founded chemical-pharmaceutical teaching-institutions based on Wiegleb’s model. Together with Dr. Johann Christian Traugott Schlegel from Langensalza Wiegleb published the second revised edition of the “Deutsches Apothekerbuch” (German druggists book) in 1793 which was published in several editions and became the standard literature for druggists. Because of his excellent chemical and scientific knowledge and his personal qualities he was appreciated in his home town and chosen into the city council. From 1770 up to the end of his life he was active in different fields, since 1783 as treasurer for the city and their citizens.

Wiegleb married Rebecca Christina Reisig the daughter of a druggist in 1758. From their seven children only two daughters survived the father. Wiegleb died on 16th January 1800 in Langensalza. He was restricted in his movement after 1789, due to an accident in the laboratory. Wiengleb is best remembered for the founding of the Chemical-Pharmacy Instituted at Langensalza.
Johann Christian Wiegleb studied under Dr. Baldinger:

Ernst Gottfried Baldinger (13 May 1738 - 21 January 1804), German physician and professor of medicine, was born near Erfurt. He studied medicine at Erfurt, Halle and Jena, earning his M.D. at Jena in 1760 under the guidance of Christoph Mangold and in 1761 was entrusted with the superintendence of the military hospitals connected with the Prussian encampment near Torgau. He was a surgeon in the Seven Years War. He published in 1765 a treatise *De Militum Morbis*, which met with a favourable reception.

In 1768 he became professor of medicine at Jena, whence he removed in 1773 to Göttingen, and in 1785 to Marburg, where he died of apoplexy on January 21, 1804. Among his pupils were ST Sommerring and J.F' Blumenbach, and Johann Christian Wiegleb. Some eighty-four separate treatises are mentioned as having proceeded from his pen, in addition to numerous papers scattered through various collections and journals.
Dr. Baldinger studied under
Dr. Mangold:

- Christoph Andreas Mangold (1719-1767) was a professor of anatomy, who also studied chemistry and philosophy, taking his M.D. at Erfurt in 1751. He is known for his studies of gunpowder and cinnabar as well as the idea that medical diagnosis should be based upon symptoms, laboratory tests and comparisons with other patients. He was notably the advisor of Ernst Gottfried Baldinger.

He argued for practical demonstration in medicine on psychological grounds that the clearest notion we have are those developed directly from sensory experience and that repeated experiences involving several senses produced the best knowledge.

Mangold’s experimentation on cinnabar may have been for medicinal or alchemical purposes. Cinnabar, a naturally occurring mercuric sulfide (HgS), has long been used in combination with traditional Chinese medicine as a sedative for more than 2000 years. Up to date, its pharmacological and toxicological effects are still unclear, especially in clinical low-dose and long-term use. Cinnabar is a colorful mineral that adds a unique color to the mineral color palette. Its cinnamon to scarlet red color can be very attractive. Well shaped crystals are uncommon and the twinned crystals are considered classics among collectors. The twinning in cinnabar is distinctive and forms a penetration twin that is ridged with six ridges surrounding the point of a pyramid. It could be thought of as two scalahedral crystals grown together with one crystal going the opposite way of the other crystal. Cinnabar was mined by the Roman Empire for its mercury content and it has been the main ore of mercury throughout the centuries. Some mines used by the Romans are still being mined today. Cinnabar shares the same symmetry class with quartz but the two form different crystal habits.

The University of Erfurt was founded in 1392 as the third university in the territory which is now Germany; for some time, it was the largest university in the country. When the town of Erfurt became part of Prussia in 1816, the university was closed.

In December 1993, the Thuringian state parliament voted to reestablish the university. The university was officially refounded on January 1, 1994. Lectures began in the winter term from 1999 to 2000. Shortly afterwards, the rector who had overseen the founding, Peter Glotz, a politician in the SPD party,
left the university. The position was taken over by Wolfgang Bergsdorf, a friend of Bernhard Vogel, Thuringia's Minister-president.

In 2001, the Erfurt University of Pedagogy (*Pädagogische Hochschule Erfurt*), founded in 1969, became part of the university. On January 1, 2003, a fourth faculty was added to the university in the form of the Roman Catholic Theological Faculty, previously the Erfurt Philosophical and Theological Centre, *Philosophisch-Theologisches Studium Erfurt*.

In 2003, a chronic lack of financing meant that there were many redundancies and that vacancies were left unfilled: this led to student protests all over Thuringia. The university management and committees were reformed and the situation was stabilized. Institutions of particular note are the Max Weber College for Cultural and Social Sciences and the Erfurt School of Public Policy (ESPP), which is partly financed by tuition fees. The Erfurt-Gotha Research Library houses the famous *Amploniana* collection of scripts from the Middle Ages.

The University of Erfurt is sometimes thought of as a reformist university. Martin Luther once attended it in 1502, receiving his bachelor's degree. Its main focuses are multidisciplinarity, internationality and a strong mentoring system, although in fact the student body is largely regional. All new courses lead to the new Bachelor of Arts or Master's degree rather than the traditional German *Diplom*, which makes Erfurt one of the first German universities to completely implement the Bologna process.

An especially important faculty is that of *Staatswissenschaften* (Government Studies), the only one in Germany to offer integrated courses in economics, social sciences and law.
Dr. Mangold studied under Dr. Hamberger:

- Georg Erhardt Hamberger, professor of medicine, surgery and botany took his M.D. at Jena in 1721. Jena was about 175 years old at the time. The elector John Frederick, Elector of Saxony first thought of a plan to establish a university at Jena in 1547 while he was being held captive by emperor Charles V. The plan was put into motion by his three sons and, after having obtained a charter from the emperor Ferdinand I, the university was established on February 2, 1558. Prior to the 20th century, University enrollment peaked in the 18th century.

The university's reputation peaked under the auspices of duke Charles Augustus, Goethe's patron (1787–1806), when Gottlieb Fichte, Georg Hegel, Friedrich Schelling, Friedrich von Schlegel and Friedrich Schiller were on its teaching staff. Founded as a home for the new religious opinions of the sixteenth century, it has since been one of the most politically radical universities in Germany. Jena was noted among other German universities at the time for allowing students to duel and to have a passion for Freiheit, which were popularly regarded as the necessary characteristics of German student life. The University of Jena has preserved a historical detention room or Karzer with famous caricatures by Swiss painter Martin Disteli.
Dr. Hamberger studied under Dr. Wedel, again, at Jena:

- Johann Adolph Wedel, professor of surgery, botany, theoretical medicine, practical medicine and chemistry, took his M.D. at Jena in 1669. At the end of the 18th and the beginning of the 19th centuries, Jena came under intense state scrutiny. The German government militated against the university, which remained unpopular until recent times. This is believed to have been caused by the opening of new universities and the suspicions of the various German governments in regard to the democratic ideas coming out of Jena.

In the latter 19th century, the department of zoology taught evolutionary theory, with Carl Gegenbaur, Ernst Haeckel, and others, publishing detailed theories at the time of Darwin's "Origin of Species" (1858). The later fame of Ernst Haeckel eclipsed Darwin in some European countries, as the term "Haeckelism" was more common than Darwinism.

In 1905, Jena had 1100 students enrolled, and its teaching staff (including privatdozenten) numbered 112. Amongst its numerous auxiliaries then were the library, with 200,000 volumes; the observatory; the meteorological institute; the botanical garden; the seminaries of theology, philology, and education; and the well-equipped clinical, anatomical, and physical institutes.

During the 20th century, the cooperation between Zeiss corporation, and the university brought new prosperity and attention to Jena, resulting in a dramatic increase in funding and enrollment.

Jena is home to “Academic fencing” or “Mensur”, which enjoyed a brief time as fashion within New York Alpha, at the turn of the twentieth century, just before the move to the Chapter’s third quarters at Old Three Twelve. Mensur is the traditional kind of fencing practiced by some student corporations (Studentenverbindungen) in Germany, Austria, Switzerland and recently to a minor extent in Latvia and Flanders as well. It is not a politically correct form of exercise in the United States.

Modern academic fencing, the "Mensur," is neither a duel nor a sport. It is a traditional way of training and educating character and personality; thus, in a Mensur bout, there is neither winner nor loser. In comparison to sport fencing, the participants stand their ground at a fixed distance. At the beginning of the
tradition, duellists wore only their normal clothing (as duels sometimes would arise spontaneously) or light cloth armor on arm, torso, and throat. In recent years, fencers are protected by a chain mail shirt, chain mail gauntlets, padding on the throat and right arm, and steel goggles with a nose guard. They fence at arm's length and stand more or less in one place, while attempting to hit the unprotected areas of their opponent's face and head. Flinching or dodging is not allowed, the goal being less to avoid injury than to endure it stoically. Two physicians are present (one for each opponent) to attend to injuries and stop the fight if necessary.

The participants, or Paukanten, use specially-developed swords. The so-called Mensurschläger (or simply Schläger; the plural form is identical to the singular form), exist in two versions. The most common weapon is the "Korbschläger" with a basket-type hilt (German Korb or "basket"). In some universities in the eastern part of Germany, the so-called "Glockenschläger" is in use which is equipped with a bell-shaped hilt (German Glocke or "bell"). These universities are Leipzig, Berlin, Greifswald, Dresden, Tharandt (in the Forestry College which is now part of Technische Universität Dresden), Halle on the Saale, Frankfurt/Oder, and Freiberg. In Jena both "Korbschläger" and "Glockenschläger" are used. Studentenverbindungen from some western cities use "Glockenschläger" because their tradition had its origin in one of the eastern universities but moved to Western Germany after WWII.

The scar resulting from a hit is called a Schmiss (German for a "smite") which was seen as a badge of honour especially in the second half of the 19th century and the first half of the 20th century. The GI Joe toy of the 1960s, modeled on a German army officer, exhibited a "smite". Today it is not easy for an outsider to identify Mensur scars in the face of a conversation partner due to better medical treatment.

Starting in Spain at the end of the 15th century, the dueling sword became a regular part of the attire of noblemen throughout Europe. In the Holy Roman Empire this became usual among students as well. Brawling and fighting was a regular occupation of students in the German speaking areas during the early modern period. In line with developments in the aristocracy and the military, regulated duels were introduced to the academic environment as well. The basis of this was the conviction that being a student meant being something different from the rest of the population. Students wore special clothes, developed special kinds of festivities, sang student songs, and fought duels, sometimes spontaneously (so called rencontre, French "meeting" or "combat"), sometimes according to strict regulations called comment (French "how"). The weapons used were the same as those employed in civilian dueling, being at first the rapier and later the smallsword (court sword, dress sword, French L'épée de cour, German Kostümdegen, Galanteriedegen) which was seen as part of the dress and always at hand as a side arm.
Student life was quite unsafe in these years, especially in the 16th and 17th century during the Reformation wars and the Thirty Year War (1618-1648) when a major part of the German population was killed. Public life was brutal and students killing each other in the street was not uncommon.

A major step towards civilization was the introduction of the "regulated" duel of which the first recordings exist from the 17th century. The fight was not decided on the spot but the time and location were appointed and negotiations were done by officials. A so-called Kartellträger did the arrangements and a second represented the interests of the fighter during the duel and could even give physical protection from illegal actions. A kind of referee was present to make decisions and eventually the practice of having an attending doctor became normal so as to give medical help in case of an injury.

At the end of the 18th century (after the French Revolution), wearing of weapons in everyday life fell out of fashion and was more and more forbidden, even for students. This certainly reduced the number of spontaneous duels dramatically. The regulated duel remained in use although it continued to be forbidden.

The foil was invented in France as a training weapon in the middle of the 18th century in order to practice fast and elegant thrust fencing. Fencers blunted the point by wrapping a foil around the blade or fastening a knob on the point ("blossom", French fleuret). In addition to practising, some fencers took away the protection and used the sharp foil for duels. German students took up that practice and developed the Pariser ("Parisian") thrusting small sword for the Stoßmensur ("thrusting mensur"). After the dress sword was abolished, the Pariser became the only weapon for academic thrust fencing in Germany.

Since fencing on thrust with a sharp point is quite dangerous, many students died from their lungs being pierced (Lungenfuchser) which made breathing difficult or impossible. However, the counter movement had already started in Göttingen in the 1760s. Here the Göttinger Hieber was invented, the predecessor of the modern Korbschläger, a new weapon for cut fencing. In the following years, the Glockenschläger was invented in East German universities for cut fencing as well.

Thrust fencing (using Pariser) and cut fencing using Korbschläger or Glockenschläger) existed in parallel in Germany during the first decades of the 19th century - with local preferences. So thrust fencing was especially popular in Jena, Erlangen, Würzburg and Ingolstadt/Landshut, two towns where the predecessors of Munich university were located. The last thrust Mensur is recorded to have taken place in Würzburg in 1860.

Until the first half of the 19th century all types of academic fencing can be seen as duels, since all fencing with sharp weapons was about honour. No
combat with sharp blades took place without a formal insult. Compared to pistol
duels, these events were quite harmless. The fight was regularly ended when an
injury occurred which caused a wound with a length of at least one inch and with
at least one drop of blood coming out from it. It was not uncommon that students
fought approximately 10 to 30 duels of that kind during their university years. The
German student Fritz Bacmeister is regarded to be the record holder of the 19th
century due to his estimated 100 mensur bouts fought in Göttingen, Jena and
Würzburg between 1860 and 1866.\[1\]

For duels with non-students, e.g. military officers, the academic sabre
became usual, apparently derived from the military sabre. It was a heavy weapon
with a curved blade and a hilt similar to the Korbschläger.

During the first half of the 19th century and some of the 18th century,
students believed that the character of a person could easily be judged by
watching him fight with sharp blades under strict regulations. Academic fencing
was more and more seen as a kind of personality training by showing
countenance and fairness even in dangerous situations. Student corporations
demanded that their members fight at least one duel with sharp blades during
their university time. The problem was that some peaceful students had nobody
to offend them. The solution was a kind of formal insult which did not actually
infringe honour but was just seen as a challenge for fencing. The standard
wording was dummer Junge (German for "silly boy").

In the long term, this solution was unsatisfying. It was around 1850 that
the Bestimmungsmensur (German bestimmen means "ascertain", "define" or
"determine") was developed and introduced throughout Germany. This meant
that the opponents of a Mensur were determined by the fencing official of their
corporations. These officials were regularly vice-chairmen (Consenior) and
responsible for arranging Mensur bouts in cooperation with their colleagues from
other corporations. Their objective was to find opponents of equal physical and
fencing capabilities in order to make the event challenging for both participants.
That is the way it is still done today. That is the concept of the Mensur in the
modern sense of the word.

Before the Communist revolution in Russia and before World War II,
academic fencing was known in most countries of Eastern Europe as well.

Academic fencing in Germany was temporarily abolished, along with the
Studentenverbindungen, during the Third Reich, but it is still practiced by
hundreds of traditional Studentenverbindung corporations.
Dr. Wedel studied under Dr. Werner Rolfinck at the University of Padua:

- Werner Rolfinck was a German physician, scientist and botanist, being the first Professor of Chemistry at the University of Jena, as well as a professor of anatomy, surgery and botany. He was a medical student in Leyden, Oxford, Paris and Padua. He earned his master's degree at the University of Wittenberg under Daniel Sennert, and his MD in 1625 at the University of Padua under the guidance of Adriaan van den Spiegel.

In 1629, he became a professor at the University of Jena. His experimental research involved chemical reactions and the biochemistry of metals. He rejected the view that other metals could be transformed into gold.

The University of Padua (Italian Università degli Studi di Padova, UNIPD), located in Padua, Italy, was founded in 1222. It is among the earliest of the universities and the third oldest in Italy. As of 2003 the university had approximately 65,000 students.

The university was founded in 1222 when a large group of students and professors left the University of Bologna in search of more academic freedom ('Libertas scholastica'). The first subjects to be taught were jurisprudence and theology. The curriculum expanded rapidly, however and by 1399 the institution had divided in two: a Universitas Iuristarum for civil law, Canon law, and theology, and a Universitas Artistarum which taught astronomy, dialectic, philosophy, grammar, medicine, and rhetoric. (The two were only reunited into one university in 1813.)

The student body was divided into groups known as 'nations' which reflected their places of origin. The nations themselves fell into two groups: the cismontanes for the Italian students and the ultramontanes for those who came from beyond the Alps.

From the fifteenth to the eighteenth century, the university was renowned for its research, particularly in the areas of medicine, astronomy, philosophy and law. This was thanks in part to the protection of the Republic of Venice, which enabled the university to maintain some freedom and independence from the influence of the Roman Catholic Church. During this time, the University adopted the Latin motto: Universa universis patavina libertas (Paduan Freedom is
Universal for Everyone). The university had a turbulent history, and there was no teaching in 1237-61, 1509-17, 1848-50.

The Botanical Garden of Padova, established by the university in 1545, was the second such garden in the world, and is the oldest which remains to this day on its original site. In addition to the garden, best visited in the spring and summer, the university also manages nine museums, including the renowned Museum of History of Physics.

Since 1595, Padua's famous anatomical theatre drew artists and scientists studying the human body during public dissections. It is the oldest surviving permanent anatomical theatre in Europe. Among the students was illustrator Andreas Versalius, author of De Humani Corporis Fabrica (1543). The book triggered great public interest in dissections and caused many other European cities to establish anatomical theatres.

On June 25, 1678, Elena Lucrezia Cornaro Piscopia became the first woman graduate in history when she was awarded a degree in Philosophy.

The University became one of the universities of the Kingdom of Italy in 1873, and ever since has been one of the most prestigious in the country for its contributions to scientific and scholarly research: in the field of mathematics alone, its professors have included such figures as Gregorio Ricci Curbastro, Giuseppe Veronese, Francesco Severi and Tullio Levi Civita.

The last years of the nineteenth and the first half of the twentieth century saw a reversal of the centralisation process that had taken place in the sixteenth: scientific institutes were set up in what became veritable campuses; a new building to house the Arts and Philosophical faculty was built in another part of the city centre (Palazzo del Liviano, designed by Giò Ponti); the Astro-Physics Observatory was built on the Asiago uplands; and the old Palazzo del Bo was fully restored (1938-45). Obviously, the vicissitudes of the Fascist period - political interference, the Race Laws, etc - had a detrimental effect upon the development of the university, as did the devastation caused by the Second World War and - just a few decades later - the effect of the student protests of 1968-69 (which the University was left to face without adequate help and support from central government). However, the Gymnasium Omnium Disciplinarum continued its work uninterrupted, and overall the second half of the twentieth century saw a sharp upturn in development - primarily due an interchange of ideas with international institutions of the highest standing (particularly in the fields of science and technology).

In recent years, the University has been able to meet the problems posed by overcrowded facilities by re-deploying over the Veneto as a whole. In 1990, the Institute of Management Engineering was set up in Vicenza; then the summer courses at Brixen (Bressanone) began once more; and in 1995 the
Agripolis centre at Legnaro - for Agricultural Science and Veterinary Medicine - opened. Other sites of re-deployment are at Rovigo, Treviso, Feltre, Castelfranco Veneto, Conegliano, Chioggia and Asiago.

Recent changes in state legislation have also opened the way to greater autonomy for Italian universities, and in 1995 Padua adopted a new Statute that gave it greater independence.

As the publications of innumerable conferences and congresses show, the modern-day University of Padua plays an important role in scholarly and scientific research at both a European and world level. True to its origins, this is the direction in which the Institution intends to move in the future, establishing closer and closer links of co-operation and exchange with all the world's major research universities.
Dr. Werner Rolfinck, also at the University of Padua, studied under Dr. Adriaan van den Spieghel:

- Adriaan van den Spiegel, professor of Anatomy, Surgery and Botany, was the son and grandson of surgeons. His father, then inspector general of the military and naval surgeons of the Dutch Republic, died in 1600. The family was probably well off, however, and both Adriaan and his brother Gijsbertus studied medicine. Adriaan attended the universities of Louvain (Löwen) and Leiden, and from 1601 at Padua, where he registered in the student sector known as the “German nation,” or the Natio Germanica.

At Padua he studied under Hieronymus Fabricius ad Aquapendente (1537-1619) and Giulio Casserio (1561-1616) and probably graduated in 1603. From 1606 he was physician to the students of the Natio Germanica.

In this period Spiegel probably assisted Fabrici in his private practice. He accompanied the old man on a trip to Florence to treat a Medici prince, and on another to Venice, where Fabrici gave a consultation. During these years Spiegel studied botany and wrote an introduction to the science, Isogoge in rem herbariam libri duo (1606), which he dedicated to the students of the Natio Germanica.

In 1607 he competed for the chair of practical medicine at Padua, left vacant by the death of Ercole Sassonia (1551-1607). The German nation, at Spiegel’s request, recommended him to the Riformatori for the position, but Spiegel did not get the chair.

In 1612 he left Italy for Belgium. He remained there briefly, however, then travelled through Germany and finally settled in Moravia. Soon afterwards he became medicus primarius of Bohemia.

On December 22, 1616, the Venetian Senate appointed Spiegel professor of anatomy and surgery. He had been nominated to this position by the Venetian patrician, Giustiniani, Venetian ambassador to the emperor in Prague when Spiegel was there.
Spiegel attracted many foreign students to his public performances in the famous theatre at Padua. On January 25, 1623, he was elected knight of Saint Marcus. He died two years later after an illness of some six weeks.

Spiegel is considered by historians to be the last of the great Paduan anatomists. Although known primarily as an anatomist, Spiegel was a busy and much sought clinician.

In 1606 Spigelius published the first instructions on making dried herbarium specimens (in his Isagoges in Rem Herbarium) - a technique that had only come into practice during the previous 50 years.
Dr. Adriaan van den Spieghel studied under Giulio Casseri, again at Padua:

- Giulio Cesare Casseri, M.D., Ph.D., took his doctorate in medical studies at Padua in 1580, then went on to be a professor of surgery and anatomy at the same. He lived 64 years, being born at Piacenza around 1552 and dying at Padua, March 8, 1616. His father was a humble and poor peasant, Luca Casseri. Giulio enrolled in the Facolta Artista and studied with Fabrizio and Mercuriale. The thought is that he arrived at Padua as the servant of a student from Piacenza.

He then became the servant of Fabrizio, whom he assisted in the latter's dissections. His interests were in anatomy, physiology and embryology. His achievements are collected in three anatomical works: *De vocis auditusqueorganis historia anatomica* (Ferrara, 1600-1601), *Pentaestheseion, hoc est de quinque sensibus liber* (Venice, 1609), and *Tabulae anatomicae LXXIX, omnes nec ante hac visae* (Venice, 1627). He left important illustrations of the formation of the foetus.

He supported himself through the practice of medicine, and through teaching. His medical practice in Padua, 1580-1616, brought him a small fortune. Giulio was a public lecturer at the University from 1609-1616 (Medicine), and concurrently from 1614-1616 (Anatomy). Early, after obtaining his degree, Casseri gave private lessons, with dissections, in Padua, until 1586. As Fabrizio began to decline with age and suspended his lectures in 1595, the students urged Casseri to replace him, which he did (privately) with enough success that Fabrizio resumed lectures. Fabrizio's envy of Casseri mounted and changed into hostility. The students wanted Casseri and privately supplied him with cadavers for dissection. Fabrizio continued to get legal prohibitions of the private dissections, and when he finally could lecture no more he blocked Casseri's appointment to replace him. Capparoni says that in 1604 the Riformatori officially approved Casseri as a substitute for Fabrizio when he was unable to lecture. Finally in 1609 the Riformatori separated surgery from anatomy, reserved anatomy to Fabrizio, and appointed Casseri to the chair in surgery. Eventually he did succeed Fabrizio, even though Fabrizio was still alive. The rivalry blocked the publication of Casseri's *Tabulae* during his life. Fabrizio outlived him.
He obtained patronage as a scientist, city magistrate and court official. Venice made Casseri a Knight of San Marco. He refused offers to leave Padua for Turin and Parma. However, he did dedicate *De vocis* to the Duke of Parma.
Dr. Giulio Casseri, again at Padua, studied under Girolamo Fabrici:

- Girolamo “Aquapendente” Fabrici, professor of anatomy and surgery, took his doctorate in medicine at Padua University in 1559. He was born on May 20, 1537 at Aquapendente on the Italian peninsula and died on May 21, 1619 at Padua in the Republic of Venice. Dr. Fabrici was an Italian anatomist and embryologist, surnamed “Acquapendente” from the city of that name, where he was born in 1537.

At Padua, after a course of philosophy, he studied medicine under Gabriele Falloppio, whose successor as teacher of anatomy and surgery he became in 1562. Among his pupils there was William Harvey, who later elaborated the circulation of the blood. From the senators of Venice Fabrici received numerous honors, and an anatomical theater was built by them for his accommodation. He died at Venice on the 21st of May 1619.

His works include *De visione, voce et auditu* (1600), *De fortunato foetu* (1600), *De venarum ostiolis* (1603), *De formatione ovi et pulli* (1621). His collected works were published at Leipzig in 1687 as *Opera omnia Anatomica et Physiologica*, but the Leiden edition, published by Albinus in 1738, is preferred as containing a life of the author and the prefaces of his treatises.
Dr. Girolamo Fabrici studied under Gabriele Fallopio, who took his doctorate at Ferrera:

- Gabriele Fallopio took his doctorate in medicine at Ferrara in 1548, and then went on to become a professor of botany, surgery and anatomy. He was born in 1523 and died on October 9, 1562, often known by his Latin name Fallopius, was one of the most important anatomists and physicians of the sixteenth century. He was born at Modena and died at Padua. His family was noble but very poor and it was only by a hard struggle he succeeded in obtaining an education.

Financial difficulties led him to join the clergy, and in 1542, he became a canon at Modena's cathedral. He studied medicine at Ferrara, at that time one of the best medical schools in Europe. He received his MD in 1548 under the guidance of Antonio Musa Brassavola.

After taking his degree he worked at various medical schools and then became professor of anatomy at Ferrara, in 1548. Girolamo Fabrici was one of his famous students. He was called the next year to Pisa, then the most important university in Italy. In 1551 Falloppio was invited by Cosimo I, Grand Duke of Tuscany, to occupy the chair of anatomy and surgery at the University of Padua. He also held the professorship of botany and was superintendent of the botanical gardens. Though he died when less than forty, he had made his mark on anatomy for all time.

This was the golden age of anatomy and Falloppio's contemporaries included such great anatomists as Vesalius, Eustachius, and Realdo Colombo (whom he succeeded at Padua). It has sometimes been asserted that he was jealous of certain of the great discoverers in anatomy and that this is the reason for his frequent criticisms and corrections of their work. However, Heinrich Haeser, an authority in medical history, declared that Falloppio was noted for his modesty and deference to his fellow workers and especially to Vesalius. His purpose in suggesting corrections, therefore, was the advance of the science of anatomy.

Falloppio's own work dealt mainly with the anatomy of the head. He added much to what was known before about the internal ear and described in detail the tympanum and its relations to the osseous ring in which it is situated. He also
described minutely the circular and oval windows (fenestræ) and their communication with the vestibule and cochlea. He was the first to point out the connection between the mastoid cells and the middle ear. His description of the lacrimal ducts in the eye was a marked advance on those of his predecessors and he also gave a detailed account of the ethmoid bone and its cells in the nose. His contributions to the anatomy of the bones and muscles were very valuable. It was in myology particularly that he corrected Vesalius. He studied the reproductive organs in both sexes, and described the Fallopian tube, which leads from the ovary to the uterus and now bears his name. The aquæductus Fallopii, the canal through which the facial nerve passes after leaving the auditory nerve, is also named after him.

His contributions to practical medicine were also important. He was the first to use an aural speculum for the diagnosis and treatment of diseases of the ear, and his writings on surgical subjects are still of interest. He published two treatises on ulcers and tumors, a treatise on surgery, and a commentary on Hippocrates's book on wounds of the head. In his own time he was regarded as somewhat of an authority in the field of sexuality. His treatise on syphilis advocated the use of condoms, and he initiated what may have been the first clinical trial of the device. Falloppio was also interested in every form of therapeutics. He wrote a treatise on baths and thermal waters, another on simple purgatives, and a third on the composition of drugs. None of these works, except his Anatomy (Venice, 1561), were published during his lifetime. As we have them, they consist of manuscripts of his lectures and notes of his students. They were published by Volcher Coiter (Nuremberg, 1575).

The University of Ferrara (Italian: Università degli Studi di Ferrara) is the main university of the city of Ferrara in the Emilia-Romagna region of northern Italy. In the years prior to the First World War the University of Ferrara, with more than 500 students, was the best attended of the free universities in Italy. Today there are approximately 12,000 students enrolled at the University of Ferrara with nearly 400 degrees granted each year. The teaching staff number 600, including 223 researchers. It is organized into 8 Faculties.

The University of Ferrara was founded on March 4, 1391 by Marquis Alberto V D'Este with the permission of Pope Boniface IX. The Studium Generale was inaugurated on St. Luke's Day (October 18) of that year with courses in law, arts and theology. After the unification of Italy, Ferrara University became a free university with faculties of Law and Mathematics, a three-year course in Medicine (reduced to two years in 1863-64), as well as Schools of Veterinary Medicine (abolished in 1876), Pharmacy, and for public Notaries.

After World War II, it started to be state-supported and this allowed the opening of many faculties and research departments. The most remarkable growth took place between the '70s and the '80s, when Prof. Antonio Rossi was in charge of it as Rector.
Dr. Gabriele Fallopio, again at Ferrera, studied under Dr. Brasavola:

Antonio Musa Brasavola took his doctorates in philosophy and medicine at Ferrara in 1520 and went on to become physician to King Francis I of France; King Henry VIII of England, and Emperor Charles of the Holy Roman Empire. An examination of the careers of three successive professors of medicine at the University of Ferrara – Nicolò Leoniceno, Giovanni Manardi, and Antonio Musa Brasavola – demonstrates the development of medical humanism, the Renaissance substitution of classical Greek medical authorities, chiefly Galen, for the medieval reliance on Latin translations of Arabic medical authorities.

Leoniceno taught philosophy as well as medicine, had an excellent knowledge of Greek, and a substantial knowledge of Greek scientific texts, but little experience or interest in medical practice.

Manardi, his successor, had an extensive medical practice as well as a long and distinguished teaching career. He was interested in practical medicine and the practical, medical side of Galen's writings, not the philosophical and abstract. He wrote on his own efficacious use of Galenic therapies for persistent maladies, the systematic terminology of medicine, and botanical pharmacology.

His successor, Brasavola, shared his interest in botany, pharmacology, and the practice of medicine. Brasavola's work on Galen includes an extensive index and an exposition of the Aphorisms that displays considerable philological erudition. Medical humanism in Ferrara emphasized the medical classics elucidated through Greek commentary and a practical interest in botany and pharmacology, and it enjoyed considerable success and prestige among scholars and physicians outside the university community.

Brasavola was the first to revive the the tracheotomy, one of the oldest surgical procedures. Amazingly, a tracheotomy was portrayed on Egyptian tablets dated back to 3600 BC. Asclepiades of Persia is credited as the first person to perform a tracheotomy in 100 BC. The first successful tracheotomy was performed by in the 15th century. In the 16th century, Guidi invented an
original method for tracheotomy. Reports of tracheotomies can be found in medical literature sporadically from the second to the eighteenth centuries. However, well documented studies do not appear until the early 1900’s. Antonio Musa Brasavola, an Italian physician, performed the first documented case of a successful tracheotomy. He published his account in 1546. The patient, who suffered from a laryngeal abscess and recovered from the procedure.
Dr. Antonio Brasavola studied at Ferrera under Nicolo Leoniceno, a graduate of Padua:

- Nicolo da Lonigo, or Leoniceno, took his doctorates in medicine and philosophy at Padua in 1453, and went on to become a professor of mathematics, Greek philosophy, and medicine. He was born in 1428 at Lonigo, and he died in 1524 at Ferrara; he was also also known as Nicolo Leoniceno, Nicolaus Leoninus, Nicolaus Leonicenus of Vicenza, Nicolaus Leonicenus Vicentinus, Nicolo Lonigo, Nicolò da Lonigo da Vincenza). Nick was an Italian physician and humanist.

He was the son of a doctor. His teacher was Pelope (1386-1459), a Croatian apothecary. He studied medicine and philosophy in Vicenza and then at the University of Padua. He completed his doctorate around 1453. In 1464, he moved to the University of Ferrara where he taught mathematics, philosophy and medicine. His students there included Antonio Musa Brassavola.

He was a pioneer in the translation of ancient Greek and Arabic medical texts by such authors as Galen and Hippocrates into Latin.

In 1493, Leoniceno wrote the first scientific paper on syphilis.
Nicolo Leoniceno, a graduate of Padua and who studied under Pelope the Croatian, translated Galen of Roma:

- Galen (Greek: Γαληνός, Galēnos, or Galinos' Latin: Claudius Galenus, Aelius Galenus, Claudius Aelius Galenus, Aelius Claudia Galenus), 129-200 CE, of Pergamon (Pergamum) was a prominent Roman physician and philosopher of Greek origin, and probably the most accomplished medical researcher of the Roman period. His theories dominated Western medical science for well over a millennium. Galen was born in the ancient Greek city of Pergamon (Pergamum or Pergamos), now Bergama in the region of Mysia on the Sea of Marmara, Asia Minor, now Turkey, which was part of the Roman Empire, on September 1, AD 129 (estimates vary from 125-131).

His name, Γαληνός in Greek, meant quiet or peaceable. The abbreviation "Cl.", was first documented in texts from the Renaissance and may denote that Galen belonged to the Claudian gens. The contention that "Cl." is an abbreviation for the honourific Clarissimus is erroneous: Clarissimus (correctly, vir clarissimus or clarissimus vir) was a title reserved for the senatorial class, of which Galen was not a member; the usual abbreviation for it being V.C. or C.V. "Cl." invariably only appears as an abbreviation for the name Claudius. However, note that Galen's father, Aelius Nicon, belonged to the Aelian gens. This being so, it is likely that Nicon's son also bore the family name Aelius.

He describes his early life in "On the affections of the mind". Born in September 129, his father Aelius Nicon was a wealthy patrician, an architect and builder, with eclectic interests including philosophy, mathematics, logic, astronomy, agriculture and literature. Galen describes his father as a "highly amiable, just good and benevolent man". At that time Pergamon was a major cultural and intellectual centre, noted for its library (Eumenes II), second only to that in Alexandria and attracted both Stoic and Platonic philosophers, to whom Galen was exposed at age 14. His studies also took in each of the principal philosophical systems of the time, including Aristotelian and Epicurean.

His father had planned a traditional career for Galen in philosophy or politics and took care to expose him to literary and philosophical influences.
However Galen states that in around 144, his father had a dream in which the God Asclepius (Aesculapius) appeared and commanded Nicon to send his son to study medicine. Again, no expense was spared, and following his earlier liberal education, at 16 he began studies at the prestigious local sanctuary or Asclepieum dedicated to Asclepius, God of medicine, as a θεραπευτής (therapeutes, or attendant) for four years. There he came under the influence of men like Aeschrion, Stratonicus and Satyrus. Asclepiea functioned as spas or sanitoria to which came the sick to seek the ministrations of the priesthood. The temple at Pergamon was eagerly sought by Romans in search of a cure. It was also the haunt of notable people such as Claudius Charax the historian, Aelius Aristeides the orator, Polemo the sophist, and Cuspius Rufinus the Consul.

In 148, when he was 19, his father died, leaving him independently wealthy. He then followed the advice he found in Hippocrates' teaching and travelled and studied widely including Smyrna (now Izmir), Corinth, Crete, Cilicia (now Çukurova), Cyprus and finally the great medical school of Alexandria, exposing himself to the various schools of thought in medicine. In 157, aged 28, he returned to Pergamon as physician to the gladiators of the High Priest of Asia, one of the most influential and wealthiest men in Asia. Over the four years there he learnt the importance of diet, fitness, hygiene and preventive measures, as well as living anatomy, and the treatment of fractures and severe trauma, referring to their wounds as "windows into the body". Only five deaths occurred while he held the post, compared to sixty in his predecessor's time, generally ascribed to his attention to their wounds. At the same time he pursued studies in theoretical medicine and philosophy.

Galen provides accounts of his later life in Rome, in On Prognosis, and On his own Books. Στάσις (stasis, or political unrest) in Pergamon was probably the reason for Galen to leave Pergamon in 161, travelling in the Eastern Mediterranean studying the properties of minerals. His travels took him to Lemnos, Cyprus, and Palestinian Syria (now Israel), before reaching Rome in August 162, aged 33, in the second year of the reign of the joint Emperors Marcus Aurelius and Lucius Verus. As a Greek in Rome, he faced cultural challenges, stiff competition and professional jealousy.

One of his more famous patients was the peripatetic philosopher Eudemus, a friend of his father, and his former tutor. He recounts curing Eudemus of Quartan Fever in 162 (Praen 2:5). This proved fortuitous, since during this illness, Eudemus was visited by Flavius Boethus, a former Consul and later Governor of Palestine (166-8), Sergius Paulus, who became a Prefect, and Severus, uncle of the Emperor Lucius. They were Arisotelians and had heard of Galen's anatomical skills and were anxious to set up vivisection demonstrations, which they hoped would promote him (AA). Galen's skills in caring for Eudemus and his rigorous philosophical explanation of the pathology greatly enhanced his reputation in the upper circles of Rome. His bent for didactic teaching of his patients led him to seek those he could discourse with as a clientale. Word of
how he gave Eudemus a prognosis earned disapproval from some Roman physicians such as Martianus (an Erasistratean), who compared it to divination. Providing a prognosis was not part of their tradition, unlike Galen and the Hippocratic school. Galen in turn criticised the Roman doctors for their relationship with rich patrons, ostentatious dress and belief that medicine could be learned quickly. Galen was fortunate in having the wise advice of Eudemus to guide him through the politics of Roman medicine and society, even warning him that he might be in danger of his life.

At first reluctantly, but then with increasing vigour, Galen promoted Hippocratic teaching including venesection, then unknown in Rome. This was sharply criticised by Erasistrateans, who predicted dire outcomes, believing that it was not blood but *Pneuma* that flowed in the veins. Galen however staunchly defended venesection in his three books on the subject, and in his demonstrations and public disputations.

Galen's fame rested on his anatomical demonstrations, success with influential patrons where others had failed, his learning and his rhetoric. His background and wealth and friendship with Eudemus, helped his advance in Roman society. However Galen was not reluctant to show his contempt for the learning and ethics of his contemporaries in Rome, and his ambitiousness created enemies. This first Roman sojourn coincided with the Parthian Wars of the Emperor Lucius Verus (161-166). (*Praen* 14:647-9).

When he returned to Pergamon in August 166 he claimed he had departed due to professional jealousy, although the outbreak of the Antonine Plague which accompanied the return of Lucius Verus' army in that year may have contributed to this.

He was recalled to Rome by the Emperors Marcus Aurelius and Lucius Verus to serve in the German wars, a task he did not relish, preferring to stay in Rome with Marcus Aurelius' son, Commodus. Amongst his clients was the Consul Flavius Boethus, who had introduced him to the imperial court, where he became personal physician to Marcus Aurelius and his son Commodus, returning to Rome on the death of Verus in 169. He later also served as physician to the Emperor Septimius Severus. His own writings are rich with anecdotes illustrating the heights of his fame. Despite being a member of the court, Galen reputedly shunned Latin, preferring to speak and write in his native Greek, a tongue that was actually quite popular in Rome. Galen spent most of the rest of his life at the Roman imperial court, where he was given leave to write and experiment. The bulk of his output occurring during this period. For instance, *On Prognosis* was written in 177-8. He returned to Pergamon in the 190s.

Because of a reference in the 10th century *Suda* lexicon, the year of Galen's death has traditionally been placed at 199/200. However, since some scholars argue that textual evidence shows Galen writing as late as 207, they
contend that he lived longer, the latest year proposed being 217, according to
Arabic sources, derived from Alexander of Aphrodisias.

Galen's works covered a wide range of topics, from anatomy and
physiology, and medicine to logic and philosophy, both summarising what was
known and adding his own observations. His writings pay homage to, amongst
others, Plato, Aristotle and the Stoics, but above all to Hippocrates, whom he
refers to as "divine" (θείότατος Ἰπποκράτης Nat Fac III: 13). Thus much of his
explanation of pathology relies on Hippocrates' humoral theories.

He proceeded by observation, deductive reasoning and experimentation,
such as his demonstration of the effect of ligating the ureters (Nat Fac I: 13), and
the functions of the spinal cord. His medical practice drew on the biological
theory and anatomical observations from Aristotle to the Alexandrians in addition
to his own research. His therapeutics led him to travel widely gathering elements
and plants. However his reasoning led him astray as much as it did to truth, such
as his rejection of the role of the stomach wall in digestion (Nat Fac III: 4) and his
concepts of specific attraction.

Galen's approach to colleagues and the state of knowledge was very
forthright. He despised what he referred to as partisanship (Nat Fac I: 13), and
was impatient with those with whom he disagreed, such as the Erasistrateans
and Asclepiadeans. (Nat Fac I: 17) Another target of his scorn were the
Methodists, abhorring their consideration of pathology in a vacuum, treating the
disease not the patient, whereas he taught that vital processes in an organism
had to be interpreted in relation to its environment. Other disputes were with the
Atomists, and the Anatomists, arguing that the whole is far greater than the sum
of the parts. His own personal credo was based on three branches of philosophy;
logic, physics and ethics. (Opt Med) He wrote in a highly polished precise Attic
style, using many words (such as haematopoietic) that have passed down to us
in modern medical terminology, albeit with altered meaning.

Galen developed an interest in anatomy from his studies of Herophilus
and Erasistratus, who had dissected the human body and even living bodies
(vivisection). Although Galen studied the human body, dissection of human
corpses was against Roman law, so instead he performed vivisections on pigs,
apes, and other animals (e.g. Nat Fac III: 8), to study the function of the kidneys
and the spinal cord. In this study of comparative anatomy, he frequently
dissected the Barbary Macaque and other primates, assuming their anatomy was
basically the same as that of humans. The legal limitations forced on him led to
quite a number of mistaken ideas about the body. For instance, he thought a
group of blood vessels near the back of the brain, the rete mirabile, was common
in humans, although it actually is absent in humans.

Galen performed many audacious operations — including brain and eye
surgeries — that were not tried again for almost two millennia. To perform
cataract surgery, he would insert a long needle-like instrument into the eye behind the lens, then pull the instrument back slightly to remove the cataract. The slightest slip could have caused permanent blindness. Galen identified venous (dark red) and arterial (brighter and thinner) blood, each with distinct and separate functions. Venous blood was thought to originate in the liver and arterial blood in the heart; the blood flowed from those organs to all parts of the body where it was consumed.

Galen produced more work than any author in antiquity, and may have possibly written up to 600 treatises, although less than a third of his works have survived. His surviving work runs to around 3 million words. Carolus Kühn of Leipzig translated 122 of Galen's writings (1821-1833) and his edition, which is the most complete although flawed, consists of the Greek text, with Latin translations, and runs to 22 volumes, 676 index pages, and is over 20,000 pages in length. More modern projects like the Corpus Medicorum Graecorum have still to match the Kühn edition. A digital version of the Galen's corpus is included in the Thesaurus Linguae Graecae a digital library of Greek literature started in 1972. Another useful modern source is the French Bibliothèque interuniversitaire de médecine (BIUM).

It has been reported that Galen employed 20 scribes to write down his words. In 191, a fire in the Temple of Peace destroyed many of his works, particularly treatises on philosophy. Others were lost in the destruction of the Library at Alexandria and in the general chaos associated with the collapse of the Roman Empire. The Arabs captured and preserved some ancient medical texts during the expansion and Golden Age of the Arab Empire - only those works exist today, and some still exist only in Arabic translation, while others exist only in mediaeval Latin translations of the Arabic. In some cases scholars have even attempted to translate back into Greek where the original is lost.

So great was Galen's output in both quantity and authority that no single authoritative collection of his work exists, and controversy still exists as to the authenticity of a number of attributed works. The surviving Greek texts represent half of all the original Greek literature we have today. For some of the ancient sources, such as Herophilus, Galen's account of their work is all that survives. Even in his own time, forgeries and unscrupulous editions of his work were a problem, prompting him to write On his Own Books. Over the years many different titles have appeared for the same treatises. Sources are often in obscure and difficult to access journals or repositories. Forgeries in Latin, Arabic or Greek continued till the Renaissance. Consequently research on Galen's work is fraught with hazard. Although written in Greek, by convention the works are referred to by Latin titles, and often by merely abbreviations of those.

Various attempts have been made to classify Galen's vast output. For instance Coxe (1846) lists a Prolegomena, or introductory books, followed by 7 classes of treatise embracing Physiology (28 vols.), Hygiene (12), Aetiology (19),
Semeiotics (14), Pharmacy (10), Blood letting (4) and Therapeutics (17), in addition to 4 of aphorisms, and spurious works. [24]

In his time, Galen's reputation as both physician and philosopher was legendary, the Emperor Marcus Aurelius describing him as "Primum sane medicorum esse, philosophorum autem solum" (first among doctors and unique among philosophers Praen 14: 660). Other contemporary authors in the Greek world confirm this including Theodotus the Shoemaker, Athenaeus and Alexander of Aphrodisias. The 7th century poet George of Pisida going so far as to refer to Christ as a second and neglected Galen. Galen continued to exert an important influence over the theory and practice of medicine until the mid seventeenth century in the Byzantine and Arabic worlds and Europe. Hippocrates and Galen form important landmarks of 600 years of Greek medicine. AJ Brock describes them as representing the foundation and apex respectively.

A few centuries after Galen Palladius Iatrosophista in his commentary on Hippocrates, stated that Hippocrates sowed and Galen reaped. Thus Galen summarised and synthesised the work of his predecessors, and it is in Galen's words (Galenism) that Greek medicine was handed down to subsequent generations, such that Galenism became the the means by which Greek medicine was known to the world. Frequently this was in the form of restating and reinterpreting, such as in Magnus of Nisibis' fourth century work on urine, which was in turn translated into Arabic. Yet the full importance of his contributions was not appreciated till long after his death. Galen's rhetoric and prolificity were so powerful as to convey the impression that there was little left to learn. The term Galenism has subsequently taken on both a positive and pejorative meaning as one that transformed medicine in late antiquity yet so dominated subsequent thinking as to stifle further progress.

The era following Galen's death, and the gradual dissolution of the Roman and then Byzantine Empire was one of continual political turmoil during which scientific study held a low priority. Many commentators of the subsequent centuries such as Oribasius, physician to the emperor Julian who compiled a Synopsis in the 4th Century preserved and disseminated Galen's works, making Galenism more accessible. Nutton refers to these authors as the "medical refrigerators of antiquity". In late antiquity medical writing veered increasingly in the direction of the theoretical at the expense of the practical. Many authors merely debating Galenism. Magnus of Nisibis was a pure theorist, as was John of Alexandria and Agnellus of Ravenna with their lectures on Galen's De Sectis. So strong was Galenism that other authors such as Hippocrates began to be seen through a Galenic lens, while his opponents became marginalised and other medical sects such as Asclepiadism slowly disappeared.

Greek medicine was part of Greek culture and as such spread West into Asia through Syria and Persia, largely by the Nestorians. There it came into contact with the Islamic world which assimilated it.
Islamic culture placed great emphasis on the teachings of Aristotle and Galen, which they systematised and commented on. Hunayn ibn Ishaq translated (c.830-870) 129 of Galen's works into Arabic. Galen's insistence on a rational systematic approach to medicine set the template for Islamic medicine, which rapidly spread throughout the Arab Empire. Arabic sources, such as Rhazes (Muhammad ibn Zakariya Rāzi 865-925 AD), continue to be the source of discovery of new or relatively inaccessible Galenic writings. As the title, *Doubts on Galen* by Rhazes implies, as well as the writings of physicians such as Ibn Zuhr (Avenzoar) and Ibn al-Nafis, the works of Galen were not taken on unquestioningly, but as a challengeable basis for further enquiry.

A strong emphasis on experimentation and empiricism led to new results and new observations, which were contrasted and combined with those of Galen by writers such as Rāzi, Ali ibn Abbas al-Majusi (Haly Abbas), Abu al-Qasim al-Zahrawi (Abulasis), Ibn Sina (Avicenna), Ibn Zuhr and Ibn al-Nafis. For example, the experiments carried out by Rāzi and Ibn Zuhr contradicted the Galenic theory of humorism, while Ibn al-Nafis' discovery of the pulmonary circulation contradicted the Galenic theory on the heart.

From the 11th century onwards, Latin translations of Islamic medical texts began to appear in the West, alongside the Salerno school of thought, and was soon incorporated into teaching at the universities of Naples and Montpellier. Galenism now took on a new unquestioned authority, Galen even being referred to as the "Medical Pope of the Middle Ages". Constantine the African was amongst those who carried out translations of both Hippocrates and Galen. Galen's writings on anatomy became the mainstay of the medieval physician's university curriculum, alongside Ibn Sina's *The Canon of Medicine* which elaborated on Galen's works. Unlike pagan Rome, Christian Europe did not exercise a universal prohibition of the dissection and autopsy of the human body and such examinations were carried out regularly from at least the 13th century. However, Galen's influence, as in the Arab world, was so great that when dissections discovered anomalies in Galen's anatomy, the physicians often tried to fit these into the Galenic system. An example of this is Mondino de Liuzzi, who describes rudimentary blood circulation in his writings but still asserts that the left ventricle should contain air. Since some of Galen's writings were translated into Arabic, the Middle East knows and reveres him as "Jalinos".

The Renaissance and fall of the Byzantine Empire (1453) was accompanied by an influx of Greek scholars and texts to the West, allowing direct comparison between the Arabic commentaries and their Greek originals. This New Learning and the Humanist movement, particularly the work of Thomas Linacre, promoted *litterae humaniores* including Galen in the Latin scientific canon, *De Naturalibus Facultatibus* appearing in London in 1523. Debates on medical science now had two traditions, the more conservative Arabian and liberal Greek. The more extreme liberal movements, as exemplified by Paracelsus began to challenge the role of authority in medicine, symbolically
burning the works of Avicenna and Galen at his medical school in Basle. Nevertheless Galen's pre-eminence amongst the great thinkers of the millenium is exemplified by a 16th century mural in the refrectory of the Great Lavra of Mt Athos. This depicts pagan sages at the foot of the Tree of Jesse, with Galen between the Sibyl and Aristotle.

Galenisms final defeat came from a combination of the negativism of Paracelsus and the constructivism of the Italian Renaissance anatomists, such as Vesalius in the 16th century. In the 1530s, Belgian anatomist and physician Andreas Vesalius took on a project to translate many of Galen's Greek texts into Latin. Vesalius' most famous work, *De humani corporis fabrica*, was greatly influenced by Galenic writing and form. Seeking to examine critically Galen's methods and outlook, Vesalius turned to human cadaver dissection as a means of verification. Galen's writings were frequently disproved by Vesalius, who demonstrated Galen's errors through books and hands-on demonstrations, despite fierce opposition from pro-Galenist orthodoxy, such as Jacobus Sylvius. The examinations of Vesalius also disproved medical theories of Aristotle and Mondino de Liuzzi. One of the most well known examples of Vesalius' overturning of Galenism was his demonstration that the interventricular septum of the heart was not permeable, as Galen had taught (*Nat Fac III xv*). The most convincing demonstration of Galen's weakness came from these demonstrations of the nature of the circulation and the subsequent work of Andrea Cesalpino, Fabricio of Acquapendente and William Harvey. Some Galenic teaching, such as his emphasis on bloodletting as a remedy for almost any ailment, however remained influential until well into the 1800s.

Galenic scholarship remains an intense and vibrant field, following renewed interest in his work, dating from the *Altementwissenschaft*. 
Galen of Roma followed in the tradition of Hippocrates of Hellas:

- Hippocrates of Cos II or Hippokrates of Kos (ca. 460 BC – ca. 370 BC) - Greek: Ἱπποκράτης; Hippokràtēs was an ancient Greek physician of the Age of Pericles, and was considered one of the most outstanding figures in the history of medicine. He is referred to as the "father of medicine" in recognition of his lasting contributions to the field as the founder of the Hippocratic school of medicine. This intellectual school revolutionized medicine in ancient Greece, establishing it as a discipline distinct from other fields that it had traditionally been associated with (notably theurgy and philosophy), thus making medicine a profession.

However, the achievements of the writers of the Corpus, the practitioners of Hippocratic medicine, and the actions of Hippocrates himself are often commingled; thus very little is known about what Hippocrates actually thought, wrote, and did. Nevertheless, Hippocrates is commonly portrayed as the paragon of the ancient physician. In particular, he is credited with greatly advancing the systematic study of clinical medicine, summing up the medical knowledge of previous schools, and prescribing practices for physicians through the Hippocratic Oath and other works. Historians accept that Hippocrates was born around the year 460 BC on the Greek island of Kos (Cos), and became a famous physician and teacher of medicine. Other biographical information, however, is likely to be untrue (see Legends). Soranus of Ephesus, a 2nd-century Greek gynecologist, was Hippocrates' first biographer and is the source of most information on Hippocrates' person. Information about Hippocrates can also be found in the writings of Aristotle, which date from the 4th century BC, in the Suda of the 10th century AD, and in the works of John Tzetzes, which date from the 12th century AD.

Soranus wrote that Hippocrates' father was Heraclides, a physician; his mother was Praxitela, daughter of Tizane. The two sons of Hippocrates, Thessalus and Draco, and his son-in-law, Polybus, were his students. According to Galen, a later physician, Polybus was Hippocrates' true successor, while Thessalus and Draco each had a son named Hippocrates.
Soranus said that Hippocrates learned medicine from his father and grandfather, and studied other subjects with Democritus and Gorgias. Hippocrates was probably trained at the asklepieion of Kos, and took lessons from the Thracian physician Herodicus of Selymbria. The only contemporaneous mention of Hippocrates is in Plato's dialogue *Protagoras*, where Plato describes Hippocrates as "Hippocrates of Kos, the Asclepiad". Hippocrates taught and practiced medicine throughout his life, traveling at least as far as Thessaly, Thrace, and the Sea of Marmara. He probably died in Larissa at the age of 83 or 90, though some accounts say he lived to be well over 100; several different accounts of his death exist.

"It is thus with regard divine nor more sacred than other diseases, but has a natural cause from the originates like other affections. Men regard its nature and cause as divine from ignorance and wonder . . . "

Hippocrates, *On the Sacred Disease*

Hippocrates is credited with being the first physician to reject superstitions and beliefs that credited supernatural or divine forces with causing illness. Hippocrates was credited by the disciples of Pythagoras of allying philosophy and medicine. He separated the discipline of medicine from religion, believing and arguing that disease was not a punishment inflicted by the gods but rather the product of environmental factors, diet and living habits. Indeed there is not a single mention of a mystical illness in the entirety of the Hippocratic Corpus. However, Hippocrates did work with many convictions that were based on what is now known to be incorrect anatomy and physiology, such as Humorism.

Ancient Greek schools of medicine were split (into the Knidian and Koan) on how to deal with disease. The Knidian school of medicine focused on diagnosis, medicine at the time of Hippocrates knew almost nothing of human anatomy and physiology because of the Greek taboo forbidding the dissection of humans. The Knidian school consequently failed to distinguish when one disease caused many possible series of symptoms. The Hippocratic school or Koan school achieved greater success by applying general diagnoses and passive treatments. Its focus was on patient care and prognosis, not diagnosis. It could effectively treat diseases and allowed for a great development in clinical practice.

Hippocratic medicine and its philosophy are far removed from that of modern medicine. Now, the physician focuses on specific diagnosis and specialized treatment, both of which were espoused by the Knidian school. This shift in medical thought since Hippocrates' day has caused serious criticism over the past two millennia, with the passivity of Hippocratic treatment being the subject of particularly strong denunciations; for example, the French doctor M. S. Houdart called the Hippocratic treatment a "meditation upon death".
The Hippocratic school held that all illness was the result of an imbalance in the body of the four humours, fluids which in health were naturally equal in proportion (pepsis). When the four humours, blood, black bile, yellow bile and phlegm, were not in balance (dyscrasia, meaning "bad mixture"), a person would become sick and remain that way until the balance was somehow restored. Hippocratic therapy was directed towards restoring this balance. For instance, using citrus was thought to be beneficial when phlegm was overabundant.

Another important concept in Hippocratic medicine was that of a crisis, a point in the progression of disease at which either the illness would begin to triumph and the patient would succumb to death, or the opposite would occur and natural processes would make the patient recover. After a crisis, a relapse might follow, and then another deciding crisis. According to this doctrine, crises tend to occur on critical days, which were supposed to be a fixed time after the contraction of a disease. If a crisis occurred on a day far from a critical day, a relapse might be expected. Galen believed that this idea originated with Hippocrates, though it is possible that it predated him.

Hippocratic medicine was humble and passive. The therapeutic approach was based on "the healing power of nature" ("vis medicatrix naturae" in Latin). According to this doctrine, the body contains within itself the power to re-balance the four humours and heal itself (physis). Hippocratic therapy focused on simply easing this natural process. To this end, Hippocrates believed "rest and immobilization [were] of capital importance". In general, the Hippocratic medicine was very kind to the patient; treatment was gentle, and emphasized keeping the patient clean and sterile. For example, only clean water or wine were ever used on wounds, though "dry" treatment was preferable. Soothing balms were sometimes employed.

Hippocrates was reluctant to administer drugs and engage in specialized treatment that might prove to be wrongly chosen; generalized therapy followed a generalized diagnosis. Potent drugs were, however, used on certain occasions. This passive approach was very successful in treating relatively simple ailments such as broken bones which required traction to stretch the skeletal system and relieve pressure on the injured area. The Hippocratic bench and other devices were used to this end.

One of the strengths of Hippocratic medicine was its emphasis on prognosis. At Hippocrates' time, medicinal therapy was quite immature, and often the best thing that physicians could do was to evaluate an illness and induce its likely progression based upon data collected in detailed case histories.

A number of ancient Greek surgical tools. On the left is a trephine; on the right, a set of scalpels. Hippocratic medicine made good use of these tools.
Hippocratic medicine was notable for its strict professionalism, discipline and rigorous practice. The Hippocratic work *On the Physician* recommends that physicians always be well-kempt, honest, calm, understanding, and serious. The Hippocratic physician paid careful attention to all aspects of his practice: he followed detailed specifications for, "lighting, personnel, instruments, positioning of the patient, and techniques of bandaging and splinting" in the ancient operating room. He even kept his fingernails to a precise length.

The Hippocratic School gave importance to the clinical doctrines of observation and documentation. These doctrines dictate that physicians record their findings and their medicinal methods in a very clear and objective manner, so that these records may be passed down and employed by other physicians. Hippocrates made careful, regular note of many symptoms including complexion, pulse, fever, pains, movement, and excretions. He is said to have measured a patient's pulse when taking a case history to know if the patient lied. Hippocrates extended clinical observations into family history and environment. "To him medicine owes the art of clinical inspection and observation". For this reason, he may more properly be termed as the "Father of Clinical Medicine".

Hippocrates and his followers were first to describe many diseases and medical conditions. He is given credit for the first description of clubbing of the fingers, an important diagnostic sign in chronic suppurative lung disease, lung cancer and cyanotic heart disease. For this reason, clubbed fingers are sometimes referred to as "Hippocratic fingers". Hippocrates was also the first physician to describe Hippocratic face in *Prognosis*. Shakespeare famously alludes to this description when writing of Falstaff's death in Act II, Scene iii. of *Henry V*.

Hippocrates began to categorize illnesses as acute, chronic, endemic and epidemic, and use terms such as, "exacerbation, relapse, resolution, crisis, paroxysm, peak, and convalescence." Another of Hippocrates' major contributions may be found in his descriptions of the symptomatology, physical findings, surgical treatment and prognosis of thoracic empyema, i.e. suppuration of the lining of the chest cavity. His teachings remain relevant to present-day students of pulmonary medicine and surgery. Hippocrates was the first documented chest surgeon and his findings are still valid.

The Hippocratic school of medicine described well the ailments of the human rectum and the treatment thereof, despite the school's poor theory of medicine. Hemorrhoids, for instance, though believed to be caused by an excess of bile and phlegm, were treated by Hippocratic physicians in relatively advanced ways. Cautery and excision are described in the Hippocratic Corpus, in addition to the preferred methods: ligating the hemorrhoids and drying them with a hot iron. Other treatments such as applying various salves are suggested as well. Today, "treatment [for hemorrhoids] still includes burning, strangling, and excising". Also, some of the fundamental concepts of proctoscopy outlined in the...
Corpus are still in use. For example, the uses of the rectal speculum, a common medical device, are discussed in the Hippocratic Corpus. This constitutes the earliest recorded reference to endoscopy.

The Hippocratic Corpus (Latin: *Corpus Hippocraticum*) is a collection of around seventy early medical works from ancient Greece, written in Ionic Greek. The question of whether Hippocrates himself was the author of the corpus has not been conclusively answered, but the volumes were probably produced by his students and followers. Because of the variety of subjects, writing styles and apparent date of construction, scholars believe Hippocratic Corpus could not have been written by one person (Ermerins numbers the authors at nineteen). The corpus was attributed to Hippocrates in antiquity, and its teaching generally followed principles of his; thus it came to be known by his name. It might be the remains of a library of Kos, or a collection compiled in the 3rd century BC in Alexandria.

The Hippocratic Corpus contains textbooks, lectures, research, notes and philosophical essays on various subjects in medicine, in no particular order. These works were written for different audiences, both specialists and laymen, and were sometimes written from opposing viewpoints; significant contradictions can be found between works in the Corpus. Notable among the treatises of the Corpus are *The Hippocratic Oath*; *The Book of Prognostics*; *On Regimen in Acute Diseases*; *Aphorisms*; *On Airs, Waters and Places*; *Instruments of Reduction*; *On The Sacred Disease*; etc.

The Hippocratic Oath, a seminal document on the ethics of medical practice, was attributed to Hippocrates in antiquity. This is probably the most famous document of the Hippocratic Corpus. Recently the authenticity of the document has come under scrutiny. While the Oath is rarely used in its original form today, it serves as a foundation for other, similar oaths and laws that define good medical practice and morals. Such derivatives are regularly taken today by medical graduates about to enter medical practice.

Hippocrates is widely considered to be the "Father of Medicine". His contributions revolutionized the practice of medicine; but after his death the advancement stalled. So revered was Hippocrates that his teachings were largely taken as too great to be improved upon and no significant advancements of his methods were made for a long time. The centuries after Hippocrates’ death were marked as much by retrograde movement as by further advancement. For instance, "after the Hippocratic period, the practice of taking clinical case-histories died out...", according to Fielding Garrison.

After Hippocrates, the next significant physician was Galen, a Greek who lived from 129 to 200 AD. Galen perpetuated Hippocratic medicine, moving both forward and backward. In the Middle Ages, Arabs adopted Hippocratic methods. After the European Renaissance, Hippocratic methods were revived in Europe...
and even further expanded in the 19th century. Notable among those who employed Hippocrates' rigorous clinical techniques were Sydenham, Heberden, Charcot and Osler. Henri Huchard, a French physician, said that these revivals make up "the whole history of internal medicine."

According to Aristotle's testimony, Hippocrates was known as "the Great Hippocrates". Concerning his disposition, Hippocrates was first portrayed as a "kind, dignified, old country doctor" and later as "stern and forbidding". He is certainly considered wise, of very great intellect and especially as very practical. Francis Adams describes him as "strictly the physician of experience and common sense".

His image as the wise, old doctor is reinforced by busts of him, which wear large beards on a wrinkled face. Many physicians of the time wore their hair in the style of Jove and Asklepius. Accordingly, the busts of Hippocrates that we have could be only altered versions of portraits of these deities. Hippocrates and the beliefs that he embodied are considered medical ideals. Fielding Garrison, an authority on medical history, stated, "He is, above all, the exemplar of that flexible, critical, well-poised attitude of mind, ever on the lookout for sources of error, which is the very essence of the scientific spirit". "His figure... stands for all time as that of the ideal physician", according to *A Short History of Medicine*, inspiring the medical profession since his death.

"Life is short, [the] art long, opportunity fleeting, experiment treacherous, judgment difficult."

Hippocrates, *Aphorisms* i.1. Most stories of Hippocrates' life are likely to be untrue because of their inconsistency with historical evidence, and because similar or identical stories are told of other figures such as Avicenna and Socrates, suggesting a legendary origin. Even during his life, Hippocrates' renown was great, and stories of miraculous cures arose. For example, Hippocrates was supposed to have aided in the healing of Athenians during the Plague of Athens by lighting great fires as "disinfectants" and engaging in other treatments. There is a story of Hippocrates curing Perdiccas, a Macedonian king, of "love sickness". Neither of these accounts is corroborated by any historians and they are thus unlikely to have ever occurred.

Another legend concerns how Hippocrates rejected a formal request to visit the court of Artaxerxes, the King of Persia. The validity of this is accepted by ancient sources but denied by some modern ones, and is thus under contention. Another tale states that Democritus was supposed to be mad because he laughed at everything, and so he was sent to Hippocrates to be cured. Hippocrates diagnosed him as having a merely happy disposition. Democritus has since been called "the laughing philosopher".
Not all stories of Hippocrates portrayed him in a positive manner. In one legend, Hippocrates is said to have fled after setting fire to a healing temple in Greece. Soranus of Ephesus, the source of this story, names the temple as the one of Knidos. However centuries later, the Byzantine Greek grammarian John Tzetzes, writes that Hippocrates burned down his own temple, the Temple of Cos, speculating that he did it to maintain a monopoly of medical knowledge. This account is very much in conflict with traditional estimations of Hippocrates' personality. Other legends tell of his resurrection of Augustus's nephew; this feat was supposedly created by the erection of a statue of Hippocrates and the establishment of a professorship in his honor in Rome.

Hippocrates' had his own Intellectual line, a legendary genealogy which traced his paternal heritage directly to Asklepius and his maternal ancestry to Heracles. According to Tzetzes's *Chiliades*, the ahnentafel of Hippocrates II is:

1. Hippocrates II. “The Father of Medicine”
2. Heraclides
   4. Hippocrates I.
   8. Gnosidicus
   16. Nebrus
   32. Sostratus III.
   64. Theodorus II.
   128. Sostratus, II.
   256. Thedorus
   512. Cleomyttades
   1024. Crisamis
   2048. Dardanus
   4096. Sostatus
   8192. Hippolochus
   16384. Podalirius
   32768. Asklepius
Hippocrates studied under Herodicus, both of Hellas:

Herodicus (Greek: Ἡρόδικος) is the father of “Sports Medicine”. He was a Greek physician of the fifth century BC, and a native of Selymbria. The first use of therapeutic exercise for the treatment of disease and maintenance of health is credited to him, and he is believed to have been one of the tutors of Hippocrates. He also recommended good diet and massage using beneficial herbs and oils, and his theories are considered the foundation of sports medicine. He was specific in the manner that a massage should be given. He recommended that rubbing be initially slow and gentle, then subsequently faster, with the application of more pressure, which was to be followed by more gentle friction.

Herodicus is also described as a gymnastic-master (παιδοτρίβης) and a sophist. According to Plato, Herodicus recommended that his patients walk from Athens to Megara, a distance of more than 70 miles, but this claim may be unfounded. In the 5th century B.C.E. he advocated exercise for the treatment of disease and compelled his patients to have their bodies rubbed, he being a firm believer in the efficacy of massage. It has been claimed that Herodicus first laid down principles for rational, mechanical methods of treatment and was one of the first to refer to the manner of giving massage.

He said friction should be gentle and slow at first, then rapid in combination with pressure, which was to be followed by gentle friction. Other advocates were Plato, Socrates, and Hippocrates, who said "rubbing can bind a joint that is too loose, and loosen a joint that is too rigid. Hard rubbing binds, soft rubbing loosens, much rubbing causes parts to waste, moderate rubbing makes them grow." This is the earliest definite information relative to the effect of variations in the application of massage. Hippocrates also suggested the direction in which to apply massage the art of rubbing up, thereby assisting mechanical and physical processes, aiding circulation, relieving stasis and consequently quickening metabolic processes."
He was also the first person in the history of medicine who actually combined sports with medicine. He used to be a sports teacher, who later studied medicine and managed to succeed Euryphon in the medical school of Cnidos, one of the most prominent in ancient Greece together with its neighbor medical school of Cos (Hippocrates’ home). In Cnidos Herodicus formed his own theoretical perspective of medicine. He considered, namely, bad health to be the result of imbalance between diet and physical activity and for this reason he recommended strict diet, constant physical activity and regular training. He believed that this combination was the ideal way to maintain good standards of health and he applied this type of treatment method to his patients. Unfortunately, Herodicus' works are lost today. However, excerpts of his medical system, which can be traced in ancient texts, support the fact that Herodicus can be considered as the father of sports medicine.
Herodicus succeeded Euryphon at the school of Knidos off the coast of Asia Minor:

- Cnidus or Knidos (Greek: Κνίδος /Knidos; at the modern-day locality called Tekir in Turkey) was an ancient Greek city in Anatolia, part of the Dorian Hexapolis. It was situated at the extremity of the long Daçca peninsula, which forms the southern side of the Sinus Ceramicus or Gulf of Gökova. It was built partly on the mainland and partly on the Island of Triopion or Cape Krio. The debate about it being an island or cape is caused by the fact that in ancient times it was connected to the mainland by a causeway and bridge. Today the connection is formed by a narrow sandy isthmus.

By means of the causeway the channel between island and mainland was formed into two harbours, of which the larger, or southern, was further enclosed by two strongly-built moles that are still in good part entire. The extreme length of the city was little less than a mile, and the whole intramural area is still thickly strewn with architectural remains. The walls, both of the island and on the mainland, can be traced throughout their whole circuit; and in many places, especially round the acropolis, at the northeast corner of the city, they are remarkably perfect.

The first Western knowledge of the site was due to the mission of the Dilettante Society in 1812, and the excavations executed by C. T. Newton in 1857-1858.

The agora, the theatre, an odeum, a temple of Dionysus, a temple of the Muses, a temple of Aphrodite and a great number of minor buildings have been identified, and the general plan of the city has been very clearly made out. The most famous statue by Praxiteles, the Aphrodite of Knidos, was made for Cnidus. It has perished, but late copies exist, of which the most faithful is in the Vatican Museums. In a temple enclosure Newton discovered a fine seated statue of Demeter, which he sent back to the British Museum, and about three miles south-east of the city he came upon the ruins of a splendid tomb, and a colossal figure of a lion carved out of one block of Pentelic marble, ten feet in length and
six in height, which has been supposed to commemorate the great naval victory, the Battle of Cnidus in which Conon defeated the Lacedaemonians in 394 BC.

Knidos was a city of high antiquity and as a Hellenic city probably of Lacedaemonian colonization. Along with Halicarnassus (present day Bodrum, Turkey) and Kos, and the Rhodian cities of Lindos, Kamiros and Ialyssos it formed the Dorian Hexapolis, which held its confederate assemblies on the Triopian headland, and there celebrated games in honour of Apollo, Poseidon and the nymphs.

The city was at first governed by an oligarchic senate, composed of sixty members, and presided over by a magistrate; but, though it is proved by inscriptions that the old names continued to a very late period, the constitution underwent a popular transformation. The situation of the city was favourable for commerce, and the Knidians acquired considerable wealth, and were able to colonize the island of Lipara, and founded a city on Corcyra Nigra in the Adriatic. They ultimately submitted to Cyrus, and from the battle of Eurymedon to the latter part of the Peloponnesian War they were subject to Athens.

In their expansion into the region, the Romans easily obtained the allegiance of Knidians, and rewarded them for help given against Antiochus by leaving them the freedom of their city.

During the Byzantine period there must still have been a considerable population: for the ruins contain a large number of buildings belonging to the Byzantine style, and Christian sepulchres are common in the neighbourhood. Eudoxus, the astronomer, Ctesias, the writer on Persian history, and Sostratus, the builder of the celebrated Pharos at Alexandria, are the most remarkable of the Knidians mentioned in history.

The Knidians traded with ancient Egypt and were influenced by Egyptian medical practices. Medicine in the Nile valley from circa 3300 BC until the Persian invasion of 525 BC is broadly categorized as “Pharaonic Medicine”. This medicine was highly advanced for the time, and included simple, non-invasive surgery, setting of bones and an extensive set of pharmacopoeia and magical spells. While ancient Egyptian remedies are often characterized in modern culture by magical incantations and dubious ingredients, research in Biomedical Egyptology shows they were often effective and sixty-seven percent of the known formulae complied with the 1973 British Pharmaceutical Codex, aside from sterilization. Medical texts specified specific steps of examination, diagnosis, prognosis and treatments that were often rational and appropriate.

Until the 19th century, the main sources of information about ancient Egyptian medicine were writings from later in antiquity. Homer c. 800 BC remarked in the Odyssey: "In Egypt, the men are more skilled in medicine than any of human kind" and "the Egyptians were skilled in medicine more than any
The Greek historian Herodotus visited Egypt around 440 BC and wrote extensively of his observations of their medicinal practices. Pliny the Elder also wrote favorably of them in historical review. Hippocrates (the "father of medicine"), Herophilos, Erasistratus and later Galen studied at the temple of Amenhotep, and acknowledged the contribution of ancient Egyptian medicine to Greek medicine.

In 1822, the translation of the Rosetta stone finally allowed the translation of ancient Egyptian hieroglyphic inscriptions and papyri, including many related to medical matters. The resultant interest in Egyptology in the 19th century led to the discovery of several sets of extensive ancient medical documents, including the Ebers papyrus, the Edwin Smith Papyrus, the Hearst Papyrus and others dating back as far as 3000 BC. The Edwin Smith Papyrus is a textbook on surgery and details anatomical observations and the "examination, diagnosis, treatment, and prognosis" of numerous ailments. It was probably written around 1600 BC, but is regarded as a copy of several earlier texts. Medical information in it dates from as early as 3000 BC. Imhotep in the 3rd dynasty is credited as the original author of the papyrus text, and founder of ancient Egyptian medicine. The earliest known surgery was performed in Egypt around 2750 BC (see surgery).

The Ebers papyrus (c. 1550 BC) is full of incantations and foul applications meant to turn away disease-causing demons, and also includes 877 prescriptions. It may also contain the earliest documented awareness of tumors, if the poorly understood ancient medical terminology has been correctly interpreted. Other information comes from the images that often adorn the walls of Egyptian tombs and the translation of the accompanying inscriptions. The tomb of Ankh-ma-hor of the 6th Dynasty (circa 2200 BC) has what looks like a detailed rendering of a ceremonial circumcision. Advances in modern medical technology also contributed to the understanding of ancient Egyptian medicine. Paleopathologists were able to use X-Rays and later CAT Scans to view the bones and organs of mummies. Electron microscopes, mass spectrometry and various forensic techniques allowed scientists unique glimpses of the state of health in Egypt 4000 years ago.

Medical knowledge in ancient Egypt had an excellent reputation, and rulers of other empires would ask the Egyptian pharaoh to send them their best physician to treat their loved ones. Egyptians had some knowledge of human anatomy, even though they never dissected the body. For example, in the classic mummification process, mummmifiers knew how to insert a long hooked implement through a nostril, breaking the thin bone of the brain case and remove the brain. They also must have had a general idea of the location in the body cavity of the inner organs, which they removed through a small incision in the left groin. But whether this knowledge was passed on to the practitioners of medicine is unknown and does not seem to have had any impact on their medical theories.
Egyptian physicians were aware of the existence of the pulse and of a connection between pulse and heart. The author of the Smith Papyrus even had a vague idea of a cardiac system, although not of blood circulation and he was unable, or deemed it unimportant, to distinguish between blood vessels, tendons, and nerves. They developed their theory of "channels" that carried air, water and blood to the body by analogies with the River Nile; if it became blocked, crops became unhealthy and they applied this principle to the body: If a person was unwell, they would use laxatives to unblock the "channels".

Quite a few medical practices were effective, such as many of the surgical procedures given in the Edwin Smith papyrus. Mostly, the physicians' advice for staying healthy was to wash and shave the body, including under the arms, and this may have prevented infections. They also advised patients to look after their diet, and avoid foods such as raw fish or other animals considered to be unclean.

Many practices were ineffective or harmful. It has been said that 72% of 260 medical prescriptions in the Hearst Papyrus had no known curative elements, and many contained animal dung which contains products of fermentation and moulds, some of them having curative properties, but also bacteria posing a grave threat of infection. Being unable to distinguish between the original infection and the unwholesome effects of the faeces treatment, they may have been impressed by the few cases when the patient's condition improved.

Magic and religion were an integral part of everyday life in ancient Egypt. Gods and demons were thought to be responsible for many ailments, so often the treatments involved a supernatural element, such as beginning treatment with an appeal to a deity. There does not appear to have existed a clear distinction between what nowadays one would consider the very distinct callings of priest and physician. The healers, many of them priests of Sekhmet or Selket, often used incantations and magic as part of treatment.

The widespread belief in magic and religion may have resulted in a powerful placebo effect; that is, the perceived validity of the cure may have contributed to its effectiveness. The impact of the emphasis on magic is seen in the selection of remedies or ingredients for them. Ingredients were sometimes selected seemingly because they were derived from a substance, plant or animal that had characteristics which in some way corresponded to the symptoms of the patient. This is known as the principle of *similia similibus* ("similar with similar") and is found throughout the history of medicine up to the modern practice of homeopathy. Thus an ostrich egg is included in the treatment of a broken skull, and an amulet portraying a hedgehog might be used against baldness.

Amulets in general were very popular, being worn for many magical purposes. Health related amulets are classified as homeopoetic, phylactic and theophoric. Homeopoetic amulets portray an animal or part of an animal, from
which the wearer hopes to gain positive attributes like strength or speed. Phylactic amulets protected against harmful gods and demons. The famous Eye of Horus was often used on a phylactic amulet. Theophoric amulets represented Egyptian gods; one represented the girdle of Isis and was intended to stem the flow of blood at miscarriage.

The ancient Egyptian word for doctor is "swnw". This title has a long history. The earliest recorded physician in the world, Hesyre, practiced in ancient Egypt. He was "Chief of Dentists and Physicians" to King Djoser, who ruled in the 27th century BC.[6] The lady Peseshet (2400 BC) may be the first recorded female doctor: she was possibly the mother of Akhethotep, and on a stela dedicated to her in his tomb she is referred to as imy-r swnwt, which has been translated as "Lady Overseer of the Lady Physicians" (swnwt is the feminine of swnw).

There were many ranks and specializations in the field of medicine. Royalty employed their own swnw, even their own specialists. There were inspectors of doctors, overseers and chief doctors. Known ancient Egyptian specialists are ophthalmologist, gastroenterologist, proctologist, dentist, "doctor who supervises butchers" and an unspecified "inspector of liquids". The ancient Egyptian term for proctologist, neru phuyt, literally translates as "shepherd of the anus".

Institutions, so called Houses of Life, are known to have been established in ancient Egypt since the 1st Dynasty and may have had medical functions, being at times associated in inscriptions with physicians, such as Peftauawyneit and Wedjahorresnet living in the middle of the first millennium BCE. By the time of the 19th Dynasty their employees enjoyed such benefits as medical insurance, pensions and sick leave.
Euryphon at the school of Knidos were influenced by the temple priests of Amenhotep I:

- Amenhotep I (sometimes read as Amenophis I and meaning "Amun is satisfied") was the second Pharaoh of the 18th dynasty of Egypt. His reign is generally dated from 1526 to 1506 BC. He was born to Ahmose I and Ahmose-Nefertari, but had at least two elder brothers, Ahmose-ankh and Ahmose Sapair, and was not expected to inherit the throne. However, sometime in the eight years between Ahmose I’s 17th regnal year and his death, his heir apparent died and Amenhotep became crown prince. He then acceded to the throne and ruled for about 21 years. Although his reign is poorly documented, it is possible to piece together a basic history from available evidence.

He inherited the kingdom formed by his father's military conquests and maintained dominance over Nubia and the Nile Delta, but probably did not attempt to keep power in Syrio-Palestine. He continued to rebuild temples in Upper Egypt, and revolutionized mortuary complex design by separating his tomb from his mortuary temple, setting a trend which would persist throughout the New Kingdom. After his death, he was deified into the patron god of Deir el-Medina.

Amenhotep I was the son of Ahmose I and Ahmose-Nefertari. His elder brothers, the crown prince Ahmose Sapair and Ahmose-ankh, died before him, thus clearing the way for his ascension to the throne. Amenhotep I probably came to power while he was still young himself, and his mother, Ahmose-Nefertari, appears to have been regent for him for at least a short time. This is evidenced because both he and his mother are credited with opening a worker village at the site of Deir el-Medina. Amenhotep took his sister Ahmose-Meritamon as his Great Royal Wife. Another wife's name, Sitkamose, is attested on a nineteenth dynasty stele.

Beyond this, his relation to all other possible family members has been questioned. Ahhotep II is usually called his wife and sister, despite an alternate
theory that she was his grandmother. He is thought to have had one son by Ahhotep II, Amenemhat, who died while still very young. This remains the consensus, although there are arguments against that relationship as well. With no living heirs, Amenhotep was succeeded by Thutmose I, whom he married to his sister, Aahmes, although once again there is no definite proof that the two were related. Since Aahmes is never called "King's Daughter" in any inscription, some scholars doubt this relation as well.

In the ninth year of Amenhotep I, a heliacal rise of Sothis was observed on the ninth day of the third month of summer. Modern astronomers have calculated that, if the observation was made from Memphis or Heliopolis, such an observation could only have been made on that day in 1537 BC. If the observation was made in Thebes, however, it could only have taken place in 1517. The latter choice is usually accepted as correct since Thebes was the capital of early 18th dynasty Egypt; hence, Amenhotep I is given an accession date in 1526 BC, although the possibility of 1546 BC is not entirely dismissed.

Manetho's Epitome states that Amenhotep I ruled Egypt for 20 Years and 7 Months or 21 Years, depending on the source. While Amenhotep I's highest attested official date is only his Year 10, Manetho's data is confirmed by information from a passage in the tomb autobiography of a Magician named Amenemhet. This individual explicitly states that he served under Amenhotep I for 21 Years. Thus, in the high chronology, Amenhotep I is given a reign from around 1546 to 1526 BC and, in the low chronology, from around 1526 to 1506 BC or 1525 to 1504 BC, though individual scholars may vary by a few years.

Amenhotep I's Horus and Two Ladies names, "Bull who conquers the lands" and "He who inspires great terror," are generally interpreted to mean that Amenhotep I intended upon dominating the surrounding nations. Two tomb texts indicate that he led campaigns into Nubia. According to the tomb texts of Ahmose, son of Ebana, Amenhotep later sought to expand Egypt's border southward into Nubia and he led an invasion force which defeated the Nubian army. The tomb biography of Ahmose Pen-Nekhebet says he also fought in a campaign in Kush, however it is quite possible that it refers to the same campaign as Ahmose, son of Ebana. Amenhotep built a temple at Sai, showing that he had established Egyptian settlements almost as far as the third cataract.

A single reference in the tomb of Ahmose Pen-Nekhebet indicates another campaign in Iamu in the land of Kehek. Unfortunately, the location of Kehek is unknown. It was long believed that Kehek was a reference to the Libyan tribe, Qeheq, and thus it was postulated that invaders from Libya took advantage of the death of Ahmose to move into the western Nile Delta. Unfortunately for this theory, the Qeheq people only appeared in later times, and Kehek's identity remains unknown. Nubia is a possibility, since Amenhotep did campaign there, and the western desert and the oases have also been suggested, since these seem to have fallen under Egyptian control once again.
Egypt had lost the western desert and the oases during the second intermediate period, and during the revolt against the Hyksos, Kamose thought it necessary to garrison them. It is uncertain when they were fully retaken, but on one stele, the title "Prince-Governor of the oases" was used, which means that Amenhotep's reign forms the terminus ante quem for the return of Egyptian rule.

There are no recorded campaigns in Syrio-Palestine during Amenhotep I's reign. However, according to the Tombos Stela of his successor, Thutmose I, when Thutmose led a campaign into Asia all the way to the Euphrates, he found no one who fought against him. If Thutmose did not lead a campaign which has not been recorded into Asia before this recorded one, it would mean that the preceding pharaoh would have had to pacify Syria instead, which would indicate a possible Asiatic campaign of Amenhotep I. Two references to the Levant potentially written during his reign might be contemporary witnesses to such a campaign. One of the candidates for Amenhotep's tomb contains a reference to Qedmi, which is somewhere in Canaan or the Transjordan, and Amenemhet's tomb contains a hostile reference to Mitanni. However, neither of these references necessarily refer to campaigning, nor do they even necessarily date to Amenhotep's reign. The location of Amenhotep's tomb is not certain, and Amenemhet lived to serve under multiple kings who are known to have attacked Mitanni. Records from Amenhotep's reign are simply altogether too scant and too vague to reach a conclusion about any Syrian campaign.

Large numbers of statues of Amenhotep have been found, but they are mostly from the Ramessid period, made for his posthumous funerary cult. This makes study of the art of his reign difficult. Based upon his few authentic statues, it appears that Amenhotep continued the practice of copying Middle Kingdom styles. Art in the early 18th dynasty was particularly similar to that of the early Middle Kingdom, and the statues produced by Amenhotep I clearly copied those of Mentuhotep II and Senusret I. The two types are so similar that modern Egyptologists have had trouble telling the two apart.

It was probably Amenhotep I who opened the artisan's village at Deir el-Medina which was responsible for all the art which filled the tombs in Thebes' necropolis for the following generations of New Kingdom rulers and nobles. The earliest name found there is that of Thutmose I, however Amenhotep was clearly an important figure to the city's workmen since he and his mother were both its patron deities.

Two important pieces of literature were developed during this period. First, the Book of What is in the Underworld, an important funerary text used in the New Kingdom, is believed to have come into its final form during Amenhotep's reign, since it first appears in the tomb of Thutmose I. The Ebers papyrus, which is the main source for information on ancient Egyptian medicine, seems to date to this time (the mention of the Heliacal rise of Sothis by which the early New
Kingdom chronology is usually calculated was found on the back of this document).

It appears that during Amenhotep I’s reign the first water clock was invented. Amenhotep’s court astronomer Amenemheb took credit for creating this device in his tomb biography, although the oldest surviving mechanism dates to the reign of Amenhotep III. This invention was of great benefit for timekeeping, because the Egyptian hour was not a fixed amount of time, but was measured as 1/12th of the night. When the nights were shorter in the summer, these waterclocks could be adjusted to measure the shorter hours accurately.

Amenhotep’s building projects have been mostly obliterated by later construction projects, so it is difficult to appraise the scope of his building program. From written sources it is known that he commissioned the architect Ineni to expand the Temple of Karnak. Ineni’s tomb biography indicates that he created a 20 cubit gate of limestone on the south side of Karnak. He constructed a sacred barque chapel of Amun out of alabaster and a copy of the White Chapel of Senusret III, however they were disassembled by Amenhotep III to fill his third pylon. Karnak also contains structures which were apparently built for his Sed festival, but he died before he could use them. A temple was constructed in Nubia at Sai, and he built structures in Upper Egypt at Elephantine, Kom Ombo, Abydos, and the Temple of Nekhbet, but did not build anything in Lower Egypt, like his father.

Amenhotep I was the first king of Egypt to separate his mortuary temple from his tomb, probably to keep tomb robbers from finding his tomb as easily. The remains of this temple are most probably to be found at the north end of Deir el-Bahri. Deir el-Bahri appears to have had some sort of funerary significance for Amenhotep, since Theban Tomb 358, the tomb of his queen Ahmose-Meritamon, was also found nearby. However, Amenhotep’s temple was located where Hatshepsut intended to build her mortuary temple. Hatshepsut’s first plan may have spared the temple, however when she added the lower terrace it was torn down, and only a few bricks inscribed with Amenhotep’s name remain. The royal statues inside of the temple were then moved into the nearby funerary temple of Mentuhotep II.

The location of Amenhotep’s tomb is as of yet unidentified. The tomb was known to be intact during the reign of Ramses IX, but its location was not disclosed. There are two possible sites for the location of Amenhotep I’s undiscovered tomb, one high up in the Valley of the Kings, KV39 and the other at Dra’ Abu el-Naga’, Tomb ANB. Tomb ANB is considered the more likely possibility, because it contains objects bearing his name and the names of some family members. Excavations at KV 39 have indicated that instead it was used as a previous storage area for the Deir el-Bahri Cache and Dra' Abu el-Naga' ANB is considered the more probable location.
Certain scholars have argued that Amenhotep I may have appointed Thutmose I as coregent before his own death. Thutmose I's name appears next to Amenhotep's name on a barque which was used as fill for the third pylon at Karnak, and this is often used as evidence that Amenhotep had appointed Thutmose as coregent. This, however, has failed to convince most scholars who note that it may be a simple case of Thutmose associating himself with his royal predecessor. Alternatively, one text has been interpreted to mean that Amenhotep may have appointed his infant son as coregent, who then preceded him in death.\[38\] However, the scholarly consensus is that there is too little evidence for either coregency.

After Amenhotep died, wherever his tomb was located, his body did not remain there. Amenhotep I's body was found in the Deir el-Bahri Cache above the Mortuary Temple of Hatshepsut and is now in the Egyptian Museum in Cairo. His mummy had apparently not been looted by the 21st dynasty, and the priests who moved the mummy took care to keep the Cartonnage intact. Because of that exquisite face mask, Amenhotep's is the only royal mummy which has not been unwrapped and examined by modern Egyptologists.

Amenhotep was deified upon his death and made the patron deity of the village which he opened at Deir el-Medina. His mother, who lived at least one year longer than he did, was also deified upon her death and became part of his litany. As previously mentioned, the vast majority of Amenhotep's statuary comes in the form of a funerary idol from this cult during later periods. When being worshiped, he had three deific manifestations: "Amenhotep of the Town," "Amenhotep Beloved of Amun," and "Amenhotep of the Forecourt," and was known as a god who produced oracles. Some of the questions asked of him have been preserved on ostraca from Deir el-Medina, and appear to have been phrased in such a way that the idol of the king could nod (or be caused to nod) the answer. He also had a number of feasts dedicated to him which were held throughout the year. During the first month, a festival was celebrated in honor of the appearance of Amenhotep to the necropolis workmen, which probably means his idol was taken to Deir el-Medina. Another feast was held on the thirtieth of the fourth month, and then two more were held in the seventh month. The first was the "spreading of the funeral couch for king Amenhotep," which probably commemorated the day of his death. The second, celebrated for four days at the very end of the month, was the "great festival of king Amenhotep lord of the town." Later in Egyptian history, the seventh month was named after this festival, "Phamenoth." Another festival was held on the 27th of the ninth month, and the last known festival was held for several days between at least the eleventh and thirteenth days of the eleventh month, which in all probability commemorated the date of Amenhotep's accession to the throne.

Further light is shed upon Amenhotep's funerary cult by multiple documents which appear to detail the rituals dedicated to Amenhotep. Three papyri from the time of Ramesses II record the liturgy used by the priests, and
reliefs at Karnak and Medinet Habu illustrate select rites and spells. The bulk of the rituals concern preparing for and conducting the daily offerings of libations for the idol, including a recitation of a htp-di-nsw formula, and purifying and sealing the shrine at the end of the day. The remainder of the rites concern how to conduct various feasts throughout the year. In these cases, Amenhotep's idol or a priest representing him is actually officiating the worship of Amun instead of being worshipped himself, which was not a typical cultic practice in ancient Egypt.
Pharoah Amenhotep I, keeper of the Sphinx Head and master of those carrying the Quill & Dagger, was son to Queen Ahmose-Nefertari:

Queen Ahmose-Nefertari of Egypt was the royal sister and wife of Egypt's pharaoh, Ahmose I. Ahmose-Nefertari became the regent for her son, Amenhotep I, upon the death of Ahmose I and reigned until he could attain the age to ascend the throne. Her name appears on many monuments from Saï to Tura. She is known still to have been alive during the first year of the reign of Thutmose I; thus, she apparently outlived her son Amenhotep I, who reigned over Egypt for nearly twenty-one years. Among her titles, she had held the office of Second Prophet of Amun, but renounced it sometime during the eighteenth or twenty-second year of the reign of her husband, Ahmose I, when she became the first living, royal woman known to be entitled, God's Wife of Amun.

Her mother, Ahhotep I, royal wife of Seqenenre Tao II and the mother of Ahmose I also, held the title of God's Wife of Amun first, but it only has been found on her coffin. Some Egyptologists assert that she may not have held the office itself and the title may have been given to her posthumously. The office of God's Wife of Amun, which had existed in earlier dynasties, was revived, now as a hereditary title to be held only by royal women and passing from one generation to another, as the highest ranking priestess in the administration of the powerful temple. Previously, the holder of the title was not of the royal line. The holder of this office was a close adviser who participated in daily contact with the pharaoh. Some scholars describe the administration of the temple of Amun as the virtual rulers of the country while Thebes was the capital of Egypt.

Some Egyptologists assert that their mother, Ahhotep I, was the founder of the eighteenth dynasty because after the death of Seqenenre Tao II, she enabled two of her sons to become pharaohs and to unite Egypt following the Hyksos occupation and ruled as regent between them, Kamose and Ahmose I. Her husband had initiated the overthrow and may have died in battle, her son, Kamose, made battle with them and died in the war, she then became regent.
and a warrior queen to continue the battle, and when Ahmose I came of age and ruled as pharaoh, he finally drove them out of Egypt.

Ahmose I became the first king of the eighteenth dynasty, a pharaoh ruling over the united country. Ahmose-Nefertari had the following royal children, Amenhotep I, Mutnofret, and Ahmose-Meritamon, two of whom would become the next king and queen of Egypt.

When she died, Ahmose-Nefertari became the last queen to be worshipped as a deity in a Theban funerary cult until the time of the High Priest of Amun, Herihor, in the beginning of the twenty-first dynasty.
Queen Ahmose-Nefertari, was daughter to Ahhotep I, the Warrior Queen and sister of Neith, Goddess of War:

- Ahhotep I (alternatively spelled Ahhotpe or Aahhotep, meaning "Peace of the Moon"), was an Ancient Egyptian queen who lived circa 1560-1530 BC, during the early New Kingdom. A member of the Seventeenth dynasty of ancient Egypt, she was the daughter of Queen Tetisheri (known as Teti the Small) and Tao I, and was likely the sister, as well as, the wife of pharaoh Seqenenre Tao II. She is considered to have been a pivotal figure in the history of Ancient Egypt, perhaps the founder of the eighteenth dynasty. Ahhotep I had a long and influential life. She is thought to have ruled as regent after the death of Tao II and enabled two of her sons who became pharaohs, Kamose and Ahmose I, to unite Egypt following the Hyksos occupation.

What is more, her matrilineal succession would extend through the 18th Dynasty, ending with Nefertiti's daughter Ankhesenpaaten. She is considered by some historians to be the founder of the eighteenth dynasty, although this is debated by some others. Her husband, pharaoh Tao II, had been the pharaoh of only Upper Egypt. At that time the invaders of the Intermediate Period, the Hyksos, controlled Lower Egypt. It is thought that after his death in battle against the Hyksos, Ahhotep played a crucial role in government, warfare, and guidance of Upper Egypt.

Ahhotep and her sons, Kamose and Ahmose, managed to unite Upper and Lower Egypt by expelling the Hyksos. They assumed full power over the country, and when Kamose, as his father had, died before they were able to defeat the Hyksos, Ahmose assumed the throne. However, evidence suggests that this occurred when Ahmose I was too young to rule, and hence, Ahhotep became regent.

Ahhotep lived until she was approximately ninety years old and was buried beside Kamose at Thebes. Evidence suggests that she played an important role
during the unsettled second intermediate period and was influential in driving the Hyksos invaders out of Egypt following the death of her husband.

Considered a warrior queen, she was buried with, among other things, three flies of honor medals (awarded in ancient Egypt for exceptional military service) and ceremonial daggers. She also was presented with the Order of Valour. She was honored with a stela, commissioned by Ahmose I, in the temple of Amun-Re that praises her military accomplishments.

Records indicate that Ahhotep led troops into battle against the Hyksos. Evidence such as the weaponry and jewelry found in her tomb, along with the following sentence on a stela devoted to her, indicates that she was a warrior queen who rallied troops:

She is the one who has accomplished the rites and taken care of Egypt . . . She has looked after her soldiers, she has guarded her, she has brought back her fugitives and collected together her deserters, she has pacified Upper Egypt and expelled her rebels.
Ahhotep I, the Warrior Queen and sister of Neith, Goddess of War, was daughter to Tetisheri the Matriarch:

Tetisheri was the matriarch of the Egyptian royal family of the late 17th Dynasty and early 18th Dynasty. She was the wife of Tao I Senakhtenre, the mother of Tao II Seqenenre, and the grandmother of Kamose and Ahmose I. Tetisheri was born to parents (Tjenna and Neferu) who did not hold hereditary or elite offices but may well have been tribal royalty from one of the western oases. She was selected by Tao I, despite her non-royal birth, to be not only his wife but his "Great Wife". Tao I granted Tetisheri many privileges not previously given to a queen. She became the first queen to wear the "Vulture Crown," which signalled that the position of "Great Wife" had become integral to pharaonic power.

The Aegis, or shield of Neith, Goddess of War

When her son Tao II rebelled against the Hyksos, Tetisheri may have played a role in maintaining order at the Theban court. Tao II was killed in battle and his successor Kamose possibly suffered a similar fate. Most likely, Tetisheri set a strong precedent for subsequent royal wives, including Ahhotep, the mother of Ahmose, who may have had a role in military activities against the Hyksos, and Ahmose-Nefertary, the first queen to receive the important priestly title of "God's Wife of Amun." It is likely that Tetisheri established the precedent for powerful female royalty in Dynasty 18 including Hatshepsut, a Royal Wife who became pharaoh, and Nefertiti, who seems to have held a position of particular importance in the royal court of Amarna. Little is known of the details of Tetisheri's life, however, and apart from a fragment of papyrus naming an endowment in her name in Lower Egypt, most conclusions drawn by scholars derive from speculation or from the little that can be gleaned from the monumental stela from Abydos dedicated in her name.

Her grandson Ahmose completed the expulsion of the Hyksos from Egypt. Ahmose had a memorial structure or cenotaph at Abydos erected in her honour, in the midst of his own extensive mortuary complex at that site. This mud brick structure was discovered in 1902 by the Egypt Exploration Fund, and was found
to contain a monumental stela detailing the dedication by Ahmose and his sister-
wife Ahmose-Nefertary of a pyramid and enclosure (or shrine) to Tetisheri.

Its discoverer, C. T. Currelly, believed the textual reference to a "pyramid" of Tetisheri to refer not to the building in which the stela was found, but rather to the more imposing pyramid associated with a large mortuary temple at its base discovered in 1900 by A. C. Mace. Based on recent discoveries, however, this view can no longer be maintained. The foundations of the structure, originally described by C. T. Currelly in 1903 as a "shrine" or "mastaba," was demonstrated in 2004 through the renewed excavations of the Oriental Institute, University of Chicago under the direction of S. Harvey to have actually formed the lowest courses of a brick pyramid, the last queen's pyramid to have been built in Egypt.

Portions of the limestone pyramidion or capstone were discovered as well, demonstrating conclusively that this structure was pyramidal in form. Magnetic survey also revealed a brick enclosure some 70 by 90 meters in scale, a feature not detected by earlier archaeologists. These accordingly may now be identified as the features described in Ahmose's stela found within: a pyramid and an enclosure, built in the midst of Ahmose's own mortuary complex. The text also indicates that Tetisheri possessed an additional cenotaph or memorial feature at Abydos (location unknown), as well as her actual tomb at Thebes. No tomb at Thebes has yet been conclusively identified with Queen Tetisheri, though a mummy that may be hers was included among other members of the royal family reburied in the Royal Cache (DB 320). A statuette long in the collections of the British Museum bearing an inscription naming Tetisheri was identified as a forgery by W. V. Davies, based on the slavish imitation of its inscription from a fragmentary lower portion of a similar statue of the queen (now lost).

However, some scholars question this attribution, and have been raising questions as to the potential authenticity of the statuette itself, if not the inscription.
Conclusion of the Abydos intellectual line

So what is the lesson of the Abydos line’s intellectual legacy within New York Alpha?

The Abydos line reminds us that we are, first and foremost, an organization founded on classical Greek ideas, ideas as they were received in the former Dutch colonial region flanking the Hudson river valley. The line is that of the Chapter's numerous doctors of medicine, as they informed the growth of the chemical sciences from their developed in the German university tradition. The roots of this line lay in the Italian renaissance and its classical foundation, back to the Egyptian and African precedents which so informed Cornell undergraduate life at the fin de siecle.