

Paracelsus, the Founder of Chemical Therapeutic Who Initiated the Application of Chemistry to Life

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Abstract Paracelsus, a German-Swiss physician, alchemist, philosopher, and astrologer who denounced the Galenic system of medicine. The application of chemistry to life was initiated by him. In fact, he stressed the spiritual side of disease but also advocated the use of mineral as drugs, rather than just using plants and animal products. He burned the works of Avicenna, and quarreled with most of his colleagues at Basel and was dismissed in disgrace and resumed his wandering from place to place, teaching chemical therapy (iatrochemistry). Johannes Baptiste van Helmont, Flemish physician was the leading iatrochemist of seventeenth century, but he opposed the dogma of Galen, astrology of Paracelsus and many other established doctrines.

Keywords Paracelsus, Helmont, Iatrochemistry, Pharmacology

In the Renaissance some Europeans reacted against the anatomy and other medical teachings expounded in medieval Islamic text, particularly the "Canon of Medicine" (al-Quanon fil-Tib), written by Avicenna (980-1037), a famous and influential Iranian physician and philosopher-scientist. Leonardo da Vinci (1452-1519), Italian and the greatest artist and scientist of the Renaissance who studied the skeletal movement and muscle structures in relation to function, rejected the anatomy, though by necessity he was forced to employ its terminology. Paracelsus burnt a copy of Canon of Medicine [1] which ranked among the most famous book in the history of medicine. He sharply broke with tradition by teaching not in Latin but in the vernacular (native German). More revolutionary was his growing tendency to subject the ancients (and their followers as well) to an unmitigatedly hostile criticism to the same extent that he angered those in authority, he attracted the young and those in training. He took his considerable interest in alchemy to heart and, in applying this to treatment of disease, earned for himself the title "father of pharmacology" in spite of his limited pharmaceutical arsenal and his highly medieval pathophysiology where in diseases were caused by influences of the stars and planets upon the "astral body" of man [2].

Paracelsus's doctrines shocked many respectable physicians of the time, who clung, sometimes with great bigotry to Galenical doctrine in the face of Paracelsian heresy [3].

1. Paracelsus, the Creator of Iatrochemistry

Iatrochemistry*, the study of chemical phenomena in order to obtain results of medical value was founded by Paracelsus.

Iatrochemists the followers of Paracelsus treated the human body as a chemical system. In iatrochemistry, disease was associated with upsets of body chemistry and treatment was directed toward restoration of the chemical balance. Drug sources were chemically treated to extract their essence, or curative portion. The movement of iatrochemistry flourished for a century and a half following the death of Paracelsus (1541) and, although violently opposed in certain medical circles, had strong influence on the development of both medicine and chemistry during the 17th century. The ideas were developed by Franciscus Sylvius (dele Boë) (1614-1672), Dutch physician, anatomist and founder of the iatrochemical school, who studied chemical imbalances in the blood, and discovered the Sylvian aqueduct connecting the third and fourth ventricles of the brain (1641) [4].

Johannes Baptiste van Helmont (1577-1644), Belgian physician and iatrochemist was a leading follower of Paracelsus in the belief that chemical remedies produced the most successful cures and was one of the earliest chemists to use quantitative methods [5]. He was an experimentalist who opposed the dogma of Galen (c.150-200), "the prince of physicians," revered as the supreme medical authority until the 16th century, the astrology of Paracelsus and many other

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* Modern equivalent of iatrochemistry is chemotherapy or pharmacology. Iatrochemistry, or medical chemistry was the name given to the fusion of alchemy, medicine, and chemistry that was practiced by Paracelsian in the 16th and 17th centuries-an alternative to the new mechanistic philosophy which eventually dominated modern science.

established doctrines including four elements of Aristotle and three principles of Paracelsus [6].

2. The Highlights

- Paracelsus proposed the true aim of alchemy should be to cure disease and the preparation and study of drugs should be the main object of the chemist.
- The application of chemistry to life was initiated by Paracelsus.



Johannes Baptiste van Helmont (1579-1644), Flemish physician and leading follower of iatrochemical school

- He was the founder of chemical therapeutics. He used the Greek term “chaos” for air.
- He denounced the ideas of Galen publicly.
- Hydrogen, first obtained under the name of combustible air by Paracelsus in the 16th century. Its properties were described by Henry Cavendish (1731-1810), British chemist and physicist who performed quantitative experiments with gases and determined the mean density of the earth.
- Quicksilver which was known in the 4th century BC, was first used as medicine by Paracelsus.
- The name “zinkum” was first used by Paracelsus, who introduced it into Europe in the early 16th century [7].
- Paracelsus used a pain-killer made with opium, which he called laudanum (tincture of opium), which was taken for headaches until the present century.
- Paracelsus burned a copy of the Canon of Medicine [8], an enormous and influential medical work written by Avicenna (980-1037), Iranian physician, called the prince of physicians.
- He interpreted “morbus gallicus” as mutable entity that invaded the body from outside [9].
- He had a deeply mystical mind, and his writings were difficult to understand.

- He believed that diseases could be cured by chemical remedies, which he spent much time in preparing.
- Paracelsus believed all matter consisted of mercury, sulfur, and salt.

3. Life

Aureolus Philippus Theophrastus Bombastus von Hohenheim [10], known as Paracelsus (1493-1541), Swiss-German physician, alchemist, philosopher, and astronomer who shirked neither challenging the ancients nor suggesting chemical therapeutics. Born Einsiedeln, cantoned Schwyz, Swiss [11], he studied medicine with his father, then wandered over Europe studying medicine, alchemy and mining, and received M.D. from the University of Ferrara, in northern Italy. He developed considerable interest in alchemy, astrology, and the occult science. Paracelsus who had a keen and retentive power, his incurable wanderlust sent him traveling all over Europe collecting information from people of every walk of life including barbers, executioners, gypsies, midwives, and fortune-tellers. With a reverence for Hippocrates, he was a wandering spirit and, except for brief stay in Freiburg, a city in Germany, Strassburg, river port of eastern France, and Basel (French Bale), second largest city of Switzerland where several remarkable cures gained him considerable fame. He journeyed about the German world quarreling with those in authority, specially for their indignant total acceptance of the classics [12].



Paracelsus (1493-1541), Swiss-German radical 16th century medical thinker, founder of iatrochemistry, and father of pharmacology

Paracelsus when was appointed as professor of medicine at Basel, Swiss, in 1527, he began his tenure there by publicly burning the work of Galen and Avicenna, and lecturing his own native German, instead of Latin, on findings based upon his own experiences. He quarreled with most of his colleagues, and was dismissed in disgrace and resumed his wandering from country to country teaching his own doctrine, iatrochemistry, advocating simple remedies including opium, sulfur, mercury, and lead. He died at Salzburg, a city of western Austria, on 24 December 1651.

4. Works

Paracelsus wrote on the nature and causes of diseases. He published "Von der Französischen Kranchheit Drey Bucher" (Three Chapters On the French Disease), a clinical description of syphilis in 1530, and a surgical textbook, "Die Grosse Wundartzney" (Great Surgery Book) in 1536 [13].

5. Conclusions and Impact

Through many centuries, thought and actions in Europe were dominated by the opinions of Hippocrates, Galen, and Avicenna. Then came the great outburst of independence and originality in the Renaissance. The Renaissance of the 15th and 16th centuries brought not only a cultural rival, but also stimulated great strides in medicine. The eminent anatomist Andreas Vesalius (1514-1564) by his outstanding "De humani corporis fabrica" (On The Structure of the Human's Body) reformed the concepts of anatomy and brought to the profession an understanding of the human body that has needed but little improvement. In France, Ambroise Paré (1510-1590), the great surgeon of the Renaissance began his career as a barber surgeon cutting hair and performing operations. Despite his ignorance of Latin, the then international language of science, his skill and accurate observations won him a place in medical history, and he is now recognized as father of modern surgery. Until 1540, surgeons did not formally divorce the especiality from barbers. In the same year, Henry VIII (1491-1547), King of England (1509-1547) who made a favorable impression because of his vigorous physical appearance and his intellectual gifts, issued a royal decree separating the two professions. According to the decree, surgeons should no longer be barbers, and barbers should restrict surgery during this period. Andreas Vesalius and Ambroise Paré the then outstanding surgeons had no counterparts in the field of medicine, and advances were slow and limited. Concepts of experimentation to find the actual nature of disease had not become established during the Renaissance era. Paracelsus, a gigantic personality who attempted to introduce new concepts into medicine added many new drugs for the treatment of diseases including sulfur, lead, iron, and mercury. Many of his ideas however, appear not to be nonsensical, for example, his view that the human body was composed of three elements sulfur, mercury, and salt. Other physician were still making use of concoctions of worms, believing in witches and regarding "humors" and stars as the regulators of bodily health [14]. The most notable influence of Paracelsus was chemistry in medicine. Iatrochemists including Johannes Baptiste van Helmont treated the human

body as a chemical system. The Iatrochemistry flourished for about 150 years following the death of "Paracelsus and, although Violently" opposed in many medical circles, had strong, influence on the development of both medicine and chemistry during the 17th century. This chemical medicine was to compete with Galenic physicians who had relied primarily on plant medicine for next two hundred years and ultimately to find a place in the accepted pharmacopoeias [15].

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