

PHYSICIANS AND ARCHITECTS – NOT AN ODD COUPLE

LIJEČNICI I ARHITEKTI – NE TAKO ČUDAN PAR

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*To my beloved daughter, Hedi,
an ardent and devoted student of architecture
at Bezalel Academy, Jerusalem*

SUMMARY

One may think that there is no apparent interface between so different occupations as medicine and architecture. The historical and present-day connections between these academic fields resulted in the creation of healthy environment, housing and hospital.

This article also speaks about another meeting point of these professions: physicians who became architects (or amateur-architects) and personal friendships between physicians, scientists, and architects which resulted in fruitful and progressive architectural creations. Both professions may be regard as art and science as well.

Key words: *history of medicine; history of architecture; health-architecture*

INTRODUCTION

Generally speaking, studies in history of medicine fall into various areas, such as 1. a history of a specific physician or researcher and their contribution to medicine [1-4]; 2. a description of unknown, newly discovered or forgotten manuscript or document [5]; 3. a history of ideas - how concepts of a disease

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or procedure developed through ages [6-7]; 4. history of a single sign, phenomenon, disease or a syndrome [8]; 5. medical aspects of personalities, disabilities or procedures that appear in literature, poetry, plays, visual or other arts or archeological findings [9-10]; 6. biographies of physicians who became eponymous of science and medicine; 7. medical, surgical, or psychiatric aspects of a personality (pathography) [11]; 8. a history of a special department, medical facility or an establishment [12-13]; 9. a history of associated health professions [14]; and 10. a history of physicians who contributed to other branches such as, art, literature, music, poetry, politics, revolutionary movements, military, espionage, and other sciences [15-17].

This review article focuses on physicians who became architects (or amateur-architects) and on close friendships between physicians, scientists, and architects that resulted in fruitful and progressive architectural creations. Gothic architects often added peculiar dysmorphic facial traits on the walls or roofs of cloisters, churches, or monasteries. Now we associate these disfigured faces with Hurler's syndrome - a metabolic disease characterized by dwarfism, hunchback, gargoyle-like appearance, mental retardation, and a large number of other abnormalities. They are often described with the term *gargoylism*, because of resemblance to the gargoyles of Gothic architecture. Perhaps historians of architecture may well give evidence to similar examples for different times and buildings or monuments.

In modern times, these two occupations have worked hand in hand to create a "healthy environment" in hospitals or to design modern facilities in hospitals. Hospitals, clinics, and medical centers are designed today to be more friendly, esthetic, efficient, and more considerate of the environment. Another interesting historical aspect is the stories about physicians who became architects or amateur-architects. It is beyond the scope of this review, however, to investigate their motives.

PHYSICIANS, MEDICINE, AND ARCHITECTURE

In 1874, Lord William Thomson Kelvin (1824-1907) said that there could be no proper indoor hygiene until "architecture becomes a branch of scientific engineering" [18]. Sanitation of hospitals became an important topic thanks to Florence Nightingale (1820-1910), Lord Joseph Lister (1827-1912), Sir Douglas Galton (1822-99), Sir Henry Burdett (1847-1920), Sir James Phillip Kay-Shuttleworth (1804-77), and Robert Baker (1803-1880) [19] and is of paramount importance today (20).

“Architecture impinges upon medicine in two ways, which correspond to the maintenance of health, and its restoration. A building should not impair the health of its occupants, as when, for example, prefabricated concrete components turn out to let in water on assembly. More broadly, architects are asked to suggest ways that people, including those with mental and physical handicaps, can live and work in reasonable physical and psychological health in the close proximity that we demand. They also design types of buildings, notably the hospital, involved with the care of the sick” [21].

Perhaps the best example of a new hospital design was the result of a friendship and co-operation between cotton spinner William Strutt (1756–1830) and the members of the Derby Philosophical Society, including physicians such as John Hollis Pigot (1758–1794) and a physician-poet Erasmus Darwin (1731–1802), then Charles Sylvester (1774–1828), a chemist and inventor who worked on galvanization, public building heating and sanitation, and railroad friction, and Robert Owen (1771–1858), a well-known Welsh social reformer and one of the founders of utopian socialism and the cooperative movement. Together they designed and saw through the construction of the Derbyshire General Infirmary in 1817. Although Strutt was involved in the hospital’s design and that of many bridges in Derby, he is not listed as architect in Sir Howard Montagu Colvin’s (1919–2007) *Biographical Dictionary of British Architects 1660–1840*, first published in 1954. It does however list Samuel Brown as the architect who brought to life Strutt’s designs.

One of the questions that puzzle medical historians is why so many physicians and surgeons shifted to other occupations? How did it happen that many of them became famous politicians, social reformers, philosophers, authors, poets, scientists, and educators? We may only assume that their intellectual drive, unending curiosity for scientific, social, and psychological issues, or involvement in humanistic/artistic areas pushed these physicians to get involved in other occupations. Perhaps the limits of medical, technological, or surgical knowledge in those days caused them to search for other challenges. It is therefore no surprise that some became architects.

Traditionally, Imhotep (27th century BC, Memphis, Egypt), architect, astrologer, and chief minister to Djoser (who reigned from 2630 to 2611 BC), was regarded as an advisor and sage and was later worshipped as the god of medicine in Egypt and Greece. It is known that the chief magician of the pharaoh’s court also frequently served as the nation’s chief physician. Tradition has it that it was he who designed the step pyramid of Djoser in

Saqqara. In addition, Imhotep's name is associated with the first known use of columns in architecture and with the invention of building with dressed stone [22-23].

During the Roman times, Marcus Terrentius Varro (116 BCE–27 BCE), Lucius Junius Moderatus Columella (4 – ca. 70 AD) and Vitruvius, none of them physicians, advocated “healthy” houses far away from swamps [24]. Marcus Vitruvius Pollio (ca. 80–70 BC, - after ca. 15 BC) was a Roman writer, architect, and engineer, who is best known as the author of the multi-volume work *De Architectura* (*On Architecture*). Vitruvius was engaged in a wide variety of subjects such as architecture, mathematics, astronomy, meteorology, and medicine. “*Let him be educated, skilful with the pencil, instructed in geometry, know much history, have followed the philosophers with attention, understand music, have some knowledge of medicine, know the opinions of the jurists, and be acquainted with astronomy and the theory of the heavens*”[25]. I believe that *De Architectura* had an immense impact on generations to come; in *Le Crime de Sylvestre Bonnard*, Anatole France refers to this monumental work displayed in an art shop in Paris [26].

At the turn of the 16th century, Italian philologist, mathematician, and physician Marco Fabio Calvo (ca. 1440-1527) translated the *Corpus Hippocraticus* into Latin (published in Rome by Francesco Giulio Calvo in 1548). In Rome he lived at the painter Raphael's house. There he translated *De Architectura* into Italian. Calvo and Raphael planned to produce a pictorial reconstruction of ancient Rome, but Raphael's sudden death ended this initiative.

Architect, physicist, physician, anatomist, and author Claude Perrault (1613-1688) designed the east wing of the Louvre Palace. He became one of the first members of the French Academy of Sciences when it was founded in 1666. He collaborated with architects Louis Le Vau (1612 –1670), Charles Le Brun (1619–1690), and François d'Orbay (1634–1697) [27]. At the Academy he was in charge of the zoology department. In his *Les Essais de Physique* he discussed the physiology of elasticity and contractility of arteries, the sense organs, and blood transfusion. He translated Vitruvius' works into French. He investigated the physics of musical sound, vibration, and acoustics (*Oeuvres diverses de Physique et de Mécanique*). Perrault also designed an observatory in Paris, the church of *St-Benoît-le-Bétourné*, a new church of *Ste-Geneviève*, an altar in the Church of the Little Fathers, and a triumphal arch on Rue Saint Antoine.

In 1624, French physician and author Louis Savot (1570?–1640) designed a fireplace in the Louvre. “*Ducts passed under, behind, and above the fire in the*

hearth. Cool air in the room entered the lower opening of a duct, was warmed, rose, and returned to the room through the duct's upper opening" [28].

THE GREAT FIRE OF LONDON

On 2 September 1666, the Great Fire of London broke out and by 5 September destroyed a large part of the centre of London. Sir Christopher Wren (1632-1723), physician, Savilian Professor of Astronomy at Oxford, and inventor of scientific instruments, was asked to re-build the City. His interest in architecture and city planning began before the Great Fire, and his great architectural output followed it. Of Wren's vast scientific contribution the least known is his early work in medicine [29 -32].

Sir William Petty (1623–1687) was also involved in the restoration of London after the Great Fire. He was an English physician, anatomist, economist, statistician, inventor, scientist, philosopher, and one of the founders of the Royal Society. In 1647, he invented a copying machine [33-35]. In 1651, he became professor of anatomy at Brasenose College in Oxford and professor of music in London. That year he also joined Oliver Cromwell as a army doctor in Ireland. He was knighted by Charles II. .

Physician, economist, property developer, and financial speculator Nicholas Barbon (1640 – ca. 1698) supported the idea of free market and criticized mercantilism. He left the medical profession and after the Great Fire to become a speculative builder. He is regarded one of the pioneers of the policy of fire insurance (36-37). It was said that he often disregarded legal and local objections, demolished existing buildings or rebuilt speculatively in search of a good profit. William Petty and Nicholas Barbon are not listed as architects by Colvin, but their involvement in the City restoration was crucial.

Robert Hooke (1635-1703) was an English physician, natural philosopher, architect, builder of telescopes, early proponent of biological evolution, map-maker, inventor, and a polymath. He served as the curator of experiments of the Royal Society, a member of its council, Gresham Professor of Geometry and a Surveyor to the City of London. The Great Fire gave him the opportunity to show his architectural talents and his plans for restoration. He assisted Wren to rebuild St. Paul's cathedral. He built hospitals and academic institutions [38-39], the Royal Greenwich Observatory, Montagu House in Bloomsbury, the infamous Bethlem Royal Hospital, and The Royal College of Physicians (1679). In 1674, a London merchant and financier Sir John Cutler (1607-1693) donated the money to build an anatomy theatre that

would face the street with an octagonal dome, allowing entry to the courtyard through an archway below. A model of the theatre is currently on display at the Museum of London [40].

A peculiar anecdote is connected with the Antwerp-born, mathematician, physician, architect, painter, and occultist Gérard (or Girard) Thibault d'Anvers (ca. 1574–1627). He became famous because of his book *Academie de l'Espée*, a fencing guidebook based on geometrical-architectural principles. Each illustration in his textbook is an engraved luxurious building [41].

THE FRENCH CONNECTION

In 1731, Jacques de Vaucanson (1709–1782), a French engineer and inventor, met the famous surgeon and anatomist Claude-Nicolas Le Cat (1700–1768). Their encounter produced the first “automaton”, the first step to creating a robot and an automated loom (42). Vaucanson also met another French surgeon and economist, François Quesnay (1694–1774), who encouraged him to create “artificial creatures”. Vaucanson decided to broaden his knowledge in anatomy in order to imitate natural mechanisms with artificial ones, the so called *living anatomies* [43]. Le Cat was an accomplished surgeon and invented an elevator for sickbeds. His writings concern mathematics, war architecture, and philosophy. He was knighted in 1762 [44].

THE AMERICAN CONNECTION

Dr William Thornton (1759–1828) [8] was born in the British West Indies (Jost van Dyke, Virgin Islands) and studied medicine in Edinburgh and Aberdeen. With John Fitch, Thornton invented the steam ship even before Fulton, fought against slavery, and dreamed about the Panama Canal. He opposed Dr Benjamin Rush (1746–1813), who advocated blood-letting as a way to treat yellow fever, and developed a communication method for deaf-mute children. Thornton designed many public institutions [45–49]. As an amateur architect he designed a building plan for the Congress at Capitol Hill in Washington, DC. Eventually, Capitol Hill was built as a result of collaboration between Thornton, Stephen Hallet (a French architect, 1755–1825), George Hadfield (a British architect, 1763–1826), and James Hoban (1758–1831) an Irish architect, who came to Philadelphia in 1785 and in 1792 won the competition for the President's House.

NORWAY, AUSTRIA-HUNGARY, AND THE RUSSIAN EMPIRE

A Norwegian physician, Hendrich Deegen (1742-92) designed a hospital for sufferers of “radesyge” (red-skin, syphilis?) in Flekkefjord, a small town in Norway, in 1776, and was its first in-house physician [50].

Austro-Hungarian Camillo Sitte (1843–1903) studied medicine with Carl Ludwig (1816-95), Joseph Hyrtle (1810–1894), and Ernst Wilhelm Ritter von Brücke (1819–1892). He became a famous and influential architect, painter, and city planning theoretician [51].

Innokenty Fyodorovich Bezpалov (1877–1959) was a famous Russian architect, artist, and sculptor, whose works are found all over Russia. At least on one occasion, he cooperated closely with Ivan Pavlov (1849–1936). In a small village of Koltushi, 10 km to the east of St Petersburg, he designed and built the Institute for Physiology of the Academy of Sciences and residences for the scientists [52].

Apparently, the key to any successful initiative is cooperation between people with different occupations. Today it is a *sine qua non*. An important moment in the history of occupational health was when, in 1914, George E. Barton (1871-1920), a disabled architect suffering from tuberculosis, traumatic left foot amputation, and left hemiplegia due to conversion reaction, contacted psychiatrist William R. Dunton, Jr. (1868-1966) because he was interested in learning about the response of the human body to occupational therapy and whose correspondence led to the founding of the National Society for the Promotion of Occupational Therapy, which later became the American Occupational Therapy Association [53-55].

In conclusion, various aspects of medicine and architecture presented in this review show that real human progress can be achieved through fruitful cooperation between different specialties.

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SAŽETAK

Netko bi mogao pomisliti da nema dodirnih točaka između zanimanja tako različitih kao što su medicina i arhitektura. Veze između tih dviju akademskih disciplina, tijekom povijesti i danas, dovele su do stvaranja "zdravog okoliša, kuće i bolnice", odnosno do nastanka novih kliničkih ili tehničkih jedinica. Nekad su se zgrade, crkve ili spomenici ukrašavali stvarnim ili legendarnim likovima s različitim fizičkim ili anatomskim malformacijama. Ovaj članak govori o još jednoj dodirnoj točki između dva zanimanja: o liječnicima koji su postali arhitekti (makar amaterski) te o osobnim prijateljstvima između liječnika, znanstvenika i arhitekata, koja su dovela do plodnih i naprednih arhitektonskih rješenja.

Ključne riječi: povijest medicine, povijest arhitekture, zdravstvena arhitektura