

Medicine in Stamps

Rudolph Virchow (1821-1902): “pope of pathology”

Tan S Y, M D, J D and Brown J*
Professor of Medicine and
Adjunct Professor of Law, University of Hawaii

*Senior medical student at John A. Burns School of Medicine, University of Hawaii



Rudolph Virchow, nicknamed “little doctor”, was one of Germany’s most prominent physicians. His doctrine that the cell functioned as the basic unit of human biology enormously expanded our understanding of disease pathophysiology.

Rise of a Star: Rudolph Ludwig Carl Virchow was born on October 13, 1821 in Schivelbein, Prussia, which is part of present day Poland. His family was poor, so he undertook his medical education at the Friedrich-Wilhelms Institute in Berlin, a tuition-free school for future army medical officers. In 1843, he earned his doctorate in medicine and became a junior surgeon at Charité Hospital. There, he honed his skills under the tutelage of microscopist Richard Froriep, and the charming physiologist, Johannes Müller.

Called “Hippocrates with the microscope”, Virchow mastered the microscope as an investigative tool, but more than that, he had a knack for correlating both macroscopic and microscopic pathological findings with clinical manifestations of disease. He urged his students to always “learn to see microscopically.” Within two years of graduation, he astutely distinguished thrombosis from embolism, and correctly described the pathophysiology of pulmonary embolism. The next year, in parallel with Bennett and Donné, he helped to establish leukaemia as a disease of white cell origin. He then began publication of *Archives for Pathologic Anatomy and Physiology and Clinical Medicine*, widely known as *Virchow’s Archives*, which quickly became the leading medical journal of the era. In its first issue, he articulated his vision of disease as an aberration of normal physiology: “*This is not the time for systems, but the time for detailed investigations . . . Pathologic anatomy is the doctrine of deranged structure; pathologic physiology is the doctrine of deranged function.*”

Virchow made numerous contributions. His theory that inflammation was aetiologic in atherosclerosis, mostly ignored at the time, proved prophetic. It was Virchow who gave us words like myelin, amyloid, leukocytosis, leukaemia, endocarditis, endarteritis,

and infectious diseases. His medical knowledge and prolific use of the microscope helped to improve public health, especially in the way of food standards. For example, by working out the life cycle of *Trichinella spiralis* and the incidence of outbreaks of tuberculosis in infected cattle, he became influential in rewriting the rules for meat inspections. For these latter contributions, he has been hailed as the father of veterinary pathology.

Omnis cellula e cellula: Virchow is most familiar to clinicians for his studies on tumour pathology, especially the association between gastrointestinal malignancy and enlargement of supraclavicular nodes (Virchow’s nodes). His true legacy however, is the identification of the cell as the fundamental unit of life, extending the foundations laid by Morgagni and Bichat a century earlier. Giovanni Morgagni (1682-1771), known as the “*Anatomical Majesty*”, was the scientist who linked anatomical changes to disease states. In his book, *De sedibus*, Morgagni described a dazzling variety of clinical conditions that included cancer of the stomach, gastritis, myocardial



infarction, and heart block. Xavier Bichat (1771-1802) was a French surgeon and anatomist who studied and classified tissues, and although he did not use the microscope, was in a sense history’s first histologist. He understood that organs themselves could be further subdivided into tissues, and identified and classified the various layers of the heart into the endocardium, myocardium and pericardium. Another scientist, Theodor Schwann had previously observed similarities between plant and animal cells, but he did not correctly describe the means of replication. Virchow however, was able to invoke the idea of Raspail (1825) that “*omnis cellula e cellula* - each cell stems from a cell,” subsequently refining his doctrine to bifurcate orderly from disorderly cellular functions. This new science he termed pathophysiology.

Initially given to vocal political outbursts, Virchow lost his appointment at the University of Berlin in 1849, and worked for a while at the University of Würzburg. In 1856, a more sedate Virchow returned

to Berlin as Chair of Pathology, where a new Institute of Pathology awaited him. In 1858, he presented a series of 20 brilliant consecutive lectures covering the pathophysiology of disease that formed the basis of his book, *Cellular Pathology*, one of the greatest medical texts of all time.

Now revered as the “*pope of pathology*”, the little doctor sported supreme self-confidence, inviting criticisms of self-promotion and egotism. He once stated that “*when they speak of the German School, it is me that they mean.*” His insistence on precise logic and supporting evidence, coupled with his command of the medical literature, made him a demanding teacher and formidable foe. Predictably, he crossed swords with many luminaries, including the prominent Frenchman, Jean Cruveilhier, and Karl von Rokitanski of Vienna. But even Virchow, the popish pathologist, was not immune from error, the most glaring being his opposition to Semmelweis’s plea regarding hand washing to stem the spread of puerperal fever. He also rejected the germ theories of Pasteur and Koch, questioned Darwin’s theory of evolution, and misled many regarding the nature of tuberculosis (he thought it was more than one disease entity).

Politics and Public Health: Virchow believed that health and disease were products of the whole person, from the very cells in the body to the social setting in which it lives. In addition to pathophysiological changes, factors such as environmental influences, inherited dispositions, social class, and occupation all played a role in disease. He had always held an interest in politics with a liberal-leaning tendency. For example, in 1848, a typhus epidemic broke out in Upper Silesia, a poverty-stricken community under Prussian rule. Sent on an official mission, Virchow observed the interrelation between living conditions and the medical outbreak, and reported his findings in a biting report against the Prussian government. From this experience, his battle cry echoed the century-old admonition of French philosopher, Pierre Cabanis, that “*Sickness is dependent upon the blunders of society.*”

As liberal revolutions against the conservative government parties of the time spread across Europe, Virchow made his presence felt through fiery speeches and his publication, *Medical Reform*. He promoted the ideal that “*physicians are the natural attorneys for the poor.*” Over time, however, he adopted less abrasive methods and his popularity as a scientist and activist allowed him to be elected to the Berlin City Council in 1859, Lower House of the Prussian Diet in 1861, and the German Reichstag in 1880. While on the city council, he contributed to building a new Berlin through the betterment of hygienic conditions throughout the city, erecting hospitals and redesigning the sewer systems.

His time on the Diet saw the ushering in of the

Junker leader, Otto van Bismark, as Kaiser. Bismark’s opening statement, “*the great questions of our country cannot be solved by speeches and majority votes . . . but by blood and iron*”, represented the strongly socialist ideals Virchow had fought so hard against in his youth. He opposed and antagonised the Kaiser at every turn, prompting the would-be dictator to issue a challenge to a duel. Virchow agreed to accept on condition that scalpels were to be used! Happily, the duel never took place. Eventually, even the Kaiser recognised his contributions, and awarded him, at the age of 80 years, with a medal for science.

Anthropology: The war over, Virchow took to anthropology and ascertained, among other things, that there was no pure German race (Das Deutsche Volk). This helped to deflate the false concept in both German unification movements and Hitler’s attempts at ethnic cleansing. The study, based on the features of millions of German school children, was published in the *Archives* in 1866. His anthropological zeal eventually led him to found the German Anthropological Society and the Berlin Society of Anthropology, Ethnology, and Prehistory, as well as help to excavate Troy and participate in fieldwork in Egypt and the Caucasus.

Death at 81: Even in old age, Virchow’s inexhaustible energy was irrepressible. At the age of 81 years, he jumped off an electric streetcar, and sustained a femoral neck fracture that kept him hospitalised for months. He never fully recovered and re-injured his hip shortly thereafter. On September 5, 1902, he died of cardiac failure. The public funeral was grand for this son of a farmer, with admirers and royalty attending. In his memory, Humboldt University in Berlin established the Virchow Chair of Pathology as a lasting tribute to one of history’s greatest clinician-scientists.

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