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Rafinesque

TRANSYLVANIA'S FAMOUS NATURALIST

By Charles T. Ambrose

Constantine Samuel Rafinesque (1783-1840) was Professor of Botany, Natural History (Zoology), and Modern Languages at Transylvania University from 1819-26. By all accounts, he was its most colorful professor and likely is the figure from the University's historical past most familiar to its alumni. He also was the most controversial biologist in early nineteenth-century America. Less well known is that he was cited by Charles Darwin for having described species variation in 1836, two decades before Darwin published his celebrated theory on biological/organic evolution (1859).

Rafinesque grew up in France and Italy in a mercantile family, but had no formal schooling or university training. He was autodidactic, acquiring a loose, unstructured education under occasional tutors. As a youth he was a voracious reader and

developed a precocious interest in nature from books on biology and travel. At age 12 he collected plants during a 100-mile journey from Leghorn/Livorno to Genoa. To research them in the literature, he mastered botanical Latin on his own.

Rafinesque first came to the United States in 1802 and was soon captivated by its native plants. He met Thomas Jefferson and corresponded with him during two periods. Several early letters in 1804, while Jefferson was President, concerned botany and included gifts of various seeds. Rafinesque returned to Europe that year, studied the flora of Sicily, earned a small fortune in trade, and moved permanently to the U.S. in 1815.

He explored and botanized extensively in the Ohio River valley, and in 1818 visited for a week or so with the artist-naturalist John James Audubon in Henderson, Ky. In 1819, he obtained an appointment as professor in natural history at Transylvania. But Rafinesque was not well tolerated by Transylvania President Horace Holley or most of its arts faculty, who favored classical studies over natural science.

After learning of the University of Virginia being created by Jefferson,

Rafinesque wrote to him seven times over a five-year period (1819-24) soliciting the professorship of natural history there. His letters were fulsome in praise of his own talents and of his expertise in various fields. He listed his extensive writings and forwarded the recommendations of a score of distinguished botanists and zoologists, two-thirds from Europe. Jefferson demurred by claiming financial constraints due to the overriding construction costs. In 1825 the Board of Visitors of the University of Virginia ultimately appointed a New Yorker as professor of natural history.

(continued next page)

The frontispiece of Analyse de la Nature provides the most certain likeness of Rafinesque. It is signed "Falopi."

Rafinesque's two-volume Medical Flora and Botany of the United States (1828 and 1830) lists nearly 600 medicinal plants, including their Linnaean and common names, descriptions, histories, and medical uses.

Rafinesque was a polymath who wrote over 220 (some claim over 600) articles and books. He submitted so many botanical reports that one journal editor eventually refused all papers from him. His reputation in taxonomy suffered because of his often hasty classifications, his disputatious reviews of others' works, and his egocentric personality. In later years he published, mainly at his own expense, books and articles on astronomy, geology, mineralogy, archeology (the mound builders), anthropology (the origin of North American Indians), philology (Indian linguistics),

ancient Mayan hieroglyphics, financing and banking, a utopian community, and the Hebrew Bible.

Rafinesque's major lifelong interest was finding and classifying new plants and animals. He had an insatiable urge to explore, examine, collect, and publish, thus gaining priority of discovery. He had a rich visual memory, a fertile imagination, and a stoic drive. It's estimated that he traveled mainly by foot over 8,000 miles in 14 Eastern and Midwestern states. He crossed the Appalachian

Mountains five times, preferring to walk rather than ride, since this put him closer to any new flora to be found along the way.

By various reports, he coined binomial names for over 6,700 species of plants plus many newly recognized animals.

“He had an insatiable urge to explore, examine, collect, and publish, thus gaining priority of discovery. He had a rich visual memory, a fertile imagination, and a stoic drive.”



His most valuable contribution was his classification of fish and mollusks of the Ohio River valley. To place Rafinesque's efforts in perspective, Linnaeus, the great eighteenth-century Swedish botanist, had devised names for 7,700 plants and 4,400 animals, and it's estimated that the earth harbors between two and 10 million biological species, all needing scientific names.

Of interest to nineteenth-century physicians was Rafinesque's *Medical Flora and Botany of the United States* in two volumes (1828 and 1830), which includes nearly 600 medicinal plants from the area and presents woodcuts in vivid green color for 100 of them (see back cover). He listed their Linnaean and common names plus their descriptions, histories, and medical

uses. For example, the genus *Euphorbia* includes several species prescribed as cathartics and expectorants.

Samuel Brown, one of Transylvania's first medical professors, introduced

Rafinesque to a regional poisonous species, *Euphorbia peploides* (blooming spurge), which frequently caused milk-sickness in cattle and people. Cows often ate this native plant, developed staggers, and soon dropped dead. Their poisonous meat and milk, eaten and drunk by people, caused a similar, fatal illness in them, as befell Nancy Hanks Lincoln in 1818, the mother of nine-year-old Abraham.

Rafinesque's other medically relevant book was *The Pulmist, or Introduction to the Art of Curing and Preventing the Consumption or Chronic Phthisis*—now termed pulmonary tuberculosis. He coined the name pulmist for someone treating lung diseases exclusively (mainly consumption), much as a dentist focuses on teeth.

No. 37.

EUPHORBIA COROLLATA.

Soon after leaving Lexington in 1826 and moving to Philadelphia, where he would spend the rest of his life, Rafinesque experienced an illness he termed "catarrhal and dyspeptic consumption." Consumption was then generally believed to be caused by an inherited weakness (a diathesis) in the body's constitution, thus accounting for its frequent occurrence in families. The infectiousness of tuberculosis was first demonstrated in 1868 by Jean-Antoine Villemin, who inoculated various experimental animals with human and bovine tuberculous material, including infected sputum. In 1720 Benjamin Marten had postulated that "some certain Species of Animalcula or wonderfully minute living Creatures" cause consumption, but the tubercle bacillus was not discovered until 1880 by Robert Koch.

Rafinesque treated himself with herbal remedies that he believed were effective against consumption. When his health returned, he became convinced (by faulty circular reasoning) of his presumed diagnosis and the efficacy of his herbal mixture, which he called

Pulmel. He made it available in seven different preparations, including syrup, wine, balsam (for inhalation), and lotion. The active agent was termed Pulmelin. He announced his purported curative in four short letters published in *The Saturday Evening Post* in 1827-28. Rafinesque never disclosed the herbal ingredients of Pulmel or the principal plant in Pulmelin. He refused to patent his discovery, since unscrupulous persons often examined government records open to the public and then marketed comparable medical products. He sold Pulmel through a dozen or so dealers in New England and even shipped some for sale in France.

In the modern era, pharmacologists have examined various folk medicines, searching for a key chemical ingredient effective for some specific disease. The botanical identity of Pulmelin is only a minor medical curiosity today, since drugs curative in most cases of tuberculosis are now available.

The symptoms, signs, and duration of Rafinesque's Philadelphia illness were never stated, nor was the diagnosis of phthisis made by a physician, leading one

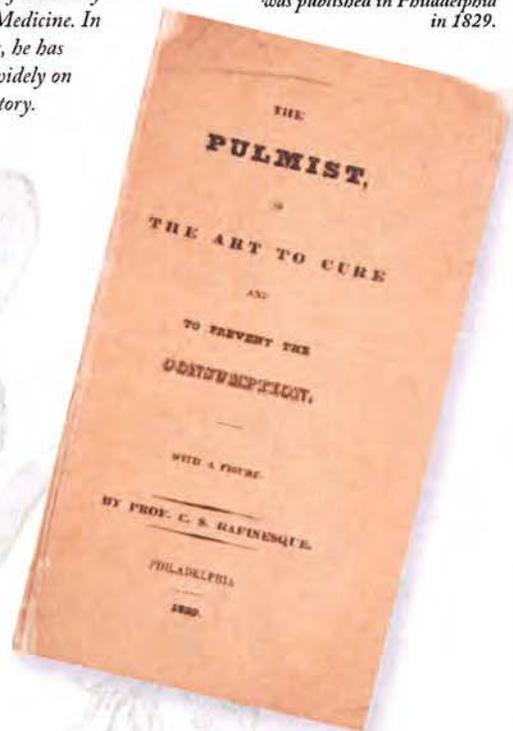
to doubt that he ever had the disease. Indeed, his interest in Pulmel apparently faded in the late 1830s, for there are no subsequent references to its promotion or sales. He lived in straitened circumstances during his final decade and died of stomach cancer in 1840 at age 57. ¶



Charles T. Ambrose is a Professor in the Department of Microbiology, Immunology, and Molecular Genetics at the University of Kentucky College of Medicine. In recent years, he has published widely on medical history.

1. C. R. Darwin. "An Historical Sketch," *On the Origin of the Species by Means of Natural Selection*, 6th edition, New York: D. Appleton & Co, 1872, p. xvi.
2. E. M. Betts. "The Correspondence Between Constantine Samuel Rafinesque and Thomas Jefferson," *Proceedings of the American Philosophical Soc.*, 1944: 87: 368-380.
3. B. Marten. *A New Theory of Consumptions: More Especially of a Phthisis or Consumption of the Lungs*. London: B. Knaplock, 1720, p. 51.

*Rafinesque coined the term pulmist for someone treating lung diseases exclusively. His book, *The Pulmist, or Introduction to the Art of Curing and Preventing the Consumption or Chronic Phthisis (now termed pulmonary tuberculosis)*, was published in Philadelphia in 1829.*



Background: A woodcut illustration from Medical Flora