

Book Reviews

Lee R. McDowell, *Vitamin History: The Early Years* (Sarasota, FL: First Edition Publishing, 2013), pp. vi, 278, £12.38, paperback, ISBN: 978-1622872-66-4

One will definitely want to take a multivitamin after reading this book. In an old-school medical history approach, Lee McDowell clearly explains how vitamins are necessary for a wide range of human metabolic functions and how research into deficiency diseases such as beriberi, rickets, pellagra and scurvy led to the discovery of thiamin, vitamin D, niacin, and vitamin C. The ‘golden age’ of vitamin research, occurring during the 1930s and 1940s, followed a general format of drawing upon older, empirical or clinical experience that tied specific diseases to particular food therapies, developing experimental procedures to isolate functional components within foodstuffs, carrying out lab-based animal experiments, and synthesising vitamins to cure deficiency diseases.

McDowell is a professor emeritus in the Department of Animal Sciences at the University of Florida. The back cover of his book notes that narrating the early history of vitamins in a humorous way is his favourite topic. He indeed accents each chapter with numerous cartoon-like slides that seem appropriate for an undergraduate introductory lecture. This book will be of interest to enthusiasts as a general introduction to the subject and for those who wish to carry out more in-depth historical research on the history of a particular deficiency disease.

A diet deficient in thiamin or vitamin B1 causes beriberi. It was predominantly a disease of rice-eating cultures. Empirical data suggested that food played some role in disease aetiology, but the strength of the germ theory at the turn of the twentieth century, McDowell argues, mitigated against the general acceptance of a diet deficiency explanation. The Dutch doctor Christiaan Eijkman accidentally discovered that chickens fed polished rice developed polyneuritis or bird beriberi, but that brown rice prevented and cured this condition. While Eijkman did not support the deficiency theory, believing instead that the disease stemmed from a toxin in white rice, these tests laid the foundation for further work by colonial doctors in the region. Later, Casimir Funk coined the term vital-amine, which was shortened to vitamin to refer to the element in rice bran that prevented beriberi. In the 1920s and 1930s, scientists isolated the crystallised form of thiamin and produced a synthetic form that enabled chemists to enrich foodstuffs in the 1940s.

During the industrial revolution in Europe, the increase in urban slums and sky-blackening air pollution led to widespread vitamin D deficiency or rickets. Vitamin D usually can be absorbed through the skin in direct sunlight. Doctors working on rickets prevention across the 19th and 20th centuries theorised that the disease stemmed from either a causal microorganism or some kind of diet deficiency. Cod-liver oil was an empirically tested cure but researchers also surmised that sunlight played a role since those living in temperate zones rarely succumbed to the disease. Animal experiments in the 1920s proved that foodstuffs irradiated by ultraviolet light prevented rickets. At the same time, Elmer McCollum isolated what he called vitamin D in cod-liver oil. British and German scientists later isolated the crystallised form of vitamins D1, D2 and D3 in the 1930s.

Poor and predominantly corn-based diets historically have caused pellagra or niacin deficiency disease. Certain corn-growing regions in Italy, France and the American South were pellagra hotspots. Although empirical experience such as Théophile Roussel's success with dietary reform and disease prevention in mid-nineteenth-century France suggested the link between diet and this disease, McDowell argues that the stubbornness of the germ theory blocked proactive prevention in the United States. From the 1910s onward, Joseph Goldberger carried out empirical studies and experimented on himself; he even ingested pellagrins' faecal matter to prove that the disease was not contagious. Instead, he showed that a restricted diet caused and milk and animal protein cured this condition. Although the value of his work was not immediately recognised and he did not live long enough to see the scientific breakthroughs in the 1930s and 1940s, Goldberger was later regarded as a pioneer in the study of pellagra and the isolation of niacin.

Scurvy or vitamin C deficiency was a disease of empire and expansion, and the Europeans brought it with them as they explored the Pacific, Atlantic and Indian Oceans, battled one another across Europe in numerous wars, and explored the northern and southern poles. In the 1750s, ship's physician James Lind, using multiple groups of sailors, including a control group, proved that only orange and lemon juice, and not other popular remedies, cured scurvy patients. Captain James Cook adopted dietary prevention measures including citrus fruits, sauerkraut, celery, scurvy grass and fresh provisions to ward off the effects of this disease. Empirical experiences formed the basis for scurvy prevention across the 19th century. Doctors later focused on nutritional studies and induced scurvy in lab-based animal experiments in the early 1900s. In the late 1920s and early 1930s, scientists isolated the acid in orange juice or vitamin C that cured scurvy and succeeded in synthesising it.

While no doubt the product of much work, scholars of mainstream science studies looking for insights into the production of scientific knowledge will be disappointed with *Vitamin History, The Early Years*. The questions asked in this book are not informed by the general trends of medical history as written over the past four decades. McDowell blames Louis Pasteur and preconceived notions for inhibiting progress and the forward march of science. We are given no sense of why certain scientists were or were not convinced of the veracity of the germ theory.¹ McDowell could have revealed how the discoveries of individual vitamins were products of particular times and places and given nuanced explanations of the politics of knowledge production at that time. Instead, we get a Whiggish narrative arguing how the young doctors who advocated the germ theory maintained an 'incorrect concept', but through 'research and observations the vitamin theory was established'.² A final criticism is that there is no index at the back of the book, making *Vitamin History, The Early Years* a less than ideal reference for future research.

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¹ M. Worboys, *Spreading Germs: Disease Theories and Medical Practice in Britain, 1865–1900* (Cambridge: Cambridge University Press, 2000), 11.

² L.R. McDowell, *Vitamin History, The Early Years* (Sarasota, FL: First Edition Publishing, Inc., 2013), 55–64.