A history of insatiable intellectuals

Proficient in a range of topics, polymaths are overlooked as often as they are celebrated

By Andrew Robinson

he development of science from the mid-19th century abounds in specialists, observes veteran cultural historian Peter Burke in his new book, *The Polymath*. Think of Louis Pasteur in medicine—the field that first embraced specialization—or Gregor Mendel in genetics, Marie Curie in physics, Edwin Hubble in astronomy, or Dorothy Hodgkin in chemistry.

Yet despite the trend toward specialization since that time, polymaths, whose expertise spans a range of subjects and who flourished in previous centuries, have remained vital to science, if fewer in number. Charles Darwin and Alan Turing come to mind. As does Linus Pauling, who contributed not only to physical chemistry and mathematical physics but also to biology, medicine, and international peace—for which he received two Nobel Prizes. Indeed, Pauling came close to discovering the structure of DNA in the 1950s but failed to achieve his goal, "perhaps because he was distracted by his other interests."

Burke names "500 western polymaths" in the appendix to his mind-stretching and thought-provoking history, which spans the half-millennium that followed the life of the most wide-ranging polymath of all, Leonardo da Vinci. Like da Vinci, their collective work embraces both the sciences and the humanities. Some notable scientific figures among them include (in order of birth) Nikolaus Copernicus, Christopher Wren, Alexander von Humboldt, Mary Somerville, Ernst Haeckel, Henri Poincaré, Alfred Wegener, Erwin Schrödinger, Richard Feynman, Benoit Mandelbrot, and Oliver Sacks. Oddly omitted is the founder of modern nursing, Florence Nightingale, who was also distinguished for her work as a social reformer and statistician.

The first half of the book sketches the lives and work of many of these individuals, with longer sections dedicated to key figures. Here we learn of Thomas Young (1773-1829)—now regarded by many as the greatest polymath since da Vinci—whose tombstone in London's Westminster Abbey describes him as "eminent in almost every department of human learning." Formally trained as a physician in the 1790s, Young taught himself physics and philology. He discovered the phenomenon of astigmatism and first proposed the three-color theory of how the retina responds to light. He showed, in his famous double-slit experiment, that light could behave as both a particle and a wave, a remarkable observation

PETER BURKE

Polymath

The Polymath:

A Cultural History from

Leonardo da Vinci

to Susan Sontag

Peter Burke

Yale University Press,

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that Richard Feynman declared "the heart of quantum mechanics" and its "only mystery." Young also named the Indo-European family of languages and took the first crucial steps in deciphering the Rosetta stone and the Egyptian hieroglyphs.

Chapter 6 aims to analyze the personal characteristics of polymaths as a group, singling out their unusual powers of concentration, capacious memory, speed, imagination, restlessness, industriousness, and obsession with not

wasting time. "[An] overdose of curiosity, long known as the *libido sciendi* and described by the polymath Francis Bacon as 'inquisitive appetite,' is surely the most general as well as the most obvious characteristic of the species," notes Burke.

Two further chapters consider the careers led by polymaths, fleshing out their familial relationships, their educations and working environments, and their reception by professional institutions and by specialists. For all its considerable insight into polymathy, however, at no point does the book address what distinguishes a polymathic genius from a specialist of comparable standing. Should Albert Einstein, for example, be considered a specialist or a polymath? Einstein receives just one glancing reference in *The Polymath*, yet it could be argued that the physicist showed some polymathic tendencies, particularly later in life when he began to engage more deeply in political affairs

> (to say nothing of his well-known musical ability). There has always been a ten-

There has always been a tension between specialization and polymathy. Universities and professions are chiefly organized for the benefit of specialists, not polymaths. Moreover, in addition to greater funding, specialists typically receive more recognition than polymaths do, as evidenced by the Nobel Prizes' emphasis on domain-specific advances. And yet, some of the greatest scientific discoveries and works of

art have benefited from interdisciplinarity and even polymathy. As Thomas Young privately concluded, near the end of his underappreciated life, "It is probably best for mankind that the researches of some investigators should be conceived within a narrow compass, while others pass more rapidly through a more extensive sphere of research."

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A healthy dose of skepticism can help one spot misleading data.

PODCAST

Calling Bullshit: The Art of Skepticism in a Data-Driven World

Carl T. Bergstrom and Jevin D. West Random House, 2020. 336 pp.

There are three kinds of lies, the oft-quoted saying goes: lies, damned lies, and statistics. In a world drowning in data, statistical methods and other tools of scientific inquiry are increasingly being used to advance erroneous claims. This week on the *Science* podcast, evolutionary biologist Carl Bergstrom explains how to identify data-driven misinformation and disinformation.

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