Species, Serpents, Spirits, and Skulls:
Science at the Margins in the Victorian Age
by Sherrie Lynne Lyons
reviewed by A Bowdoin Van Riper

We imagine that the boundaries dividing science from pseudoscience are clear and well-marked, and that—even if we cannot define either one with the precision of a philosopher—we know the difference when we see it. Science, we tell ourselves, deals with the concrete, the real, the measurable, and the universal. Scientists, we solemnly repeat, formulate hypotheses only after they have gathered an abundance of facts, and test those hypotheses through repeatable experiments. Science works, in other words, just as the “Chapter 1” lessons in a dozen long-forgotten schoolbooks say it does. Except that it doesn’t.

Scientists have long known—and over the course of the last half-century or so, historians of science have carefully documented—that real science is far more complex than the sterile, streamlined, step-by-step process described in textbooks. Not all scientific disciplines have the luxury of dealing with things that are tangible and directly measurable, or with processes that can be recreated at will on a laboratory bench. Then, too, scientists are human: as vulnerable to laziness, jealousy, ambition, pet ideas, and self-deception as the rest of us. The rigors of modern scientific practice—double-blind clinical studies, peer review, and take-no-prisoners questioning at meetings—exist, in large measure, to compensate for such human weaknesses. Physicist-turned-historian Stephen G Brush once asked, in a famous article in Science (1974), “Should the history of science be rated X?” The real story of what the great scientists of the past did behind closed laboratory doors is, Brush argued—tongue only half in cheek—a terrible example to hold up to impressionable young scientists-in-training.

Sherrie Lynne Lyons would disagree. A historian of evolution and allied sciences in nineteenth-century Britain and a biographer of Darwin’s friend (and fierce defender) TH Huxley, she argues that the philosophical and methodological messiness of Victorian science—properly understood—sheds valuable light on the messiness of present-day science. Species, Serpents, Spirits, and Skulls is a substantial contribution toward such an understanding. Lyons’s concern is with subjects from the outer edges of Victorian science: sea serpents, phrenology, spiritualism, and the spiritual dimensions (if any) of human evolution. The boundary between science and non-science was, she persuasively argues, fluid and sharply contested in Victorian Britain, and these subjects were the intellectual fields on which it was contested. Professional scientists (a group whose own boundaries were only beginning to take shape), amateur scientists, outright charlatans, and members of the general public all weighed in on them. The resulting debates touched not only on science,
but also on religion, philosophy, and law—not only on the nature of science, but also on the nature of proof and on the nature of the human spirit.

Organizing the book as a series of case studies, Lyons sketches the historical and intellectual background for each debate before teasing apart the arguments, the motives, and the stakes for each of the groups involved. The chapter on sea serpents, for example, begins with the discovery of plesiosaurus and ichthyosaurus fossils that, in the 1810s and 1820s, lent new plausibility to old legends. It quickly moves, however, into deeper conceptual waters: eminent geologist Charles Lyell's interest in sea serpents as evidence for his theories about the history of life, the desire of newly professionalizing scientists to establish themselves as arbiters of questions about nature, the status of eyewitness testimony (even when submitted as sworn affidavits) as scientific evidence, and the drive to find naturalistic explanations for the wondrous that manifested itself in science writing and in novels such as Jules Verne's *Twenty Thousand Leagues Under the Sea*.

The remaining case-study chapters differ in their particulars, but make broadly similar points. Lyons treats phrenology, the science of using the shape of an individual's skull as an indicator of their psychological makeup, as part of psychologists' attempt to separate their field from philosophy and establish it as an experimental science allied with biology. She shows—after a long, entertaining stripping-away of thick layers of trickery, deceit, and deception—why spiritualism (communicating, via mediums, with the spirits of the dead) attracted the attention and interest of late-Victorian physicists interested in the nature of energy and invisible electrical fields. The book's best chapters—not surprisingly, given the author's background—are those that deal with the evolutionary theory: with Alfred Russel Wallace's wrestling with the problem of the evolution of the human mind and moral sense, and TH Huxley's deep differences with Darwin over the tempo of evolutionary change. Lyons sketches the scientific and social backgrounds of her protagonists with admirable conciseness, showing how each came to the positions they defended so vigorously in their writings through the complex interplay of evidence, interpretation, and prior (or simultaneous) intellectual commitments.

*Species, Serpents, Spirits, and Skulls* is strongest when it immerses the reader in the particulars of Victorian scientific practice and personalities. The narrative flows smoothly, the explanations of unfamiliar scientific concepts are clear, and the stories are satisfyingly complex without becoming impenetrable, even to the general readers who are the book's intended audience. The introductory and concluding chapters, which use the case studies to make larger points about the nature of science, are less successful. A long exploration—fascinating, but a digression—of the contested relationship between fossils and ancient myths robs it of momentum, and Lyons's restrained, judicious narrative style (so effective in the case studies) makes it seem muted when it should be bold.

One of the beauties of the book, however, is that its case studies boldly and clearly advance its central point. Readers will come away convinced that that science in the mid-nineteenth century was (like science today) messy, complex, and far from the streamlined process outsiders imagine: an X-rated show, perhaps, but one well worth taking in.

**References**

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