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Strange Science

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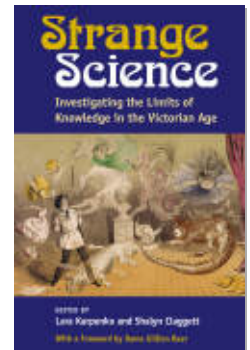
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Foreword

Dame Gillian Beer



In this volume, *Strange Science*, the editors Lara Karpenko and Shalyn Claggett emphasize the borders of investigation in their subtitle, *Investigating the Limits of Knowledge in the Victorian Age*. “Limits” here are subjects for fresh investigation rather than clamping containers. Beyond the current limits are thriving new territories, or delusive dream countries. This powerful collection gathers examples of both. But a number of the essays also make it clear that even work that fails or where the procedures are chaotic and the assumptions doubtful may eventually find some presence in later discoveries. Work that challenges dominant assumptions may provoke different kinds of insight from more orthodox workers over time.

Science is preoccupied with discovery and with justification. To that degree, all science seeks the strange. When found, the aim is to find a place for the discovery within the known system or, more radically and more rarely, to change the system. The struggle between novelty and affirmation of the known gives the zest to much scientific work. It demands cautious procedures and audacious guesses at the same time. Innovation and repetition are both essential. That much can be said of scientific work across fields and across time. But there are major differences between the practices of knowledge-seekers in the nineteenth century and the present day. One difference is the emphasis then on individual investigation rather than teamwork and the somewhat belat-

ed arrival later in the century of university laboratories with an array of instrumentation.

The essays here are concentrated in Britain so that the research cultures described are those of people in Victoria's reign, living with-in arguments and assumptions about empire, gender, and class that may—or may not—be unfamiliar now. Most of the people discussed in this book could assume a postal system that in London made deliveries at least ten times a day; they took for granted prodigious letter writing and intricate face-to-face contacts within social groups. Even within this kingdom diverse methods and enquiries were being pursued. The sheer variety of research cultures in different parts of the British Isles during the nineteenth century has been explored in the collection of essays edited by David N. Livingstone and W. J. Withers, *Geographies of Nineteenth-Century Science*.¹

Empire produced some hierarchical delusions but it also propelled British people across the world and gave many an intimate familiarity with places remote from these islands. The passion for collecting, whether birds' eggs or butterflies, stones or big game, seems to have been unhampered by qualms about its effects. It ravaged some species; it also allowed an exquisite awareness of minute differences from example to example. It fueled taxonomic sophistication and it gratified the urge to possess, which is always a tempered or intemperate element in knowledge-gathering. The rich array of general journals, many of which discussed scientific matters alongside political, literary, and local issues, meant that the sciences were present in ordinary conversation among the educated. Geoffrey Cantor and Sally Shuttleworth demonstrated that in their edited collection *Science Serialized: Representations of the Sciences in Nineteenth-Century Periodicals* and in their website *Science in the Nineteenth-Century Periodical*. Shuttleworth is now leading a major investigation, "Constructing Scientific Communities: Citizen Science in the Nineteenth and Twenty-first Centuries," which is producing fresh knowledge about the contribution of amateurs to scientific projects in the Victorian era as well as in our own.² There is room for much more work on the contributions of Victorian working people to scientific knowledge-gathering.

How, then, to distinguish between scientific work familiar and strange, orthodox and odd? As the collection of essays makes clear, some enquiries that may now seem strange were, for a time at least, accepted as potentially mainstream science. The most famous of these is spiritualism, with the careful, even skeptical, evidence-gathering of the British Society for Psychical Research drawing in important scientists such as

the distinguished chemist and physicist Sir William Crookes. The Society's *Phantasms of the Living*, as L. Anne Delgado comments, shows "the unsteady nature of both human perception and the knowledge that perception itself produces." Nevertheless, their use of witness statements chimes with current interest in individual accounts of phenomena, and their concern with perceptual bias even connects forward to some of the preoccupations of neuroscience now. And mesmerism, as Karpenko's essay suggests, has never gone away.

Strange science has a way of leaving traces for later workers to pursue. As Barri Gold points out, the continuity between traditional and more exotic theories relies on "the principle . . . that what we learn or hypothesize about the natural world must be consistent with what we already know," which "constrains and shapes any paradigm shift within the sciences." Yet what we know about the natural world is itself shifting; indeed, exploring and opening up those shifts is a fundamental and central concern of scientific enquiry. It becomes clear that no easy and permanent boundaries exist between the sober known and the extreme imagination. W. K. Clifford, whose geometric Clifford algebras now underpin many advances in physics and computing (though they were beyond the capacity of most of his contemporaries), asked his contemporaries in the 1870s to question even the uniformity of nature and to be skeptical of induction since there may always be another case not yet known or encompassed by the definitive current laws. Clifford was married to the novelist Lucy Lane Clifford and himself enjoyed writing fairy stories. His central demand was for the constant testing of belief by evidence. This demand does not exclude imagination. Like John Tyndall, another foresighted thinker whose work is alluded to in a number of the essays here, Clifford emphasizes the uses of imagining. He writes: "The scientific discovery appears first as the hypothesis of an analogy; and science tends to become independent of the hypothesis."³ Before science can detach itself from the hypothetical, it must work through guesses and analogy. Though hypothesis may be superseded, analogy persists as a tool for understanding similarities, and for measuring differences.

So in Victorian scientific writing, as the contributors to this collection often brilliantly show, disciplines, systems, boundaries, fields, and the constraints of gatekeeping lie alongside overlaps, leakages, struggles, analogies, and fault lines. All these terms appear in the current collection, and together they aptly suggest the degree of reciprocity between way-out and conventional thinking in the period. The editors have organized the volume under the topics of plants, bodies, and energies, and

the three parts address different subjects of scientific enquiry. Their concerns are coherent with each other.

One of the most fascinating outcomes of collecting together these essays by diverse hands is that certain works emerge strongly in different essays and begin to suggest fresh patterns for understanding scientific controversies of the period. One such work is Balfour Stewart and Peter Guthrie Tait's *The Unseen Universe, or Physical Speculations on a Future State* (1875). This popular and notorious work (denounced by materialists such as Tyndall and Clifford) was authored by well-respected physicists. Indeed, Tait was the close friend and major correspondent of the great mathematical physicist James Clerk Maxwell. Their argument attempts to recuperate energy and to point beyond entropy. They use rhetoric and evidence and analogies between systems of very different scale to argue for an eventually Christian universe. Strange science, it's clear, was produced by orthodox scientists as well as by intelligent and trained outsiders such as Annie Besant, who repudiated many of the methods of scientific proof, and whose insights fueled thinking well past her lifetime, as Sumangala Bhattacharya here argues.

The relatively slight presence of women workers among the topics of essays here (Marianne North and Annie Besant being honorable exceptions) is of course symptomatic of the exclusion of women from universities, societies, and public scientific laboratories in the Victorian period. When the British Association for the Advancement of Science decided not to admit women as full members, they nevertheless did open their lectures to both sexes, and women were an important part of their audiences. Popularizing was considered suitable for women writers, and perhaps partly for that reason their work would not figure in the outer reaches of enquiry but would stay close to orthodox science. Recent investigation has reminded us of women whose research was both central and innovative, such as the mathematician and electrical scientist Hertha Ayrton, even if their social position in relation to other scientists was peripheral.

A particular gain of the collection is the emphasis on forgotten aspects of well-known scientists' work. Francis Galton, famous as statistician and eugenicist, here emerges in Danielle Coriale's essay as a pioneer in the study of deafness and "the auditory imagination." The Bell family, well before the phonograph and the systemization of phonetics, were involved in extraordinary demonstrations of "Visible Speech." James Emmott's essay describes in lucid detail "how the fields of physiology, phonetics, and phonography are mutually determined in the

1860s and 1870s, and how each draws on a shared understanding of articulatory performance.” Read the essay to discover why this is such a thrilling insight.

Respect for unexpected or unconsidered sources of experience and intelligence fuels the volume. This is very striking in the first part, on plant life and Victorian excitement about the senses and the erotic life of plants. Plant intelligence is the special theme of these essays, and as Elizabeth Chang observes: “To imagine how the organic world imagines the human is also to confront the limits of the possibilities of imagination.” Lying behind that fascination, and that tonic realization of human limits, is the work of Erasmus Darwin in his poem *The Loves of the Plants* (1790) and his scholarly prose work *Zoonomia* (1794–96), which developed the theory of a common ancestor behind all living things and emphasized variability and evolution as a precursor to his grandson Charles Darwin. Even more, Erasmus Darwin developed an understanding of the sense-life of plants and its capacity to cast light on human senses. He was much mocked among his contemporaries. His work now stands as an example of strange science become familiar, and yet still with the capacity to surprise. That resilience is shared by a number of the figures discussed in this stimulating volume. Failure is not shameful when the work has been ardently pursued and the whole collection reminds us that enquiries that run askance the current norm may yet open unforeseen pathways for future workers.

Notes

1. David N. Livingstone and W. J. Withers, eds., *Geographies of Nineteenth-Century Science* (Chicago: University of Chicago Press, 2011). See also David N. Livingstone, *Putting Science in Its Place: Geographies of Scientific Knowledge* (Chicago: University of Chicago Press, 2013).

2. Geoffrey Cantor and Sally Shuttleworth, *Science Serialized: Representations of the Sciences in Nineteenth-Century Periodicals* (Cambridge: MIT Press, 2004); Geoffrey Cantor and Sally Shuttleworth, *Science in the Nineteenth-Century Periodical*, December 18, 2007, <http://www.sciper.org/index.html>; Sally Shuttleworth, *Citizen Science in the 19th and 21st Centuries*, <http://conscicom.org>.

3. William Kingdon Clifford, “Conditions of Mental Development,” *Lectures and Essays*, vol. 1 (London: Macmillan, 1901), 92.

