Words of wisdom

A scholarly selection of scientific soundbites and sayings.

Oxford Dictionary of Scientific Quotations

edited by W. F. Bynum & Roy Porter
Oxford University Press: 2005. 730 pp.
£30, \$50

Steven Shapin

In the popular mind, scientists are supposed to be people of few words, fewer still memorable. Most sayings by scientists that stick in the mind do so because at some point we have been made to memorize them, or at least some form of them. This is true for scientific laws ("To every action there is always an opposite and equal reaction"), principles ("Ontogeny recapitulates phylogeny") and more general sentiments ("Nature makes no jumps"). Modern scientists are not strong on rhetoric, but they are not supposed to be.

The motto of the Royal Society of London — "*Nullius in verba*" — is properly translated as "On no man's word", but some commentators construe it to mean something like "Don't use fancy language". The society's founders in the seventeenth century argued strongly against the sorts of stick-in-the-mind figurative speech in which their literary contemporaries trafficked. In the twentieth century, literary critic I. A. Richards pointed out: "We believe a scientist because he can substantiate his remarks, not because he is eloquent and forcible in his enunciation."

So the editors of the *Oxford Dictionary of Scientific Quotations* were well advised to assemble not just notable scientific sayings by scientists, but also comments on science, scientific objects and scientific practitioners made by non-scientists, and remarks by scientists on all sorts of things outside their specialized expertise. That allowed them to include W. H. Auden's comment "When I find myself in the company of scientists, I feel like a shabby curate who has strayed by mistake into a drawing room full of dukes," and Oscar Wilde's dismissive quip about the splendours of Niagara Falls: "It would be more impressive if it flowed the other way."

Nor were the editors much bothered about what properly counts as science. They trawl ancient philosophy (Aristotle's

"All men by nature desire to know"), proverbial lore, both traditional and modern ("Nature is by nature perverse" and "Garbage in, garbage out"), sociology (Émile Durkheim's "Consider social facts as things") and anthropology (Mary Douglas's "Where there is dirt there is system"). There are also such miscellaneous bon-bons as the unbotched version of what Neil Armstrong was meant to have said when he set foot on the Moon ("It's one small step for a man...") and Niels Bohr's "Predictions can be very difficult — especially about the future", which is usually attributed to the great American baseball player and malaprop-artist Yogi Berra. Inclusiveness is good, although sometimes the criteria for inclusion puzzled me. What is supposed to be relevant to science about Simone de Beauvoir's observation that "To be a woman, if not a defect, is at least a peculiarity"?

Dictionaries of quotations do not — and should not — have a point of view about their subject matter, so their higgledy-piggledy character displays the incoherence of equally compelling statements about practically any aspect of science. In contrast to Robert Merton's "Science is public, not

private knowledge", we have the assertion of his Harvard contemporary Percy Bridgman that "Science is essentially private". The mathematician David Hilbert insisted that neither science nor technology have "anything to do with the other", but, not many years later, D'Arcy Thompson observed that "When I was young, science walked hand-in-hand with art; now she walks arm-in-arm with trade".

Actually, these examples give a misleading impression of the dictionary. Many of the entries are neither memorable nor concise: philosopher Daniel Dennett is given 250 words to pronounce on human consciousness; Francis Crick has more than 270 to characterize the 'central dogma' of molecular biology; Pierre Duhem's discourse on the differences between British and Continental physics weighs in at almost 400 words; and the selection from Robert Hooke's "method of experimenting" is even longer than that. The all-encompassing *Oxford Dictionary of Quotations*, by comparison, has far fewer entries approaching that length.

But that's partly an artefact of the pool of material with which the editors of the *Oxford Dictionary of Scientific Quotations* had to work. The age of the scientist-aphorist probably ended with that of the scientist-generalist, the scientist-philosopher and the scientist-moralist, whose last great twentieth-century representatives included Albert Einstein, Robert Oppenheimer, J. B. S. Haldane, J. D. Bernal and Stephen Jay Gould, all of whom could turn a phrase. You don't just need literary skills to make a memorable statement: you also need a subject of some scope and cultural resonance, but the specialization of science and its ever-increasing divorce from the humanities make it harder for modern scientists to say resonant things in a resonant manner.

Nevertheless, the dictionary is a good source material, richly produced in the best Oxford University Press manner. It is one that many scientists will want to own, and will doubtless be ransacked for future Nobel prize acceptance speeches. Quibbles? Only a few: why no words by Dwight D. Eisenhower on the military-industrial complex, and no Alvin Weinberg on 'big science'? What about blunders? I noticed only one big

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Master of the *bon mot*: Oscar Wilde, without whom no dictionary of quotations could be complete, painted here by Henri de Toulouse-Lautrec.

one: the editors follow Lewis Wolpert in mistakenly attributing to Oppenheimer a statement about the social responsibility of the scientist that was in fact made by the man who destroyed Oppenheimer's reputation, Edward Teller. ■

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A natural history of India

Inventing Global Ecology: Tracking the Biodiversity Ideal in India, 1947–1997

by Michael L. Lewis

Ohio University Press: 2004. 352 pp.

\$55, £36.95 (hbk); \$26, £17.50 (pbk)

Deepak Apte

The title of this book couldn't be more apt. It is hard to be sure whether the word 'tracking' is a cleverly crafted metaphor or is just used to mean 'tracing the path of something'. Nevertheless, the word conjures up visions of an English gentleman (preferably with the name Major Bill Witherspoon) in a pith helmet, shielding himself from thorny acacia branches, extricating a 1948 Morris Minor from a mud pool, and trying to have a conversation in Swahili while pursuing a herd of *Loxodonta africana* (to 'shoot' them one way or the other) over the intractable terrain of sub-Saharan Africa. Or if you would prefer a less colonial scene, you might think of a young Indian postgrad trying to fulfil the specifications of her World Bank grant by pursuing the flighty (and nocturnal) Nilgiri marten as it scampers across the rainforest of the Kalakad Tiger Reserve. Or you might want to indulge in visions of technological empowerment and imagine instead a technocrat lounging at his computer station logging satellite data that beep in by the minute from a piece of silicon embedded within the dorsal skin of a brown palm civet.

Michael Lewis has done pretty much all of the above. He has faithfully traced and eloquently recorded the labyrinthine evolution of wildlife science (now called conservation biology). From its governing ideology and practice in India, he moves through the highways and byways (many of them literal, rather than figurative) of history, international politics (and politicking), Indian nationalism and nation-building. He even takes in the 'anthropology of science', the changing face of global scientific debate, and the evolution of field biology itself.

He has straddled the academic worlds of both biology (as an undergraduate) and history (graduate and doctoral). It therefore

seems natural that he should apply one to the other, and thus magnify insights into both. After all, they are intellectual disciplines located not separately in a vacuum, but in an interactive matrix of other fields of enquiry.

Inventing Global Ecology is based on Lewis's doctoral dissertation, so it reads as a fairly scholarly piece of writing. It smacks of painstaking research, which is its greatest claim to credibility. In fact, the information is often so detailed that the reader senses impatience within.

More importantly, the reader gets the distinct impression that Lewis has made a sincere attempt to embody 'deep democracy'. He is politically correct in the most profound and meaningful sense. He has the ability to transcend his inner barriers of rank, race, culture, affluent 'developed world'-ness and geopolitics. He writes with humility, grace, honesty and openness about the geopolitical realities of a people and its wildlife that are positioned often antagonistically and disadvantageously to his own. It is people such as Lewis, and the debate that books like this can initiate, that have the potential to make a real difference to difficult and chronic global problems.

The prose is smooth, unselfconscious and eloquent. For example, he uses elegant metaphors while writing about the Bombay Natural History Society (BNHS): "Perhaps more than a gateway, the BNHS has been a colossus astride Indian conservation-oriented ecology over the last fifty years." He also demonstrates his insight into the society and its activities. Of Salim Ali, its driving force for many years, Lewis writes: "His story is the story of the BNHS". He perceptively explains that ecology "was not introduced to India by

Westerners, but by the degreeless Ali, by way of his German training". It's certainly true that Ali brought the BNHS to the highest possible standards of ecological research in India. But it is because of Ali's pioneering work on Indian ornithology that even now the BNHS is known as an institute specializing only in birds.

Lewis also examines the various reasons for the shift in funding for the BNHS from Britain to the United States. Whether this shift was strategic or coincidental, it is worth adding that, in the past decade or so, the funding for BNHS projects has come mainly from Britain, completing the circle.

In the subsequent chapters, Lewis chronicles the evolution of the BNHS and various controversies during this process. Without being judgemental, he covers various facets of these debates in lucid prose. These chapters will be essential reading for anyone with an interest in the BNHS.

Chapter 2 focuses on what could be called the anthropology of science — the social, cultural and political constructs upon which science is based and conducted. There is a growing dialectic among social scientists around the related issues of what constitutes science, whether or not its nature and practice are independent of the context in which it exists, and on the appropriateness of transplanting scientific practices from one part of the world to another. Lewis uses this as a springboard to question whether the import of scientific techniques, legislative measures (such as prohibiting human habitation in wildlife sanctuaries) and methods of enquiry (for example, using expensive radio collars in developing countries) in wildlife science and management is meaningful or

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On the move: Indians have made huge strides to improve their own conservation efforts.

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