

# Occasions of experience

Eric Ashby

*The Star Thrower.* By L. Eiseley. Introduction by W. H. Auden. Pp. 319. (Wildwood House: London, 1979.) £5.95.

THIS book is about Nature but it is an unusual book to be reviewed in *Nature*. Its author was a professor of anthropology but the book would score zero in an examination paper in anthropology. It is about Man in the Darwinian scheme of evolution but it is concerned with "the phase beyond the evolutionist's meager concentration upon survival".

Loren Eiseley was a poet who became a professional scientist. The essays and poems in this volume were collected for publication shortly before his death in 1977. They are autobiographical musings written by a deeply sensitive man who never reconciled himself with what he calls the "crystalline and icy objectivity" of the scientific attitude towards Nature. The imagery is vivid and personal; the style ornate and in places opaque. His naturalist's eye observes something—a playful fox cub too young to know fear, a spider keeping its web under surveillance, a fossil bone, a flint arrow head—these ignite his imagination and illuminate Man's relationship with the other living things around him.

The most interesting essays are those on science and humanism. Eiseley is distressed by reductionism. He does not dispute the need to think about living things at the level of atoms and molecules but he asserts that the things worth understanding about Nature cannot be discovered at this level; which of course raises the question: What, then, does he think is worth understanding? He answers this question by drawing the reader away from Darwin to Emerson and Thoreau. It is the numinous in Nature which matters to Eiseley, the attitude which the Germans call *Ehrfurcht*, the eye that sees the whole. "The finest intellect", he writes, "is that which employs an invisible web of gossamer running into the past as well as across the minds of living men and which constantly responds to the vibrations transmitted through these tenuous lines of sympathy".

Eiseley is not the only scientist who recognises the limits of reductionism and the dilemma of a theory of evolution from which the idea of purpose has been excluded. But, for my part, I do not think an appeal to the heady

prose of Emerson or the (sometimes querulous) protestations of Thoreau is likely to clarify these issues. Two essays on Thoreau—by far the best in the book—raise an interesting question, namely: What is the difference between imagination as it is used in science and imagination as it is used in poetry? Unfortunately Eiseley misses the opportunity to discuss this question. Imagination is as important in science as it is in poetry. The difference in the use made of imagination is this: the scientist disciplines imagination to make it comply with observation or experiment; the poet gives imagination free rein to range over whatever imagery his mind can design. Both these uses of imagination are legitimate. But it is confusing to mix the usage, and that—so it seems to me—is what Eiseley frequently does.

*The Star Thrower* has earned eulogies from other reviewers. I confess that I find the book disappointing. I think the reason for my disappointment is the use Eiseley makes of imagination. He uses it as a poet does, displacing (as he says of Emerson) "the sedate white doorstone into nature by something wild and moon-haunted, whether in science or art." In art, yes; Wordsworth, Emerson, Walt Whitman have

put on record vividly the human response to Nature. But in science, moon-haunted descriptions are not satisfactory records of Nature. Eiseley has tried to do something very important: to describe the intricacies of the biosphere as compellingly as Watson and Crick describe the intricacies of the double helix. It is an immensely difficult task and to have tried and failed is in itself creditable. Some poets—Robert Bridges in the *Testament of Beauty*, for instance—have got closer to it. So have some essayists—Lewis Thomas, for instance, in his charmingly allusive *Lives of a Cell*. I think the prize goes to A. N. Whitehead (and Eiseley generously acknowledges this), for he set out, with impeccable logic, the concept of process in evolution in a way which does enable one to think about the biosphere with the clarity Eiseley was seeking. It was Whitehead who linked together what he called "occasions of experience" like bars of music in a sonata. Eiseley's book, too, is a record of occasions of experience. It is not a clear record, but it is the testimony of a sincere and sensitive poet. □

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## Belief in a created Universe

P. E. Hodgson

*The Road of Science and the Ways to God.* By S. L. Jaki. Pp. 478. (Chicago University Press: Chicago; Scottish Academic Press: Edinburgh, 1978.) £9.50.

PROFESSOR JAKI is already well known as an historian of astronomy, with major works on the Milky Way, Olbers' Paradox and the Planetary System. In his *Relevance of Physics* he reviewed the history of physics and its relationship to other disciplines, and in *Science and Creation* (for review, see *Nature* 251, 747, 1974) he showed why science had its only viable birth in seventeenth-century Europe and not in the civilisations of antiquity. In the present volume, containing his Gifford Lectures for 1975 and 1976, he extends this line of thought by showing the deep connection between scientific creativity and natural theology. His thesis is that the belief in a created Universe implies the

epistemology that underlies scientific creativity, so that the road of scientific development and the ways leading the mind from the created world to a knowledge of the Creator are mutually sustaining and inextricably intertwined.

Science first came to maturity when Newton found the middle way between the empiricism of Bacon and the rationalism of Descartes. Newton's mind was dominated by a vision of truth incarnate in nature, a truth that can be revealed by a dynamic interaction between bold speculation and meticulous experimentation. His theory of gravitation was a creation of the mind—a leap beyond sensory data—but because it was a vision rooted in the data provided by nature it could become a vigorous science. Newton's awareness of the created nature of the world implied a recognition of its contingency, and hence the necessity of painstaking experimental work to uncover its secrets. The middle way found by Newton thus transcended empiricism without becoming trapped in a *priorism*.

The reverse side of this thesis is illustrated by detailed discussions of subsequent philosophers including Hume, Locke, Kant, Fichte, Hegel, Schelling, Mill, Comte and Mach. Their admiration of Newton's achievement and their ambitions to extend his

method far beyond physics was seldom matched by any comparable understanding of his scientific work, still less of its epistemological roots. Insofar as they departed from the epistemology inherent in the ways to God, they developed theories of science that would have been lethal if scientists had taken any notice of them. Fortunately they did not, so no great harm was done, at least to science itself.

The second great period of scientific creativity was initiated by Einstein and Planck, and here again the wellsprings may be traced to the same theistic source. Although initially Einstein was influenced by Mach, his scientific creativity gradually forced him to repudiate Mach's sensationalism. Its ravages are still evident in the philosophy of quantum mechanics and in Bohr's theory of complementarity.

## Fragmentation of culture

W. H. Brock

*Nature and the Victorian Imagination.* Edited by U. C. Knoepfelmacher and G. B. Tennyson. Pp. 519. (University of California Press: Berkeley, Los Angeles and London, 1978.) £15.

"WHAT a glorious title, *Nature*, a veritable stroke of genius to have hit upon", wrote the mathematician J. J. Sylvester enthusiastically to *Nature's* editor, the astronomer J. N. Lockyer, on the first appearance of the journal in November, 1869. Yet, although the title was copied by French, Italian, Dutch and Norwegian commercial science publications, it is significant that when American scientists founded a similar journal in 1883 they chose the title *Science*. Again, T. H. Huxley, in translating a German nature poem for the first issue of *Nature*, could think of no more fitting a preface for a periodical "which aims to mirror the progress of that fashioning by nature of a picture of herself, in the mind of man, which we call the progress of science". Yet, as the editors of this elegant book point out, by 1918 any serious writer, painter or scientist would have thought it "impossible, quaint, archaic, Victorian . . . to rise from a bird's plumage to a consideration of man's position in the Universe".

That the scientific community pioneered this "denaturing" process few would deny. Put briefly, the collective theme of this interdisciplinary feast of a book is what S. F. Cannon has called "the fragmentation of culture", whereby the common

At the present time, increasing evidence of the singularity of the Universe is again pointing to its radical contingency.

Professor Jaki develops his theme with a masterly command of the original sources, and the text is supported by over a hundred pages of notes and references. It is so densely packed with ideas that it is not easy to read, but scientists, philosophers and theologians will find it a mine of stimulating analysis. Inevitably his thesis raises many other questions such as the relationships between the Christian churches and science, which have not always been harmonious, and the acceptance of science by radically different cultures; and these are apt future subjects for Jaki's pen. □

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religious, moral, poetic and scientific perspective of the early Victorians was gradually fragmented into, on the one hand, a literary consciousness which continued for a long time to seek symbols in Nature; and on the other, the various scientific forms of imagination which pursued separate, and sometimes, unrelated, disciplinary goals by measurement, experiment and abstraction. That "Ruskin . . . in looking at botanical specimens . . . saw nothing of what Darwin saw in them", is, for example, brought out by F. Kirchoff in a fascinating analysis of Ruskin's floral mythology in *Proserpina*.

Apart from R. Smith's fine essay on the human significance of biology, the question whether value systems were completely abandoned by scientists is, unfortunately, little explored by the 26 contributors to this volume, which is primarily addressed to the literary reader. Concentrating on the changing artistic interpretation of Nature, there are only three essays by historians of science who actually explore the directions taken by chemists, physicists and biologists during the century. These, together with a fine essay on science education from the Arnold scholar, R. H. Super, stand for the systems of knowledge that challenged traditional "inscape". Ignored, except for the editors' allusion to the nature writer, W. H. Hudson, is the powerful tradition of natural history (whose social history has been so ably analysed by D. E. Allen in *The Naturalist in Britain* (Allen Lane: London, 1976) which may well be seen as continuing a moralistic science long after Darwin. By the same token, the essays are exclusively concerned with the intellectuals' imagination; whereas cursory reading of "working-class" natural history journals suggests that their readers continued, like the literary

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and artistic intelligentsia (but unlike laboratory-bound biologists) to find mystery and feeling in Nature.

Despite such reservations the book triumphantly succeeds in revealing the many-sided character of the Victorian imagination as it responded to Nature. The essays include a photographic study of how the Victorians perceived nature through the camera lens; several interesting treatments of the ways in which natural space was tamed symbolically in architecture and domestic ornamentation; how the Victorians explored wild and mysterious environments like the Alps and subjugated them by sports and tourism; how their painters were torn between moral and realist models of representation (a notable essay here on the rainbow by G. P. Landow); and how the issues were perceived by such sages as Keble, Dickens, Browning, Mill and Hardy. Printer, publisher and editors are to be commended for placing footnotes where they belong, and for their choice of quality illustrations and fine typography. They have produced a book which is not only a pleasure to read, but also to hold, handle and shelve. □

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