A walk on the wilder side

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Let Newton Be! A New Perspective on His Life and Works. Edited by John Fauvel, Raymond Flood, Michael Shortland and Robin Wilson. *Oxford University Press: 1988. Pp.269. £17.50.*

Isaac Newton, an eccentric professor of mathematics at Cambridge unaccountably chosen for the chief office of the Royal Mint in 1696, was author of two books, published posthumously, *The Chronology of Ancient Kingdoms Amended* and the *Prophecies of Daniel and John*. Further, he left behind a vast quantity of manuscripts dealing with his business at the Mint, his views on the doctrine of the early Church, and alchemy. As scholar, theologian and monetary expert Newton was neither original nor up to date, and in these fields his work has been passed by without ever receiving much consideration.

If this had been Newton's obituary, it is doubtful that he would be of more interest today than Archbishop Ussher, even to scholars. But in fact Newton also wrote the *Principia, Opticks* and *Optical Lectures*, a large number of papers in *Philosophical Transactions* and several mathematical texts. It is a truism to affirm that if he has any place in the history of civilization, it is because of his scientific writings.

This elegantly produced collection of papers — with an appalling dust jacket — tells us more about the eccentric don than about the experimenter and mathematician known to scientists. It is all, or nearly all, quite true: Newton (like other mathematicians) did look into 'equal temperament' in music and he did have (to us) bizarre ideas about the reappearance of the harmonic ratios in other parts of physics, such as the optical spectrum (as Penelope Gouk relates). He did (as P.M. Rattansi and she report) draft learned pages on the Pythagoreans' ancient knowledge of the deeper principles of physics, such as the inverse-square law of gravitation. He did meticulously ascertain the life-span of the locust (species unstated) in order to calculate the prophesied length of the expansion of Islam. And he did (as J. Henry and J. Golinski explain) painstakingly copy out the (apparent?) gibberish of the alchemists, with their fanciful symbolic pictures, and himself experiment on the volatility of metallic salts and the reality of Diana's Doves.

As Keynes wrote long ago, Newton's mind was complex and strange. He accepted as unquestionable the priority of Hebrew learning. He was equally confident that ancient texts were pregnant with metaphors and codes, whose meaning could not appear to the unlearned. Only by discovering it, and so disclosing and restoring the pure wisdom of the infant world, could men perform their duty to God by understanding his Creation and Providence and so prepare for his Son's second advent. As P.M. Rattansi says, natural knowledge was but one element in Newton's *weltbild*, of whose theological character a strong hint is conveyed in the final scholium of the second *Principia* (1713).

Since Keynes (and so many others afterwards — nothing here is really new) read the pages that Newton would have kept hid, our knowledge of him has become richer but more confusing. Scholars are in danger of writing about the Newton who was insignificant to the neglect of the Newton who transformed thought. To be dismissive of Newton — as Whiteside, Westfall and Cohen, for example, have *not* been — is absurd. We see in this book two pictures of Harpo Marx representing Isaac Newton in the 1957 film *The Story of Mankind*, and many images taken from the books of the mystic 'platonist', Robert Fludd; it is doubtful if any of these is relevant to either Newton, the open or the concealed. Nor was Newton himself muddled about the natures of the diverse studies he pursued with equal ardour.

We need to be cautious about the inference that the scientific Newton drew inspiration and principles from the esoteric reading of his other self. My impression is that when experimenting or measuring or developing a structure of geometrical theorems, Newton was as much a 'scientist' as if he had had no other interests. In this book the investigations of the scientific Newton are well described, though necessarily in elementary language, by John Roche (*Principia*), C. Hakfoort (optics) and Jon Pepper (mathematics) — no place here for the kind of technical article ("Newton and the Calculus of Variations") that seemed appropriate 60 years ago. □

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Pollen stations

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Paleopalynology. By Alfred Traverse. *Unwin Hyman: 1988. Pp.600. Hbk £50, $75; pbk £24.95, $34.95.*

Palaeopalynology is the study of fossil pollen grains, spores and other organic microfossils (excluding diatoms and nannofossils) preserved in rocks and sediments. Among the objects of interest are acritarchs, dinoflagellates, microforaminiferal inner tests, chitinozoans, scolecodonts, selected algae, fungal, bryophyte and pteridophyte spores, and, of course, pollen from the recent past to the Precambrian. With such an enormous taxonomic diversity and stratigraphical range, it is inevitable that palaeopalynologists tend to be divided according to their specific stratigraphical or taxonomic interests, or both. And it is not surprising that, until now, nobody has written a book in English that sweeps across the subject as a whole.

Alfred Traverse, of Pennsylvania State University, has done just that. His book covers what palaeopalynology is and why it works; the basic biology and chemistry of palynomorphs; the stratigraphical palynology of the Precambrian and all the way through to the Quaternary; the production, dispersal and deposition of modern pollen; and applied palaeopalynology and laboratory techniques. It is profusely illustrated and has an extensive and up-to-date bibliography. Despite the enormous amount of information included, it is easy to read, with fascinating comments about many of the pioneers of the subject.

The book's greatest strength lies in the wealth of practical information it contains — the appendix on laboratory procedures is a monograph in itself and provides palynologists with an invaluable illustrated account of preparation techniques. The chapter on pollen morphology abounds in common sense and sound judgement, and includes a helpful synthesis of the different morphological terminologies and philosophies that are involved in understanding pollen-wall structure, along with an excellent account of the neglected topic of pollen orientation. The 30-page glossary is important for everyone concerned about precise terminology.

Traverse has maintained an admirable balance between the chapters on stratigraphical palynology and has avoided the temptation to put undue emphasis on the Tertiary (his main speciality). The book's weaknesses are the inevitable result of its breadth — some topics seem to my Quaternary palynological eyes to be covered too superficially. For example, there is virtually no mention of pollen-analytical studies of the effect of prehistoric man on vegetation, one of palynology's great success stories in Europe; and little is made of palynology's contribution to climatic reconstructions in the Quaternary or to modern plant ecology.

Traverse's book contains much of interest to all palaeopalynologists and it will, I hope, help to narrow the gaps between the different sub-disciplines. I urge all pollen analysts, novice or expert, to acquire and read it, and to share the author's manifest enthusiasm for his subject. □

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