

Faulting the heavens

David W. Hughes

Under Newton's Shadow: Astronomical Practices in the Seventeenth Century.

By Lesley Murdin.

Adam Hilger: 1985. Pp. 152. £16.75, \$26.

WHAT was it like being an astronomer in the Newtonian age (1643–1727)? There is no easy answer to the question as there was in fact only *one* full-time professional and even he, the Reverend John Flamsteed, diverted himself with his parish at Burstow, instrument-making and tide tables. The remainder were scientific generalists who saw little reason to specialize and flitted from subject to subject apparently as the whim took them. Even Edmond Halley, probably next in line for the astronomer appellation, spent only a quarter of his time studying lunar motion, planetary transits, occultations, eclipses, southern stars, proper motion and comets. For the rest he enjoyed the pleasures of meteorology, geomagnetism, physics, pure mathematics, and the editing and translating of ancient mathematical texts, not to mention his duties at various times as a captain in the Royal Navy, a diplomat and the deputy comptroller of the Chester Mint.

The Newtonian age was a time of transition. The pre-Civil-War concept of a magical and mystical world was tackled by men with a desire to avoid speculation and a preference for observation and the accumulation of data. Aristotelian views of a changeless, perfect (and extremely boring) heaven crumbled with the invention and development of telescopic instruments. Astronomers were provided with a goal, the discovery of an easy method of finding the longitude of a ship at sea, and the government were even prepared to spend money to find an answer. In the new Royal Society the scientific generalists found an excellent means of exchanging ideas, meeting like-minded friends and publishing their results. The gap between amateur and professional astronomer was only just beginning to open up. All that was needed was a grammar school education, enthusiasm, a cheap refracting telescope, an altitude measurer and a clock.

Lesley Murdin has tried to introduce us to the sort of men who found astronomy fascinating. The list is mercifully short — Flamsteed, a dozen or so university dons (for example Gregory, Halley, Hooke, Newton, Wallis, Ward, Whiston and Wren) who spent a fraction of their time with stars and planets, another dozen interested amateurs (among them Towneley, Derham, Pound, Gray and Moore) who had also to work for a living, and a final dozen "observatory technicians" (Crosstwait, Denton, Leigh and Sharp, for instance). From this narrow base Murdin has drawn a series of sweeping conclusions. "The number of astronomers who never

married seems high and might suggest a general tendency to put work before relationships." Astronomers were independent thinkers and creative but generally had "an interest in objects rather than people" and "found difficulty in co-operating with others". They exhibited "a tendency to solitariness".

At the end of the book I was left with a very sketchy idea of the motivation of astronomers as such, and of their specific problems of learning, observing, calculating, interrelating, publishing, teaching and instrument-making. Little is

said about their standing in the community. Murdin has provided us with a readable gallop through the astronomical seventeenth century but one which makes clear that much more work needs to be done in this field. Additionally, the lack of references is frustrating, often leaving the reader with no idea of the provenance of a quotation. An index that only lists proper names also hints at a job half done. □

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Diverse questions

Elvin A. Kabat

The Antibody Enigma.

By Thomas J. Kindt and J. Donald Capra.

Plenum: 1984. Pp. 270. \$35, £33.25.

A PERSON wishing to learn about the structural and genetic basis of antibody diversity and antibody specificity might well be overwhelmed by the literature. *The Antibody Enigma* is a good place to start to get to grips with the subject.

The authors do not follow a strictly historical treatment but attempt to present the subject in the light of the working hypotheses considered and discarded as new experimental data became available. As they state in the preface, "*The Antibody Enigma* is a somewhat personal view of the antibody diversity problem from two investigators who have spent the past 18 months trying to penetrate the enigma". Presumably, much of this was done in face-to-face discussion, to formulate points of agreement and resolve differences. I wish I could have listened in. It would have been difficult not to interrupt, however, for despite enormous progress this is an area which is still filled with differences of opinion, of interpretation, and of judgement about the relative weight to be given to the various mechanisms contributing to the vast repertoire of antibody combining sites.

After defining the problem, the authors set down the serologists' and biochemists' approaches to it and their unique features. In subsequent chapters, they analyse "polar", specifically the germ-line versus somatic mutation hypotheses, and the "maverick" solutions (those based on data not in accord with either). This is followed by discussion of the contributions of molecular biology and a final chapter entitled "Antibody Diversity: A Contemporary Solution". Many key references are provided, but the authors often mention individuals by name with no reference and at many points I found it frustrating not to be able to pin down the source of some of the statements.

In the preface, Kindt and Capra apologize if they have "offended anyone by

omitting their own contribution..."; given the vastness of the literature they may well have. In line with the general trend among molecular biologists who have established so many ways of generating antibody diversity that they no longer consider how much of this diversity is related to antibody complementarity, the authors do not deal with this question. More understandably, there is no hint of the ferment of activity consequent upon the cloning and sequencing of the T-cell receptor (the book was in press when all the excitement began). But clearly this is a volume that should be read by individuals wishing to enter the field. □

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