and rightly anticipated that it would transform his relations with Newton and the Royal Society over the question of the contentious *Historia Coelestis*. In the event Newton and the referees were forced to call off their campaign against Flamsteed to whom the remaining copies of the *Historia Coelestis* were returned—mostly for burning—together with the manuscripts of the observations on which the work itself had been based, and which Flamsteed then used to prepare his own version of the *Historia Coelestis*, published by his wife some years after his death.

A surprising feature is the absence of any letters between Newton and Clarke relating to the latter's famous controversy with Leibniz although this fell entirely within the span of the present volume. As the editors suggest, this could simply have resulted from Clarke's intimacy with Newton and the fact that they both lived in London, although it should not be assumed that Newton played the same sort of role in the Clarke/Leibniz controversy, as in the controversy over the calculus.

Cotes' letter of 22 December 1713 to Newton (No. 1029) marks the dismal end to the magnificent correspondence relating to the preparation and publication of the second edition of the *Principia*. Whatever the reason, resentment at Newton's failure to thank him

for his vast unpaid labours on the *Principia*, or increasing ill health—he was to die young in June 1716—Cotes coldly rejected all the corrigenda and addenda suggested by Newton in a previous letter. As for some 20 additional errata listed by Newton in the same letter, Cotes had noticed some of them for himself, but had forebore to enter them in his own list of errata lest he should appear “too diligent in trifles”. He ends his letter with a final implicit reproach by pointing out that he had himself silently corrected some hundreds of errors without troubling to acquaint Newton of their existence.

The standard of editing maintains the high level of previous volumes and there is an excellent introduction including a very helpful survey of the controversy over the calculus. An unfortunate omission, however, is any reference in the page opposite the list of contents to the late J. F. Scott's editorship of Volume 4 of the Newton correspondence. Nor do all the footnotes relating to mathematical questions have that luminous clarity which one is entitled to expect. This I found particularly true of note 1 to Newton's notes on Leibniz's ‘Tentamen’ (letter 1069a). This work of Leibniz certainly provides good justification for Voltaire's quip that “Leibniz is come to confuse the sciences” but unfortunately the footnote itself compounds this confusion. Thus it is misleading to say that the theory of Leibniz is “congruent mathematically with that of Newton in the *Principia*” unless by congruent is meant that Newton and Leibniz arrived by entirely different mathematical methods at the same inverse square result for the radial force for motion in an ellipse. Nor is it entirely true that the difference between the two treatments “lies in the physical interpretations of Newton and Leibniz”. For although it is true that Leibniz posits a miraculous *ad hoc* ‘harmonic’ vortex to account for the circulatory motion of a planet in conformity with Kepler's second law, nevertheless a careful examination shows that this vortex plays no part whatsoever in the actual mathematical argument in which the one physical factor is the assumption that the force directed towards the focus will be measured—for a given time interval—by the deviation between the actual curved path and the inertial path along the tangent or approximating cord. It is extraordinary that Leibniz should have hit on this notion—one of the most profound physical insights in the *Principia*—before reading the *Principia* itself.

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Illuminating mental darkness

Light and Life. By Lars Olof Björn. (Hodder and Stoughton: London, Sydney, Auckland and Toronto, 1976.) Hardback £3.45; paperback £1.75.

As its title implies, this small book seeks to cover a vast field. All situations where light interacts with living organisms provide a subject for discussion in this book. It begins very naturally with photosynthesis and then moves into the animal kingdom for such topics as bioluminescence and vision. Photoperiodism and spatial orientation with respect to light, influence both animals and plants. There remain some essentially anthropocentric subjects—namely, suntan, artificial illumination and photochemical smog.

The book is based on the original Swedish edition, but some of the later chapters are new additions. It has been well translated and reads very freely. The level is about that of *Scientific American* and, like that journal, it relies heavily on simplified diagrams for the communication of information. Technical detail and jargon are avoided and the emphasis is essentially on readability. This, coupled with its accurate, full and up-to-date content, make it the sort of book one can pick up and read cover to cover. It will appeal most especially to sixth-formers and first-year undergraduates but should, and undoubtedly will, also be read by more advanced students and researchers.

When a small book attempts to cover so much it is not difficult to find gaps. A surprising one is the potential of solar energy for space and water heating and energy farming. One could also criticise the inevitable shallowness of parts of the text. It is not a work of reference to which one might resort for a detailed exposition of, say, photorespiration in C-3 plants or phototaxis in *Euglena*. But at least such topics are mentioned and the basis of their interest and importance is adequately conveyed. The provision of a carefully selected further reading list amply covers the needs of the student whose interest has been fired and who needs to delve deeper. Like the Sun god, Aton, to whom this book is dedicated, Professor Björn should succeed in illuminating the mental darkness of many.

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