unlike any in the current mainstream of American geography, but it is not without antecedents; indeed, British geographers may find in it some of the ideas implicit in the writings of a generation or two ago of men like Sir Halford Mackinder, Professor H. J. Fleure and Sir Cyril Fox. Though showing a scholarly respect for the facts, *Imperial Texas* is interpretative and consequently reflects the author's perception of the area. Prose, theme, ideas and subject blend together into an essay which is compulsive reading and it could well be considered as a possible model by anybody about to write a historical or cultural geography of some other part of the world.

If the ultimate objective of geography is "to describe and interpret the variable character from place to place of the earth as the world of man"⁴ then *Imperial Texas* brilliantly succeeds where *Louisiana: Its Land and People* falls short. Though the latter contains far more facts, the reader of both with little or no prior knowledge of either of the two States will obtain a deeper appreciation of Texas than of Louisiana and derive greater satisfaction in doing so.

G. MALCOLM LEWIS

¹ Meinig, D. W., *Annals Ass. Amer. Geographers*, 55, 191 (1965).

² Thompson, J. H., (ed.), *Geography of New York State*, 121 (Syracuse University Press, 1966).

³ Meinig, D. W., *The Great Columbia Plain: A Historical Geography, 1805-1910* (University of Washington Press, 1969).

⁴ Hartshorne, R., *Perspective on the Nature of Geography*, 47 (Association of American Geographers, 1959).

ASTROBOTANIST

Herschel at the Cape

Diaries and Correspondence of Sir John Herschel, 1834-1838. Edited by David S. Evans, Terence J. Deeming, Betty Hall Evans and Stephen Goldfinch. (History of Science Series, No. 1.) Pp. xxxv+398+20 plates. (University of Texas Press: Austin, Texas, and London, October 1969.) \$10; 95s.

JOHN HERSCHEL spent four years at the Cape of Good Hope, from 1834 to 1838, continuing his father's sweep of the heavens into the southern hemisphere, and in so doing discovered and catalogued a very large number of nebulae. He did not go to the Royal Observatory, which already existed, but set up his telescope a few miles farther south in what is now the suburb of Claremont; and the spot is marked by a small memorial which is rather hard to find in the suburban streets. During this time he kept a diary, which is reproduced in the volume under review, together with a number of letters. The

whole collection describes a busy life, a great deal of energy being devoted to botany. Perhaps this is a little misleading, because a whole night's work on the telescope is dismissed in a line or two and the botanizing expeditions are rather a feature of the diary. The collection is of fascinating interest to me because I spent some years of my youth at the Cape; but to the general reader the diary may seem rather scrappy. The editors have made a thorough job of transcribing difficult handwriting and have contributed copious notes, with the Latin names of the plants and animals. A substantial sketch of John Herschel is given by Dr Evans. The book is of very great interest to those interested in the early history of the Cape Colony or in the early development of its botany.

RICHARD WOOLLEY

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John Herschel (1792-1871) from an engraving published in 1875 (Ronan Picture Library).

Physical Sciences

ASTRONOMY WITHOUT MATHS

Invisible Astronomy

By Colin A. Ronan. Pp. xvi+173+12 plates. (Eyre and Spottiswoode: London, September 1969.) 50s.

THIS book, intended for the non-specialist reader, discusses the evolution and impact of modern astronomy on present scientific knowledge concerning the nature of the universe. As its title suggests, it deals primarily with those regions of the spectrum to which the eye is not sensitive, particularly the X-ray, ultraviolet and radio wavelengths, and also with some aspects of cosmic particle astronomy.

The book begins with a review of the interaction of experiment and theory in the formulation of a physical law; followed by a useful discussion on the danger of accepting on a universal scale laws which have only been terrestrially validated.

The part played by visual astronomy in determining

our picture of the universe in terms of the distance, motion, brightness and spectra of stars is discussed at length, and concepts such as stellar classification in terms of temperature and luminosity are introduced. A more unified picture of the universe is shown to evolve as each historic advance in understanding allows stars and galaxies to be fitted into an evolutionary pattern.

Elementary particles, nuclear fusion and fission, discrete spectral line emission from atoms and molecules and the energy processes in stars are very well treated. So, too, are the recent advances in radio, particle and ultraviolet astronomy dealt with in subsequent chapters. These I found particularly interesting and informative, dealing with instrumental and observing techniques as well as the astronomical data obtained.

Finally, the author reviews the present state of the three major cosmological theories—the Big Bang, Steady State and Oscillating Universe theories—and in particular