picture. The silvering process was evidently described during a moment of relaxation when the author's characteristic humor came to the surface as follows: "Personally I never weigh my nitrate of silver, as I enjoy the element of the personal equation which enters the problem when scales are dispensed with." How seriously this is to be taken may be judged from one or two of his immediately following sentences. "From one to two grams to 100 c.c. of distilled water is about right." "Unfortunately things as described above seldom happen at the first trial." "It troubled me much when my personal equation contained one more variable than at present, but I have not seen it occur recently. As the production of the uniform blue film depends upon getting the proportions just right, I suppose the beginner had better mix measured amounts for each trial unless he has access to a large jar of silver nitrate which 'belongs to the department.'" "The cause of this I do not know. Probably it is osmotic or perhaps catalytic!"

The results contained in the next paper, entitled, "Note on the electron atmospheres of metals," are capable of a quite different and less significant interpretation than that given by the author, as has already been pointed out by several other investigators.

The resolution of the four principal mercury lines, by a five-inch plane grating, ruled by Anderson at Baltimore, is discussed in Paper No. 10, and speaks well for the high quality of the grating.

The eleventh paper concludes the series with an interesting explanation and experimental verification of the "Imprisonment of Radiations by Total Reflection."

Of the volume as a whole, one hardly knows whether to admire more the boldness of ideas which prompt the experiments or the manipulative skill with which they are executed.

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Astronomy: A Popular Handbook. By HAROLD JACOBY, Rutherford Professor of Astronomy in Columbia University. The Macmillan Company, New York. 1913.

Most astronomers yield at one time or another to the desire to write some popular treatise on astronomy. Professor Jacoby has prepared his volume in the effort "to meet the wishes of the ordinary reader who may desire to inform himself as to the present state of astronomical science, etc." The book is intended also to serve for use in high schools and colleges. To meet this double end, the author has placed all the mathematical notes and explanations in the appendix, where they are at the service of students, while the main body of the text is free from mathematics, which might discourage the "ordinary reader." This method of arrangement is not unusual, but the author has carried it out more systematically than is usually done.

Professor Jacoby's treatment of the subject is distinctly out of the ordinary, and it is this originality of method and style which may well furnish the *raison d' être* for this addition to our astronomical literature. The first chapter is in the form of a general survey of the universe, a prelude to the detailed descriptions which follow. In the third chapter methods are given for finding the planets and stars. This chapter, however interesting for other reasons or valuable for intellectual training, does not impress one as containing the simplest methods for gaining familiarity with the stars and planets. Monthly maps are now published giving the appearance and positions of planets and comets as well as the stars, and it is doubtful if any verbal description, tables and small diagrams can compare in efficiency with such maps in assisting an ordinary reader to the identification of celestial objects. The author, however, would doubtless encourage the use of such maps in connection with the reading of the book. Chapter V. gives a brief but admirable discussion of the sun dial with a description of the manner in which one may be constructed by the reader. The earth and its relationships are handled in an original and interesting way. Under "Moonshine" the author presents the leading facts about our satellite, giving the usual proof of the absence of an atmosphere and the probable cause of its disappearance. No reference is made to the

conclusions of Professor W. H. Pickering, and others, regarding a slight atmosphere and various changes of the lunar surface. The author evidently has little confidence in these observations, since they, if trustworthy, would be of exceptional interest to the "ordinary reader." The different members of the solar system are taken up in order and briefly but clearly described. Probably no other astronomical subject is of such popular interest as the question of the presence of intelligent life on Mars. The author states: "We conclude that neither by visual nor by photographic evidence has the existence of an artificial network of markings been proven, or even rendered highly probable. Therefore the time has not yet come when we shall have to inquire whether geometric lines indicate the presence of intelligent inhabitants: that time will arrive if the lines themselves are ever shown to possess a real or even a highly probable existence." This view is doubtless shared by the great majority of astronomers at the present time.

Throughout the book Professor Jacoby calls attention to the familiar celestial phenomena of life, such as the rising of the sun and moon and their summer and winter paths. In calling attention to such facts and explaining them in a popular manner he has done a real service to the readers of his book. Even among educated people few can answer promptly the question, "Where does the moon rise?", and its changing path during the month and year is either not noticed or regarded as a mystery.

The volume is attractive in form, appears to be free from errors, and is admirably, if not profusely, illustrated. Many lines of recent astronomical advance have been lightly referred to, if at all, but this is inevitable in a popular treatise of such wide scope. The paramount importance of photography in research at the present time might well have been emphasized somewhat more strongly. On the whole, the book is exceptionally well written, and as a popular exposition of the whole field of astronomy is unexcelled.

S. I. Bailey

Elliot's Review of the Primates

For many years the Primates have been in need of systematic revision. The last general work on the order, Forbes's "Handbook," was published in 1894. Study of the group since then, particularly in Berlin, London and Washington, has resulted in a great increase in the number of recognized forms and in the modification of previously accepted views regarding many of those earlier known. In no one of the chief centers of activity is the material extensive enough to form the basis of a general review of the order, and in no two has a common standard of work existed. The resulting confusion was such that the understanding of relationships and the identifying of specimens had become in the larger genera impossible. To remedy these conditions and to establish a foundation for new work are the main objects of Dr. D. G. Elliot's "Review of the Primates."[1] This book is one of the most elaborate monographs ever devoted to a single order of mammals. By its publishing the outlook on the primates has been altered in a way that can be appreciated by those only who have for some time been actively occupied in the study of monkeys. In its 1,351 quarto pages may be found a complete review of the work done in the past by the author himself, his contemporaries and predecessors. It contains descriptions of all the known species drawn up by one person from direct examination of the specimens in all the principal museums of the world. Finally the series of photographs reproduced in 111 of the plates is so well selected and so fine in quality that it might be said almost to exceed in general usefulness the specimens hitherto existing in any one museum.

The inception and plan of the work are thus described by the author (Preface, pp. iii–ix):

[1] "A Review of the Primates," by Daniel Giraud Elliot, D.Sc., F.R.S.E., etc. Monographs of the American Museum of Natural History, Vols. 1–3. Three volumes, quarto, with 169 plates (28 colored). New York, published by the American Museum of Natural History (1912), June, 1913. Price, $30.