

$(r_1 + r_2 + s)^{3/2} \mp (r_1 + r_2 - s)^{3/2} = 6\kappa(t_2 - t_1)$ , is ascribed to Lambert. Long ago, Tisserand called attention in his "*Mécanique Céleste*" to the fact that this formula was first given by Euler. To Lambert is due the corresponding formula for elliptic orbits.

In so large a volume, containing so much standard material, it is impossible to enter much into details. Nearly all the methods described are abundantly illustrated with numerical examples. As the text itself is clear and the author's style nearly always good, there would seem to be no reason why any one with the proper mathematical equipment should experience any difficulty in understanding it, which can not be said of either Watson or Oppolzer. Without doubt, it is the most valuable work on "Computational Astronomy" which we have.

W. D. MACMILLAN

*Modern Microscopy.* A Handbook for Beginners and Students. By M. I. CROSS and MARTIN J. COLE, Lecturer in Histology in Cook's School of Anatomy. Fourth edition, revised and enlarged, with chapters on special subjects by various writers. Chicago, Chicago Medical Book Co. 1912.

Time was when "microscopy" had a distinct place in the range of the sciences. This was, however, before the day when the microscope had become an instrument so subordinated to the scientific branches in which it is largely used. That time was marked by a lively curiosity in the world of the very small which expressed itself in the establishment of microscopical clubs, societies, journals, etc.

Popular interest in the "microscope and its revelations" seems to have been largely lost at the present day, perhaps as the detailed results of its use have become more public property. This change of attitude which seems to the reviewer a real one is for many reasons to be deplored, so that such a book as the one whose title is given above should have a distinct place as a guide book for amateur microscopists—but only as such. Attempting to cover, as it does, practically the entire field in which the microscope is applied, it neces-

sarily falls short as a book for professional workers or serious students in the various fields.

The book is clearly written, fairly illustrated with a selection of figures, in general well chosen. The formulas of preserving fluids, stains and similar prescriptions are standard, although the selection often does not reveal a thorough familiarity with the more recent advances in the field.

Five chapters constitute Part I. on the Microscope and its Accessories. Part II., fifteen chapters, is devoted to the technique of animal and vegetable examination by means of the microscope, together with chapters on mounting entomological specimens, crystals, diatoms, etc. Part III. comprises special chapters by special writers on The Petrological Microscope, Rotifers, Mites, Foraminifera, Mosses and Liverworts, The Microscope and Nature Study and the Microscopy of Foods.

The book is therefore believed to have its place as a means of arousing and encouraging the interest of the layman in the world around him.

As a book for use in America, by Americans, however, it is believed that it would meet the demands that will be made of it better if it were to take some recognition of the excellent microscopes put out by such firms as The Bausch & Lomb Optical Company and the Spencer Lens Company among others. The special chapters, furthermore, deal with a peculiarly English fauna.

B. F. KINGSBURY

#### NUMBER OF SPECIES OF LIVING VERTEBRATES

RECENTLY I have had occasion to make an estimate of the number of known species of living vertebrates. After consultation with a number of specialists, the figures below have been fixed on as a reasonably close approximation to the truth. Thinking these estimates may be of interest to others, I send them to SCIENCE to publish for what they are worth. Such figures can not, of course, be accurate if for no other reasons than that in compiling them no attempt has been made to discriminate between forms described as species or as