

The first part contains a classification of all active substances known, and a succinct account of the theory of Van 't Hoff and Le Bel. The properties of the active, racemic and inactive modifications of a substance are then contrasted, and the methods of converting them into and separating them from each other described. A chapter by Prof. Lindner, on the micro-organisms employed in splitting up racemic compounds into their constituents, should be helpful to chemists. In the third part the rotation is considered from the physical point of view, the chapter on the influence of solvents on rotation being especially interesting. Many of the phenomena observed are still unexplained, and it would appear that a study of these should be capable of throwing some light on the nature of solutions. After a discussion of Guye's hypothesis, which is found to be insufficient, the author remarks that it will probably be impossible ever to discover the numerical connection between chemical constitution and rotation.

One hundred and forty-two pages are devoted to a very excellent account, by Dr. O. Schönrock, of polarimeters and saccharimeters, the subsidiary apparatus connected with them, and the methods of using them. Dr. Schütt contributes Part 5, on saccharimetry and the determination of several other active substances of technical importance, and the book terminates with a collection of the rotatory powers of all active substances known, which is complete up to the middle of 1896, and includes some of the data published since that date. A good index is added. T. E.

OUR BOOK SHELF.

The Span of Gestation and the Cause of Birth. By John Beard. Pp ix + 132. (Jena : Gustav Fischer, 1897.)

COMMENCING with the assumption that there is a "critical period" in the development of every mammal "when the embryo is first beginning to look like the form whose offspring it is," Dr. Beard proceeds, in this monograph, to point out the close connection existing between the extent of time, or "critical unit," which elapses before the "critical period" is attained and the ovulation and total gestation periods.

Dealing shortly with the probability of an alternation of generations in mammals, which he has so ably advocated in earlier communications, he reaffirms now his previous conclusion that the attainment of the "critical period" is coincident with the completion of all the important parts of the sexual generation, and with the commencing degeneration of the asexual generation or phorozoon. The length of the "critical unit" is, therefore, the length of the life of the phorozoon, and when it is completed, in the more primitive forms, *e.g.* the marsupials, the birth of the sexual generation occurs.

Obviously the simpler conditions prevailing in the lower forms have been altered in the higher mammals, and at first sight the alterations have not occurred along definite lines, for the "critical unit" is not a fixed quantity; on the contrary, it varies in length from $7\frac{3}{4}$ days, in the opossum, to 47 days, in man. Dr. Beard is convinced, however, that the variations can only occur in conformity with some discoverable law, and he shows that the "critical unit" is either slightly less than one, or than two combined ovular periods, which he proposes to term "ovular units." He suggests that if ovulation was not previously restricted it became impossible when gestation was established, and could only recur, in the most favourable circumstances, shortly after birth, and thus the

"critical unit" came to govern the "ovulation unit." But the intimate correlation between the critical and ovulation units is not closer than that which exists between the "critical unit" and the gestation period, for the latter is always some multiple of the former, and the greater the number of the "critical units" contained in the gestation period the greater is the stage of the development of the fœtus at birth; nevertheless, the completeness of the development of a fœtus at birth is not dependent merely upon the length of its gestation period, but upon the number of critical units in that period, for the "critical unit" has probably been doubled or trebled in certain cases, and the author believes that such lengthening is associated not with increase of the development, but only with increase in the size of the fœtus.

The points raised in this interesting memoir are clearly stated, the evidence in their support is well arranged, and the author is to be congratulated on having thrown light on some obscure problems. It is to be hoped that he will push his observations further, and that he will eventually succeed in demonstrating "the cause of birth."

ARTHUR ROBINSON.

A New Astronomy. By Prof. David P. Todd, M.A. Ph.D. Pp. 480. (New York, Cincinnati, Chicago : American Book Company.)

ASTRONOMY is pre-eminently a practical science, yet instruction in it, and especially in the branch which pertains to geography, usually consists of a course of study of text-books. This is not as it should be. It is far better to observe the apparent movements of the stars and planets than to learn that they are hundreds of thousands of miles away from us; and to note the annual movement of the sun among the stars is more instructive than to learn the dimensions of some sun-spots and prominences. In astronomy, as in other sciences, the only firm conceptions are those obtained from direct observation. Prof. Todd's book marks a new departure by showing how the fundamental principles of the subject may be studied with the aid of tangible objects, somewhat as in physics and chemistry. The result is most successful. No book with which we are familiar contains a clearer account of astronomical geography, and certainly none show so well how to observe celestial movements or illustrate astronomical phenomena with simple appliances. The pupil who learns astronomy through Prof. Todd's book will have a real idea of the motions and measurements of the heavenly bodies instead of abstract conceptions concerning them.

The practical presentation of what may be termed the geometry of astronomy only forms, however, one commendable feature of the book. Other characteristics which call for just as much praise are the large number of illustrations—well reproduced and well chosen—and the attention that is given to the advances made in recent years in all branches of celestial science. Throughout the book the endeavour has been to present the subject in a way which will induce the student to think for himself, and not merely commit facts to memory. In other words, Prof. Todd shows how astronomy may be given an educational value, instead of being presented as a collection of isolated and imperfectly connected facts. Fortunate is the pupil whose teacher instructs him in astronomy on the sound methods described in this book.

Lessons in Domestic Science. Part i. By Ethel R. Lush. Pp. viii + 88. (London : Macmillan and Co., Ltd., 1898.)

THIS instructive little book has been prepared for use by children in public elementary schools. It contains simple information on food, clothing, and personal hygiene, and is well adapted for the purpose for which it is intended. Wherever possible, the principles described are illustrated by experiment.