

of the staff of the Geological Survey of Canada, was published in *The American Geologist* for July 1900. It needs careful revision, but might be made the foundation of a good bibliography. Sir William took so prominent a place in his time that there must be many hundreds of his friends and pupils who, while delighted to have his autobiographical sketch, would be glad to possess a fuller memorial of the man and of his achievements in the cause of science and of education.

A. G.

#### THE FLORA OF INDIA ILLUSTRATED.

*Annals of the Royal Botanic Garden, Calcutta.* Vol. ix. Part i. *A Second Century of New and Rare Indian Plants.* (Calcutta: 1901.)

WITH the exception, perhaps, of Brazil, the flora of which has been more systematically illustrated, the flora of no country of very large area is so well pictorially illustrated as that of India. Disregarding the earlier publications of less precision, there are the works of Wight, Wallich, Roxburgh, Griffith, Royle and Hooker, and, later, of Brandis, Beddome and others, to say nothing of the very numerous scattered figures of Indian plants.

In 1888 Dr. (now Sir George) King, then Superintendent of the Calcutta Botanic Garden, commenced publishing a new series of quarto illustrations of Indian plants under the title cited above. The first volume contains all the Indian species of *Ficus*; the second the species of *Artocarpus*, *Quercus* and *Castanopsis*; both by King himself. The third volume is an illustrated monograph of the Indian species of the herbaceous genus *Pedicularis*, by Dr. D. Prain, the present Superintendent of the Calcutta Garden. The fourth volume is devoted to the *Anonaceæ*, by King; and the fifth contains a century of orchids, edited by Sir Joseph Hooker, and a century of new and rare Indian plants, by King and P. Brühl. The sixth volume is of a different character, and illustrates some of the microscopic researches of Dr. D. D. Cunningham. The seventh is a fully illustrated monograph of the *Bambuseæ* of India, by Mr. J. S. Gamble. The eighth volume, nominally, consists really of three thick volumes and comprises 448 coloured plates of Indian orchids, by Sir George King and Mr. R. Pantling. Each of these volumes has been more or less fully noticed in *NATURE* as it appeared.

The first part of the ninth volume, contains a second century of new and rare Indian plants, by King and Prain and Mr. J. F. Duthie, Director of the Botanical Department, Northern India. Remarkable among these novelties are five beautiful species of *Meconopsis* (*Papaveraceæ*), thus nearly doubling the number of this essentially Himalayan genus. The specific names, *grandis*, *superba*, *bella* and *primulina*, are suggestive of the ornamental characters which these herbaceous plants possess in a high degree. Unfortunately they are rather difficult to cultivate, but one or two species succeed very well in the rock-garden at Kew. Two or three very fine species of *Meconopsis* are among the comparatively recent discoveries in western China, and *M. horridula* is one of the most generally dispersed plants in the meagre flora of Tibet, at altitudes of 12,000 to 17,000 feet. Indeed, all the Asiatic species inhabit high levels, and some of them reach the upper limit of

phanerogamic vegetation. The only outliers of the genus are *M. Cambrica*, the lowly Welsh poppy, and *M. heterophylla*, a native of California. One of the finest of the species figured in the "Annals," *M. grandis*, is only known from Jongri, in Sikkim, where it is cultivated at altitudes of 10,000 to 12,000 feet, not for its beauty, however, but for the oil obtained from its seeds. Figures are given of three other pretty *Papaveraceæ*, namely, *Cathcartia lyrata*, *C. polygonoides* and *Chelidonium Dicanostigma*.

From a botanical standpoint the drawings are very good, and the lithography deserves to be rated as excellent. Nearly the whole is the work of native artists.

We have made a point of the new *Papaveraceæ*, but there are other equally interesting subjects illustrated in this part. New *Rutaceæ*, *Burseraceæ* and *Sapindaceæ*, chiefly by King; *Leguminosæ* and *Labiatae*, by Prain; and alpine Himalayan plants, including new species of *Primula*, by Duthie.

There is also a proposed new genus of *Orobanchaceæ*, concerning which particulars of its affinities might have been given. It is named *Gleadovia ruborum*, and was discovered by Messrs. Gleadow and Gamble growing on the roots of *Rubus niveus*, in fir woods, in the North-west Himalaya. The great value of such a publication as the "Annals" can only be appreciated by the working botanist, and it will be of general interest to know that plants of special economic interest will be a feature in the next part.

W. BOTTING HEMSLEY.

#### OUR BOOK SHELF.

*Essais sur la Philosophie des Sciences. Analyse, Mécanique.* By C. de Freycinet. Second edition. Pp. xiii + 336. (Paris: Gauthier Villars, 1900)

A GOOD book on the philosophical aspect of space, time, mass and force is rare. M. de Freycinet has produced a work that is both readable and worth reading. It opens with a chapter on space and time in which the essential differences of these two fundamental conceptions are discussed, and the impossibility of forming a quantitative estimate of time except by artificial means is clearly pointed out. The next chapters deal with the notions of infinity, of continuous magnitude, of limits, of infinitesimals and of differential coefficients. In considering the reality of such conceptions, the author is careful to distinguish between reality in a mathematical and in a physical sense, and to point out that reality in the first sense does not necessarily imply reality in the second. Thus the solutions by the calculus of many problems in mathematical physics are based on the assumption that both space and matter are continuous and capable of indefinite subdivision, and these solutions are none the less correct although other phenomena teach us that matter is to be regarded as built up of discrete molecules.

The second part deals with the quantities occurring in dynamics, the laws of motion, the principle of conservation of energy. In it M. de Freycinet has endeavoured in the present second edition to throw greater light on the debated question as to the relative parts played by Galileo and Kepler in the discovery of the laws of motion. According to him these laws consist of (1) the law of equality of action and reaction, due to Newton; (2) the law of inertia, now attributed to Kepler; (3) the law of independence of movements due to Galileo, according to which the relative motion of the parts of a system is unaltered by impressing a common velocity on them; and (4) the law of equivalence of work and heat due to Mayer