The sections on the metamorphism of minerals, and on the formation of minerals in nature, will be found of great interest to the petrologist. Here are described the effects on minerals of heat, of gases at high temperatures, of fusion, of fused magmas, of water containing carbonic acid, &c. In the last section, dealing with the composition and constitution of minerals, the present imperfect state of our knowledge is brought prominently to light. The battle is still being fought between the so-called chemical, liquid, and crystal molecule; between constitutional and empirical formulæ. Mineralogists are beginning to understand that it is impracticable to attempt to use for complicated minerals principles which are only applicable to volatile organic compounds, and the idea is gaining ground that many minerals are molecular compounds only capable of existing in the solid state, the crystal molecule being built up of different chemical molecules.

The author intends to supplement the present work by another, entitled "Chemical Mineralogy," in which the composition, synthesis, &c., of each individual mineral will be treated more particularly. The present volume is intended as quite a general treatise on the subject of mineral chemistry; in fact, we cannot help thinking that in many parts the treatment is far too general, and that the book has been partially sacrificed for the sake of the volume that is to follow. The value of the book is increased by the lists of references to the literature which precede each section. G. T. P.

OUR BOOK SHELF.

Bush Friends in Tasmania: Native Flowers, Fruits, and Insects, drawn from Nature, with Prose Descriptions and Illustrations in Verse. By Louisa A. Meredith. Executed by Vincent Brooks, Day, and Son. (London and New York: Macmillan and Co., 1891.)

UPWARDS of thirty years ago Mrs. Meredith gave the world a volume containing admirable coloured figures of a selection from the many beautiful plants and insects that inhabit her island home, Tasmania; and now, in the evening of a long life, she has travelled to the old country to publish a second volume, which is to be the last. Her purpose achieved, she "hopes to return and end her days among her children in that pleasant colony," which has given a brighter home to so many of our kith and kin. Lovers of the beauties of Nature in this country will find much pleasure and instruction in this second volume from that talented lady's pen and pencil, and will be able thereby to form some conception of the totally different kind of vegetation from our own that clothes this remote southern island, as well as the great Australian country, for it is only a part of the same flora. To the colonists themselves the book will be even more attractive, as a means of becoming acquainted with the names and affinities of the beautiful objects with which they are surrounded. It will also, it is to be hoped, teach them to prize and preserve these rare and precious gifts. Like all true lovers of Nature, Mrs. Meredith deplores the wanton destruction of rare flowers near Hobart by thoughtless or greedy persons whose only aim seems to be quantity.

The botanical part of Mrs. Meredith's book is perfectly trustworthy, having been scrutinized by so eminent an authority as Sir Joseph Hooker; and Prof. Westwood furnished the names of the insects.

Some of the poems have a special interest in connection with the early history of the settlement of Tasmania. Notably an "Old Story" of 1834, which narrates the massacre by aborigines of a whole family—father, mother, and seven children.

The Elementary Geometry of Conics, with a Chapter on the Line Infinity. By C. Taylor, D.D. (Cambridge: Deighton, Bell, and Co., 1891.)

DR. TAYLOR'S "Geometry of Conics" is so well known, and has met with such acceptance—this is the seventh edition, revised—that we are not called upon to give a detailed account of it. Two additions, however, claim a brief notice. A new chapter (xii.) contains "a course for beginners," in which students who prefer to take the three conics separately have a selection of articles, from the text, indicated for a first reading. Further, a set of duplicate proofs is given in outline, the completion of which is left to the reader. The other novelty (chapter xi.) is "a new treatment of the hyperbola." This is the expansion of a paper which the author read before the Association for the Improvement of Geometrical Teaching, in January 1890, and of which the President (Prof. Minchin) is reported to have said: "One thing that struck him about the paper was, that Dr. Taylor arrived at points on the curve in a very much more rapid and simple way than any he had previously known of." The author remarks that it is in accordance with the historical order to draw the asymptotes before tracing the curve, for the hyperbola seems to have been discovered from its "equation" (A.I.G.T. Report, 1890, p. 12).

It is somewhat remarkable that Dr. Taylor does not give a proof of this equation. We append one. Taking his figure on p. 103, we draw the second asymptote. Now draw PM parallel to Cp, cutting the axis in K, and the second asymptote in M: then,

$$\begin{aligned} 4CM \cdot MP = 4MK \cdot MP &= (MP + MK)^2 - (MP - MK)^2 \\ &= Cp^2 - KP^2 = \lambda^2(pN^2 - PN^2) \text{ (where } \lambda \text{ is a constant)} \\ &= \lambda^2(Sp^2 - SP^2) \\ &= \lambda^2(Sp^2 - pY^2) = \lambda^2 \cdot SY^2 = Ca^2 = a^2 + b^2. \end{aligned}$$

Again, let PQ be any chord meeting the asymptotes in p, q; and let Ql, Pm, parallel to Cp, Cq respectively, meet those lines in l, m. Then we have

$$\frac{Pq}{Cm} = \frac{Pp}{pm} = \frac{pq}{Cp} = \frac{Qq}{Ql},$$

$$\therefore \quad \frac{Pq}{Qq} = \frac{Cm}{Ql} = \frac{Cl}{Pm} = \frac{pQ}{Pp};$$

hence

$$Pp = Qq, \text{ and } Pq = pQ.$$

Other properties occur to us, but the above are classic properties of the curve, and the wonder is that Dr. Taylor has not applied his new treatment to obtain them. There is no suggestion that they can be so obtained, either in the book or the original paper as printed in the A.I.G.T. Report. R. T.

Les Engrais Chimiques. Par Georges Ville. Septième Édition. (Paris: M. Engel, 1890.)

THIS is a new edition of the author's lectures on chemical manures, which were first published in 1868, and which have been translated into seven languages. An English edition, by Mr. Crookes, was published in 1879. The sixth French edition has been out of print for about ten years, and during that time the price of chemical manures has considerably declined, on an average about 40 per cent. On this account the author has introduced, at the end of the volume, a chapter containing new formulæ for mixed manures, based on considerations of market value and more complete knowledge of the requirements of