

understood by such persons, at least with readiness.

Eighteen pages are devoted to vegetative reproduction with a discussion of cuttings, runners, bulbs, tubers, grafting, etc., in the higher plants, and of conidia, swarm-spores and fission in the fungi and algæ. Eighty-seven pages treat of sexual reproduction. The author traces the history of the knowledge of sexuality in plants from the Greek philosophers down to its demonstration by Camerarius, confirmation by Kohlreuter, discovery of the pollen-tube by Amici, observation of sexuality in cryptogams by Hofmeister, Thuret and Pringsheim, and the more recent investigations showing the part played by the nuclei, chromosomes, synapsis, etc., thus bringing the subject down to this year. After this historical and general discussion the different groups of plants are taken up, showing the increasing complexity of the sexual process from the union of two equal cells up to the complicated processes in the higher fungi and algæ, the alternation of generation and development of heterospory in the Archegoniata and the double fertilization in the Angiosperms. Under the caption General Questions are taken up sexual affinity, hybrids, polyspermy, parthenogenesis, parthenocarp, apogamy, apospory, merogony and determination of sex. The final considerations take up the theory of fertilization and the theory of sex, the various views being presented in an unbiased manner as well as the objections to them.

Although professedly designed for those who are not specialists this book should prove valuable for both students and teachers. The references to literature, both old and very recent, although with no pretence to completeness, yet give the most important contributions bearing on the subject. The figures are, for the most part, very good.

ERNST A. BESSEY.

SOCIETIES AND ACADEMIES.

THE AMERICAN PHILOSOPHICAL SOCIETY.

A STATED meeting was held on Friday evening, November 2, 1906, at 8 o'clock. The following papers were read:

DR. ALFRED C. HADDON, F.R.S., University Lecturer in Ethnology, Cambridge, Eng.: 'The Decorative Art of British New Guinea.' (Illustrated.)

DR. JOHN W. HARSHBERGER: 'A Grass-killing Slime Mould.'

DISCUSSION AND CORRESPONDENCE.

SOME POINTS IN TEACHING CRYSTALLOGRAPHY.

THE writer wishes to call attention to and invite discussion of the following points in the teaching of crystallography as a part of the work in elementary mineralogy.

The best classification even for beginning students is that of the thirty-two crystal classes, based upon symmetry. All ideas of hemihedrism should be dropped as there is no structural connection between the whole and partial forms. The name of the class is the name of the general form. Groth's set of names is the best, but his names for the isometric classes may be replaced by the terms, tetartoidal, gyroidal, diploidal, hextetrahedral and hexoctahedral for classes twenty-eight to thirty-two.

A division of crystals into seven systems is preferable to that of six. Crystals with an axis of three-fold symmetry naturally form one system and those with an axis of six-fold symmetry another system. And this is true whether the three axes of Miller or the four axes of Bravais are used. The writer prefers to treat the orthorhombic system, one of moderate symmetry, first.

It is believed that von Fedorow's method of naming forms (adopted by Groth in his 'Physikalische Kristallographie') is the only logical one. The name of a form depends upon its shape and is independent of how it cuts the axes of reference. A pinacoid consists of two parallel faces whether its symbol is 100, *h0l*, *hkl* or what not. A pyramid is three or more like faces meeting in a point and a bipyramid is two such solids placed base to base. Instead of using a name for the particular form, *e. g.*, pinacoid of the first kind, as von Fedorow does, we may simply give the name of the form together with the symbol, *e. g.*, pinacoid (100).