cule of cane-sugar, respectively—both being measured when compressed to the osmotic pressure—then $p(v-bv/V)=RT$ is found to give a fair fit to the results both at 0° C. and at 30° C.

A closer approximation is obtained with

$$(p-a/v^2)(v-v/Vb)=RT,$$

in which case the same constants give the values of p for both 0° C. and 30° C.

I also find that a somewhat less good fit is obtained from $(p+a/v^2)(v-vb/V)=RT$; this last equation, however, has the advantage that it gives a value of V when $dp/dV=0$, which, assuming that this point is the limit of supersaturation, we know is about right; that is, V is greater than the molecular volume of cane-sugar in the solution, and less than its value in a saturated solution, *i.e.*, a solution containing about 960 grams per litre at 30° C.

I would reserve the discussion of the meaning of these equations and others, which I have also obtained, until our final results are published.

BERKELEY.

Foxcombe, near Oxford, May 15.

A Bibliography of Fishes.

THE time is ripe—and has, indeed, long been ripe—for the publication of a carefully prepared bibliography of fishes, to cover the entire range of the subject: fishes fossil as well as living, and fishes from many points of view, such as anatomy, physiology, embryology, pathology, parasitology, distribution, taxonomy, everything, in short, excepting matters which deal with clerical details of the fisheries. Such a compilation, it is clear, means much for this branch of zoology, for the literature of the fishes is vast, widely scattered, and ill-digested. In fact, I believe that there is scarcely an investigator to-day who has not been obliged, needlessly, to give weeks or months of his time to searching for references.

The importance of such a bibliography was brought home to me about 1890; at that time I began the work of collecting references to be used in my studies, and as years passed I was able to build up a card-catalogue giving author and subject, which proved indispensable. Later my catalogue became known to correspondents, who in turn found it of use in their studies; and they, for their part, were generous in contributing references, and thus added notably to its value. It next, through the kindness of the Smithsonian Institution, absorbed the bibliography which Prof. Goode undertook to publish, and which his death left unfinished. Thus the value of the work became greater year by year. About 1910 the American Museum of Natural History allowed me secretarial help in the direction of editing the catalogue for publication. And thereafter, for about a year and a half this secretarial work was carefully carried on under the supervision of my colleague, Dr. Louis Hussakof, and since 1914 by Dr. C. R. Eastman, of the American Museum.

The scope of the undertaking may be understood when one considers that nearly 50,000 references are brought together. These have been gathered from all sources, notably from all accessible bibliographies, serial publications, and book catalogues. Finally, the effort was made to complete the lists of titles by bibliographies secured in so far as possible from authors themselves. To this end circulars were sent out to several hundred writers on ichthyology, many of whom responded cordially.

There still remain, however, a number of individual writers who have not contributed the titles of their publications. I have, accordingly, been led to publish the present note in the hope that any who have not already sent to Dr. Eastman or myself their bibliographies, may be reminded that we are especially anxious to make the work as complete as possible. We urge that their lists be sent in without delay, for the work is undergoing its final revision, and the first volume is shortly to go to press. This is the "author's" volume, which will consist of about 1000 pages, and include under the names of writers a serial list of their publications. The second, or "subject" volume, will be a classified index of the titles in vol. i. Here one has access to special papers in the various branches; for example, in anatomy, distribution, embryology.

BASHFORD DEAN.

American Museum of Natural History, New York.

The Use of the Term "Pinacoid" in Crystallography.

CAN any of your readers help me as to the original definition of the familiar term "pinacoid"? I suspect that it was introduced by C. F. Naumann about 1830; it was derived from πίναξ, a slab, and appears from the first to have included two parallel planes. Naumann, for instance ("Anfangsgründe der Krystallographie," 1841, p. 126), uses "basal pinacoid" for the pair of planes parallel to the two lateral crystallographic axes. But he restricts the use of pinacoid to the three possible pairs in a crystal that cut only one of the three axes, and (p. 19) defines a pinacoid as including "two parallel planes which are parallel either with the base or one of the other co-ordinate planes."

In 1856 we find Tennant and Mitchell ("Mineralogy and Crystallography") using pinacoid for a single plane of any of these pairs, and this, which is clearly a mistake, has been followed by writers of very recent date. Story-Maskelyne ("Crystallography," 1895, p. 20) agrees with Naumann, calling the single plane a "pinacoid plane." This latter fact has not been observed by the authors of the Oxford Dictionary. P. Groth ("Physikalische Krystallographie") in 1876 and 1885 employed the term in Naumann's way; but in his third edition of 1895 he introduced the term "pedion" (p. 337) for any single plane, and defined a pinacoid (p. 340) as consisting of any two parallel planes.

This extension of the term pinacoid from Naumann's original usage has been adopted by Lewis, Liebisch, Miers, and Tutton in their authoritative works. The pinacoids parallel to the three co-ordinate planes are thus left without a distinctive title, and in my own small "Outlines of Mineralogy" (1913) I have styled them "principal pinacoids." If the history of the matter is as I have traced it, it would seem better if Groth had invented a new term, side by side with pedion, rather than, as was so often done by Rosenbusch in the nomenclature of rocks, employed a well-established term in a new signification.

GRENVILLE A. J. COLE.

Royal College of Science for Ireland,
Dublin, May 11.

A Mistaken Butterfly.

A FEW summers ago I noticed a fine cabbage butterfly executing a number of gyrations in front of a milliner's shop in New Bond Street, and making every effort to get through the plate-glass window. Immediately inside the window was a lady's hat (or bonnet, I am not sure of the distinction), ornamented by an enormous artificial scarlet poppy. It was quite clear that the object of the butterfly's attention was the poppy. Apparently he was guided by sight, and not by smell.

EDWARD A. MARTIN.

Grange Wood Museum, South Norwood, May 12.