

lastly, it renders possible the total regeneration of the nucleus. In the present state of our knowledge, however, there is obviously much that is hypothetical in the respective importance of these consequences.

It is chiefly in his researches on the embryology of Nematoda that Prof. Carnoy has reached conclusions which are totally at variance with those already arrived at on the same subject by Messrs. Nussbaum and E. Van Beneden. We allude especially to the mode of formation of the polar bodies in the egg of *Ascaris megaloccephala*. For the Louvain Professor, the two successive divisions which take place in the germinal vesicle assume the following characters:—

(1) The nuclear element ("élément nucléinien typique") of the egg of *Ascaris megaloccephala* becomes at an early stage broken up into eight nearly equal rod-like portions; these at once separate into two groups of four rods ("bâtonnets"), thus constituting the Wagnerian spots.

(2) When a spermatozoid has made its way into the egg, sometimes very soon afterwards, occasionally later, an alteration of the germinal vesicle becomes visible; its membrane dissolves away, and subsequently, by a process of true karyokinetic division accompanied by the formation of asters of remarkable variety and complexity, the first polar body is expelled. This he finds to consist of four nuclear rods and a portion of the protoplasm of the egg. At this stage, therefore, according to Dr. Carnoy, four rods only remain within the egg.

(3) Now the same process begins again, in all essential respects resembling that which has just been described; finally, the second polar body is expelled in its turn. It consists of two nuclear rods, so that only two rods remain now in the egg for the formation of the female pronucleus. We are thus in a position to calculate accurately the amount of nuclein lost by the germinal vesicle during the expulsion of the polar bodies. According to Prof. Carnoy, the loss, for *Ascaris megaloccephala*, would amount exactly to three-fourths of the nuclein originally present in the egg.

We are not sure whether Prof. E. Van Beneden's views on this delicate question may not be to a certain extent reconciled with those of the eminent biologist of Louvain, especially as regards the number of nuclear portions contained in the first polar body. But respecting the constitution of the second polar body the views of the two Belgian observers are certainly difficult, if not impossible, to reconcile.

Prof. Carnoy's book reads easily, and his statements are always clear and definite. The text is illustrated by a large number of figures, beautifully executed, which greatly enhance the value of this most interesting and important work.

L. MARTIAL KLEIN.

OUR BOOK SHELF.

The Climatic Treatment of Consumption: a Contribution to Medical Climatology. By J. A. Lindsay, M.A., M.D. (London: Macmillan and Co., 1887.)

DR. LINDSAY does not profess to have written a systematic and exhaustive treatise upon the climatic treatment of consumption. He holds that we are only on the threshold of climatological investigation: and "for its

exhaustive discussion," he says, "prolonged inquiry will be necessary, and more exact methods than those hitherto generally employed." He has made, however, an important contribution to the study of a very difficult subject, and his book ought to be of much service not only to physicians but to many sufferers who may still hope to find in climatic treatment a powerful adjunct to hygienic and medical measures. Having discussed the causes of consumption and the general principles of climatic treatment, Dr. Lindsay presents a general view of the chief sanatoria for consumption. He then describes mountain sanatoria and the ocean voyage, and gives a full and trustworthy account of sanatoria he himself has visited, including Australia, Tasmania, New Zealand, California, the Cape, Algeria, Southern France, and the home sanatoria. The value of the book is, of course, greatly increased by the fact that he has relied for his information mainly on personal observation.

Illustrations of the British Flora. Drawn by W. H. Fitch, F.L.S., and W. G. Smith, F.L.S. Second Edition. (London: L. Reeve and Co., 1887.)

WHEN the illustrated edition of Bentham's "Hand-book of the British Flora" was exhausted, the wood engravings of that work were reproduced in a volume intended to serve as a companion to the "Hand-book" and other British Floras. The volume has been so popular that the publishers have found it necessary to issue a second edition; and they have taken pains to secure that it shall be more useful than ever to students of botany, and especially to beginners. Five cuts have been added, and the arrangement of all the illustrations has been brought into accordance with Bentham's "Hand-book" as it has been revised by Sir J. D. Hooker. To facilitate reference from other Floras, the index has been greatly enlarged, and there is a new index of English and popular names.

Sketches of Life in Japan. By Major Henry Knollys, R.A. With Illustrations. (London: Chapman and Hall, 1887.)

In this book Major Knollys undertakes to tell us something of "the minor lights and shades" of the social life of Japan. He is a careful observer, and writes brightly and pleasantly; and no doubt the lively record of his impressions will interest a good many readers who would not have cared to study a more elaborate and systematic account of the Japanese people. The substance of the book was written "on the spot," but all statements with regard to matters of fact have been carefully revised.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Thought without Words.

THERE appears to be some ambiguity about this matter as discussed in the correspondence which has recently taken place in your columns. In the first instance Mr. Galton understood Prof. Max Müller to have argued that in no individual human mind can any process of thought be ever conducted without the mental rehearsal of words, or the *verbum mentale* of the Schoolmen. Now, although this is the view which certainly appears to pervade the Professor's work on "The Science of Thought," there is one passage in that work, and several passages in his subsequent correspondence with Mr. Galton, which express quite