matrix and a part passes into the peripheral layer. If the sphere material is derived from the nucleus as is the case in Gasteropods, according to Conklin, then both the mesoplasm and entoplasm receive substances derived from the nucleus at the preceding division. Again, the clear protoplasm (ectoplasm, Conklin) escapes from the nucleus at the first maturation division.

The various substances arise epigenetically even in the nucleus, but 'all the evidence favors the view that back of the organization of the cytoplasm is the organization of the chromosomes which is definite, determinate and primary.' Thus from visible formative substances we pass to invisible, hypothetical substances and end not far removed from Weismann in the organization of the chromosome.

The term 'organization' is much employed of late, apparently as an explanation. But organization alone is the dynamo without electricity. The important question regarding all hypothetical organization in biology is, will it work? It would seem that at least some suggestion as to how it may work should be offered. How and why, for example, do the formative substances form what they are assumed to form? How and why does the nucleus give rise to ectodermal substance at one time and to mesodermal substance at another? If we have truly abjured vitalism organization must be reducible to terms of physics and chemistry. Why should we not make the attempt to reduce it instead of clinging to the vague term. If it is not so reducible then organization is a vitalistic concept. To the writer it seems at least a question whether a 'definite, determinate and primary' organization of the chromosomes is reducible to terms of physics and chemistry.

Four types of germinal localization are distinguished by Conklin: the annelid-mollusk, the ctenophore, the echinoderm and the ascidian. Among these there is no convergence in passing from later to earlier stages. Precocious segregation is rejected as an explanation of egg organization. This organization, like adult structure, must in the final analysis depend upon the chromosomes in the germ cells. The structure of later stages is the result, not the cause of the structure of the germ cell. Extensive modifications of adult structure may therefore be brought about by slight changes in germinal organization.

In conclusion, one or two minor matters should, perhaps, be mentioned. The author uses the words 'ovocyte' and 'ovogonic,' but also the word oöplasm. The first two are examples of those mongrel words with which biology has been frequently afflicted; the last is a word of good parentage.

Addition of the plate numbers to the references to figures would certainly facilitate the finding of particular figures.

C. M. Child.

Lehrbuch der Meteorologie. Von Dr. Julius Hann. Second edition. 8vo. Leipzig, 1906. Pp. xi + 642.

What Hann's 'Handbuch der Klimatologie,' in its first and second editions, is to climatology, the same author's 'Lehrbuch der Meteorologie,' in its first and second editions, is to meteorology—a comprehensive, well-digested, thoroughly authoritative text-book; absolutely indispensable to every worker in this science, and to every one else who seeks information on any special point in meteorology and who wishes to go to headquarters for an answer to his question. The first edition of the 'Lehrbuch' appeared in 1901 (see review in Science, Vol. XIV., N. S., December 20, 1901, pp. 966–967), and although but four years have elapsed since then, a second edition is now before us, with all the latest advances of the intervening period set fully and clearly before the reader. What we said in our notice of the first edition can be repeated, with added emphasis, of the second. Everything is brought down to date. For example, in the earlier edition it was stated that the results of the international cloud year were incomplete, but would probably give a fairly conclusive answer to questions regarding cloud heights and velocities. On p. 208 of the new edition it is stated concerning these results that they *have given* an answer to almost all questions as to cloud heights and velocities. This is typical of the treatment

of every subject in which advance has been made within four years. To give one other example, on pages 384–5 of the later edition the evidence concerning the movements of the upper air currents around cyclones which has been obtained by means of *ballons-sondes* is added to what was included in the first issue. The most important additions naturally concern the results obtained in the free air with balloons and kites, and all the important results obtained up to the time of printing the book are discussed, including the newer investigations of Bigelow, Shaw and Hildebrandsson. The recent Antarctic expeditions have contributed towards making this volume thoroughly complete up to date.

The second edition differs from the first in having larger type for the main portion of the text, which improves the book decidedly, and in the omission of a good many of the fine-print passages which rather clogged the first edition so far as easy reading was concerned, although they contained much valuable matter. There have been added a useful table of monthly and annual mean temperatures for about 140 different stations scattered over the world, many of these means having been newly determined by the author; a small table of monthly rainfalls for some of the more important stations; a vapor-pressure table, and a table for the convenient calculation of differences of altitude from barometer readings. The first edition had 805 pages; the second has 642. There is thus a considerable reduction, brought about by the omissions just referred to, but in spite of this shortening, the new book is extraordinarily complete, and for all ordinary purposes will serve as the authority beyond which there is no need of going. For detailed investigations of special points, however, it will be necessary to refer to the fuller bibliographical notes of the earlier edition. For the working meteorologist both books are needed. The climatologist also, in spite of the extraordinary richness of the material in the same author's 'Handbuch der Klimatologie,' will find many of the data and discussions in the 'Lehrbuch' invaluable as supplementary to the 'Handbuch.'

Meteorologists may well congratulate themselves on having the 'Lehrbuch' in its new form. Their fellow workers in other sciences may well envy them. For it does not happen to every scientist that the master mind in his subject produces a volume so wholly beyond the possibility of unfavorable criticism; so indispensable; so sure to last for years as the undisputed authority.

R. DEC. W.

SOCIETIES AND ACADEMIES.

THE TORREY BOTANICAL CLUB.

THE meeting of November 14, 1905, was called to order by President Rusby in the American Museum of Natural History. Twenty persons were in attendance.

Dr. C. Stuart Gager was elected recording secretary to succeed Mr. Edward W. Berry, resigned.

The first number on the scientific program was a paper by Dr. D. T. MacDougal on 'Bud Sports.'

The speaker gave an outline of the subject of bud sports and described some illustrative cases. Three striking examples from the cultures of the evening primroses in the New York Botanical Garden in 1905 were discussed. In one, a hybrid gave a flowering branch which sported into the characters of a sister hybrid; in the second, a fixed hybrid produced a branch constituting a reversion to one of the parents, a third, a mutant of the common evening primrose, produced a branch which resembled the parental form. Attention was called to the fact that all mutations are essentially vegetative and, therefore, a greater terminology would necessitate the use of the terms 'bud sport' or 'bud mutant,' or 'seed sport' or 'seed mutant.' While seed mutants may theoretically be traced to one cell, it seems difficult to do this in the case of bud sports. The action of the growing point in the protection of buds was illustrated with diagrams, and an enlarged photograph of one of the bud sports was exhibited.

Dr. Tracy Hazen exhibited a hybrid between *Asplenium murrare* and *A. trichomenes* from Vermont.