a centrosome to the egg cell, which before the entrance of the spermatozoon lacked a centrosome and was, therefore, incapable of division. Since then a large number of investigators have devoted attention to this subject with more or less conflicting results. In the first edition of his book on the Cell, Professor Wilson took a very positive stand in favor of the hypothesis of Van Beneden and Boveri; in the present edition he takes the much safer ground that the problem is still an open and unsolved one. As to the origin of the cleavage centrosomes he suggests (p. 230 *et passim*) that Boveri's hypothesis may still be maintained in a modified form if we assume that the sperm centrosome gives rise indirectly, through chemical stimuli, to the cleavage centrosomes.

Other important changes are found in the treatment of the structure of protoplasm, the mechanics of mitosis, and chromatic reduction, while minor alterations are found on almost every page. There are about 100 additional pages and more than 50 new figures, while several old figures have been redrawn and improved.

On the whole, the author's temper is much more cautious and judicial than in the first edition, while at the same time there is no loss of that enthusiasm which is the peculiar charm of his writing. The few erroneous statements of the first edition have been entirely rectified, and few, if any, new ones have crept in. Strange to say, however, the typographical errors have increased, though they are still few and for the most part unimportant. Too much praise cannot be given to the mechanical execution of the work. The illustrations are of the highest type of excellence; in fact it is no exaggeration to say that many of the figures are clearer and better than the originals (usually lithographs) from which they were taken.

The book mark of the Columbia Biological Series has been changed from a mitotic figure in the metaphase to one in the anaphase, which fittingly symbolizes the passing of this work from a first to a second edition. Although one of the latest books in this field, this is the first general work on cytology to pass through a second edition. May it see still other editions, telophases and yet other cycles of development, in the future!

Edwin G. Conklin.
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North American Forests and Forestry, Their Relations to the National Life of the American People. By Ernest Bruncken, Secretary of the late Wisconsin State Forestry Commission. New York and London, G. P. Putnam's Sons. 1900. Pp. vi + 266.

This work, which appeared early in the year, is a timely contribution to the much needed literature of forestry in North America. We have been so earnestly engaged in ridding the ground of the covering of trees which prevented us from 'planting corn to feed to hogs, to sell for money, to buy more land, to plant more corn, to feed more hogs,' etc., etc., that we have overlooked the fact that *a forest is often the best crop which a given area can produce.* With the disappearance of the great forest tracts we are learning the hard lesson that we have 'wasted our substance in riotous living,' and as the thoughtless prodigal of old finally 'came to himself' when he had spent all, so we are beginning to have different notions as to the value and importance of the heritage of trees which we so thoughtlessly wasted. This book is itself a result of this changed feeling. It is an attempt to treat the forest problems of the country as of such importance as to demand our most thoughtful consideration.

Some idea of the scope of the book may be obtained from the titles of a few of the chapters: The North American Forest, The Forest and Man, The Forest Industries, Destruction and Deterioration, Forestry and Government; Forestry and Taxation; Reform in Forestry Methods, Forestry as a Profession, etc. In the treatment of these topics the author discusses each with liberality, and is not given to urging his particular theory upon the reader's attention. In fact the book is very largely a calm discussion of forestry questions, and it is singularly free from long statements of the author's particular theories as to the proper solution of the problems in hand.

It should have a large sale throughout the country and should be found in every public

library. Some one ought to make the experiment of using it as a supplementary reader in the high schools.

CHARLES E. BESSEY.

THE UNIVERSITY OF NEBRASKA.

Catalogue of the Flora of Montana and the Yellowstone National Park. By PER AXEL RYDBERG, Ph.D. New York. 1900. 8vo. Pp. xii+492.

This fine volume, which is issued as the first volume of the Memoirs of the New York Botanical Garden, appeared early in the year, bearing date of February 15, 1900. It is the result of several seasons of work done in the field by the author as collector for the United States Department of Agriculture and the New York Botanical Garden. When he came to work up these collections he found that the flora of Montana was but little known, and accordingly he availed himself of all the accessible material of previous collectors. The final result is a list of 1976 species and varieties of Pteridophyta and Spermatophyta, of which 776 are not recorded in Coulter's 'Manual of the Rocky Mountain Region,' and 163 are new to science.

The treatment of the subject is liberal, and we have here much more than the old-fashioned list which has all but disappeared from botanical literature. The nomenclature is modern, of course, and authorities and descriptions are so freely cited that no one need have any difficulty in certainly identifying all of the species and varieties included. Habitat and locality notes are given with much fullness, and in nearly every case herbarium specimens are particularly indicated by numbers, the only exception being in those cases where the species had been authoritatively reported in standard works. The selection of type, the size of page, and quality of paper all contribute to the finish of the work for which the author supplied so well wrought a text.

The work includes 42 Pteridophytae, 21 Gymnospermae, 423 Monocotyledones, and 1490 Dicotyledones. The large families are Polypodiaceae (22 species), Pinaceae (20), Gramineae (191), Cyperaceae (105), Juncaceae (23), Liliaceae (28), Orchidaceae (22), Salicaceae (29), Chenopodiaceae (50), Amaranthaceae(27), Alsinaceae (34), Ranunculaceae (71), Crucifereae (76), Saxifragaceae (35), Rosaceae (84), Papilionaceae (122), Onagraceae (43), Umbellifereae (41), Primulaceae (24),Polemoniaceae (39), Boraginaceae (40), Scrophulariaceae (93), Compositeae, including Ambrosiaceae and Cichoriaceae (357).

That much work is yet to be done in this region may be seen from the author's remark in the preface that "the area east of the 108th meridian on the south side of the Missouri River, and of the 112th meridian on the north side is practically unexplored botanically," in fact it appears that it is only the mountain regions that have been fairly well explored.

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The Agricultural Experiment Stations in the United States. By A. C. TRUE and V. A. CLARK. U. S. Department of Agriculture, Office of Experiment Stations, Bulletin No. 80. Pp. 636, pls. 153.

This book was prepared as a part of the exhibit of the American Agricultural Experiment Stations at the Paris Exposition. It is an exhaustive treatise on the history, work, and present status of the experiment stations in general and of the fifty-six stations individually, profusely illustrated with half-tones showing the buildings, plats, laboratories, herds, etc., of the different stations. It opens with an account of the general agricultural conditions of the United States as related to the work of the stations, dividing the country into six general regions. The part devoted to the history of the stations includes an account of the early experimental work carried on by the agricultural colleges and other institutions prior to the establishment of experiment stations supported by State appropriation. The first of these stations was located at Middletown, Conn., in 1875, and was afterwards removed to New Haven, where it continues in operation. The movement to secure Federal aid for experiment stations, resulting in the passage of the Hatch Act in 1887, and the development of the stations under the Hatch Act are reviewed. There are now fifty-six stations in operation, including those in Alaska and Hawaii, fifty-two of which receive Federal aid.