checking radiation and thus decreasing the danger of frost. Professor Cleveland Abbe contributes some further notes on the life and work of Espy. In connection with a letter from a correspondent in Curaçao, who attributes to deforestation in that island certain electrical effects which now produce less rain than formerly, Professor Abbe ('Drought and Atmospheric Electricity') takes occasion to point out what is known regarding the connection between rain and electricity. In a series of observations on 'The Zodiacal Light,' Dr. Maxwell Hall reaches conclusions which would relegate this phenomenon to the department of astrophysics, the influence of the atmosphere being only to render obscure the fainter details. In a note on 'Cloud Banners,' reference is made to the report that heavy columns of smoke or steam were ascending from the peak of Mount Rainier on March 6 last. Public attention was attracted by the phenomenon, and it was eagerly watched. In reality, it was a cloud banner of the ordinary type, developed in a warm southerly wind. A similar appearance, in December, 1904, led to the sending of an expedition up the mountain by a Seattle newspaper. A review of a recent paper by Brückner on the influence of the oceans on precipitation over the continents brings out the fact that if the figures and underlying assumptions are taken as accurate, it appears that were the influence of the oceans eliminated, the continents would still receive four fifths of their present precipitation.

CENTRAL LOW PRESSURE IN A TORNADO.

A FEW years ago there was no barograph record from the center or from near the center of a tornado. Almost every year now some tornado in the United States passes near enough to a Weather Bureau station to leave some record of its existence on the curve traced by the self-recording barometer, yet the number of these records is not yet so large that new ones are uninteresting or not worth noting. The tornado at Meridian, Miss., March 2 last, whose passage caused a considerable loss of property and resulted in the death of 23 persons, was within 250 yards of the local office of the Weather Bureau. The barograph pen dipped .16 inch, and recovered almost immediately, making a straight line down from the main part of its curve. This is the usual form of tornado pressure curve. A facsimile of the original tracing may be found in the *Monthly Weather Review,* 1906, p. 118.

NOTES.

'SOME Meteorological Results of the Scottish National Antarctic Expedition,' by R. C. Mossman, appear in the *Scottish Geographical Magazine,* Vol. 22, 1906, pp. 252–272. This is a more complete discussion than has hitherto been published, and is illustrated by means of curves and wind roses. The most important results of the *Scotia* expedition have already been noted in SCIENCE.

THE rainfall of a region little known meteorologically, German Southwest Africa, is discussed by T. Klengel in *Das Wetter,* 1906, beginning with the April number and extending through July.

THE optical effects resulting from the dust thrown out in the recent eruption of Vesuvius are briefly discussed in the July number of *Das Wetter.*

R. DEC. WARD.

BOTANICAL NOTES.

A NEW FLORA OF COLORADO.

ABOUT thirty years ago Professors Porter and Coulter prepared a very useful 'Synopsis of the Flora of Colorado,' and ten years later this was expanded by the junior author into his well-known and widely used 'Manual of the Botany of the Rocky Mountain Region.' In the two decades since the appearance of the latter so much has been done in the collection and closer study of the plants of the Rocky Mountain region that these old books no longer represent the present state of our knowledge of the species and their distribution. Dr. Rydberg's 'Catalogue of the Flora of Montana and the Yellowstone National Park' (1900) gave some idea of what additions and changes would have to be made in

a comprehensive treatment to-day of the plants of the region. Several years ago the officers of the Agricultural Experiment Station of Colorado felt the need of having the growing botanical collections of the station determined more accurately than was then possible with the available manuals and other publications, and appealed to the director of the New York Botanical Garden for such help as he could afford them. The ultimate result of this appeal is a well-printed octavo volume of more than 450 pages, entitled the 'Flora of Colorado,' and published as Bulletin 100 of the Colorado Experiment Station. It is the work of Dr. P. A. Rydberg, whose acquaintance with the Colorado flora is based upon much actual study and field work in different parts of the state, in addition to the rich collections in the herbarium of the New York Botanical Garden. It has been known for some time that he has had in preparation a manual of the botany of the whole Rocky Mountain region, and the present volume is thus a sort of prodrome of that work.

The plan of the book is similar to that of the very useful 'Flora of Pennsylvania,' prepared a few years ago by Dr. Porter. By convenient keys in the beginning of the book the orders are sufficiently characterized for recognition; then on the designated page of the volume by another key the families are briefly characterized; and so in like manner under each family is a key to the genera, and under each genus, a key to the species. Finally after the specific key each species is given a separate paragraph, including the authority, habitat, general distribution in North America, particular distribution in Colorado, altitude, and now and then a synonym. It is thus a synoptical manual, and has the merit of maintaining the identity of order, family, genus and species, a matter of no small importance to the beginner who wishes to know something more than the mere names of his plants. A failure to maintain such distinctions is a grave fault of many of the local manuals accompanying botanical text-books. Dr. Rydberg's book will no doubt at once become the handbook for the student and collector in Colorado, for which it is admirably adapted.

From the preface we learn that it contains 'over 700 genera, and 2,900 species' of fernworts and flowering plants, and that 19½ per cent. of these are composites; 9 per cent. grasses (*Poaceae*); 6½ per cent. *Fabaceae;* 5 per cent. *Brassicaceae;* 3½ per cent. sedges, etc.

The nomenclature is modern, and the treatment of genera and species quite radical, yet the author has not published any new genera or species in the book, thus setting a good example, which it is to be hoped will be followed by other botanists who prepare similar floras. It is a good piece of work, and the officers of the experiment station are to be congratulated upon their liberality and foresight in providing for its publication.

THE NORTH AMERICAN CHAREAE.

Twenty-seven years ago Dr. B. D. Halsted published in the *Proceedings* of the Boston Society of Natural History a twenty-page paper entitled the 'Classification and Description of the American Species of Characeae,' including characterizations of all of the species then known in North America, viz., of *Nitella* 8 species, *Tolypella* 1, and *Chara* 9 species and 6 varieties. Three years later Braun's 'Fragmente' increased these numbers to *Nitella* 21 species, *Tolypella* 3, and *Chara* 15, besides many varieties and 'forms.' Now we have a paper, 'The Chareae of North America,' published by Dr. Charles B. Robinson in the *Bulletin* of the New York Botanical Garden, which shows what progress has been made in the last quarter of a century in the study of these interesting plants. As indicated in the title this paper is limited to the *Chareae,* a subfamily represented in this country by the genus *Chara* only, and yet the author finds more species (50) than were recorded in all our genera by previous students. Of these species fifteen are here described for the first time, while ten varieties are raised to specific rank. Of the new species two each come from New York, New Jersey, Canada, Michigan, Florida and Mexico, while Kansas, New Mexico and Illinois add one each.

The paper, which covers 64 pages, includes a ten-page structural and historical introduction, followed by a key to the species of *Chara*. Following the key are full descriptions of all of the species, with the type locality, distribution, illustrations and exsiccatae for each species. Suggestive critical notes are appended in many cases, adding much to the value of this important contribution to our knowledge of this interesting group of plants.

A MOSS BOOK.

SOME weeks ago Part III. of Dr. Grout's 'Mosses with Hand-lens and Microscope' came to hand, continuing the work from page 167 to 246. In this part we have the completion of the family *Tortulaceae*, and the treatment in succession of *Encalyptaceae, Orthotrichaceae, Schistostegaceae, Splanchnaceae, Funariaceae, Meeseaceae, Timmiaceae, Aulocomniaceae, Bartramiaceae, Bryaceae* and *Leskeaceae*. The two families to which the most space is given are *Orthotrichaceae* and *Bryaceae*, which together take up more than half of the pages of this part. The illustrations and text maintain the high standard set by the author in the two preceding parts. The statement is made that two more parts will complete this important and very useful work.

CHARLES E. BESSEY.
THE UNIVERSITY OF NEBRASKA.

CENTRAL BUILDING OF IOWA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

ON June 8, 1906, the new central building of the Iowa State College of Agriculture and Mechanic Arts was dedicated. Hon. W. J. Dixon, in speaking of the construction of the building, said:

> The building is 216 feet long by 112 feet in depth. Floor area 98,000 square feet. The building contains 1,892,738 cubic feet of materials. The base is of Georgia granite and the outer walls of Bedford stone. The roof is tile set in concrete. Construction is fire-proof throughout. The plumbing, heating and lighting is of the most approved modern systems. The cost of the completed building is $375,000.

The architects were Proudfoot & Bird, of Des Moines; the builder was Henry W. Schleuter, and the superintendent of construction was Dean Anson Marston. The furniture cost $52,000.

The commencement address was made by Dr. F. W. Gunsaulus, of Chicago. The following number of degrees were conferred: B.S.A., 34; D.V.M., 4; B.M.E., 19; B.C.E., 27; B.S. in E.E., 21; B.S. in Min.E., 8; B.S., 14, three men and eleven women; M.S.A., 6; C.E., 1; M.S., 2; B.D.S., 1. One honorary degree of M.Ph.

At a meeting of the board of trustees on June 1, R. Earle Buchanan was made assistant professor of general bacteriology and Estelle D. Fogel was made instructor in botany.

The following departments have rooms in the new central building: English, history, mathematics, civics, economic science, modern languages, elocution and oratory. There are also general offices for the board and the secretary, the purchasing committee, the president and faculty, and a reception room, treasurer's office, and the rooms of the department of botany. The department of botany occupies most of the upper floor and the attic story.

L. H. PAMMEL.

SIR WILLIAM PERKIN AND THE AMERICAN JUBILEE OF THE COAL TAR INDUSTRY.

WE have already noted the British celebration in commemoration of the fiftieth anniversary of the discovery of the dye-stuff mauve by Sir William Perkin. American chemists decided to celebrate the foundation of the coal tar industry independently, and Sir William Perkin and Lady Perkin left Liverpool on the *Umbria*, on September 22, to be present at a banquet which will be given at Delmonico's, on October 6.

The American committee submitted to a public meeting, held May 28, 1906, the following program: (1) To invite Sir William Perkin to be present at the American celebration as the guest of the Americans. (2) The presentation to Sir William Perkin of a personal token. (3) The foundation of a Perkin medal to be awarded annually to an American chemist for distinguished work in applied