pollen chamber, open apically and containing pollen grains in its lower part. The vascular system of the seed consists of nine bundles radiating from a single supply bundle and running to the apex.

It furnishes something more than suggestive evidence of the origin of the Mesozoic Bennettitales and Cycadales, on the one hand, and the Paleozoic Cordaitales and other and later gymnospermous orders on the other hand, from some type of Paleozoic Cycadofilicales, the latter leading back to the true Filicales as recently diagrammatically set forth by Coulter.*

Professor Seward† has styled this discovery of Oliver and Scott as 'one of the most important contributions to botany published in recent years.' The full details, which are promised soon, will be awaited with impatience.‡

EDWARD W. BERRY.

CURRENT NOTES ON METEOROLOGY.

ANTARCTIC METEOROLOGY.

A RECENT number of the *Bulletin of the American Geographical Society* (Vol. XXXVI., 1904, 22–29) contains an account of Dr. Otto Nordenskjöld's Swedish Antarctic expedition of 1902–03, in which are numerous notes of meteorological interest. During five months, beginning with May, there was a period of storms with short intermissions never exceeding three days, during the whole of which period the average wind velocity was 23 miles an hour, and during a whole fortnight it averaged 45 miles. The gales from the southwest brought the lowest temperature recorded. The stormiest day, in June, with a mean wind velocity of 63 miles an hour, was one of the coldest experienced (— 24° F.). The mean temperature for the first year was about 10.2° F.; that of the summer being 28.2° F. The general direction of the winds was southwest, *i. e.*, out from the south polar region.

VERTICAL DECREASE OF TEMPERATURE IN THE FREE AIR.

AT the February meeting of the Royal Meteorological Society in London, Mr. W. H. Dines read a paper on 'Observations by Means of Kites at Crinan in the Summer of 1903,' this being a continuation of the work done in the previous summer, already referred to in these columns. The results of the ascents during August, 1903, show a mean temperature gradient for the first 5,000 ft. of 3.2° per 1,000 feet. This is at the rate of about .59° C. per 100 meters. In the previous summer the average rate per 100 meters was found to vary from .56° C. per 100 meters in a column of 500 meters to .43° C. at 3,500 meters. The averages thus accord quite closely with those given in Hann's 'Lehrbuch der Meteorologie,' pp. 157–161.

THE SAHARA AND THE SOUDAN.

ACCORDING to Sir Frederic Lugard, High Commissioner for Northern Nigeria, the sands of the Sahara are gradually encroaching on the districts of the Sudan which border the desert on the south. Sir Frederic is of the opinion that the desiccation of the country is chiefly caused by the destruction of the young acacias and tamarinds, which are cut down by the natives, and given to the camels for fodder.

MONTHLY WEATHER REVIEW.

THE *Monthly Weather Review* has recently contained an unusual number of articles of general interest. Vol. XXXII., No. 1, 1904, contains an account of the tornado of January 22, at Moundville, Ala. This tornado was first noted about 1.20 A.M., the previous evening having been warm, with fairly heavy rains at intervals, and the wind blowing in heavy gusts from southeast and south. At Moundville nearly every building was demolished, and thirty-six persons were killed and eighty injured, out of a total population of about 300. The storm moved northeast; the

* 'Morphology of the Spermatophytes,' p. 172, 1901.

† Presidential Address, Botanical Section, British Association for the Advancement of Science, Southport, 1903.

‡ These were read before the Royal Society, January 21, 1904, and a new class of seed-plants, the Pteridospermæ, was proposed to include these and similar remains.

path was five miles long, and 250 yards wide at the point of greatest destruction. The funnel-shaped cloud 'had a phosphorescent glow.' Debris from Moundville is reported to have been carried nineteen miles to the northeast. The tornado occurred on the southeast side of a well-marked barometric depression, according to the usual habit of these disturbances.

Concerning lightning rods, Professor W. S. Franklin, in the same number of the *Review*, states that, 'given a good ground connection, then directness of path to ground from the region which is to be protected is so important that the matter of insulating the rod from the building, either by air spaces or by glass, is of no importance whatever in comparison. If the path is direct, there is no need of insulation, and if the path is roundabout, effective insulation is not practically feasible.'

A short article on 'Paths of Storm Centers' brings together a few essential facts regarding the tracks and velocities of cyclones.

NOTES.

It is stated (*Bull. Amer. Geogr. Soc.*, XXXVI., 39) that the front of the Muir Glacier has retreated two and a half miles in four years, which is a higher rate of retrogression than has been observed before. The present indications are that the glacier will before long cease to reach tide water.

During 1903 Mr. W. G. Black, of Edinburgh, collected in an open dish, 8½ inches square, 17 ounces of 'dust and soot.' This would give a fall of 32 ounces per square foot.

R. DeC. Ward.

WILLIAM HENRY PETTEE.

The senate of the University of Michigan has adopted the following memorial as offered by the committee, Professors Prescott and Demmon:

Again the university senate has been sorely stricken, and we are called to record the loss of another of our beloved members. For nearly thirty years he has sat with us in all our deliberations, scrupulously attentive to every official duty, thoroughly informed on all university affairs, courteous, firm and wise. Possessed of a genial and kindly nature, of refined sensibilities and a wide culture, he early won the respect and affection of his colleagues and held these steadily to the end. He has gone from us honored by many years of valuable service to the university, and his loss must continue to be felt in many ways for a long time to come. It seems peculiarly fitting that the senate should come together and spread upon its records some expression of the esteem and love with which we cherish his memory and of our high regard for his services in the great cause of learning, services to which his life was devoted without reserve.

Professor Pettee died at his home on May 26, 1904. He was engaged in his regular duties in the university up to the last evening before his death, but his health had been impaired for nearly a year and his physician had informed him of the uncertain tenure of his life.

William Henry Pettee was born in Newton Upper Falls, Mass., January 13, 1838, of representative New England parentage. His father was a manufacturer of cotton fabrics and of mill machinery. In boyhood his studious tastes had to be restrained and his college preparation delayed out of regard to his somewhat slender bodily frame. He entered Harvard College at nineteen years of age, took high rank in the required classical course of that period, was selected to deliver a Latin oration in the junior year, and graduated with distinction in the class of 1861. He continued in graduate studies in the same university for over three years, receiving the degree of master of arts in 1864, studying at first in the engineering work of the Lawrence Scientific School and then in the college, where at the same time he was an assistant in chemistry under Professor Josiah Parsons Cooke, Irving professor of chemistry and mineralogy and then well known as an author. Mr. Pettee had taken chemistry as his elective subject in his junior year. Of his remaining opportunity for election he had chosen Spanish, in this having the pleasure of reciting for a year and a half to James Russell Lowell. As a chemical assistant, 1863–65, he taught the required chemical physics to the sophomore class and had charge of the elective section of the