

meeting. His devotion to Astronomy, prior to this, had led him to undertake the construction of an 8½ inch silvered glass reflecting telescope, the mirror and diagonal of which he purchased from Brashar, of Pittsburgh, and obtained the eye-pieces from England. The mountings were made under his own supervision, in Montreal, and a magnificent instrument was the result. I remember that the views of Saturn obtained on one or two occasions, when I had the pleasure of using the telescope, were particularly fine. But it was as an entomologist that he became best known. Instrumental in forming a branch of the Entomological Society of Ontario at Quebec on July 7, 1864, he was unanimously elected its first Secretary, holding the office until that Branch broke up. After removing to Montreal, Mr. Bowles immediately identified himself with the work of the Branch here. Becoming a member about the close of 1873, he was elected Vice-President of the Montreal Branch of the Entomological Society of Ontario, May 6, 1874, and President on May 4, 1875, when his opening address proved a masterpiece of composition. He continued to fill the position until May 10, 1881, when he willingly took the less honorable post of Secretary, owing to the departure of the then Secretary to the United States. Retaining the Secretaryship until May 8, 1883, he was then re-elected President, continuing in the office with one year's intermission as Vice-President, until he died. His writings on entomological subjects are well and extensively known, and most of his essays have been printed in journals devoted to that science. He is said to have been the first to have called public attention to the introduction of the Common White Cabbage Butterfly, (*Pieris Rapae*), into America in 1864, by a paper read at Quebec, where some cabbages had been thrown on the wharf out of a vessel recently from Europe, from whence the "Cabbage Worms" have spread over the whole Continent. Other noted papers from his pen were: "On the Causes of the Scarcity of Insects;" "On the Noctuidæ Common to Norway and North America;"—specially interesting to Meteorologists and students of Climatology; "List of the Noctuidæ of Quebec Province," etc., etc. His correspondence was naturally with some of the leading entomologists, amongst others Scudder, Lintner and Henry Edwardes, besides other well known Lepidopterists, with whom he exchanged letters and specimens until his general collection grew to be one of the finest in Canada. For some time ailing, owing to kidney trouble, Mr. Bowles visited England about a year ago and obtained the most eminent advice, securing however, but temporary relief. His loss is a loss to science.

REVIEW.

Tornadoes: What they are and how to observe them; with practical suggestions for the protection of life and property. By John P. Finley, M.S., F.S.Sc., Lieut. Signal Corps U. S. Army, etc., 1 vol., 196 pp. New York, 1887: C. C. Hine, Insurance Publisher, 137 Broadway.

The settlement in recent years of the fertile Western and South Western States had brought the residents of this continent into such alarmingly frequent contact with the disastrous funnel shaped cloud, that a work of this nature was an imperative necessity. For it is not as an historical work that the book is of most value, albeit the records are, many of them, of great interest, but rather as a guide in future cases to the inhabitants of the devastated districts. "For," says the author: "The populous region of the United States is forever doomed to the devastation of the tornado. As certain as that night follows day is the coming of the funnel shaped cloud. So long as the sun shines upon the vast regions in the Mississippi and Missouri Valleys, there will forever occur these atmospheric conditions which terminate in the destructive violence of the tornado." Not only in the West, for, according to the full and carefully prepared tables in the work, one finds that of 1,867 tornadoes recorded since 1682, 67 were in New York, 61 in Pennsylvania, 22 in Massachusetts, 13 in Connecticut, 12 in New Jersey, 8 in New Hampshire, 7 in Maine, 4 in Vermont, and 1 in Rhode Island. Even this country has experienced their fury at intervals. The work is well printed in "old style" type; price, \$1.00, bound in cloth; has numerous illustrations, some of them from photographs of tornado wrecks, as well as special charts, elucidating the text. The suggestions for constructing tornado caves as places of refuge are very interesting and explicit, as is also the "scientific résumé of tornado characteristics." Lieut. Finley's work is also of such value to the meteorologist that very few would care to miss reading it. It will also, doubtless, prove the basis of future works on this important subject, which, owing to the devastation caused by tornadoes, is one of the most interesting known to meteorology.

The New Jersey Weather Chronicle is a neat four-page monthly, about the size of ASTRONOMY AND METEOROLOGY, "published in connection with the New Jersey State Weather Service, for the benefit of co-operating observers" at New Brunswick, N. J. Besides a weather bulletin for June, the July number contains well written articles on "Fog Predictions for the Banks of Newfoundland," by Sergeant E. B. Garriott, and "The New York World's Balloon Voyage," by H. Allen Hazen.

Meteorology.

RECENT BALLOON ASCENSIONS.

Following close on the recent ascension in the United States comes the news of what is said to have been a most successful ascent at Paris on August 13th, when Capt. Paul Jones and M. Mallet left *terra firma* in the balloon "Horla," inflated under the auspices of the *Paris Figaro*. The start was made at 7 a.m., a very much more favorable hour than those at which ascents are usually made in this country, where it is generally late in the afternoon, ere the balloon gets away, and night comes on at once, decreasing the buoyancy of the gas and sending the balloon to earth. In Europe, however, it is the interests of science that are consulted in such cases, and not those of the public. At the start, the balloon rose rapidly that it became invisible in twenty-five minutes. It descended the same afternoon in Belgium, after passing an altitude of 7,000 metres, or about 22,000 feet. M. Mallet was twice insensible. The object of the ascension was to ascertain the height at which human life can be sustained. Other memorable ascensions are recalled by this. On September 5, 1862, Glaisher and Coxwell ascended at Wolverhampton, Eng., to the height of 29,000 feet, when Mr. Glaisher became insensible. It is said that the highest point reached was some 37,000 feet, or 7 miles. On April 15, 1875, Sivel ascended at Paris, with Tissandier and Spinelli. At the height of 22,000 feet Tissandier fainted. On reviving, one hour later, he found the balloon descending and his two companions dead. The altitude then reached, as indicated, by a self-registering barometer, was about 8 miles.

SIGNAL SERVICE PROBABILITIES.

Lieut. Ireland, in answer to the request in last issue for an account of the way in which the "Weather Probabilities" are prepared, sends the following

When observers are required to make predictions from observations taken at a single point, as a rule, the predictions are erroneous; but a number of observers making observations at a given time, and telegraphing them to a central point to an "indications officer," (who will deduct certain conclusions from these observations) the observers are generally given the credit of making the predictions. The predictions really are made by the "indications officer" to suit the different localities in his district. Thus Baltimore, Md., Lynchburg, Danville, Richmond and Chincoteague, Va., as well as numerous other stations in this district report to Washington, D.C., the reading of the barometer, range and