or north-east and south-west, than when they trend east and west.

7°. Tornado predictions have been made a matter of daily study since the 10th of March, 1884; and the average up to June 1 shows that it has been possible on fifty-five days to successfully predict from the morning weather-map that no tornado would occur on that day. On twenty-eight other days tornadoes were predicted for particular states or larger regions; and of them the tornadoes on seventeen days occurred in or near the specified region, while on eleven days tornadoes occurred in regions for which they were not predicted.

JNO. P. FINLEY,
Sergeant signal-corps, U. S. army.

RECENT PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Trenton natural-history society.

June 10. — Mr. F. A. Lucas described the building-habits of some birds. The cat-bird seems indifferent as to locality, building ten feet from the ground, or quite as often in a tangle of weeds within eighteen inches of the surface. The song-sparrow's nest is small and delicate, resting on the ground, often in a slight depression, which makes it very inconspicuous. —— Dr. C. C. Abbott remarked on crayfish; also on a catfish new to the locality, and on field-mice. He had taken the meadow-mouse (Arvicola riparia) from a dead log, where it had hollowed a nest, lining it with hay and a few feathers; also from driftwood into which it had tunnelled. The food seems to be chiefly seeds, although it is probably carnivorous at times. Under the loose bark of decaying, prostrate trees, the white-footed mouse (Hesperomys leucopus) is occasionally found, although it usually makes a home in a thicket of briers or a deserted bird's nest. The favorite food is unfledged birds. They are much afraid of snakes. They beat a hasty retreat when a dead snake is placed near the nest; but when convinced, by cautious examination, that the intruder is harmless, they bravely devour it. —— Prof. A. C. Apgar remarked on some rare plants: Vicia Americana, Muhl., never before observed in New Jersey; Viola pubescens eriocarpa, Nutt., a western variety; Polemonium reptans, L., which had been removed from the Geological survey's preliminary catalogue of New-Jersey plants, under the supposition, that, being so remote from its usual habitat, it must have been incorrectly determined; Nuphar pumilum, Smith, and Struthiopteris Germanica, Willd., the last not having been previously observed in the state. —— Dr. A. C. Stokes communicated a paper on Tarantula arenicola Scudder, detailing its method of burrowing, of building the tower above the entrance, and of capturing food. Before the pit and tower are completed, the spider will seize food at some distance from the aperture: when finished, she leaps from the tower, and runs across the ground to take the selected victim. If within the burrow when an insect passes over the tower, or becomes entangled in the loose grass of which it is usually formed, the spider rushes to the top, and the insect, if acceptable, is seized. The towers are irregularly five-sided, and an inch or less high. The burrows are cylindrical, perpendicular, and vary in depth from eight to twenty inches; in diameter, from one-quarter to three-quarters of an inch.

Entomological society, Washington.

June 5. — Mr. George Marx read a composite paper on the geographical distribution of the Arachnidae of the United States, on the respiration of Epeira insularis, and biological notes on Latrodectes verecundus. The range of each family was pointed out in succession; and the colorational changes, dependent upon locality, were treated at some length. The speaker had noticed a true alternate opening and closing of the pulmonary stigmata of the Epeira, on taking it from a tight box in which it had been confined for some days. By a careful rearing of the Latrodectes, he had thrown together no less than ten species described by Abbott, which are now referable to the different stages of L. verecundus. —— Mr. E. A. Schwarz exhibited specimens of Ino immunda (Cucujidae) and Eleusis pallida (Staphylinidae), calling attention to the marvellous resemblance, which he stated could not be referred to mimicry for protective reasons, but must be considered accidental. —— Mr. L. O. Howard exhibited specimens of Inostemma Boscii (Proctotrupidae), and gave a short history of the theories concerning the curious thoracic appendage, arriving at the conclusion that it is a secondary sexual character. He also exhibited specimens of a new species of the genus Schizaspidia, collected in Florida by Mr. Schwarz, and which is also furnished with remarkable thoracic prolongations. —— Dr. W. S. Barnard read a short paper on the development of Gordius and Mermis, exhibiting a specimen observed to issue from Harpalus pennsylvanicus.

Brookville society of natural history, Indiana.

June 3. — Robert M. King presented a paper upon some studies of the land-shells of Indiana, showing differences in habits, food, and color of the shell. —— Aug. Diener gave a short paper upon the Luna moth, presenting the time of its appearance, and the length of periods of its several changes. —— E. R. Quick spoke at some length on the results of the trip of Alexander Wilson down the Ohio River in 1810, referring particularly to Wilson's advice concerning the opening of the Grave Creek mound, and to his labors in the neighborhood of Cincinnati, at the mouth of the Big Miami River, at what is now the town of Vevay in Switzerland county, this state, and in the neighborhood of Louisville, — all points of interest, because of their proximity to the field in which the society is working.

Biological society, Washington.

May 31. — Mr. James E. Benedict described the recent cruise of the steamer Albatross in the Gulf of Mexico and the Caribbean Sea, and exhibited some of the most remarkable objects collected. —— Ensign E. E. Hayden, U.S.N., read a paper on a new method of figuring fossil leaves and other objects by the aid of photography, with a saving of time, and increase of accuracy; the method consisting of drawing in India ink, upon a silver-print photograph, the outline of the object to be figured, the defects of the photograph being supplied by the draughtsman through comparison with the specimen. The photograph is then dismissed, and a photo-engraving is made by the ordinary method from the black lines of the sketch which remains. In the discussion which followed, it was shown that this process was novel only in its successful application by the author to the illustration of fossil leaves. —— Mr. J. A. Ryder spoke of the development of viviparous minnows, and particularly of Gambrusia patruelis B. & G. The young fish develop within the body of the female parent, and within the follicles in which the eggs themselves were developed. These follicles, which were covered with a rich network of fine capillary vessels, assumed the office of a respiratory apparatus, by which the gases were interchanged between the embryo and the parent fish. This follicle also acted as an egg-membrane, being actually perforated by a round opening, which the speaker termed the 'follicular pore,' and which was analogous to the micropyle of the ordinary fish-egg. The arrangement of the follicles of the ovary within the body of the female was described at some length, and the peculiar differences between the two sexes in the arrangement of the viscera were pointed out. The fibrous bands, which act as supports or stays to the basal portion of the anal fin of the male, which is modified as an intromittent organ, were also described. The great difference in the sizes of the sexes was also referred to, the female weighing over six times as much as the male. The speaker concluded by expressing his earnest desire to investigate the other known forms of viviparous fishes, such as the Embiotocoids of the west coast, the viviparous blenny, and other bony fishes which have this habit, and which, in his opinion, would throw considerable light upon some of the peculiar physiological processes involved in the viviparous methods of development. —— Mr. Romyn Hitchcock exhibited a collection of Foraminifera belonging to the genus Lagena, and explained the relations between this genus and the Nodosarine group; these briefly being that Lagena may be taken as the type of the group, passing through various stages of complexity, through Nodosaria, and ending in Cristellaria as the most complete manifestation of its method of growth.

Natural-history society of New Brunswick, St. John.

May 6. — Mr. R. Chalmers read a paper on the history of the Grand Falls of the St. John River, explaining its origin and features. Like Niagara Falls, it was shown to be the result of geographical changes in the quaternary era, causing the damming-up of a more ancient channel, and the consequent erosion of a new one. Facts bearing upon the nature and rate of change were at the same time given.

June 4. — Mr. C. F. Matthew gave an account of the late meeting of the Royal society of Canada, in Ottawa, reviewing the papers read in the natural-history section, and especially remarking on the importance of Dr. G. M. Dawson's discovery of evidences of an interglacial era in the north-west. —— Dr. L. Allison read a paper on the structure and habits of rhizopods, with special reference to local forms.

NOTES AND NEWS.

ONE of the best results of the polar exploration congress, held at Vienna in April, was a resolution that the observations of all the polar stations should be published not only in the language in which they were written, but in German, English, or French as well. Neumayer of Hamburg appealed to the congress for aid in his endeavors to make hydrographic charts of the South Atlantic Ocean. The chiefs of the different stations reported their observations. The scale adopted by the committee of the electrical exhibition of Paris, in 1881, was adopted as a basis for the observations of the intensity of the magnetic earth-currents. The end of the year 1885 was named for the conclusion of the work of the various stations.

— Prof. F. H. Snow of the University of Kansas reports, that although the month of May was one of the coldest on record, yet it was marked by an entire absence of frosts. The rainfall was ample, though less than the average.

— Prof. W. B. Scott is now on his way to Montana with the fourth scientific expedition from Princeton, with the object of exploring the Wahsatch eocene of Wyoming and Montana.

— Professor Mushketoff will be sent by the geological committee of the St. Petersburg academy of sciences to explore the Kalmuk steppe (between Volga, Don, and Manikh). Later in the season he will make a geological exploration of the celebrated mineral springs of Piotigozsk and vicinity (northern Caucasus). This study is to decide many important questions about their protection and improvement. These springs are under direct government administration from the beginning of this year, after a long lease to a contractor.

— *Nature* announces the call of Dr. Hugo Gyldén, director of the Stockholm observatory, to the professorship of practical astronomy at Göttingen.

— The forthcoming volume of the Encyclopaedia Britannica, the seventeenth, extending from MOT to ORM, will contain the following articles: Navigation, by Capt. H. A. Moriarty, R.N.; Nebular theory, by Dr. R. S. Ball, F.R.S.; Newton, by Mr. H. M. Taylor of Trinity college, Cambridge; Nitrogen, by Prof. W. Dittmar; Nitroglycerine, by Sir Frederick A. Abel; Numbers, by Prof. A. Cayley; Numerals, by Prof. W. Robertson Smith; Numismatics, by Mr. Reginald S. Poole; Nutrition, by Prof. A. Gamgee;