

little over ten dollars. By request of the commission, the U. S. coast survey has also aided the work by extending its triangulation over about nine hundred square miles during the past season, at a cost of a little less than two dollars a square mile, about a fourth of which has been borne by the state.

A year ago the state appropriated nine thousand dollars to enable the commissioners to take advantage of the progress of the present survey to determine by triangulation the boundary-lines of all the towns of the commonwealth. A commencement of the work was made the past season, only to discover that the estimate of the expense, based on the irregularities shown in the boundary outlines as given in the old state map, — the only possible basis for a calculation, — was far too little; probably at least double the original estimate will be required. As less than twenty-five hundred dollars have been expended, the abandonment of the scheme would be no severe financial loss; but the commissioners rightly urge its continuance under a doubled appropriation, as, when completed, it will form the best basis for a cadastral or property survey yet provided by any state in the country. This is only one of a number of ways in which our legislators are beginning to learn what it costs *not* to have a good state map, and there can be little doubt that they will be witty enough to carry the intended boundaries survey to completion.

Among the numerous partly executed plans for the improvement of Boston, its schemes of public parks hold a prominent place. The recent death of Hon. Elizur Wright has called attention anew to his proposal to establish a forest-preserve within easy reach of Boston, in the wild and little-inhabited region known as the Middlesex Fells, — a region belonging to some half-dozen municipalities, and situated on the Charlestown or northern side of Boston, not half a dozen miles from the city. On the opposite side, progress is making in the Arnold arboretum, which now forms part of the Boston park system, where definite plans, long maturing, are being put into execution. It is proposed to form two distinct collections of growing trees, — one for display; and one, less permanent, for investigation and experiment. The plan of the former contemplates, among other things, that each hardy-tree species of eastern America shall be represented by an individual planted so as to secure the maximum growth attainable here, and also by a group of from six to twenty-five individuals selected to show variations of character and habit, and planted so as to secure expression in mass rather

than perfect individual development. The representation of no species will therefore depend on the life of one tree, and the natural behavior of our principal trees will also be illustrated.

The Appalachian Mountain club celebrated its decennial anniversary last Friday by a dinner at the Parker House; Prof. E. C. Pickering, whom every one recognizes as the founder of the club, presiding. As a first experiment of the kind, it proved a great success. About one hundred and twenty-five members were present, about equally divided between ladies and gentlemen, and sat to a late hour. After dinner, speeches were made by Profs. W. H. Brewer of New Haven and C. A. Young of Princeton, and by many of the home members, with letters from those who could not be present. The club may well be proud of what it has accomplished, having succeeded in obtaining a paying membership of considerably over six hundred in these ten years, and in publishing more than three volumes of *Appalachia*, — a journal which, with its two sides of mountain exploration and geographical science, holds a somewhat unique and enviable place in literature. A new number is announced to appear immediately.

It is announced that the liberality and co-operation of the Woman's education association will enable the Boston society of natural history to open its seaside laboratory at Annisquam to students, during the coming summer, from June 15 to Aug. 15, 1886. Mr. B. H. Van Vleck, an assistant in the laboratory of the society, will have charge of the instruction. Y.

Boston, March 8.

NOTES AND NEWS.

THE danger of poisoning from arsenic in wall-papers is a subject attracting considerable attention in Boston. At a public meeting the past week, called for its consideration, a draught of a bill was submitted, prohibiting the manufacture and sale of such papers when they contain more than one-fourteenth of a grain of arsenic to the square yard. A number of cases of illness from this cause were reported, as also the death of one child from the wearing of stockings colored by arsenic.

— A resolution has been introduced in the senate, empowering the superintendent of the Coast and geodetic survey to loan any instrument or instruments named in a list to any college or incorporated institution of learning in the United States, to be retained by such college or institution until the dissolution thereof, whereupon such instrument or instruments shall, if existing, be returned to said survey.

—The house committee on agriculture has reported favorably a bill to establish agricultural experiment-stations in connection with the colleges in the several states. The object and duty of these stations are to conduct original researches or verify experiments on the physiology of plants and animals; the chemical composition of useful plants; analysis of soils and water; the composition and digestibility of different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese, etc. The appropriation sought is \$15,000 a year for each state, or \$570,000 in all. Similar experimental stations have been conducted in Europe with great success for the last thirty years, and at the end of 1884 there were one hundred and forty-eight in existence there. There are now nine stations in this country.

—It has been decided to abandon the governmental tea-farms recently established, as they have not been productive of good results.

—The Prince of Monaco, it is reported, proposes the attempt to ascertain the course of the Gulf Stream by means of submerged floats, which will not be subjected to the influence of the winds. It is also said that the co-operation of the British authorities has been asked in the scheme.

—A recent London telegram announces that Mount Etna is in a state of eruption. It is supposed that lava is issuing from the crater, but the dense mist prevents observations. Slight shocks of earthquakes have been felt in the immediate vicinity, and stones and cinders are continually being thrown out.

—Active steps are being taken for the founding of a Hebrew university in New York City. It is proposed to make it a thoroughly orthodox sectarian institution, chiefly with the object of educating young men for the ministry. In addition to voluntary subscriptions, it has been proposed to rely upon a tax on the different Jewish congregations.

—Prof. A. C. Merriam of Columbia college, whose editions of Herodotus and the Odyssey, and more particularly his investigations in Greek archeology, have gained him a foremost place among the classical scholars of this country, has been elected director of the American school at Athens, for the year 1887-88. While in Greece, Professor Merriam will pay particular attention to archeology, especially Cyprian.

—The cost of small-pox to Tennessee is estimated by the State board of health to have been nearly one hundred and fifty thousand dollars during the past five years.

—Russian papers have lately been discussing the project of a canal between the Sea of Azov and the Caspian Sea, with speculations upon the probable effects of the higher water-level of the former. The shores of the Caspian Sea are low, and there is a question whether or not they would be inundated.

—An article by G. L. Kittredge in a late number of the *American journal of philology* describes a singular custom among the Greeks. An ancient Greek, if he murdered a man, sometimes mutilated his victim in a peculiar way, known as *μασχαλίζειν*, or arm-pitting. The extremities of the hands were cut off, strung together, and fastened under the arm-pits of the corpse by a band or girdle round the neck. There are two main theories as to the purpose. According to the one, the *μασχαλίζειν* was a part of the *ἀφοσίωσις*. The cut-off extremities were the *ἀπαρχή* of the victim, a sin-offering to the infernal gods to expiate the murder. According to the other, the mutilation of the body was supposed to effect a corresponding mutilation of the soul; so that the shade, deprived of its limbs, would be powerless to take vengeance on the criminal. It is the latter view that the writer advocates, formed on the basis of a close examination of the *loci classici*, and next by a long array of evidence from the history of culture.

—An extract from a letter recently received at the hydrographic office from the master of the Russian bark *Preciosa*, at New Orleans, states, that "on the 26th of January, at six A.M., the vessel being in latitude 17° 04' north, longitude 69° 07' west, running with all sails set, steering west, speed ten knots, wind fresh, north-east, I felt what I considered to be a strong earthshock. It threw the vessel over a good deal, and at the same time we shipped a heavy sea, although the vessel was in ballast, and the water had been smooth all the morning. It only lasted for a few seconds, and, directly after, the wind went to the south-east, and died away; afterwards it was nearly calm for the three following days."

—We would call the attention of amateur astronomers to a very convenient collection of ephemerides, etc., contained in the 'companion' to *The observatory*, for 1886. Positions for the sun, moon, and major planets, are given at suitable epochs, with ephemerides for the satellites of the planets, and in many cases for physical observations. There are also lists of double and variable stars, test objects, remarkable nebulae and clusters, etc., all made easily accessible and intelligible.

—The Transactions of the seismological society

of Japan, vol. viii. 1885, contains a long paper by Professor Milne, in which he has collected a detailed description of ten series of experiments carried on at different times from 1881 to 1884, for the purpose of investigating phenomena connected with earth vibrations. The experiments were all performed in or near the city of Tokio, and consisted in originating artificial earth vibrations, usually by dropping a heavy weight or by exploding dynamite, and then studying the circumstances of their propagation by means of the various seismographs which have been devised by himself or his co-workers in Japanese seismometry. It appears that the first effect upon a seismograph with a single index is an impulse in a normal direction; and, similarly, a bracket seismograph arranged to indicate normal motion begins its indications before a similar seismograph indicating transverse motion, implying that the normal wave travels more rapidly than the transverse. Near to an origin, the normal motion is first outwards, then inwards, and the motion inwards is greater and more rapid than the motion outwards; while, at a distance from an origin, the first motion may be inwards, and the two phases are practically of equal amplitude. Roughly speaking, the amplitude of normal motion is inversely as the distance from the origin. The laws of transverse motion are practically the same with those of normal motion, but less pronounced. Near to an origin, the amplitude of the transverse motion is less, but the period greater, than that of the normal motion. The velocity of transmission obtained varies from two hundred to six hundred feet, which is much less than the velocities obtained by Mallet and by Abbott.

—Uhler's check-list of the Hemiptera heteroptera, or true bugs, of North America, recently published, contains 1,448 species, distributed among 425 genera, or an average of 3.6 species to each genus. Classification here, as in some other branches of entomology, appears to have been carried too far, though doubtless many more species yet remain to be discovered.

—Drs. D. E. Salmon and T. B. Smith have just published (Proc. biol. soc. of Washington, vol. iii.) a remarkable discovery, made by them, of a new method of producing immunity from contagious diseases. By experimenting upon pigeons, they were able to establish an immunity from the disease known as swine-plague, by the inoculation of solutions in which the pathogenic bacteria had been cultivated, and afterwards destroyed by heat. The conclusions they reach are as follows: 1°. Immunity is the result of the exposure of the bioplasm of the animal body to the chemical

products of the growth of the specific microbes which constitute the virus of contagious fevers; 2°. These particular chemical products are produced by the growth of the microbes in suitable culture-liquids in the laboratory, as well as in the liquids and tissues of the body; 3°. Immunity may be produced by introducing into the animal body such chemical products as have been produced in the laboratory.

—Professor Davidson, in a paper on the temperature of the water of Golden Gate, in Bulletin No. 4 of the California academy of sciences, states, that, from a mean of nearly ten years' observations, the lowest temperature is for the month of January, 50°.49 F.; and the highest for the month of September, 59°.68 F. The average range is thus only nine degrees, and the extreme range has only been thirteen degrees. The temperature of the air follows closely that of the water; and it is the uniformity of the latter's temperature along the Pacific coast, and its coldness, which conspire with the north-west winds of summer to cause the peculiar foggy conditions which prevail.

—In the Proceedings of the Linnean society of New South Wales, Dr. Lendenfeld reports upon a sponge destructive to oyster-culture. Large areas of oyster-beds in the Clarence River were destroyed by their attaching themselves to the shells, preventing the formation of spat. With the destruction of the beds the sponge disappeared. The latter he describes under the name *Chalinula* Coxii.

—Examination of the cheese, which some time ago caused the sudden and severe illness of several hundred persons in Michigan, has shown the poisonous character to be due to a peculiar crystallizable substance, or ptomaine, of an intensely cheesy odor, to which the discoverer, Dr. V. C. Vaughan, has given the name of 'Tyrotoxinon' (*Zeitschr. f. physiol. chemie*, x. 146, 1886).

—Dr. Ten Kate, the anthropologist, has been pursuing his investigations in Dutch and British Guiana, and intends to extend them into Venezuela and Florida, chiefly with reference to the Carib Indians. He has already measured, in a very detailed manner, one hundred and six individuals of the Arrowak and other tribes, wood negroes and métis.

—Major Powell has submitted to the commission investigating the question of the proposed consolidation of the various scientific bureaus his reply to the recent strictures of Professor Agassiz upon the work of the geological survey. The letters have not yet been made public, and are to be printed in connection with the testimony taken

before the committee now investigating the subject.

—The Abbe Laflamme, of the University Laval at Quebec, has lately read an essay on the physical geography of the Saguenay, before the society of geography in that city. He first describes the actual geographic form of the district, and then discusses its geological history, even from Archæan times, with special reference to the formation of the old limestones that lie in basins on the crystalline rocks as an early chapter, and to the glacial invasion as a later one. The present discharge of Lake St. John is recognized as post-glacial; the old outlet being more or less obstructed by drift, and in part occupied by Lake Kenogami. The deep gorge of the lower Saguenay is attributed to ordinary erosive action through long geological periods, and the cañon of the Colorado is called recent in comparison with it.

—The programme for the first half of the course of weekly lectures at the national museum is as follows: Saturday, March 6, Mr. William Hallock, The geysers of the Yellowstone; Friday, March 12, Prof. William Harkness, How the solar system is measured; Saturday, March 20, Prof. T. C. Mendenhall, The nature of sound; Saturday, March 27, Prof. F. W. Clarke, The chemistry of coal; Saturday, April 3, Dr. C. Hart Merriam, The migration of birds.

—The bill now before congress, providing that from and after March 4, 1892, the metric system shall be exclusively employed in the several departments of the government, was favored by the Boston society of civil engineers, at their meeting the past week.

—An account of a singular habit in the cicada is related and illustrated by J. S. Newberry in the *School of mines quarterly*. In Rahway, N.J., a house had been built and a cellar dug in an orchard some time before the appearance of a brood of cicadas. The unused cellar was opened about the time of their advent, and the bottom was found to be thickly set with mud-cones or tubes from six to eight inches high and an inch or more in diameter, each of which had been formed by the pupa of a cicada that had emerged from the earth beneath the cellar. Finding a dark chamber, and apparently desiring to work up to daylight, the cicadas had taken the moist clay and of this formed pellets, with which the tubes were built up, apparently with the purpose of bridging over the vacancy, and thus reaching the surface. The tops of all were closed; but, on breaking some of them, the pupæ were seen, both in the hole in the ground and in the cone. After

the cellar was opened, and light admitted, they stopped building, and made holes in the tops of the cones for exit. The author further remarks that in these facts there is evidence of the exercise of intelligence in the cicada, and a judicious adaptation of means to an end in circumstances that, it would seem, must have been without precedent in the experience of that or any preceding generation, and therefore for which no education of ancestors could have given a preparation. It is possible that the pupa of the cicada is sometimes embarrassed, in its ascent to the surface by water, by too wet or too dry sand or mud; but it is hardly possible to imagine circumstances where the construction of a tunnel would be necessary. There seems to be no adequate explanation of the phenomena that will bring them within the scope of the theory according to which all our organs and faculties are the result of formative influences progressively developed through a long line of ancestors.

LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Bishop's ring during solar eclipses.

THE persistent visibility of Bishop's ring—the dusky reddish ring around the sun—gives interest to the following extract from Langley's 'Report on the Mount Whitney expedition,' which recounts observations made at his camp, at an elevation of about twelve thousand feet, on Aug. 19, 1881. "The sky to-day, as always, is of the most deep violet-blue, such as we never, under any circumstances, see near the sea-level. . . . Carrying a screen in the hand between the eye and the sun, till the eye is shaded from the direct rays, it can follow this blue up to the edge of the solar disk without finding in it any loss of the deep violet or any milkiness as it approaches the limb. . . . It had been part of my object to make an effort to see the solar corona by directly cutting off the sun's light by a very distant cliff. . . . On the south of the camp was a range of cliffs running nearly east and west, and whose perpendicular wall rose from one thousand to two thousand feet. I found that I could choose a position on the north of the cliff, along whose edge the sun was moving horizontally; so that the shadow was fixed as regards the observer, and so sharp, that, though I must have been over a quarter of a mile from the portion of the cliff casting it, I could, without moving my place, and by only a slight motion of the head, put the eye in or out of view of the sun's north limb. The rocks were, in these circumstances, lined with a brilliant silver edge, due to diffraction. This I had anticipated, but now I saw, what could not be seen by screening the sun with a near object, that the sky really did not maintain the same violet-blue up to the sun, but that a fine coma was seen about it of about 4° diameter, nearly uniform, though it was sensibly brighter through the diameter of 1½°. Upon bringing to bear upon it an excellent portable telescope, magnifying about thirty times, I found it was composed of motes in the sunbeam, be-