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.*

American geological railway-guide.

I HAVE commenced revising my geological railway-guide for a second and much improved edition. I should be glad if persons who have used the book, and made notes of corrections and additions, would send such corrections or additions to me; or, if it will be a saving of labor, it will be a great favor to me if they will send me their copies of the book by mail; and I will return them, and refund all postage.

JAMES MACFARLANE.

Towanda, Penn.

A wider use of scientific libraries.

In *Science* for Oct. 3, your editorial calls attention to the need of making scientific libraries more widely useful. Perhaps some of your readers will be glad to know the liberal policy of the Boston society of natural history. The society is willing to send such books as can be replaced, to students in any part of the country, at their expense of course; asking from strangers a deposit of twice the market-value of the books so sent, as a guaranty against loss. This is an example which may well be followed by all special libraries.

EDWARD BURGESS, *librarian.*

Boston, Oct. 17.

Eye-pieces of the meridian circle at Washburn observatory.

In vol. ii. of the Publications of the Washburn observatory, p. 28, I have incorrectly said that the eye-pieces furnished by the Messrs. Repsold of Hamburg with our meridian circle were not Steinheil achromatics. I made this statement after receiving a letter from the firm of Steinheil & Co., which I erroneously supposed to convey this meaning.

EDWARD S. HOLDEN.

Madison, Wis., Oct. 14.

THE OCTOBER MEETING OF THE NATIONAL ACADEMY OF SCIENCES.

THE autumn session of the National academy was held last week at Newport, R.I. The time and place did not combine to a very successful gathering, the hotels having just closed their doors upon the exodus of summer visitors, while many a college-professor was still too much entangled in the work of an opening year to be able to leave his duties. At the beginning of the meeting on Tuesday, indeed, it looked as though a two-days' session was all that could be counted on; but so many of the papers provoked discussion, that the session lasted, as usual, into Friday, with only half an hour devoted to business; and the number of papers finally offered surpassed that of the year before. Twenty-three of the ninety-three members were present, and twenty-three papers were presented.

The meeting was not marked by any paper of exceptional importance; but most of them were of general interest, and provoked extended discussion. Perhaps that which awakened the liveliest interest was the one in which Dr. E. B. Tylor of Oxford, who addressed the academy by request, gave his observations upon our native tribes, and called attention to the parallelism of their customs and those of widely distant races. He dwelt at length upon the distinction which should be drawn between the origin of identical customs in separate groups of men, some of which are due to the descent of such groups from one primordial stock, and some have arisen spontaneously from similar psychic conditions. To the former, Ray Lankester had applied the term 'homogeny,' and, to the latter, 'homoplasy.' He asked the academy to tell him to which class so complicated a symbol as the pentagram belonged, which is used both by the Indians and the Asiatic astrologers. Professor Hilgard thought that such a symbol would arise spontaneously, as only in that form could a stellar figure be produced by the use of one continuous line. Major Powell believed that a third class should be added, to include arts and customs borrowed from neighbors, — a class which he was accustomed to call 'origin by acculturation.'

Among the physical papers, astronomy, as usual, held a leading place. Professor Langley offered the academy a continuation of his observations on the temperature of the moon's surface, as studied by the bolometer, showing that it must be even lower than two hundred degrees below zero, Centigrade. Professor Valentiner of Carlsruhe, by invitation of the academy, gave in his own language an account of the meridian-work he intended to undertake at the observatory, recently removed from Mannheim, and the installation of which would be completed by the middle of next year. His principal work was to be the observation of all stars, up to the eighth magnitude, between the equator and 22° south latitude, and he hoped to accomplish the task in twelve years. Dr. Peters of Clinton stated what progress he had made in determining the stars in the star-catalogue of Ptolemy's Almagest, and gave a very interesting account of his studies of the manuscripts extant, and the errors which had crept into them, exhibiting photographs of some codices.

Mr. C. S. Peirce explained some of the errors still needing correction in pendulum observations, particularly such as were due to the flexure of the pendulum. He presented the outline of a scheme for a gravitation sur-

vey of the entire country, indicating the position of points in the eastern portion of the country which he thought most desirable to occupy, in which the stations would be about two hundred miles apart, regions of geological disturbance avoided, but their sides occupied, together with the summits of the higher mountains. Seven or eight stations could be occupied in a year, and thus a series of curves secured which would give us the form of the geoid; i.e., of the surface beneath the continent where the force of gravity was uniform.

In an interesting communication on the theory of atomic volumes, Dr. Wolcott Gibbs made the point that writers had left out of consideration the volume of the interstitial spaces. Mr. Fairman Rogers described some special features of Grant's difference-engine, showing, that, by its method of calculating tables by successive differences, it was an improvement on previous arithmometers, eliminating many sources of error. Those present who had used such calculating machines believed them to be more useful in mathematical than in astronomical work.

Of papers other than physical, much interest attached to the exhibition, by Mr. Pumpelly, of the first attempt to obtain a composite photograph of the members of the academy. Thirty-one photographs were obtained at the last May meeting of the academy; and three composites had been made from the full-face views, — one in which all were represented, and two in which the physicists and naturalists had been separately combined. The latter two showed marked differences, the physicists having a much more oval face, and greater temporal breadth. The common composite, as well as the others, had a far more youthful appearance than any of the pictures from which they were taken: only four or five at all approached them in this respect. Messrs. Peirce and Jastrow's experiments on the question, whether there is such a thing as a minimum perceptible difference of sensation, or what the Germans call *differenzschwelle*, were interesting. The experimenter arranged for the production, by an assistant, of successive differences of pressure upon the surface of his own body, so slight that he was unable, so far as he himself could judge, to either hear, or see, or even feel them; but actually, in the majority of cases, determined correctly whether the change was positive or negative.

Of purely zoölogical papers there were few. A paper by Professor Verrill gave an account of the present season's work of the U. S. fish-commission, which, by the steamer Albatross, continues to bring from the deep sea additional forms of animal life new to science, and in great numbers. The most unexpected result is the finding, in some of the deepest dredgings, of large masses of exceedingly compact clay, instead of the usual globigerina and other ooze. Dr. Packard showed, that, in a blind isopod crustacean from the Mammoth Cave, the brain differed from its allies only in that traces of the pigment-layers of the eye remained more or less developed after the entire abortion of the optic lobes and nerve. Professor Cope believed he had found the probable ancestors of the Mammalia in the Pelycosauria, — an extinct type of reptiles, which, of all reptilian types, shows at once the most distinct batrachian and mammalian features.

Major Powell gave a succinct account of the operations of the U. S. geological survey, exhibiting two copies of the land-office map of the country, — one colored to show the regions which had been occupied; the other, the broader features of its geology. Mr. Pumpelly gave a similar account of the work of the recently closed Northern transcontinental survey, and a special notice of the mesozoic coals met with in that survey. By the study of transverse and cross sections of the crystalline tufa of Nevada, Prof. E. S. Dana was able to determine that the original form of thinolite was a steep pyramid: it was probably a chloro-carbonate of calcium, now altered to calcium carbonate. Professor Brewer stated that in the dry regions of the west, especially when several dry seasons followed a succession of moister ones, in which the lands were overstocked, the nutritious grasses were eaten to death by cattle, and thereupon supplanted by noxious types. Several were mentioned as producing a rapid obliteration of our native pastures, and their seeds as injurious by piercing the skin, and producing sores.

Two reports called for by the government had been transmitted to the president of the academy, and will form a part of his annual report to congress, — one upon the organization of the scientific bureaus of the government, called for by the commission, whose appointment we noticed in the first number of this volume; the other upon the proper classification of philosophical instruments under the existing tariff regulations, called for by the secretary of the treasury. A second quarto volume of memoirs was announced as in the hands of the binder.

The next session of the academy will be its annual meeting, next May, in Washington.