Peirce's binocular results obtained by looking through a tube 35 centimeters in diameter and 2 meters long. The mean deviation for the horizontal then becomes (average of 29 subjects) —.25° and for the vertical —.56°. The settings are so nearly correct that the direction of the error cannot be regarded as significant; in both sets of observations the excess in number of those who tended to one type of error was not very great upon those who tended to the contrary type. I also investigated the errors for oblique settings. These proved to be much greater, on the average about nine times as large, and with a pronounced tendency to set both the oblique lines in a position nearer the horizontal than the two 'ideal' oblique lines making angles of 45° with the horizontal and vertical.

In the same group of contributions from the Laboratory of the University of Wisconsin may also be found a study of the accuracy with which lines could be set in given positions, when a model or copy was furnished; and a study of the accuracy with which angles may be reproduced.

The variations in the manner of estimating which Professor Peirce has introduced are extremely interesting and contribute something of value to the determination of the factors which influence such judgments of position. I can recall that at the time we were engaged in these investigations, I had in contemplation a set of experiments in which the subject should be required to set vertical and horizontal lines in a room in which contained no true verticals or horizontals or rectangular dimensions. The floor was to be slightly out of the horizontal in one direction, the ceiling in another, while the walls might present various kinds and degrees of divergence from the vertical. How far such an unusual environment might effect one's estimate of the true horizontal and vertical seems an interesting subject of inquiry.

Joseph Jastrow.

Psychological Laboratory, University of Wisconsin, Madison, Wis., October 5th.

THE THIRD PRINCETON EXPEDITION TO PATAGONIA.

Mr. J. B. Hatcher and his assistant, Mr. O. A. Peterson, have returned from their third exploration of Patagonia, where they were sent by the Geological Department of Princeton University. The work has been highly successful and admirably supplements that of the two previous journeys. We hope to give later a more detailed report of the results of the expedition, but may state at present that the party sailed from New York on December 9, 1898, and returned August 17, 1899, bringing very extensive collections of both vertebrate and invertebrate fossils of Patagonia, together with much material illustrating the zoology and botany of that region. The work of cleaning and preparing these great collections for study and publication has already made good progress, and is being pushed forward as rapidly as possible.

In a recent report Mr. Hatcher summarized the results of the work for the last three years as follows:

"(1) A good preliminary geological survey of that part of southern South America, lying between the Andes on the west and the Atlantic on the east, and between the Straits of Magellan and the forty-seventh parallel of south latitude, sufficient to serve as a basis for a geological map of the region.

"(2) Very extensive and complete collections of fossils from all the different fossil-bearing horizons known to that region, with the one exception of the Pyrotherium beds.

"(3) The discovery of four distinct and previously unreported geological horizons.

"(4) A collection of more than one thousand skins and skeletons of recent birds and mammals, embracing about one hundred and fifty species of birds and fifty species of mammals, and fairly representative of the mammalian and avian life.

"(5) Extensive collections of the fresh water, terrestrial and litoral invertebrate life.

"(6) Botanical collections, especially of the mosses, Hepaticæ and flowering plants, not including the grasses and sedges."

(7) To the above should be added a large and very valuable series of photographs, illustrating the geology and physical geography of Patagonia.

It is hoped that a series of adequately illustrated monographs will be issued from the Princeton museum containing the results of the

study of these great collections. The geology will be treated of by Mr. Hatcher, the Tertiary invertebrates by Dr. Ortmann, the fossil vertebrates by Messrs. W. B. Scott and Hatcher, and the recent birds by Mr. W. E. D. Scott.

It is difficult to exaggerate the value of Mr. Hatcher's and Mr. Peterson's long and arduous labors. Materials have now been gathered that will make possible the solution of many vexatious and much discussed problems, and for the first time a full and representative collection of the wonderful fossil mammals of Patagonia has been brought to a Northern museum. We can, at last, directly compare the Tertiary mammals of the Northern and Southern Hemispheres, and may hope to reach some definite conclusions concerning the mutual relations of these two faunal assemblages.

A LONG PHOTOGRAPHIC TELESCOPE.

LAST spring a plan was proposed at the Harvard College Observatory for the construction of a telescope of unusual length for photographing the stars and planets. Anonymous donors have now furnished the means by which this experiment may be tried. The plan will, therefore, take definite shape, and it is expected that a telescope, having an aperture of 12 inches and a length of a hundred feet or more, will be ready for trial at Cambridge in a few weeks.

EDWARD C. PICKERING.

HARVARD COLLEGE OBSERVATORY,
October 12, 1899.

SCIENTIFIC NOTES AND NEWS.

WE announce with great regret the death on October 16th, of Dr. Edward Orton, the eminent geologist, professor in the Ohio State University, president of the American Association for the Advancement of Science.

DR. J. T. ROTHROCK has been reappointed for a term of four years, State Commissioner of Forestry for the State of Pennsylvania.

PROFESSOR GEORG STEINDORFF, the director of the Ægyptologische Sammlung at Leipzig, has, says *Nature*, obtained leave of absence for six months to enable him to undertake a scientific journey to Africa.

IT is stated in *Natural Science* that Dr. Robert Logan Jack, late Government Geologist for Queensland, and special commissioner in charge of the exhibits at the Greater Britain Exhibition, has accepted an appointment from Mr. Pritchard Morgan to run some mining concessions in Szechuan, Korea, and North China. Dr. Jack sailed in September.

AT a sitting of the International Geographical Congress on October 2d, it was announced that Dr. Scott Keltie had received a telegram from Mr. H. J. Mackinder, the reader in geography at Oxford, who has just succeeded in reaching the summit of the hitherto unscaled Mount Kenia (about 18,000 feet), in British East Africa. Mr. Mackinder left England in June last in command of an expedition subsidized by the Royal Geographical Society. The telegram, which was sent *via* Mombasa, states that some 15 glaciers were found upon the mountain.

DR. G. W. HILL will give a course of lectures on celestial mechanics at Columbia University on Saturday mornings beginning October 21st. The subjects treated will be:

I. Delaunay's Method in the Lunar Theory generalized and applied to the Planets.

II. Gyldèn's Method of Perturbations.

III. Gauss' Method with Secular Perturbations.

IV. General Expressions for the Secular Inequalities of the Solar System.

V. Poisson's Theorem on the Invariability of the Mean Distances.

VI. Periodic Solutions in the Planetary Problem.

VII. The Restricted Problem of Three Bodies.

VIII. General Considerations on the Stability of Motion of Planetary Systems.

PROFESSOR R. W. WOOD, of the University of Wisconsin, having received several inquiries as to whether he could furnish lantern slides of the plates illustrating his article on the photography of sound-waves, which appeared in the *Philosophical Magazine* for August, has placed the original negatives in the hands of Miss Blanchard Harper (Madison, Wis.), who is prepared to supply slides from any or all of the plates at a nominal cost. The slides will be found useful in teaching, showing as they do the wave fronts by reflection from all sorts of surfaces, refraction, diffraction, Huyghens' principle, etc.