

mens in botany, which formed the types included in his "Flora of Yucatan," and considerable material for exchange to augment the small herbarium in his department. He also secured about four hundred specimens in zoology, principally conchology, and a number of excellent negatives relating to geology, botany, ethnology and travel. Prof. Holmes secured altogether about one thousand specimens in archæology from Yucatan, Chiapas, Oaxaca, Vera Cruz and the valley of Mexico, and made a number of important observations. An expedition to San Domingo, conducted by Mr. Geo. K. Cherrie, Assistant Curator in the Department of Ornithology, resulted in the collection of 1958 bird skins, 16 mammals, 80 reptiles; and a number of specimens of fish and Crustacea. Among the birds, two species proved new to science, and a number of others are very interesting as representing rare and little-known forms. Captain Miner W. Bruce was fitted out by the Museum for an expedition to Alaska and Siberia in June 1894, and he acquired valuable ethnological material from North Alaska. A number of minor expeditions were also organised in the interests of the Museum, and they have resulted in numerous additions to the collections in different departments, as well as the acquisition of information of great scientific value, which information is made known through the admirable series of publications issued by the Museum.

THE additions to the Zoological Society's Gardens during the past week include a Lesser White-nosed Monkey (*Cercopithecus petaurista*) from West Africa, a White-throated Monitor (*Varanus albigularis*) from South Africa, presented by Sir Gilbert Carter; a Vervet Monkey (*Cercopithecus lalandii*) from South Africa, presented by Mr. Henry Russell; a Diana Monkey (*Cercopithecus diana*) from West Africa, presented by Mr. E. Kirby; a Striped Hyæna (*Hyæna striata*) from Arabia, presented by Mr. C. A. Osborne; a Hamster (*Cricetus frumentarius*), European, presented by Miss Hilton; three Yellow-bellied Liothrix (*Liothrix luteus*) from India, presented by Mr. Robert E. Graves; an Iceland Falcon (*Hierofalco islandus*) from Iceland, eight Horsfield's Tortoises (*Homopus horsfieldi*) from Central Asia, two Giant Toads (*Bufo marinus*) from Brazil, a Reticulated Python (*Python reticulata*) from Malacca, deposited; two Lettered Aracari (*Pteroglossus inscriptus*) from Para, a Black-necked Swan (*Cygnus nigricollis*) from Antarctic America, purchased; a Burrhel Wild Sheep (*Ovis burrhel*), two Glossy Ibis (*Plegadis falcinellus*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE CLUSTER IN COMA BERENICES.—The results of a triangulation of the more conspicuous stars in this group have been recently issued from the astronomical observatory of Yale College. This contribution to a class of observations that is now receiving much attention, has been made with the heliometer by Mr. F. L. Chase at the suggestion of Dr. Elkin. The instrument employed is the same that Dr. Elkin used in his measurements of the Pleiades group, and the method of reduction follows generally the same lines that were then adopted; but the different configuration of the fundamental stars on which the measures are based, has enabled the observer to dispense in some degree with measures of position angle, the less trustworthy coordinate in heliometer observations, and to rely upon measures of distance from six selected stars, five of which form nearly an equilateral pentagon, the sixth being approximately in the centre. Two lines of stars roughly crossing the pentagon at right angles, and extending some six degrees, have been utilised for determining the scale value. The final result is to give the coordinates of thirty-three stars (Equinox 1892.0) limited to about the 8.5 mag., below which magnitude the most satisfactory observations cannot be made with the Yale instrument. An examination of the probable errors of the measures, classified according to the magnitude of the stars, does not disclose any law dependent on brightness, so that Mr. Chase has not over-

stepped prudence in this respect. At the same time the position of so many well-scattered points of reference has been determined, that it should be an easy task, and one worthy of accomplishment, to derive the places of the remaining and fainter stars of the group by means of photography.

OBJECTIVE GRATINGS.—Messrs. Hall and Wadsworth describe in the June number of the *Astrophysical Journal* the results of a fairly successful application of an objective grating, constructed on the original Fraunhofer method, and attached to a 12-inch photographic object-glass, whose ratio of aperture to its focal length is as 1:18. Two screws 27 cm. long, and with 63 threads to the centimetre, were cut in two along their axes, and the half-screws mounted, parallel to each other, on the opposite sides of rectangular frames. Copper wire was wound across in the successive threads, and soldered to the screws so as to produce a grating. When applied to the telescope, photographic spectra of both the first and second order could be obtained, and cases are quoted showing the agreement of the deduced wave-length with Rowland's values. One of the difficulties experienced in the use of this form of grating arises from the wind disturbing the lines of the grating, an annoyance which, it is suggested, might be prevented by soldering light rods across the wires parallel to the half-screws. The time required for exposure with objective gratings is of course longer than with the objective prism; but against these two disadvantages is to be set the comparative small cost of construction. In the one used in the experiments at Chicago, the cost was only one-thirtieth of that of an equally large objective prism of small angle, and evidently the advantage on the side of economy increases as the aperture increases. In the case of the Yerkes telescope, it is computed that the grating would cost about the two-hundredth part of the prism of the same size.

DISTORTION OF THE EARTH'S SURFACE.—Under the title of "An Earth-bending Experiment," Prof. H. H. Turner gives a description of a series of observations undertaken at Oxford by Prof. J. Milne (*Observatory*, July). In his investigation of terrestrial disturbances in the Isle of Wight, Prof. Milne found evidence of their being due to several causes. For instance, some are due to real local earthquakes on a small scale, some owing to faint echoes of very distant earthquakes, while it appears that others may have their origin in the various states produced on the surface of the ground by meteorological causes. These last have specially attracted attention, as it is quite possible that the considerable load represented by a shower of rain or snow, or a heavy fall of dew, may be capable of bending the surface of the ground to such a degree as to affect the stability of any astronomical instruments not having very deep foundations. In looking for these effects, it might be expected that tilts due to rainfall, though irregular, would show some evidence of an annual periodicity, while those produced by dew would show a diurnal variation. To test whether any of these causes might have an appreciable disturbing effect, the University Observatory at Oxford was chosen as being particularly suitable, standing alone in a grassy park. The instruments for detecting and recording any difference of level consisted of one of Prof. Milne's horizontal pendulums and the level of the Barclay transit circle. The effect of a sudden shower was imitated by securing the services of seventy-six people, who were marched, in various degrees of compactness, up to and away from the slate slab supporting the registering apparatus. The result of these experiments was that a small depression was observed, always towards the crowd, the maximum value, however, being only 0".5, when the load was concentrated and close to the instrument. The load employed being estimated greater than is likely ever to be produced by rain, &c., it is concluded that on that particular site at least no disturbance due to meteorological causes need be feared.

ON THE LIQUATION OF CERTAIN ALLOYS OF GOLD.¹

THE molecular distribution of the metal in alloys of gold and of metals of the platinum group has been described by me in several papers, the most important of which has been published in the *Philosophical Transactions*. New

¹ Abridged from a paper read before the Royal Society, May 7.