the results of a critical examination of the latitude observations made by army engineer officers at Willets Point during the year 1885. These observations are of peculiar interest from their bearing upon the mooted question of the variability of terrestrial latitudes; but it appears that the sequence of the results from 1880 to 1884, which seemed to indicate a gradual decrease of latitude, is interrupted by the result for 1885, which is practically the same as that for 1881. The conclusion which Miss Lamb reached from a similar discussion of previous observations (*Science*, vi. p. 118) is now further confirmed. The evidence seems to be rather against a systematic change of latitude at Willets Point, though the results for future years will be awaited with interest.

Astronomical activity. — In looking over the reports of observatories for the year 1885, one cannot but be impressed with the increase of activity in all branches of observational astronomy. Greenwich has ordered a 28-inch refractor for spectroscopic work; Struve at Pulkowa, with the new 30-inch, can go deeper than ever into the star depths for faint 'doubles;' the Vienna 27-inch, in the hands of Dr. Vogel, has already done good work in astronomical physics; and Paris has taken the front rank in stellar photography. The interesting report of Admiral Moucher, the director of the Paris observatory, now before us, gives especial prominence to this comparatively new method of research. A reproduction of a photograph of the Pleiades, taken by the Henry Brothers with an exposure of one hour, has suggested a comparison with Wolf's well-known chart of that group, upon which he spent three years' labor, and the advantage of photography in certain directions is strongly brought out. Wolf's chart contains 671 stars, the limit being the 13th magnitude; while the photograph shows no less than 1,421, the faintest being of about the 16th magnitude. In the meridian service over sixteen thousand observations have been made by sixteen different observers; the instrument devised by M. Loewy, the *equatorial coudé*, has been brought into regular use for observations of comets and minor planets; and the time service, meteorological department, etc., are all in a most satisfactory condition. A department of the observatory which we should like to see imitated in this country is the 'Ecole d'astronomie,' in which courses of instruction are given by such members of the observatory staff as Loewy, Tisserand, Gaillot, and Perigaud. The students are given employment in the computing bureau, and, after sufficient instruction, they take part in the observations with the meridian instruments. The schools of astronomy in this country are not very thriving adjuncts of our colleges.

NOTES AND NEWS.

THE following appropriations are recommended by the committee on appropriations for the various scientific departments of the government for the fiscal year ending June 30, 1887: — coast survey, $407,246, being $146,250 less than was appropriated the past year; the number of field officers is reduced from 64 to 48; office force, from 103 to 91: geological survey, $467,700, the same amount as was appropriated last year: signal service, $799,493, being $64,587 less than was appropriated last year: national museum, $157,500, $19,000 more than was appropriated last year: Smithsonian institution — international exchange, $10,000; North American ethnology, $40,000; being the same amounts as were appropriated last year: fish commission, $220,040, being $40 more than was appropriated last year.

— The final excursion of the geological class of the Academy of natural sciences of Philadelphia, extending over a period of about ten days, and beginning with the first week in July, will be directed to Nantucket and Martha's Vineyard. It is proposed to investigate the physical (geological and paleontological) features of the islands, and the recent fauna of the coast. The total expense, including the academy admission-fee of seven dollars, will not exceed thirty-five dollars.

— About twenty-five thousand deaths from typhoid-fever occur in this country annually, says the *Medical record*, and this represents fully one hundred and fifty thousand cases of the disease. Statistics show that there is no disease so easily preventable as this; and it is safe to say that fully one-half of this mortality might be saved by greater cleanliness and more attention to sewage.

— A new monthly magazine devoted to the now popular art of photography has just appeared in England under the appropriate title of the *Camera*. Mr. R. A. Proctor supplies an interesting paper on photography and astronomy, with illustrations of some of the recent results of observations; Dr. Lindsay Johnson and Mr. T. C. Hepworth also contribute useful articles; and a descriptive account of the amateur photographic exhibition in Bond Street, with reproductions of some of the principal examples, is carefully written.

— Letters from Colonel Lockhart's mission, dated May 9, have reached India. The party were then near Gumbaz, on the northern slopes of the Hindoo-Koosh. They had gone northward from Gilghit, through Hunza, and would work along the Hindoo-Koosh, and enter Kafristan from the north.

— Dr. Julius Stöckhardt, the well-known agri-

cultural chemist, died at Tharandt, in Saxony, on the 1st of June, in his seventy-seventh year.

— The *Athenaeum* of June 12 states that arrangements are being made for holding an international congress for discussing papers upon climatology, mineral and thermal springs, and allied subjects at Biarritz, under the presidency of Dr. Durand Fardel, the first week in October, to be followed by a three-weeks' tour to the principal watering-places of southern France.

— The *Athenaeum* chronicles the appearance of a new Italian journal of zoölogy, entitled *Bolletino dei musei di zoologia ed anatomia comparata della R università di Torino*. At Jena an *Anatomischer anzeiger*, under the editorship of Prof. K. Bardeleben, is announced to begin its existence this month.

— The following is a list of the publications of the geological survey now in the hands of the public printer: — Sixth annual report of the director: Monographs — Lamellibranchiata of New Jersey, by Whitfield; Dinocerata, by Marsh; Geologic history of Lake Lahontan, by Russell; Geology and mining industry of Leadville, by Emmons; Geology of the Eureka district, by Hague; Lake Bonneville, by Gilbert; Stegosauria, by Marsh: Bulletins — Work done in the division of chemistry and physics, 1884–85, by Clarke; Gabbros and associated hornblende rocks, by George H. Williams; Freshwater invertebrates of N. A. Jurassic, by C. A. White; Cambrian faunas of N. A., by Walcott; Fossil insects, by Scudder; Mineral springs of the United States, by Peale; Geology of northern California, by Diller; Relation of the Laramie molluscan fauna to succeeding fresh-water eocene, by White; Physical properties of carburets, by Barus and Strouhal; Subsidence of small particles of insoluble solid in liquid, by Barus: A geologic map of the United States.

— Howard Ayers has been appointed as an instructor in zoölogy at Harvard college.

— Under the patronage of the Grand Duke of Baden, and with the concurrence of the grand ducal government, the Industrial society of Karlsruhe, says the Journal of the Society of arts, has organized an international exhibition of the manual arts and domestic economy, to remain open from Aug. 15 to Sept. 15, 1886. The principal object of the exhibition is to make known the best *matériel* and apparatus suitable for small industries, and to popularize their use; so that all small motors, tools, and machine tools will be welcomed.

— An important exhibition of apparatus and implements for the prevention of the diseases of the vine, and for destroying insects that infest it, says the Journal of the Society of arts, was held last month at Conegliano. The exhibiters, who were not limited to Italians, were 197 in number; and of the 524 different machines, apparatus, and implements shown, 450 were connected with application of milk of lime, the most effectual remedy for the disease called peronospora, the proportion being from 8 to 10 of slaked lime to 100 of water. The experiments, made before a jury composed of the most eminent viticulturists and scientific men, which lasted five days, will be described in a report to the minister of agriculture, and will contain a variety of useful information and plates. Three gold medals, three silver with money prize of 150 francs, seven silver ones, and four bronze ones, were awarded, and, besides these, three special premiums were given by the local agricultural committee.

— The following changes have been made in the coast survey service since our last issue: Assistant Gresham Bradford has been ordered to Sandy Hook to make an examination for the location of a permanent self-registering tide-gauge; Lieut. F. S. Carter has been ordered to Baltimore to relieve Lieut. G. H. Peters of the command of the Arago, which has been ordered to New York; Ensign A. W. Dodd has been detached from the schooner Bache, and ordered to the Drift; Assistant J. B. Weir has been ordered to duty at the home office. The following parties engaged in state work have been recalled, owing to the failure, on the part of congress, to appropriate money for the continuance of this field-work: Prof. H. L. Barnard, Chambersburg, Penn.; Prof. A. H. Buchanan, Lebanon, Tenn.; Prof. J. E. Davies, Madison, Wis.; L. A. Bowser, New Brunswick, N. J.; Assistants E. F. Dickins and J. S. Lawson, Anaheim, Cal.; J. L. Campbell, Crawfordsville, Ind.; Prof. Mansfield Merriman, Bethlehem, Penn.

— The following charts will shortly be issued by the coast survey: Cape Flattery to Dixon's Entrance, and from latter point to Cape St. Elias; Head Harbor Island to Petit Manan, coast of Maine; Icy Bay to Semidi Islands, Alaska; topographical sheets of New York and Jersey City water-front from Battery to 68th Street, North River.

— Mr. A. Schuster has recently published (*Phil. mag.*, April, 1886) an analysis of certain observations on the daily variations in earth-magnetism which indicate definitely that the cause of the disturbances lies wholly without the earth.

— According to Professor Heim, says *Ciel et terre*, the total number of glaciers in the Alps is 1,155, of which 249 have a length greater than

four miles and a half (7,500 metres). They are distributed as follows: in France, 144; Italy, 78; Switzerland, 471; Austria, 462. Their total superficial area is between five hundred and a thousand square miles. The longest is the Aletsch glacier in Austria, measuring over nine miles.

— Dr. Freire of Rio de Janeiro, in a letter to the Louisiana state board of health, thus speaks of the results of his inoculation for yellow-fever: "I have performed over seven thousand inoculations with full success. The immunity was almost absolute, notwithstanding the intensity of the epidemic this year. More than three thousand persons who were not inoculated died of yellow-fever; while among the seven thousand inoculated, inhabiting the same infected localities, subject to the same morbid conditions, but seven or eight individuals, whose disease was diagnosed as yellow-fever, died."

— During the year 1885 there were 246 earthquakes, according to the statistics of C. Detaille, as given in the June number of *Astronomie*. The largest number of these, 49, occurred in January; the smallest, 11, in October. For the other months the numbers are as follows: February, 18; March, 15; April, 19; May, 14; June, 29; July, 23; August, 13; September, 16; November, 16. Only 6 are given for North America, as follows: Jan. 12, Washington; Jan. 18, New Hampshire, Carolina; Jan. 26, California; Feb. 5, Virginia; Nov. 19, California.

— A. Raggi has published some observations on the intermittent variation in sound-perception in the human ear, instances of which are probably familiar to many persons. In deep stillness, if one listens to a faintly heard sound, like that of the ticking of a watch, it will be noticed that at irregular intervals the tones are wholly inaudible, while at other times they are distinctly recognized. Mr. Raggi ascertained, by experiments on different persons, that the intervals of silence usually varied between seven and twenty-two seconds; while the periods of sound-perception were between seven and eleven seconds in duration, with a maximum of fifteen. He also found that the variation was not due to extraneous sounds, nor to the blood-circulation or respiration, and concludes that it results from the inability to keep the attention for long periods at a sufficient degree of tension for the perception of faint sounds, or possibly to a variable physiological receptivity in the auditory nerves.

— A legacy of some $75,000 has been left to the Jena university to be applied in zoölogical research on the basis of Darwin's evolution theory. The testator is Herr Paul von Ritter of Basle, who believes the teaching of Darwin to be the greatest sign of progress which the century has yet given.

— According to the statistics recently published by the minister of agriculture and commerce, it appears that the quantity of olive-oil produced last year, in the various provinces throughout Italy, was 52.34 per cent below the average annual yield, which is calculated at 3,405,500 hectolitres (74,921,000 gallons), it being only 1,782,400 hectolitres (39,212,800 gallons); 11 per cent of this total amount was of superior quality, 73 per cent good, and 16 per cent mediocre.

— The Royal academy of medicine of Belgium has recently offered its largest prize ($5,000) for the most meritorious work or paper on the treatment of diseases of the nervous centres, especially for a remedy for epilepsy. The great need of some better means of controlling this last disease induced the academy to offer an additional prize of $1,600 for the best paper on that subject. The prizes are international, and will be awarded in December, 1888.

— Late deep-sea explorations in the Atlantic, carried on under the auspices of the London geographical society, have shown that the ocean-bottom in the northern region is formed of two valleys, of which one, in width, reaches from the tenth degree of east to the thirtieth of west longitude, extending to the equator, at a depth of not less than thirteen thousand feet. The other lies between the thirtieth and fiftieth degrees of west longitude. The mountain-chain separating the two valleys extends northwards towards Iceland, and southward to the Azores, and is of a volcanic character at its ends. Its greatest breadth is a little less than five hundred miles.

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.*

Is the ocean surface depressed?

Do barometric observations give any hint regarding the depression of the sea 'at the centre of the oceans'?

If, as is maintained, there be a depression of a thousand metres, the barometer should show about three inches and a half more pressure at the centre of the oceans than at what we ordinarily call sea-level.

Were there any barometric observations made on the islands where the pendulum was swung? or do barometric observations made on any of the oceanic islands cast any light on this subject? I have no authorities at hand to consult, or would not ask the question. W. H. S.

Candelaria, Nev., May 25.

The notion that there exist in the sea-surface of the earth elevations and depressions amounting to several hundred metres has recently gained a much