interest attaches to an official document issued in the latter country on the subject. All the Loochoo Islands, the Japanese maintain, are connected by certain geomantic signs in the earth with the Japanese province of Satsuma. The forty-eight characters of the Japanese alphabet are in use there, having been communicated to the islanders by Minamotonotametono. As regards language, they use a mixture of Chinese words and the Japanese alphabet in their literature. They call their own kingdom Okina, or otherwise, Okinawa. As regards religion, they worship Yi Shih, the Great Spirit of Japan, besides other divinities. In many of their domestic customs, too, the Japanese maintain that their practice indubitably indicates their origin.

THE new number of *Les Annales de l'Extrême Orient* contains some ethnographical notes on Thibet by the Abbé Desgodins, illustrated by a map of that country and the neighbouring regions.

THE just published part of *Le Globe* contains a paper by Dr. E. Dufresne, entitled "Une station d'hiver pour les phthisiques dans les Hautes-Alpes," and a third article by M. Venuikof on geographical discoveries in Asiatic Russia.

THE *Bulletin* of the Antwerp Geographical Society contains the text of the "Résolutions et Vœux," presented by the section of the late Commercial Geography Congress at Brussels, and adopted by the general meeting.

AT the last sitting of the Paris Society of Geography a letter from M. Sibiriakoff, one of the promoters of Nordenskjöld's North Asiatic Expedition, was read. This generous gentleman proposes to the Society to send a handsome subscription, in case a French expedition is sent to these parts. But it does not appear likely this suggestion will be taken into consideration.

M. HERTZ, the founder of *L'Explorateur*, the first popular journal of geography established in Paris, died a few days ago at the age of fifty. He was a member of the Council of the Geographical Society and one of the promoters of the Commercial Geographical Society.

U.S. NATIONAL ACADEMY

THE National Academy of Sciences held its semi-annual meeting at Columbia College, New York, October 28th-30th. Prof. W. B. Rogers presided. The meeting was welcomed by Prof. F. A. P. Barnard (President of Columbia College), as being the first use that has been made of the new building recently constructed and not yet quite finished, on the western front of the college grounds; thus appropriately inaugurating it in the interests of science. Prof. Rogers opened the meeting with a few brief but eloquent remarks, descanting on the far-reaching character of the researches which are now most prominently before the scientific world. As instances he cited the proofs brought by Prof. Whitney of the discovery of human remains in the pliocene; the evidence adduced by Mr. Lockyer, showing that in the sun many of the elements may prove to be compounds; the marvellous expositions of "radiant matter" in Mr. Crookes's experiments; and the striking discoveries in the uses of electricity and the telephone. Prof. Rogers is not ready to accept all the new theories which accompany these novel conceptions, but he feels assured that we are on the road toward new truths. The present age, like that which preceded the Newtonian era, has brought together a vast and somewhat chaotic mass of observations, out of which great principles shall be determined. In this work it is to be expected that some of the members of the Academy will bear an active part.

Dr. Henry Draper read a paper on the photography of star spectra, which we gave at p. 83.

Prof. C. A. Young contributed some "Spectroscopic Notes." He showed the want of true achromatism in the ordinary achromatic object-glass. By special arrangement of apparatus and the use of high dispersive powers, he has divided several spectral lines hitherto regarded as basic. The abundance of double lines in the spectrum has a meaning that needs to be investigated; as a curious fact, it is comparable to the excessive number of double stars that the telescope reveals. Prof. Young is prepared to indulge in a doubt as to whether the dark lines are really produced by absorption.

Dr. J. J. Woodward, Surgeon, U.S.A., read an elaborate paper on original researches reported in the second medical volume of the "Medical and Surgical History of the War of the Rebellion." This is a work published by the U.S. Government in several large quarto volumes. In preparing the work, Dr. Woodward consulted 124 different authors. His studies were aided by the use of the very large number of specimens in the pathological collection of the U.S. Army Museum. For various representations, *e.g.*, showing the cicatrices of diphtheritic ulcers, photography and the heliotype were employed. The special researches applied chiefly to diseases of the internal organs, such as dysentery and intestinal catarrhs. The minute changes indicating the beginnings of disease were closely studied. Dr. Woodward's conclusions tend to confirm the more recent and advanced views of pathology.

Dr. J. C. Dalton presented some observations on the structure of the human brain. He divided all brain matter, including the part which extends into the spinal column, into two kinds, the white and the gray. He proceeded to show that the gray kind was in three deposits, which are connected with one another—the spinal cord, the cerebral ganglia, and the extension into the outer sheath of the brain. The connection between these portions was shown to be continuous. The true shape of the corpus striatum and its connection with, as a part of, a circular organ called the surcingle, was demonstrated; and it was also shown that the lobes of the brain presented the appearance of being lapped together and doubled over around the crus cerebri. In the discussion that followed, Dr. Woodward stated that the brain had been so prepared by a peculiar process, that a single one was sawed into 1,000 slices for microscopical examination.

Prof. A. Guyot presented some remarks on a new map of the Catskill Mountains, and on the topographical relations of that mountain group to the adjacent regions of the Appalachian system. The excellent work that has been done by Prof. Guyot in the survey of the Catskill region was described some months ago in a paper read before the New York Academy of Sciences: copies are now furnished of the original map that was then exhibited. The object of the present paper was to call attention to the geological problems exhibited by the Catskill plateau. The author did not regard the carving of the mountains as glacial work, though the evidence of glacial scratches was not wanting. The process which had taken place, he thought, was an elevation of the whole district. But at the time of that rise the Adirondack formation was already in position, and by it the Catskill plateau was squeezed as it rose. The mountains which now occupy the place of that plateau were left by erosion, their valleys being carved out by the rivers. Prof. James Hall, in the discussion which followed, expressed himself as delighted with the adhesion of so good an observer as Prof. Guyot to this theory of the formation of mountains by erosion, and not by their separate upheaval. Prof. Rogers described an instance where one of the Shenandoah Mountains could scarcely have been formed by a separate upheaval, for all its strata were horizontal from bottom to top; but the surrounding region was full of the evidences of disturbance.

Prof. James Hall exhibited some new and remarkable forms of crinoids from the Lower Helderberg formation. These specimens were obtained partly in New York State, and partly in Tennessee. They were from three to four inches in diameter, and of varying shapes, no two alike, though mostly spheroidal; some were hemispherical or much flattened; others were turbinated. It was at first suspected that these were expansions of the bulbous root of crinoids, but subsequent observations indicated that these are the summits of the animal. They are made up of polygonal plates, but the arrangement is not distinctly radial, and its stellate character is greatly obscured. The specimens, which are now quite numerous, seem to be overgrowths, and present great difficulties in classification.—Prof. Hall read also a paper upon another Silurian fossil, *Lycopoditis vanuxem*. This has been regarded as a plant, allied to the ferns: a more thorough study of the subject has convinced Prof. Hall that this fossil was an animal form. It is found in quantities that cover many acres with a thickness of five to fifteen feet. The attention of the Academy was also called to the question as to the classification of *Stomatophora*, a coral found upon masses of favosite, and in the same horizon as the curious crinoids. In the discussion which followed, Prof. Newberry called attention to the sponge-like appearance of the crinoid specimens, suggestive of a missing link between crinoids and sponges.

Prof. Asaph Hall read a brief paper on this year's observations on the satellites of Mars. The discrepancies of position of Deimos are very small. It is found that Phobos comes to its

greatest elongation 44 minutes before the place as computed: its period as now ascertained is 7h. 39m. 13·996 sec.

A paper by Prof. Joseph Le Conte on the old river-beds of California, was read in the absence of its author, and attracted much attention. These river-beds are now in process of being washed out by hydraulic mining, in the search for gold; and it is in them that some of the earliest traces of prehistoric man are alleged to have been discovered. Prof. Le Conte does not regard the hydraulic method of attack as promising to yield many fossils in good preservation; it is more likely to destroy all traces. The mode of formation of the old river-beds, which are found in Middle California, is peculiar. Their rivers had been completely displaced and have formed new channels, sometimes parallel, and sometimes even at right angles to the old ones. The new channels are cut perpendicularly through 2,000 to 3,000 feet of slate rock. The old channels are filled with boulders and pebbles; capped with a conglomerate layer, described as "trifaceous," the product of a volcanic overflow, with few pebbles. Under ordinary circumstances the tendency of rivers to clear their own channels is effective, though sometimes operating at long intervals. If the load of detritus is too heavy, it is deposited; but eventually there comes a time when the river is no longer overloaded, and then it proceeds to tear up and remove its previous deposits. Thus at the present time the Colorado River is underloaded, and is cutting its channel, while the Platte is overloaded and filling up; the Yuba River has filled a depth of 15 feet within the past 20 years. But in the old river-beds under consideration, the deposit has been capped and protected by a volcanic overflow. We find evidences of this lava flood over a vast district, but not extending to the British possessions. Prof. Le Conte is inclined to fix the period of the lava flow as at the boundary between the tertiary and quaternary. Whitney and other geologists have referred the gravel of these river-beds to the pliocene; Prof. Le Conte thinks that the fossils indicate the approach of a change to the quaternary, and that the passage from the pliocene to the glacial epoch was gradual. To review the whole procedure, he begins with the elevation of the Sierras, when a general drainage system was constituted without much tendency to erosion. Glaciers formed and were melted, and thus were provided the boulders and gravel. Then came the lava flow, which destroyed the old drainage system, and compelled the rivers to seek new channels. The further elevation of the Sierras had renewed the glacial operations, which in some instances had wholly swept away the lava and replaced it by a different class of deposits. The paper elicited a very lively discussion, in which all the geologists present took part. Prof. O. C. Marsh is inclined to give full weight to the views of Prof. Whitney and Clarence King, who have been long in the field and have studied the subject very thoroughly. Prof. Marsh said that he himself has picked out fossil remains from these river-beds, which were unquestionably pliocene, and of animals living in a tropical climate. The volcanic outbreak certainly took place in the pliocene, and before the glacial epoch; of this he had assured himself by observing the position of layers of basalt. We find the remains of man in this position—in the pliocene, along with remains of sloths and other tropical animals. We concede that these animals were there in that era. Why must we suppose that the remains of man were brought thither by some accident? It seems more reasonable to believe that man was there in that warm climate, in which he could live, than that he came in with the cold and the glacial era.

"Our Memory for Colour and Luminosity," was the subject of an essay by Prof. O. N. Rood. He proposed to give a few results from a series of experiments recently begun and not yet completed. It is generally supposed that while we have a distinct memory of different colours, such, for instance, as those which are called "primary," we do not remember with definiteness, particular shades of colour or specific mixtures of white and black. Nearly all optical instruments in which there is a provision for comparing either colours or amounts of luminosity, are constructed with great care so as to bring as nearly as possible into contact the colours or shades to be compared. The prevailing notion seems to be that we do not retain for ten seconds an exact memory of a given shade or tint. Prof. Rood exhibited the apparatus by means of which he tested the correctness of this notion. Two disks were so arranged that either one could overlap the other in any required proportion. The disks were of different colours, which blended into a given tint when the disks were rapidly revolved—a tint having a known percentage of each of its components. Let us suppose that this tint was obtained by thus blending 43 parts of yellow with 57 parts of red. Prof Rood wished to ascertain how near to that proportion he would get when he reproduced that tint from memory. So he took a glance at it while the disks were revolving. An assistant then disarranged the disks, and afterwards proceeded to rearrange them, making the blended tint more or less yellow as directed by Prof. Rood, until the colour attained corresponded to the latter's recollection of the original tint. The original having 43 per cent. of yellow, the reproduced colour had—on an average of many trials—42·6 per cent. of yellow. This was when only a minute elapsed between looking at the tint and reproducing it. The largest variations from the mean were not over ½ of one per cent., a difference of tint so slight as to be just barely perceptible when it is shown by direct contrast and the superposition of the differing shades. When an hour was allowed to elapse before the colour was reproduced from memory, the tint obtained averaged 45·2 of yellow, showing an error of 2·2 per cent. error. Reproductions 24 hours afterwards gave 47·5; *i.e.* 4½ per cent. Equally near results followed in testing the memory for other mixtures of colours, such as yellow with green, and blue with green. The amount of error in several of these instances was exhibited to the Academy by means of the apparatus, and was scarcely distinguishable. This power of memory for colours might, however, be peculiar to this experimenter: to test that point, a similar set of observations were made upon his assistant's memory, with as good results. There was a single and curious exception. During one of the experiments a cord in the apparatus snapped; this incident so distracted the assistant's memory of a given tint that his reproduction of it was utterly at fault; but immediately afterwards he regained his usual average of correctness. The reproduction of grays, that is, mixtures of white and black, is attended, as might be supposed, with a somewhat larger average of error; but the experiments on this point are not yet complete. From what has thus been shown it is evident that the memory of definite tints is fairly accurate, so that it can be depended upon within certain limits. Hence the juxtaposition of tints to be compared in spectroscopes and other optical instruments is not always necessary. The instruments themselves can be made far less complicated and costly where this feature of cons ruction is not required. Observers can be trained to an accurate memory of tints and even of differences of luminosity. Prof. Rood showed also some apparatus for obtaining a quantitative analysis of the effect of contrast upon adjacent colours. It was shown, for instance, that the colour of a small disk on a large ground was overwhelmed by its background to the extent of 12 per cent. In the discussion on this paper, Prof. Trowbridge, of Columbia College, stated that his students in drawing, preparatory to a course of engineering, were required first to make a draught from a model, and then, the next day, to reproduce the draught from memory. Several of these drawings, with the duplicates from memory, were exhibited; they gave conclusive proof that the memory of form under such circumstances may be cultivated to a high pitch of accuracy.

Prof. S. P. Langley gave a brief account of a portion of his researches on the radiation of the solar atmosphere. These have demonstrated the decline of heat-radiating power from the centre to the edge in a certain series; and also a decline of light-radiating power in a totally different series, the light near the centre having a blue tinge while that of the outside edge is chocolate red. The apparatus used in these researches was exhibited. About thirty years ago Secchi ventured the assertion that there was a marked difference of temperature between the northern and southern hemispheres of the sun. Prof. Langley afterwards disproved this by experiment, and placed the facts before the French Academy. Somewhat recently two Frenchmen, Messrs. Cruls and Lacaille, announced to the Academy, (through the Emperor of Brazil, who is a corresponding member) that they had verified the original observations of Secchi. They stated that the heat of the northern hemisphere of the sun was to that of its southern, as 100 to 75. Prof. Langley has since carefully repeated his experiments, and is satisfied that there is not a demonstrable difference in the heat of the two hemispheres. In the course of 400 observations he has found only fractional differences of less than one per cent., and since there is no systematic relation between these, they are to be ascribed to such errors as we may reasonably expect.

A second paper from Dr. Joseph Le Conte was read, on the glycogenic function of the liver, being a continuation of a paper on the subject read at a previous meeting and since published. The theory which is advanced in these papers and

supported by certain experiments, is as follows:—Food passing into the liver is there changed into materials fitted for the blood, the albumenoids into nitrogenous and saccharine substances, the amyloids into glycogen or "liver sugar." In preparing sugar for the blood, the liver exercises its chief function by supplying easily combustible fuel. The combustion of this fuel takes place in the capillaries, whither oxygen is also carried by the blood. With regard to the place of combustion being in the capillaries, in contact with tissue, there is no longer a question; the novelty claimed by Dr. Le Conte is in respect to the preparation by the liver of the fuel for this combustion. He does not concede that the tissues are themselves burned in the process. He regards the liver as a sort of storehouse, and asserts that the fuel it provides one day may not be consumed till the next day in the capillaries. Many arguments were brought to bear in support of these views. The paper elicited a brilliant discussion in the meeting, for although the main point, the alleged function of the liver, was cheerfully conceded, a question was raised as to the use of the word "combustion" in describing vital processes; such use of the term being ably opposed by Dr. J. Lawrence Smith, who regards oxygen as serving an alimentary rather than a destructive purpose in the animal economy, while Dr. G. F. Barker argued that a true combustion was performed where the oxygen united with carbo-hydrates and the process was accompanied by evolution of heat.

A paper delivered by Dr. George F. Barker had for its title "On Arago's Experiment." It bore reference to the theory which asserts that a wire becomes a magnet during the passage of electricity. This was called in question about fifteen years ago by Prof. Franklin Bache, of Philadelphia (brother of the late Alexander Dallas Bache of the U.S. Coast Survey). He found that when the magnetic field was cut in two by means of a disk of cardboard, a wire that had previously supported a quantity of iron filings, suddenly dropped them. He inferred that the support of the filings had not been due to the wire being a magnet during the passage of the current, since the current was still passing when they dropped. Their previous support, before the interference of the cardboard, was therefore to be attributed either to their magnetic adhesion to one another, or to the direct influence of currents circulating in the magnetic field which were cut in twain by the cardboard. Dr. Barker has been experimenting with a very powerful magneto-electric machine of the Wallace pattern. It was capable of heating a quarter of an inch gas pipe, three feet long, to bright cherry redness in a minute. Its current was used with a copper wire in Dr. Barker's experiments: the question at issue being whether this copper wire became a magnet during the passage through it of the electric current. A five inch iron spike was held under and close to the wire; the gravity of the spike was lessened, but not sufficiently to support it, even when it was brought within the 1000th of an inch of the wire. But as soon as the spike actually touched the wire, it stuck fast, was wholly supported, and arranged itself transversely to the wire. When the spike was withdrawn from the wire by only the 1000th of an inch, it fell, being no longer sufficiently attracted. Dr. Barker regards this as showing that the attraction in the wire is greater than that in the field. The wire was then passed perpendicularly through a hole in a glass plate on whose upper surface iron filings were sprinkled; these, when the current was passed through the wire, arranged themselves on the plate in concentric circles around the wire, thus indicating that such was the direction of the currents in the magnetic field. When the spike was placed near the wire and parallel to it, but suspended by the upper end, the lower end moved in the direction of the field-currents, throwing the spike out of perpendicular. These observations were regarded by Dr. Barker as evidence that the wire becomes a magnet in the experiment of Arago.

Prof. J. S. Newberry delivered a paper on the vegetation of the Atlantic coast of North America in the cretaceous period. He began by briefly sketching the position of the cretaceous in the United States (and specially the lower cretaceous), along the eastern base of the Appalachian chain. A large collection of fossil leaves from this horizon, obtained in the green sands of New Jersey, was exhibited; it included many leaves from trees of the salix family, in great variety; and leaves and twigs of conifers; the specimens were of remarkable beauty and clearness of detail. These fossils indicate that the dawn of the cretaceous period in this country was attended by a temperate climate. It seems probable that the plants of that period spread from America to Europe before the tertiary age, and were destroyed by the glacial epoch, after which, an Asiatic flora spreading westward, filled the void. In a discussion upon this paper, Prof. Marsh stated his belief that these fossil leaves were older than the lowest cretaceous marls of New Jersey, in which we find crocodilian and other remains indicative of a warm climate. A similar question had arisen about fossils from Dakotah; animal remains at first regarded as cretaceous, but now known to be Jurassic. Local proximity of formations differing widely in age, is not uncommon at the West. Within fifteen or twenty feet of a place where he picked out remains of dinosaurs, crocodiles and the like, he had found at fifty feet lower depth, the ichthyosaurus. Dr. Newberry said that the clays referred to in New Jersey underrun the marl beds, and are a shore deposit, probably a freshwater one. Prof. Marsh hoped that these localities would be very thoroughly explored. Up to the present date we know of no cretaceous mammal; this is the most serious break in our palæontological record. Prof. Rogers mentioned that certain fossils obtained in Virginia sandstones had been classed as Wealden, but he was inclined to consider them as on the border line between cretaceous and Jurassic. He regarded the position of the New Jersey fossils as yet open to question. Prof. Newberry sketched on the blackboard a sectional view of the strata in the New Jersey locality. Prof. Marsh suggested that these conifers and willows may have grown in elevated positions, on mountain sides, where they would have a temperate climate though it was tropical at the base of the mountains; and that these forests might have been dislodged by flood or avalanche, and carried down into the swamps at the base. It was long supposed in Europe that there was no angiospermic flora below the miocene, and when Prof. Marsh picked up there the leaves of an angiosperm in the cretaceous, the specimen was regarded as a great curiosity. In this country such fossils were abundant; but as to the Jurassic flora we know too little to speak with any certainty. Prof. Rogers stated that an investigation of Virginia and Maryland clays, now in progress, would probably solve this question; and Prof. Newberry expressed a similar hope in regard to certain researches on the shores of Buzzard's Bay, Mass.

A second paper by Prof. Newberry was descriptive of some interesting deposits of gold and silver ores in Utah and Colorado. Specimens were shown of sulphate of baryta with ruby silver. The Horn silver mine of Utah had $20,000,000 of ore in sight; the footwall was limestone; the sandstones are full of the impressions of plants, the plants themselves being replaced by horn silver. Such impregnation by a metal is rare, but there are parallel instances with copper, in New Jersey, in porous sandstone. Near the Horn silver mine is one of a conglomerate rock containing a rich argentiferous galena, going down at least 200 feet, and yielding $50 to $60 to the ton. A similar class of deposits has been found in Colorado, in the district of the Silver Cliff mine, a region of trachytic rock like that of the Horn silver district. It would appear that when the trachyte had been heated so as to be softened, while in the shape of balls of various sizes, the ores had coated them and filled their crevices. The ground is covered with this rusty-looking rubbish. At depths of 150 feet in it, silicified wood is sometimes found, and occasionally free gold, or "wire" gold. A man named Bassick, a sailor who had been round the world, and was quite penniless, picked up one of the rusty trachyte lumps and succeeded in having it assayed; the yield was $50 to the ton. He was thus led to the discovery of what is now known as the Bassick mine, which he eventually sold for $1,000,000. Silver Cliff is distant about six miles; it is a hill of shattered rock—breccia which has been cemented together; the mining operations there have gone 250 feet below the surface, into a zone of oxidized ore; the rock of the hill itself is worth $50 to $60 per ton, and its quantity is simply enormous. From other mines specimens were exhibited containing large quantities of arsenic, the ore being also accompanied by veins of orpiment and realgar. Specimens from Leadville mines showed the progress of change from carbonate to galena ores. The limestone surface had been eroded, and then porphyry was poured over it; the fissure veins were formed in this contact. The famous Leadville deposits are not so rich as had been supposed; specimens picked out for assay were very choice; in general the ore contains iron and a great deal of silica. There are two gold mines in Leadville, one of which is ferruginous quartz. The town itself is vile. Its climate is repulsive. It is at an elevation of 10,500 feet, and water is scarce, so that the whole place is covered with at least 5 inches of dust. There is no sewerage, and this dust is the filth of the town; the air is full of it, and it

must be inhaled with every breath of the dwellers there. But every man in Leadville believes himself potentially rich, and has a mine or a claim for sale. Speculation in claims, and mere gambling in fractional ownerships, is the principal business. Prof. Newberry had seen the law papers in the examination of a mining property where no less than 14 claims overlapped one another. There is really valuable mining property in abundance, not yet developed, in Colorado and Utah; but the properties that are put on the market for sale in New York are generally worth little or nothing, and will tend to discredit investment in all Western mines.

Prof. J. Lawrence Smith gave an informal account of some recent researches for new elements. A few years ago he found a field of research in the cerium and yttrium minerals, and was well satisfied that he had obtained a new substance, which he named mosandrum, in the cerium group. Since then he has been studying the components of samarskite, and has found, he believes, two new elements, one of which he calls columbium, and the other he proposes to name in honour of his friend and the instructor of his youth, Prof. William B. Rogers. But having much other business requiring his attention, Prof. Smith has done little in that line of research, since then, except to purify some mosandrum. Not wishing to delay the progress of discovery, he turned over a mass of the earthy material to Messrs. Lafontaine and Lecoq Boisbaudran, who have since announced several discoveries. The new elements are not yet separated; the supposition of their existence is based upon observations on their absorption spectra. Prof. Smith has great doubts whether this method is trustworthy. He found that a given solution showed a different spectrum the second day from that of the day before. The addition of nitric acid in greater or less strength was found to alter a spectrum to an extent fully as great as would be considered indicative of the presence of a new metal. But in nitric acid itself there is nothing to provide these new spectra. Hence a doubt is thrown over all discoveries that rest exclusively upon absorption lines. There are probably 8 or 10 new earths in the yttria group. Of the newly announced metals, Prof. Smith thought philippium was more likely to prove real than most of the others. In the discussion that followed, Dr. Barker pointed out that the colour of a solution affected its spectrum. He regarded the discoveries based solely on absorption spectra as not to be trusted until supplemented by chemical tests.

The other papers read at the meeting were as follows: "On the Mean Pressure of the Atmosphere over the United States at Different Seasons of the Year," by Prof. Elias Loomis; "Questions as to a very Direct and Simple Method of Ascertaining the Ellipticity of the Terrestrial Spheroid," and "The Completion of the Theory of Parallel Straight Lines," by Prof. Stephen Alexander.

The meeting closed with a brief address by its presiding officer, Prof. Rogers. In the course of his remarks he expressed a wish that hereafter some measures should be taken for a more general and widespread invitation to the public to be present at the meetings of the Academy. This suggestion will probably be adopted.

WM. C. WYCKOFF

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The following Statutes, which the University of Cambridge Commissioners contemplate making for the University, having been communicated to the Council of the Senate, the Vice-Chancellor hereby gives public notice thereof in the University.

"The University shall have power to adopt as an affiliated College in any place within the United Kingdom or in any part of the British Dominion any institution founded for the education of adult students, with such conditions as to the provision of lectures, and as to the rules and arrangements for the students, as may be determined from time to time by Grace of the Senate. Students of the institution who shall have continued members of it for such length of time, not less than two years, and shall have attended such lectures, and passed such examinations, as may be required from time to time by Grace of the Senate shall, if admitted as members of the University, be deemed to have kept already three of the terms required for any degree."

"Students in Science, who having already taken a degree in Arts, Law, Medicine, or Surgery, have given proofs of distinction in Science by some original contribution to the advancement of Science, and having done all that is required by the statutes and Ordinances of the University, may be admitted to the title of Doctor designate in Science, and shall afterwards be created Doctors at the time prescribed by the University."

"The management and regulation of the Botanic Garden, together with the appointment and removal of the Curators, Superintendents, Officers, and servants employed therein, shall henceforth be vested in a Syndicate consisting of the five Governors and Visitors appointed by Dr. Walker, that is to say, the Chancellor, or in his absence the Vice-Chancellor of the University, the Master of Trinity College, the Provost of King's College, the Master of St. John's College, and the Regius Professor of Physic, together with such other persons as may be appointed from time to time by Grace of the Senate."

The Syndicate appointed on May 31, 1877, to consider how to encourage students to read for honours in more than one tripos, in consequence of urgent representations on the part of head masters of public schools, have made a sixth and final report, leaving the Board of Natural Science Studies to propose the necessary and more than formal changes required in the regulations. With this exception, the Syndicate consider the duties committed to them to have been completely discharged.

Lord Rayleigh, we are glad to learn, has consented to become a candidate for the Chair of Experimental Physics at Cambridge; the election takes place to-morrow.

Mr. E. B. Tawney, F.G.S., Assistant to the Woodwardian Professor, who has made most valuable donations to the Woodwardian Museum, has had the degree of Master of Arts conferred upon him. Every geologist and palæontologist who knows Mr. Tawney will be glad to see this recognition of his merits.

THE number of matriculated students attending the University of Edinburgh this season is 2,510, the number of students in medicine being 1,138, in law 363, and in divinity 74. There is an increase, as compared with last year, in all the faculties, that in medicine being 96, and the total increase 178.

THE Court of Assistants of the Cordwainers' Company being impressed with the importance of the City Guilds employing part of their funds in the establishment of a central institution for the promotion of technical education, have, in addition to a grant of 250*l.* per annum already made, voted a donation of 500*l.* towards the building fund, on condition that the total sum agreed to be subscribed for that purpose be in their opinion adequate to the satisfactory fulfilment of the object contemplated.

SCIENTIFIC SERIALS

Gazetta Chimica Italiana, fasc. viii. and ix.—On cimene of cuminic alcohol, by SS. Paterno and Spica.—Decomposition of chlorhydrates of ethylamine by means of heat, by SS. Fileti and Piccini.—Gasometric analysis and methods, by SS. Amalo and Figuera.—Artificial improvement of leaves of indigenous tobacco by means of the sap of exotic leaves, by S. De Negri.—On phenoltolylates, by Dr. Mazzara.—On meta-amido-cinnamic acid, by the same.—Synthesis of phenyl-cumarine, by Dr. Ozliaboro.—On sulph-acids of cumene and on a new cumophenol, by Dr. Spica.—On insecticide powders from the flowers of *Chrysanthemum cinerieæfolium*, Trev., by Prof. Dal Sie.—Artificial production of the oligiste of Vesuvian lava, by S. Coppola.—Researches on the products of oxidation of alcoholic derivatives of natural and synthetic thymol, by SS. Paterno and Canzoneri.—On a new organic acid, lithobilic acid, found in oriental bezoar, with lithofellic acid, by Dr. Roster.—On a new method of preparing phenolglycolic acid and on pyrogallotriglycolic acid, by Dr. Giacosa.—Resistance of seeds (especially clover) to prolonged action of gaseous and liquid agents, by S. Giglioli.—On lapacic acid, by S. Paterno.

Journal of the Franklin Institute, November.—We note here the following:—A general differential equation in the theory of the deformation of surfaces, by Mr. Craig.—Future water supply of Philadelphia, by Mr. Bukinbine.—A new illustration of persistence of vision, by Prof. Tobin.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, November 27.—"On the Structure of Serous Glands in Rest and Activity." By J. N. Langley, M.A., Fellow of Trinity College, Cambridge. Communicated by Prof. Michael Foster, M.D., F.R.S.