

when it is best adapted to its surroundings, so that the less it is adapted, the more variable does it become."

#### SCIENTIFIC NOTES AND NEWS.

THE Committee of Coinage, Weights and Measures of the House of Representatives has unanimously agreed to report as an amendment to the Sundry Civil Bill the measure establishing a United States Standardizing Bureau. A full account of this important measure was published in the issue of this JOURNAL for May 4th.

IN accordance with the recommendation of the Rumford Committee, the American Academy of Arts and Sciences has voted to award the Rumford Medal to Professor Carl Barus of Brown University for his various researches in heat.

THE Academy has further granted from the Rumford Fund the sum of \$230 to Mr. Arthur L. Clark of the Worcester Academy in furtherance of his research on the 'Molecular Properties of Vapors in the Neighborhood of the Critical Point.'

Two excursions were recently given under the auspices of the Geological Department of the Johns Hopkins University, in honor of Professor W. C. Brögger, of the University of Christiania, Norway, who completed, May 3d, his course of George Huntington Williams Memorial lectures on the Principles of Geology at the Johns Hopkins University. The first excursion was made upon the State steamer *Governor McLane* to southern and eastern Maryland to examine the several formations of the Coastal Plain, and was participated in by Mr. S. F. Emmons, of the U. S. Geological Survey; Professor B. K. Emerson, of Amherst; Professor J. A. Holmes, of North Carolina, and Professors William Bullock Clark, Joseph S. Ames and Harry Fielding Reid, of the Johns Hopkins University. Several days were spent along the estuaries of the Chesapeake Bay in studying Cretaceous and Tertiary deposits.

ANOTHER excursion was organized by Professor Clark at the close of Professor Brögger's lectures on May 4th, the steamboat of the General Manager of the Chesapeake and Ohio Canal being placed at the command of the

party, who made an all-water trip from Washington to Cumberland, in the heart of the Allegheny Mountains, spending six days *en route* in the study of the rocks of the Piedmont Plateau and the Appalachian Region, and subsequently passing a day as the guests of the Western Maryland Companies, studying the coal deposits of the Georges Creek Basin. Hon. C. D. Walcott, Director of the U. S. Geological Survey, and Messrs. Arnold Hague, C. W. Hayes, Bailey Willis and Arthur Keith, of the same organization, and Professors Clark, Reid and Matthews participated in this excursion.

THE Franklin Institute has awarded an Elliott Cresson medal to Professor W. O. Atwater and Mr. E. B. Rosa for their respiration calorimeter.

PROFESSOR R. W. WOOD, of the University of Wisconsin, has been elected a fellow of the London Physical Society.

MR. CARL HERING has been appointed a member of the jury of award for the electrical group of the Paris Exposition.

MR. S. HERBERT HAMILTON, former Jessup scholar in geological chemistry at the Academy of Natural Sciences of Philadelphia, has accepted a call to the Museum of Geology and Archæology of Princeton University.

GEORGE GRANT MACCURDY, instructor in prehistoric anthropology at Yale University, has been made a corresponding member of the Society of the Institute of Coimbra, a society especially interested in developing literature, science and the liberal arts. Coimbra was once the capital of Portugal and is still the seat of its only university, an institution founded in 1290.

THE seventieth anniversary of the birth of Dr. A. Jacobi, clinical professor of the diseases of children in Columbia University, was celebrated by a banquet in New York City on the evening of May 5th. Addresses were made by Dr. Joseph D. Bryant, Dr. William H. Thomson and Dr. Carl Schurz, and a poem by Dr. S. Weir Mitchell was read. A 'Festschrift' was presented to Dr. Jacobi, containing scientific contributions from fifty-three medical men representing eleven nations.

THE death is announced of M. Edouard Grimaux, the eminent chemist, member of the Paris Academy of Sciences and professor in the Polytechnic School of Paris, until deprived of this office by General Billot for maintaining his belief in the innocence of M. Dreyfus. We have no information that the wrong done him on that occasion had been repaired in view of the more recent developments. M. Grimaux's numerous publications include 'Equivalents, atomes et molécules' (1866), 'Chimie organique' (1872-1878), 'Chimie inorganique élémentaire' (1874-1879), 'théories et notations chimiques' (1884), and 'Lavoisier.'

DR. LANGDON-CARTER GRAY of New York City, a specialist in nervous and mental diseases and a past president of the American Neurological Association, died on May 8th at the age of 50 years.

THE death is announced of Dr. George Viner Ellis, who held the chair of anatomy in University College, London, for twenty-seven years and was the author of several works on human anatomy. He became a member of the Royal College of Surgeons 65 years ago.

THE Senate Committee on Commerce on May 10th agreed to report the Philadelphia Commercial Museums Bill carrying an appropriation of \$200,000.

THE mansion of P. A. B. Widener, at Broad Street and Girard Avenue, Philadelphia, was presented to the city on May 8th to be used as a free library and art gallery. The gift is valued at \$1,000,000, and it is said that Mr. Widener intends to endow the institution amply.

THE forty-first meeting of the American Society of Mechanical Engineers was held at the Grand Hotel, Cincinnati, O., May 15 to 18, 1900.

THE *Geologische Reichsanstalt* of Vienna will commemorate the fiftieth anniversary of its foundation at a meeting to be held on June 9th.

THE German Congress of Medicine which has been holding its sessions at Wiesbaden will meet next year at Berlin under the presidency of Professor Senator. In the German Surgical Congress Professor Czerny has been elected president in succession to Professor von Bergmann.

Two hundred and sixteen cases of the plague have now been reported at Sydney, of which number one-third were fatal. Twenty cases including thirteen deaths have been reported at Port Said. The disease shows no abatement in India. During the last week regarding which records are at hand there were in the Bombay Presidency 730 deaths, in Karachi 815 deaths, in Calcutta 648 deaths, and in Hong Kong the disease was increasing. Cholera is seriously epidemic in the famine districts of India.

THE *British Medical Journal* reports that all the arrangements have now been made for the carrying out of the experiments as to the prevention of malaria which were referred to by Dr. Manson in his address before the Colonial Institute. A mosquito-proof malaria hut has been constructed by Messrs. Humphrey, of Knightsbridge, and will be sent out to Italy about the first week in May. The experiments, the cost of which is to be defrayed by the Colonial Office, will be begun in June and continued till October, thus covering the malaria season. Dr. Luigi Sambon, lecturer of the London Tropical School of Medicine, and Dr. G. C. Low, a distinguished student of the school, have volunteered to be the subjects of the experiment by occupying the hut throughout the period indicated. Their business will be to keep themselves from being bitten by mosquitoes. Professor Celli has kindly offered every assistance in furtherance of the experiments, and will select a site for the huts within the area of his own field of experimental work on malaria. The Italian government has also expressed its sympathy with the objects of the expedition, and Professor Baccelli has promised his assistance. A series of correlative experiments will be made in England by exposing healthy Britons to the bites of malaria-infected mosquitoes, which will be supplied for the purpose by Professors Bignami and Bastianelli, of Rome. In this case, too, several persons have already offered themselves as subjects of the experiments, including a son of Dr. Manson's.

THE report of the Corporation of Glasgow on the Museums and Art Galleries, for 1899, shows

the continued interest of the public in the four institutions embraced under the above title, for while the attendance was not so large as in 1898, it was something over 898,000. The growth of the collections is pretty evenly divided between art and science, the most important acquisition during the year being a collection of fossils obtained from the Geological Society of Glasgow.

At the monthly meeting of the British Astronomical Association, on April 25th, some statements, reported in the *London Times*, were made regarding the arrangements for observing the total solar eclipse of May 28th next. A party, of which the Rev. J. M. and Miss Bacon, and Mr. and Mrs. Nevil Maskelyne will be members, will go to Wadesboro, in North Carolina; Mr. and Mrs. E. W. Maunder, Mr. and Mrs. Crommelin, Mr. Evershed, and others, will go to Algiers; and Mr. G. F. Chambers and others to Portugal. In describing the proposed work of the expedition to the United States, Miss Bacon said that Mr. Nevil Maskelyne, assisted by Mrs. Maskelyne, would direct the telescopic kinematograph upon the corona throughout totality, and expose a long film in an ordinary kinematograph camera directed towards a chosen point of the landscape for a period commencing somewhat before and terminating somewhat after totality. The Rev. J. M. Bacon, with a telescopic camera, would photograph the inner corona as at Buxar, India, in 1898, the exposures, however, being shorter, and the development more prolonged. He would endeavor to make these exposures at definite and exact moments symmetrical with reference to mid-totality to aid in determining the relative position of sun and moon. He would also expose to the zenith for several minutes before, during, and after totality, a long sensitive film, continuously driven in a especially designed automatic instrument. By means of a kite he would compare during the eclipse the temperature at an altitude of a few hundred feet with that on the ground. Miss Bacon said that she would endeavor to photograph the outer corona and extensions, and would also repeat her former experiment of taking a 'gathering gloom' series. Special observations of shadow

bands would be organized, these including a proposal to pursue them along a white road by a party of cyclists. Photographic tests would be adopted as at Buxar to compare the light of the corona with that of the full moon. Miss Bacon mentioned that the Pennsylvania Railroad authorities had kindly promised special concessions for the occasion. The United States Naval Department had intimated that the instruments would be admitted into the country free of charge and of examination; the Canadian government had granted similar facilities should the expedition pass into Canada, and the British government had done the same in respect of the return to England, so that much inconvenience and risk to photographic material and instruments generally which would otherwise be experienced would be avoided. Professor Young, the eminent solar authority, who, with his party from Princeton, had chosen the same station, Wadesboro, had offered them every assistance in his power.

THE annual meeting of the members of the Royal Institution was held on May 1st. The annual report of the Committee of Visitors for the year 1899, testifying to the continued prosperity and efficient management of the Institution, was read and adopted, and the report on the Davy Faraday Research Laboratory of the Royal Institution, which accompanied it, was also read. Sixty-three new members were elected in 1899. Sixty lectures, 17 evening discourses, and two centenary commemoration lectures were delivered in 1899. The books and pamphlets presented in 1899 amounted to about 280 volumes, making, with 672 volumes (including periodicals bound) purchased by the managers, a total of 952 volumes added to the library.

THE Association of Economic Entomologists will as usual hold its annual meeting in conjunction with the American Association for the Advancement of Science. It will meet at Columbia University, New York City, on June 22d and 23rd. A joint session with the Society for the Promotion of Agricultural Science will be held on the morning of June 23rd. Members of the Association are requested to send to

the Secretary, Mr. A. H. Kirkland, Malden, Mass., at their earliest convenience, titles of papers that they desire to read.

THE council of the Royal Geographical Society has awarded the two Royal Medals for this year to Captain H. H. P. Deasy and Mr. James McCarthy. The Founders' Medal has been awarded to Captain Deasy for the exploring and survey work which he has accomplished in Central Asia during two expeditions lasting three years altogether. He was incessantly engaged in surveying in districts where an experienced professional surveyor would find exceptional difficulties. As tested by the Indian Survey Department, his mapping is scientifically constructed on thorough survey principles. His observations on the great extent of country traversed and on the people are of high geographical value. Mr. McCarthy is the Government Surveyor of Siam, and the Patron's Medal has been awarded to him for his great services to geographical science in exploring all parts of the Kingdom of Siam, for his laborious work during twelve years in collecting materials for a map, to form the basis of a survey system, and for his admirable map of Siam just completed. The other awards have been made as follows: The Murchison award to M. Henryk Arctowski for the valuable oceanographical and meteorological work which he performed on the Belgian Antarctic expedition; the Gill Memorial to Mr. Vaughan Cornish for his researches, extending over several years, on sea-beaches, sand-dunes and on wave-forms in water; the Back grant to Mr. Robert Codrington for his journeys in the region between Lakes Nyassa and Tanganyika, during which he removed, on behalf of the Society, the section containing the inscription from the tree under which Livingston's heart was buried; and the Cuthbert Peek grant to Mr. T. J. Alldridge for his journeys during the past ten years in the interior of Sierra Leone, during which he has done valuable geographical work.

THE 71st anniversary meeting of the Zoological Society of London was held on April 30th. The report stated that the income had been £28,879, a decrease of £328 as compared with that for 1898. The average annual re-

ceipts of the Society for the previous ten years had been £26,370. The ordinary expenditure of the Society for 1899 had amounted to £26,884, an increase of £904 over that of the previous year. Besides this a sum of £2537 had been paid and charged to extraordinary expenditure, having been devoted mainly to the construction of new buildings in the gardens and to the acquisition of a young male giraffe. After payment of the ordinary and extraordinary expenditure a balance of £1043 had been carried forward. The number of visitors to the gardens in 1889 had been 696,707, being 14,241 less than the corresponding number in 1898. The number of animals living in the Society's gardens on December 31st last was 2753, of which 821 were mammals, 1471 birds, and 461 reptiles and batrachians. Amongst the additions made during the past year 13 were specially commented upon as being of remarkable interest and in most cases new to the Society's collection. Of these by far the most noticeable objects exhibited for the first time were the splendid pair of Grévy's zebras, placed under the care of the Society by the Queen on August 14, 1899. These animals had been presented to her Majesty by the Emperor Menelek, of Abyssinia. The Council also called special attention to the young male giraffe, acquired on April 1, 1899, by purchase for £800. It was believed that this animal, together with the female purchased in 1895, formed the only pair of young giraffes now to be found in any of the zoological gardens in Europe. The meeting elected the new members of the Council and the officers for the ensuing year as follows: Lord Avebury, Mr. William Bateson, F.R.S., Sir Joseph Fayrer, F.R.S., Mr. P. Chalmers Mitchell and Mr. Oldfield Thomas to the Council in the place of the retiring members, and the Hon. Walter Rothschild, M.P., Professor George B. Howes, F.R.S., and Lieutenant-Colonel Leonard H. Irby re-elected. The Duke of Bedford was re-elected President, Mr. Charles Drummond, Treasurer, and Mr. Philip Lutley Sclater, F.R.S., Secretary.

PROFESSOR FREDERICK STARR, of the University of Chicago, has returned from his tenth journey of study and investigation in Mexico. The expedition was assisted by Mrs. Frank G.

Logan, of Chicago. The chief object in view was to study the physical types of the Indians of southern Mexico. This study, begun two years ago and carried on by Professor Starr in his last two journeys, makes use of three methods of investigation—measurement, photography and plaster work. In each tribe visited, measurements are made upon one hundred men and twenty-five women—fourteen different measures being taken of each subject. Photographs are made of good types, a front and profile view being made of each. Views are also made of scenery, towns, groups, houses, occupations, etc., etc. Five persons of each tribe—notable types—are subjected to the operation of bust-making; plaster mixed with water is applied directly to the subject to form a waste-mold in which the bust is afterwards run. Five tribes were examined—the Chinantecos, Chochos, Mazatecos, Tepehuas and Totonacos. These tribes are conservative and clannish and all retain their own languages, although Spanish is understood to some extent in all their towns. Of the Tepehuas, whose linguistic relationship has been uncertain, a fair vocabulary was secured. The survival of the ancient art of beating paper from the bark of trees, was investigated among the Otomis in the mountains of the states of Hidalgo and Puebla. The survival of the pagan practices among the Tepehuas and Otomis of the same district was somewhat studied. Several days were spent among the Tlaxcalan villages on the slopes of Mount Malintzi and many curious data were secured relative to life and customs. Other minor but interesting studies were made. It is hoped that the results of the expeditions may all be printed within the next two years. The party consisted of four persons—the director, the photographer, Louis Grabic; the modeler, Ramon Godinez, and a helper, Manuel Gonzales. The expedition involved five hundred miles of horse-back riding in the most mountainous regions of the states of Oaxaca, Hidalgo and Puebla. Of the tribes visited the Chinantecos and Tepehuas were the most interesting and best known. Professor Starr hopes to complete his work next year by a study of the tribes of the Huasteca, Chiapas and Yucatan.

At an extra meeting of the British Institution

of Civil Engineers, held in April at its house in Great George-street, the eighth 'James Forrest' lecture was delivered by Sir William Preece, the subject being the 'Relations between Electricity and Engineering.' According to the *London Times* the lecture began with a statement of four fundamental principles underlying the practical applications of electricity and illustrated them with some elementary experiments. Sir William Preece pointed out that electricity was purely mechanical in its effects. It required matter to render it evident to the senses. Its transference was characterized by motion, chiefly undulatory as regards the ether, but partaking of the most known forms as regards conductors and insulators. It was, therefore, essentially a dynamical agent in the hands of the engineer to carry out his duties. The lecturer proceeded to discuss the applications of electricity under a number of heads. Among these were the purification of matter; the annihilation of space, as for instance in the telegraph, the telephone, and the use of electrical energy to move railway signals and points; the transmission of power, including the employment of electric motors to drive the machines in manufacturies; traction, including electric railways and automobile cars, the lecturer believing that the motor-car of the future will be electrical; electricity in war; and sanitation. In conclusion he said there was now a distinct line of demarcation separating the physicist from the engineer. The former dived into the unknown to discover new truths; the latter applied the known to the service of man. Research was the function of the one, utility that of the other. In the past the engineer had to rely upon himself for his facts, but the advance of modern science, the growth of technical education, the formation of laboratories, and the endowment of chairs, had changed all that. We could scarcely hope for new sources of energy to be discovered but there were some known ones as yet untouched. When the evil day arrived for our coal supplies to give out we might perhaps be able to utilize the heat of the sun and the tides of the ocean. There was, however, a vast illimitable store of energy not only in the rotation of the earth upon its axis, but in the eternal heat of this globe itself. As

we descended below the surface the temperature became higher and higher, and it ought not to be difficult to reach such temperatures that by thermo-electric appliances we might convert the lost energy of the earth's interior into some useful electric form.

WE learn from the *British Medical Journal* that Mr. A. L. Jones, whose name has for some time been associated with the Liverpool School of Tropical Medicine, has set on foot a scheme for assisting natives of tropical colonies to go to Liverpool to study medicine and obtain a qualification to practice. The African Steamship Company has consented to convey to and from England any natives of Africa who desire to avail themselves of this arrangement at a greatly reduced cost, and it is calculated that it will be possible for them to fulfill the five years' curriculum and obtain their qualification to practice at a cost of about £600, including the passage money and the expenses of living. Messrs. Elder, Dempster and Co. have addressed a circular to the respective Governors of the West African Colonies, asking them to bring the scheme to the notice of schoolmasters and others in touch with secondary education, and seeking for information as to how far the education in the colony is organized to admit of natives being prepared for one of the preliminary examinations recognized by the General Medical Council. It is intended to include West Indian natives in the scheme.

IN presenting Mr. Charles Hose for the honorary degree of Doctor of Science at Cambridge University, the Public Orator, Dr. Sandys, stated, according to the *London Times*, that for the last ten years, Mr. Hose had been the Resident of the Baram district in Borneo, in that part of the island which was under the rule of Sir Charles Brooks, Rajah of Sarawak. As Resident, Mr. Hose had, in a masterly manner, put an end to an inveterate blood feud between two hostile tribes, and had diverted their energies from the pursuits of war by the peaceful institution of an inter-tribal boat race. At the sacrifices connected with the ratification of the treaty of peace, he had proved himself a most skillful *haruspex* by finding in the flesh of the victims omens of peace and prosperity to all the

tribes of the district; while in his scientific knowledge of the birds of Borneo, he had also proved himself an *augur et auspex admirabilis*. It was under his auspices that the museums of Switzerland, Holland, Germany, France, and England had successively been supplied with many important specimens of the birds and mammals of Borneo; while his own researches had thrown a new light on the zoology, the anthropology, and the geography of the island. He had thus extended the bounds of science near the confines of the British Empire. In recognition of the value of his scientific work, he had received distinctions from the Royal Geographical Society and from other bodies, and among the honors he had received from the nations of Europe was the not inappropriate title of 'Knight of the White Falcon' of Sachs-Weimar. Lastly, for more than ten years he had been a constant and generous benefactor to the Cambridge Museums of Zoology, Anatomy, and Archæology; and, only two years ago, he had given the most cordial welcome and the most valuable assistance to the Cambridge Anthropological Expedition to New Guinea and Borneo.

THE Friday evening discourse at the Royal Institution was given on April 13th by Lord Kelvin, whose subject was 'Nineteenth Century Clouds over the Dynamical Theory of Heat and Light.' Sir Frederick Bramwell was in the chair, and among those present were Sir George Stokes, Sir Andrew Noble, Sir Frederick Abel, Sir William Crookes, Sir J. Wolfe-Barry and Sir James Crichton-Browne. Lord Kelvin said, according to the *London Times*, that there were only two clouds to obscure the beauty and clearness of the dynamical theory which might be briefly expressed by saying that heat and light were modes of motion. The first came into existence with the undulatory theory of light, and was dealt with by Fresnel and by Dr. Thomas Young; it involved the question, how could the earth move through an elastic solid, such as the luminiferous ether was supposed to be, far more easily and freely than the 'wind through a grove of trees'? This cloud hung heavy and undispersed. Some years ago Michelson made a beautiful experiment to discover whether the ether

passed freely through the earth, and *vice versa*. Lord Kelvin still hoped that it did, but from the results of that experiment, which proved that it did not, he could see no way of escape. The second cloud over the dynamical theory was the Maxwell-Boltzmann doctrine of the partition of energy. Here the outlook was less sombre. He held that mathematics had not proved the doctrine and that the doctrine was not true. Still he did not know any one but himself that attacked it, and his own views had been attacked by Poincaré, Lord Rayleigh, and other distinguished mathematicians, though none of his assailants had proved the proposition. Lord Kelvin proceeded to give some illustrations of the doctrine, and emphasized the labor and difficulty of putting it to experimental tests. Its mathematical consequences indeed sometimes appeared to be contrary to common sense, but that was not conclusive, for mathematics must never be judged by common sense. Still, within the last few months he had worked out a large number of cases and had obtained results that did not agree with the doctrine. The simple way, therefore, to destroy this second cloud on the dynamical theory was to drop the destructive general conclusion of the Maxwell-Boltzmann distribution. In conclusion, Lord Kelvin brought forward some considerations respecting the structure of the atom and the nature of the ether, regarded as a true imponderable outside the law of universal gravitation.

#### UNIVERSITY AND EDUCATIONAL NEWS.

THE endowment fund committee of Brown University has issued a statement of the condition of the fund. The effort to raise \$1,000,000 in order to secure the conditional gift of \$250,000 of John D. Rockefeller resulted in securing in cash, legacies and pledges \$700,000. The remaining \$300,000 must be pledged by commencement in order to make Mr. Rockefeller's gift available.

YALE UNIVERSITY has purchased land opposite the State Hospital for its medical school.

THE Cambridge University General Board proposes to establish a lectureship in ethnology

for Dr. Haddon and a lectureship in bacteriology and preventive medicine for Dr. Nuttall. New lectureships in experimental physics and agricultural chemistry are also recommended.

THE *Educational Times* states that active steps are now being taken for the establishment of Commercial Universities at Marseilles, Hamburg, and Berlin. The advance of commercial education is very marked in Japan. The establishment of an Imperial High School of Commerce at Tokio has had such satisfactory results that a like school is now in contemplation for Osaka, and the creation of a degree of Doctor of Commercial Science is under discussion. There are four grades of commercial schools in the Japanese Empire. In schools of the second and third grades, designed for youths who have completed their fourteenth year and will devote three to five years to special study, amongst the subjects taken up we find ethics, Japanese, Chinese, and English (or other foreign language), mathematics, geography, history, economics, commercial legislation, bookkeeping, commodities, principles of commerce, business practice, and gymnastics, together occupying respectively thirty and thirty-three hours a week, with a five years' course. In the third grade correspondence and commercial arithmetic figure as additional subjects, and the whole course is more extensive.

EDWIN A. ALDERMAN, for several years president of the University of North Carolina, has accepted the presidency of Tulane University, New Orleans.

DR. CHARLES W. GREEN of Leland Stanford University, has been elected to the professorship of physiology in the University of Missouri. Dr. Green is a graduate of Leland Stanford, '92, and for the last two years has been assistant professor of physiology at that University.

HERBERT G. LORD, A.M. (Amherst), has been appointed professor of philosophy in Columbia University. He will have charge of the introductory collegiate courses.

TEACHERS COLLEGE, Columbia University, has awarded four fellowships as follows: Frank P. Bachman, A.B. (Chicago); Edwin C. Broome, Ph.B. (Brown); Rufus C. Bently, A.B. (Nebraska); John W. Hall, A.B. (Colorado).