

and also in meteoric bodies, as has already been noticed in these notes. It, therefore, appeared to be of interest to determine if it is present in the sun. A paper on this subject has been read by these authors before the Royal Dublin Society. The first problem was to determine with great accuracy the wave-lengths of the principal lines in the spectrum of gallium. This was accomplished by photographing the spectrum of gallium with the 21.5-foot radius grating spectrograph in the Physical Laboratory of the Royal University of Ireland. The wave-length of the two principal lines was found to be 4,172.215 and 4,033.125. In Rowland's map of the solar spectrum 4,172.211 is given as an aluminum line and 4,033.112 as not identified. As gallium is present in every bauxite and shale and every specimen of aluminum examined by the authors there is no doubt that this line should really be attributed to gallium and not to be aluminum. Gallium must, therefore, be added to the list of elements known to occur in the sun; which only emphasizes the widespread occurrence of this element in nature.

J. L. H.

#### SCIENTIFIC NOTES AND NEWS.

##### CIVIL SERVICE EXAMINATIONS IN SCIENCE.

Two important scientific positions are to be filled under the Smithsonian Institution, by examination, on June 7th.

One of these is that of Assistant Curator, Division of Mammals, U. S. National Museum, with a salary of \$1,500 per annum. Competitors will be rated in the elements of education, experience, publications and thesis, which will be weighted 10, 15, 50 and 25, respectively. Applicants will be furnished with the subject for the thesis, and with special forms upon which it is to be submitted. The Department states that it is desirable that persons certified for this position shall be men not less than 25 nor more than 40 years of age, and that they should possess a good general education (college graduates preferred); a general knowledge of zool-

ogy, and a thorough knowledge of mammalogy, more especially as relating to the North American fauna; they should have a practical knowledge of field-collecting, and of museum methods of preserving, arranging and labeling collections.

The second vacancy is in the position of Physicist, for special work in connection with the Astrophysical Observatory, Smithsonian Institution, at a salary of \$1,000 to \$1,200 per annum. This examination will consist of the subjects below, which will be weighted as follows:

General physics,.....	7
Physical laboratory training,.....	5
Treatment of observations,.....	2
Mechanical drawing,.....	2
French,.....	1
German, .....	1
English,.....	2
Total,.....	20

##### MUSEUMS OF THE SCIENCE AND ART DEPARTMENT, LONDON.

THE Select Committee appointed to inquire into and report upon the administration and cost of the Museums of the Science and Art Department have agreed to the following first report:

Since the issue of the report of the Museums of the Science and Art Department Committee in July, 1897, your committee have continued the inquiry, but reserve for a further report the publication of additional evidence with their final review and recommendations.

They feel, however, bound to report without delay certain conclusions at which they have arrived, on consideration of the evidence, as regards the South Kensington Museum and the Geological Museum in Jermyn-street.

They are unanimously of opinion that with a view to present efficient management, to economy of administration, to future development of the collections, and to their full use for the purpose of exhibition and of instruction, it is necessary:

1. That the whole area on the east side of Exhibition-road (except that occupied by the Royal College of Science, which cannot be sacrificed except at great cost) be exclusively devoted to the Art Museum and the Art Library,

with provision for the conduct of the business connected with Loans of Art Objects and the Art Schools. They are satisfied that the whole of this space is required for the Art Schools, the due exhibition of the Art Collection and the administration connected with such a museum.

2. That provision for the whole of the Science Collection, the Science Library, for Loans of Scientific Objects and for the Science Schools be made on the west side of the Exhibition-road.

They are convinced that this concentration of Art on one side of the road and of Science on the other is essential to good administration, to satisfactory results from the money expended, and efficiency both in the museum and in the schools. This arrangement would allow space for the future development both of the Art and of the Science branches.

They also unanimously recommend that the Geological Museum in Jermyn-street be no longer occupied for the same purposes as now, and that the collections there exhibited be removed to the west side of Exhibition-road and made part of the Science collections.

#### OBSERVATORIES ON THE AZORES.

As we have already stated, the Prince of Monaco, on April 29th, brought to the notice of the Royal Society the project which he suggested to the British Association in 1892, of establishing a meteorological station on the Azores. As reported in the *London Times*, he said its objects, as he conceived them, were the observation of certain atmospheric disturbances apparently formed in this region, and the correction of the path assigned to others that are announced from America at too great a distance of time and space for there to be any assurance that their strength and direction may not be considerably modified before they reach European coasts. He pointed out that at such an observatory the study of seismic phenomena could be advantageously carried on, because in certain circumstances earthquakes felt in Europe had previously affected the Azores. Moreover, in the study of terrestrial magnetism, being situated in mid-ocean, it could render useful service, for the increasing use of elec-

tricity for lighting and traction was making it more necessary that magnetic observations should be carried out in very remote places. Observations made on the Azores would benefit many countries directly, because they interested all branches of the nautical profession as well as the populations of the western coasts of Europe. Since the scheme was first mentioned, in 1892, an event which he had awaited with much impatience had, the Prince said, arrived to help it, and that was the establishment of telegraphic communication between the Azores and Europe. Soon after this was done the Portuguese government gave effect to his views by setting up on the Island of San Miguel, under the direction of Captain Chaves, a regular meteorological station, which, however, was most modestly equipped. Finally, last year Captain Chaves was commissioned to establish on the Island of Flores, the most westerly of the Azores, a second station whose observations would usefully supplement those of San Miguel. Unfortunately this was even poorer than the other, and was not yet reached by the telegraph cable. In order that science might the sooner profit by the advantages promised by this observatory, and in order to guard against interruption of its functions, he proposed to give it a constitution founded on the principle of an international guarantee to be secured by the pecuniary contributions of the countries concerned. He suggested that this arrangement might be carried out by the various countries bearing the expense of the particular class of observation in which each was interested. One, for instance, might support observations on magnetic phenomena, another on those of the winds, and so on. Portugal, accepting the principle of an international *régime*, had commissioned Captain Chaves to invite the maritime nations concerned to give their adhesion to the project and to associate themselves with the organization of this meteorological service. It might, therefore, be hoped that in the near future an understanding would be arrived at as to the development of the observatories on the Azores, and he asked the Royal Society to use its great influence in the domain of science for securing the accession of England to the ideas he was upholding.

## GENERAL.

PROFESSOR GEORGE H. DARWIN, of Cambridge, England, was elected a foreign honorary member of the American Academy of Arts and Sciences at its meeting of May 11th, in place of the late Professor J. J. Sylvester.

PROFESSOR NICHOLAS SENN, of Chicago, has been appointed Assistant Surgeon-General of the army with the rank of Lieutenant-Colonel.

PROFESSORS METCHNIKOF and Roux, of Paris, have been elected honorary members of the Imperial University of Kieff.

THE council of the Institution of Civil Engineers, London, have made the following awards for papers read and discussed before the institution during the past session: Watt medals and premiums to Messrs. H. L. Callendar and J. T. Nicolson, B.Sc.; a Telford medal and premium to Mr. A. H. Preece; George Stephenson medals and premiums to Messrs. Whately Eliot and W. O. E. Meade-King; a Crampton prize to Mr. E. W. Anderson; Telford premiums to Messrs. L. B. Atkinson, Henry Fowler and W. L. Strange.

THE meeting of the British Association for the Advancement of Science in 1899 will be held at Dover, September 13th–20th. The meeting of the French Association will be held at nearly the same time at Boulogne, so as to enable the two associations to interchange visits. The preliminary arrangements for these meetings have already been made, and Professor Michael Foster will be nominated President for the meeting of the British Association at Dover. The meeting of the British Association in 1901 will be held at Glasgow. An important exhibition will be open in that city at the same time. The place of meeting for the previous year is not yet fixed, but we understand that an invitation to hold it at Bradford, Yorkshire, will be presented to the Association at the Bristol meeting next September.

AT a recent meeting of the General Committee of the Philosophical Society, Washington, a special committee, consisting of the President of the Society, Mr. Frank H. Bigelow; the Chairman of the Committee on Communi-

cations, Mr. J. H. Gore, and a Past-President, Dr. William H. Dall, was appointed to consider new lines of work and activity appropriate to the usefulness of the Society in the future.

THE death is announced, in *Nature*, of Dr. Karl Ludwig Fridolin von Sandberger, who until recently was professor of mineralogy and geology in the University of Würzburg, and Director of the Mineralogisches Institut. Although known for his many important contributions to mineralogical science, to the study of ore deposits and to the microscopic structure of eruptive rocks, he was likewise distinguished for his researches on the fossil Mollusca of various formations in the Rhenish provinces and other parts of Germany. His published works date back to 1847. During the years 1850–56 he issued, in conjunction with his brother, Dr. Guido Sandberger, ‘Die Versteinerungen des rheinischen Schichten-systems in Nassau,’ a work remarkable for the beauty of its illustrations and the fidelity of its descriptions, and one which was honored by the award of the Wollaston Fund, which was given to the authors by the Council of the Geological Society in 1855. In 1863 Dr. Fridolin Sandberger published ‘Die Conchylien des Mainzer Tertiärbeckens;’ in 1870–75 he issued, in two volumes, ‘Die Land-und Süßwasser-Conchylien der Vorwelt;’ and in 1882–85, ‘Untersuchungen über Erzgänge,’ an authoritative work on the subject of mineral veins. In the course of his long labors he turned his attention to the Mollusca of many different formations, from those of Devonian age to those of Pliocene and Pleistocene deposits. In later years his work became more concentrated on mineralogical science. In 1875 he was elected a foreign member of the Geological Society of London. He was born in 1826, and died at Würzburg on April 11th.

WE regret to record the deaths of Dr. Hermann Kämmerer, professor of chemistry at the Industrial School at Nuremberg, on April 12th, at the age of fifty-eight years; of Dr. Samuel Gorden, President of the Royal Academy of Medicine of Ireland, and President of the Royal Zoological Society of Dublin; and of M. Demontzey, Correspondent of the Paris

Academy of Sciences (Section of Rural Economy).

At the Royal Institution, London, on May 12th, Lord Rayleigh delivered the first of a course of three lectures on 'Heat,' and on May 21st Mr. J. Arthur Thomson will begin a course of two lectures on 'The Biology of Spring.' The Friday evening discourse on May 6th was by Mr. E. A. Minchin, whose subject was 'Living Crystals.'

PROFESSOR H. G. SEELEY, F. R. S., is again conducting the annual course of excursions of the London Geological Field Class, arranged to illustrate the physical geography and geology of hills, valleys and rivers in the basin of the Thames. The following meetings were arranged for the present month: May 7th, Greenwich Park and Charlton; May 14th, Aylesbury; May 21st, Highgate and Hampstead.

A MEETING of the New England Association of Chemistry Teachers was held in the United States Hotel, Boston, on May 14th. There was a short business session and a dinner. Professor Theodore William Richards, of Harvard University, spoke on 'The Aim of the Harvard Requirements in Chemistry.'

THE Horticultural College at Swanley is for the first time opening courses of instruction to non-resident students of both sexes. Courses of lectures will be given during the summer—on 'Soils,' by Professor Warington, of Oxford; the 'Psychology of Plants,' by Professor Henslow, of the Royal Horticultural Society; and on the 'Culture of Flowers and Vegetables,' by the Misses Dean. Classes will also be held in bee and poultry keeping.

THE Russian government has decided to introduce the metric system of weights and measures throughout the Empire, and by order of the Czar a decree to this effect has been submitted to him for signature.

THE steam yacht 'Windward,' loaned to Lieutenant Peary for his Arctic expedition by Mr. Harmsworth, has arrived in New York, fifty-two days after leaving London.

AN electrical exhibition of much interest is now in progress in the Madison Square Garden,

New York. Many of the exhibits are chiefly of technical interest, and others are arranged to attract spectators. But the exhibit as a whole deserves the attention of the student of physical science.

WE incidentally noticed last week that a kinematograph of the eclipse of the sun taken by Rev. C. M. Bacon, at Buxar, had disappeared. The London papers announce 'a reward of fifty pounds for the arrest of the person or persons who on Wednesday last stole a kinematograph negative of the last total eclipse of the sun, between the Royal Albert Docks and Egyptian Hall, in Piccadilly.'

THE House of Representatives has passed a bill appointing three commissioners to propose necessary revision of the statutes relating to patents, trade and other marks, and trade and commercial names. The commissioners are to be named by the President, and are to report to Congress such proposed revisions as may appear necessary to make the laws conform to recent international agreements.

AMBASSADOR WHITE has forwarded to the State Department a copy of a note from the German Foreign Office in regard to restrictions placed on United States fruit imported into Germany, from which it appears that the Imperial Chancellor has, in accordance with the opinion of experts, divided plants into three groups, namely: 1. Those absolutely prohibited. 2. Those admitted unconditionally; and 3. Those admitted upon being found free from the San José scale, after examination.

AN extraordinary feat was performed by the engineers of the Great Northern Railway at Hatfield; and by the engineers of the Pennsylvania Railroad, later, a greater feat was performed in the replacement of bridges on those lines. In the one case the replacement of the structure was effected in fifty minutes; in the other instance it required but *two minutes and twenty-eight seconds*. An English technical journal, at the time, asserted that the first statement was 'creditable and credible,' but that the second was entirely beyond belief. The whole story of the second of the two wonderful performances is, however, told by Mr. Joseph Richards, of the A. S. C. E., in a paper

read before the Engineers' Club of Philadelphia, December 4, 1897, and now in type. The method adopted is described and the statement above confirmed. As the English editor says, after reading it and frankly admitting its truth: "It is the old story of Columbus's egg; the thing is very simple when you know how to do it, and American engineers deserve credit for knowing how."

MR. J. G. JACK is conducting a series of lectures and field meetings at the Arnold Arboretum, Jamaica Plains, during May and June, for the purpose of supplying popular instruction about the trees and shrubs which grow in New England. The lectures are held on Saturday mornings at ten o'clock and on Wednesday afternoons at three o'clock, beginning on Saturday, May 7th, and closing June 25th. The class assembles each day in the lecture-room of the Bussey Institution, where a review is given of certain groups of trees and shrubs. It then adjourns to the Arboretum for an informal out-door study of the plants.

THE bill before the Massachusetts Legislature for the promotion of anatomical science, a measure amending the present law relative to the disposal of bodies for dissection, so that the four leading colleges of the State shall have the bodies of paupers from State institutions, unless the pauper requests an ordinary burial, during his last illness, or the same request is made by one of his friends, has been ordered for a third reading by a vote of eighty-three to forty.

THE Governor of Hong Kong has reported to the Secretary of State for the Colonies that there have been 609 cases of plague in that colony during the current year. The return is complete up to April 25th, and in the last week which it embraces there were 127 cases, or over one-fifth of the total for the four months. Cultures of bacilli from suspicious cases of illness in Calcutta have been sent to Bombay to be subjected to Professor Haffkine's examination and have been pronounced to be those of true bubonic plague.

It is stated in *Nature* that the Liverpool Marine Biology Committee's Easter party, at the Port Erin Biological Station, included Mr.

Isaac C. Thompson, Mr. Frank J. Cole, Mr. R. A. Dawson, Mr. H. C. Chadwick, Professor Herdman, and several students from University College, Liverpool. The Lancashire Sea Fisheries steamer is also at Port Erin, and several dredging and trawling expeditions are taking place. Spawn of several fishes has been obtained and fertilized, and is now developing in the tanks. Under the care of Mr. Chadwick, Curator of the Station, the aquarium is in a flourishing condition, and contains a number of interesting animals, some of which are spawning. A recent addition to the laboratory accommodation at the Station has been completed, which gives five additional work windows for students, so that there is now plenty of room for other workers.

THE will of the late Mr. Oliver A. Judson, of Philadelphia, has bequeathed to the College of Physicians of that city \$1,000, the interest, whenever it amounts to \$100, to be offered as a prize for the best original essay on 'The Practical Prevention of Disease.' The essay must be written in English, but the competition is open to foreigners.

MR. BERNARD QUARITCH, London, offers for sale a complete set of the transactions of the Zoological Society, London, beginning in 1833, for £52 10s. The set is very rare and being sold much below the cost of publication would be a valuable addition to many American libraries. A copy of the first edition of Izaak Walton's *Compleat Angler* was sold recently in New York for \$240.

THE arrangements for laying the cable from Iceland by way of the Farøe Islands have been completed, and the cable will be laid during the summer.

#### UNIVERSITY AND EDUCATIONAL NEWS.

OWING to demonstrations upon the part of the students, the Universities of Naples, Bologna and Rome have been closed.

THE next meeting of the Association of Colleges and Preparatory Schools of the Middle States and Maryland will be held at Columbia University, New York City, N. Y., on Friday and Saturday November 25 and 26, 1898.

PLANS have been completed for a new build-