the possibility of two more before the year closes.

The mid-winter meeting will be held at Cleveland, Ohio.

SCIENTIFIC NOTES AND NEWS.

RAILWAY SPEED IN GREAT BRITAIN.

Mr. Charles Rous-Martin, an English authority on railway working, published a paper in the London *Engineer* of August 9th, in which he discusses what has come to be called 'the railway race to Aberdeen,' between the East and the West Coast routes. It began July 1st by the reductions of the schedule time from 11 h. 35 m. and 11 h. 50 m. to 11 h. 40 m. by the West Coast line. East Coast, then, came to 11 h. 20 m.; then West Coast to 11 hours. Next East Coast made the 523 miles in 10 h. 45 m., July 22 and, the same day, West Coast 543 miles in 10 h. 45 m. The last figures to date were 10 h. 25 m. and 10 h. 20 m. The running speed ranges between 60 and 75 miles an hour, which figures have been repeatedly bettered, previously, for short distances, by local trains. The higher the speed, the steadier was the motion of the train. The present writer came up from Perth to Edinboro' on such trains and can report extraordinarily easy and smooth motion of engine and carriages at speeds estimated to be much above seventy miles for considerable distances. It is concluded that the American system of 'bogie' or 'truck' is much better than the old English six-wheeled rigid type of carriage. The East Coast line employed single drivers 7 ft. 7 in. to 8 ft. 1 in. diameter and the West Coast two pairs coupled of 6 ft. 6 in. diameter. Speeds of 80 miles were sometimes touched; but rarely were the velocities considered extraordinary. The engines were in some cases simple, sometimes compound. All did magnificent work. The loads were 180 to 200 tons. R. H. T.

ROYAL SOCIETY OF NEW SOUTH WALES.

The Society offers its Medal and £25 for the best communication (provided it be of sufficient merit) containing the results of original research or observation upon each of the following subjects:

Series XV.—To be sent in not later than 1st May, 1896. On the origin of Multiple Hydatids in man. On the Occurrence of Precious Stones in New South Wales with a description of the Deposits in which they are found. On the effect of the Australian Climate on the Physical Development of the Australian-born Population.

Series XVI.—To be sent in not later than 1st May, 1897. On the Embryology and Development of the Echidna or Platypus. The Chemical Composition of the Products from the so-called Kerosene Shale of New South Wales. On the Mode of Occurrence, Chemical Composition, and Origin of Artesian Water in New South Wales.

The competition is in no way confined to members of the Society, nor to residents in Australia, but is open to all without any restrictions whatever, excepting to members of Council for the time being. The communication to be successful must be either wholly or in part the result of origin observation or research on the part of the contributor. The Society is fully sensible that the money value of the Prize will not repay an investigator for the expenditure of his time and labor, but it is hoped that the honour will be regarded as a sufficient inducement and reward. The successful papers will be published in the Society's Annual Volume. Fifty reprint copies will be furnished to the author free of expense. Competitors are requested to write upon foolscap paper—on one side only. A motto must be used instead of the writer's name, and each paper must be accompanied by a sealed envelope bearing the motto outside, and containing the writer's name and address inside.

All communications are to be addressed to the Honorary Secretaries, T. W. E. David and J. H. Maiden, The Society's House, 5 Elizabeth Street, Sydney.

GENERAL.

THE Kansas University Geological Expedition has returned from the field with large and valuable collections of Mesozoic and Tertiary vertebrate fossils, aggregating nearly five tons in weight. Among the material are two complete skeletons of *Bos antiquus*, which will be mounted in the museum; an excellent skull of *Monoclonius* (*Triceratops*) and a specimen of *Hesperornis*, which is unequalled in any collection for perfection and completeness, and is of especial interest from the fact that the chalk slab upon which it is lying shows clear impressions of the dermal covering.

A FEDERAL DECREE published in the 'Diario Oficial,' on the 25th June, established the metric system of weights and measures obligatory in the United States of Mexico, on and after September 16, 1896. The metric system has been in use in the government departments of Mexico for some time past; the decree makes it the sole legal system throughout the Republic and will do away with the heterogeneous old Spanish measures hitherto tolerated in ordinary business transactions.

AFTER one of the sessions of the Section of Mechanical Science and Engineering of the A. A. A. S. the members were invited to inspect the Duryea motor wagon, and saw the carriage in successful operation. Some of the members rode in it and were delighted with the ease with which the carriage could be managed and the way in which it performed its work. The Messrs. Duryea began their study of this subject in 1886, began construction in 1891, and the present carriage was completed last March. Further improvements have been made which will be embodied in the next one constructed. The tires are pneumatic and the general appearance of the carriage is very nearly like the ordinary piano-box type.

ON the occasion of the visit of members of the A. A. A. S. to Amherst, Professor Emerson exhibited the important paleontological, geological and mineralogical collections belonging to the College. Professor Emerson's laboratory and lecture-room was, from a pedagogical point of view, of much interest. One of the appliances was a blackboard constructed on what seems to be a new principle. The face was of ground glass in a hinged frame with a black surface back of the glass. This makes a good blackboard in itself, but its special advantage is that diagrams can be inserted back of the glass, and the drawing can be continued in the presence of the students.

Nature states that a civil list pension of £200 has been granted to Mrs. Huxley.

The Educational Review for September contains three of the principal evening addresses given before the Denver meeting of the National Educational Association:—the Presidential address, by Prof. N. M. Butler, on 'What Knowledge is of Most Worth,' an address by Prof. Joseph Le Conte, on 'Evolution and Education,' and an address by Prof. W. H. Payne, on 'Education According to Nature.' *The Review* also contains the reports of two committees presented to the National Council of Education:—one on the 'Laws of Mental Congruence and Energy applied to some Pedagogical Problems' and one on 'The Rural School Problem.'

THE daily papers contain a telegram from St. John stating that news of the Peary Relief Expedition has been received from the American schooner John E. Mackenzie, returning from the Greenland halibut fishery. The Mackenzie met the Kite with the expedition at Holsteinburg on July 15. At

Holsteinburg the Kite took aboard Professor Dyche, one of the members of the expedition, and sailed again that same evening. Very little ice was reported south of Greenland waters. The crew of the Mackenzie think the Kite will have no difficulty in reaching Whale sound, where Peary's headquarters are located. The return of the relief party is expected about the end of this month.

The conditions attached to the bequest of $60,000 made by the late Sir William Macleay to the Sydney University to found a chair of bacteriology are such that the University has decided to decline the bequest. The money will now revert to the Linnæan Society to maintain a bacteriologist who will carry on bacteriological investigations and also take pupils.

M. C. H. Frémont described before a recent meeting of the Paris Academy of Sciences a special microscope for the observation of opaque bodies. A concave mirror is placed within the tube of the microscope which reflects a ray of light through the lenses of the objective to the object.

Among recent appointments abroad, Professor Strahl, of Marburg, has been called to the chair of anatomy in the University of Giesen; Professor Hans Lenk, of Leipsig, to the professorship of geology in the University of Erlangen; Dr. Haecker, of Freiburg i. B., and Dr. v. Dalla-Torre, of the University of Innsbruck, have been made assistant professors of zoölogy.

On August 15th, Dr. Münch, the physicist, died at the age of 75 years. The deaths are also announced of M. H. Wittmeur, professor of minerology and geology in the University of Brussels, and of Dr. W. Fabritius, astronomer in the Observatory of Kiew.

La Nature states that an Ethnographical Exposition has been opened at Paris on the Champ-de-Mars by MM. Barbier, exhibiting a negro village of western Africa; not only the inhabitants, but also the manners and customs of the people are represented. The negro families occupy houses grouped according to their race, the architecture being a faithful imitation of the originals. Even native animals and plants have been introduced.

Prof. H. H. Powers, now of Smith College, has been called to the professorship of economics at Stanford University.

It is stated that Professor Carl Barus has constructed a new top for educational purposes. The 'peg' of the top consists of a writing stylus, adapted to pencil a graphic record of its motions upon a slate or sheet of paper. This motion of the 'peg' simulates the motion of precession about a movable axis which, in its turn, is in both rotational and translational motion. The complex spiral and cycloidal curves which may be thus obtained present an exceedingly beautiful appearance.

The *American Engineer and Railroad Journal* gives a full account, of the Japanese Industrial Exhibition opened in Kioto on April 1st. The present exhibition is the fourth of a series instituted in 1877 by imperial ordinance of Japan with the object of encouraging the development of agriculture, the arts and commerce. The former exhibitions were held in Tokio in the years 1877, 1881 and 1890. The fourth exhibition is held on the occasion of the eleven hundredth anniversary of the founding of the city of Kioto by Emperor Kwammu. The site for the exhibition is near the incline of the Lake Biwa Canal. The exhibition grounds are 42½ acres in extent. The buildings, eight in number, occupying an area of 305,388 sq. ft. are as follows: Industrial Building, Machinery Hall, Agricultural and Forest Building, Marine Products Building, Aquarium, Fine Arts Building, Live Stock Building and Ceremonial

Hall. The number of exhibits has increased from 16,703 in 1890 to 170,184 in 1895.

DR. LEBER, Professor of Opthalmology in the University of Heidelberg, has been awarded the Graefe Medal by the Opthalmological Congress recently held at Heidelberg.

THE American Electro-Therapeutic Association held its 5th annual meeting at Toronto on September 3d, 4th and 5th.

THE professorship of geology and mineralogy in the University of Toronto is vacant, owing to the resignation of Prof. Chapman.

PROF. PRICE, Commissioner of Fisheries of the Dominion of Canada, has been examining the coast of British Columbia with a view to finding a suitable place for lobster breeding.

PROFESSOR ADAMKIEWICZ, of Vienna, has been elected correspondent of the Paris Academy of Medicine in recognition of his researches on the nature and treatment of cancer.

DURING the month of September there will be held in Hamburg a meeting of the Society of German Physicians for the Insane, and in Stuttgart the annual meeting of the German Society for Public Hygiene.

MR. WILLIAM KENT has become a member of the editorial staff of *Engineering News*.

DR. ALBERT GÜNTHEE, F. R. S., has resigned his position as Keeper of Zoölogy in the Natural History Museum at South Kensington after having filled it for thirty years.

DR. JOHN SYER BRISTOWE, a London physician who acheived great success as a writer, pathologist and clinical teacher, died recently at Monmouth, at the age of 68. His treatise on the 'Theory and Practice of Medicine' first published in 1876 is regarded as one of the leading text-books on the subject and has passed through many editions. In 1888 he published 'Diseases of the Nervous System,' a collection of papers containing important contributions to neurology.

THERE will be held at Amsterdam on September 20th and 21st an International Congress of Railway and Marine Hygiene. The work of the Congress will be divided into three sections, dealing respectively with the securities for the physical competence of the staffs of railways and ships, the organization of the medical service, and the hygienic interests of employees and travelers.

MR. MARSHALL MCDONALD, Head of the United States Fish Commission, died on September 1st, at the age of 60 years.

PROFESSOR SVENON LOUIS LOVEN, a Sweedish zoölogist, died recently at the age of 86 years.

PROFESSOR HOPPE-SEYLER, of Strassburg, one of the founders of modern physiological chemistry, died on August 12th, at the age of 70.

We learn from the *British Medical Journal* that in the *Ugeskrift for Läger* Dr. Friis advances a claim on behalf of a Holstein schoolmaster named Peter Plett, to the honour of priority in the discovery of vaccination. Jenner's first vacination was, he says, performed on May 14th, 1796, but Plett had already done it in 1791. The latter was a tutor in a family at Schönweide in Holstein in 1790, and while there he heard that it was a matter of common knowledge that the milkmaids who had previously been infected with cow-pox never caught small-pox. Having by chance seen a medical practitioner perform inoculation, Plett conceived the idea that cow-pox lymph might be used for the purpose of conferring protection against small-pox. In 1791 he was at Hasselburg, and an epidemic of cow-pox occurring among the cows on a farm, he told the children under his charge to rub their hands with matter from the pus-

tules; as no result followed he himself vaccinated three of them without the consent or knowledge of their parents. He used a table knife for the purpose, making the incisions on the back of the hand, between the thumb and the forefinger. The operation was successful, and a year later, when the other children of the family suffered from small-pox, the three who had been vaccinated by Plett remained free from the disease. There appears to be no record of his having performed other vaccinations.

Ginn & Co. announce '*Chemical Experiments—General and Analytical*,' by R. P. Williams, instructor in chemistry in the English High School, Boston. The book contains 100 sets of illustrative experiments, about one-half in general chemistry and one-half in metal and acid analysis.

The Fifth International Congress for combatting the abuse of alcohol met at Bâle on August 20th, 21st and 23d. The president, M. Heemskirk, the Dutch Minister of State, opened the proceedings by a brief survey of the progress made since the last Congress held at the Hague in 1893. Papers on physiological and psychological effects of alcohol were read and discussed, including an elaborate paper on the effects of different kinds of alcoholic beverages by Dr. Lancelot, delegate of the French Minister of Public Instruction. The second day was devoted to the various anti-alcoholic organizations throughout Europe. On the third day the principal paper discussed the effect of alcoholic abuse in fostering crime. The majority of the members favored total abstinence. Brussels was decided upon as the place of meeting in 1896.

During the past ten years the extinction of wolves in France has proceeded rapidly. One hundred and eighty thousand francs were expended by the government in 1894 for the destruction of wolves. In 1895 the total reported is only 2,500 francs. The official reports state that there are now 55 departments where the presence of wolves is very rare.

It is stated that the report of the death of M. Lucien Bonaparte Wyse is incorrect, his name having been substituted for that of his brother, M. Napoleon Alfred Wyse.

At the last meeting of the Council of Manchester Museum, Owens' College, as reported in *The Lancet*, the library committee recommended that a grant of £400 per annum be made on condition that the Lancashire and Cheshire County Councils and the local district councils gave £800 a year. As an amendment it was proposed that the £400 should in any case be given.

CORRESPONDENCE.

WINDS AND OCEAN CURRENTS.

The article by Mr. Bache in a recent number of Science on the causes of the Gulf Stream brings up a number of points on which other opinions than those which he advocates may be fairly maintained. Some of these points have been indicated by Prof. Le Conte (Science, Aug. 16). The scheme of a northeast surface movement and southwest subsurface return of an oceanic circulation in the northern hemisphere, if uninterrupted by continents, is essentially a return to the untenable view advocated by Dove in his theory of atmospheric circulation; now displaced by Ferrel's much more satisfactory theory. The deducible circulation of the ocean, under convectional control alone, whether interrupted by continents or not, has been best stated by Ferrel, especially in several articles in Science, first series, 1886 or 1887; my file is not now at hand for precise reference.

While there is good reason to believe that the difference of density of the equatorial and polar waters produces a slow convectional circulation of the ocean, and is responsible for the low temperature of the great body of the torrid oceans, there is also good reason for thinking that the comparatively rapid and notably systematic, eddy-like circulation of the surface waters in the several oceans is determined essentially by the winds. The argu-