mittee decided to take up first the consideration of the proper form, system of graduation, limits of accuracy, manner of labelling, and methods of using glass volumetric apparatus. The committee has made a careful study of the work that has already been done in other countries on the subject, an account of which is given on pp. 527–550 of the Journal of the Society.

Your committee accordingly submits the following recommendations for your consideration:

1. That the American Chemical Society, in a manner consistent with its constitution and by-laws, ask the U. S. Office of Weights and Measures to adopt regulations for the verification of volumetric apparatus which shall be similar in purpose and scope to the regulations of the Kaiserliche Normal-Aichungs-Commission, after due consideration of the criticisms to which the latter have been subjected.

2. That the U. S. Office of Weights and Measures be asked to give special consideration to the question of a standard temperature or temperatures to be adopted for the graduation of volumetric apparatus, and to obtain as far as practicable an expression of opinion from American chemists on this point.

3. That the U. S. Office of Weights and Measures be asked to submit its regulations to the American Chemical Society, or a duly appointed committee thereof, for suggestions before final adoption by that office.

4. That the international kilogram be adopted as the standard of mass.

5. That the liter as defined by the International Committee on Weights and Measures, be adopted; *viz.*, the volume of the *mass* of a kilogram of pure water at the temperature of maximum density and under a pressure of 760 mm. of mercury.

6. That all density determinations be referred to water at its maximum density and under a pressure of 760 mm. of mercury.

7. That all temperatures be expressed in terms of the hydrogen thermometer of the International Bureau of Weights and Measures.

8. That if any question arise as to the interpretation of the above definitions the decision and standards of the U. S. Office of Standard Weights and Measures shall be accepted by the Society as final.

SCIENTIFIC NOTES AND NEWS.

THE American Association for the Advancement of Science is holding, at Columbus, Ohio, its 48th annual meeting as we go to press. We are able to publish, this week, the address given on Monday by the retiring President of the Association, Professor F. W. Putnam, and the address, before the Section of Physics, of the Vice-President, Dr. Elihu Thomson.

PROFESSOR ROBERT WILHELM EBERHARDT BUNSEN, the great chemist, born at Göttingen, on March 13, 1811, died at Heidelberg, on August 16th.

THE death is announced of Sir Edward Frankland, K.C.B., F.R.S., the eminent chemist. Born in 1825, he was educated in the Royal School of Mines, London, and in German universities under Bunsen and Liebig. He was successively professor of chemistry at Owens College, Manchester; at the Royal Institution, London, and at the Royal School of Mines, London. He was the author of works on chemistry and water analysis, and is perhaps best known for his inquiries into the polution of rivers and his reports on the water supply of London. He had been President of the Chemical Society and was Honorary Secretary of the Royal Society. His son is Dr. Percy Faraday Frankland, F.R.S., professor of chemistry at Mason College, Birmingham, and a leading authority on bacteriology.

ON August 2d Queen Victoria conferred the honor of knighthood upon Sir William Henry Preece and Sir Michael Foster, Knight Commanders of the Order of the Bath.

THE Neill Prize for 1895–98 has been awarded to Professor J. Cossar Ewart, M.D., F.R.S., by the Royal Society, Edinburgh, for his experiments and investigations bearing on the theory of heredity.

THE Pharmaceutical Society of Great Britain has awarded the Hanbury Gold Medal to Professor Albert Ladenburg, for his work on alkaloids and their derivatives.

THE Alvarenga Prize of the College of Physicians of Philadelphia has been awarded to Dr. Robert L. Randolph, of Baltimore, for his essay entitled 'The Regeneration of the Crystalline Lens: an Experimental Study.'

Dr. William Z. Ripley has recently been elected a corresponding member of the Società Romana di Antropologiá and of the Société des Sciences Mathematiques et Naturelles de Cherbourg.

Nature states that Mr. J. S. Budgett, of Trinity College, Cambridge, who accompanied Mr. Graham Kerr on his expedition in search of *Lepidosiren*, has been successful in obtaining eggs and larvæ of the Crossopterygian Ganoid *Polypterus*. From a short account of his investigations, illustrated by sketches, which Mr. Budgett has sent to England, it appears that the larva is very minute, and possesses a 'cement organ' on the dorsal surface of the head.

The death is announced of M. N. Rieggenbach, Correspondent of the Paris Academy of Science in the Section of Mechanics.

The will of Mr. George Averoff, who died, at Alexandria, on July 27th, gives large sums to educational and other public institutions. Among these is a bequest of £20,000 to create an agricultural school in Thessaly and one of £50,000 to the Polytechnic Schools at Athens.

A British departmental committee, with Sir Hubert Maxwell as chairman, is investigating preservatives and coloring matter in food.

The Commissioners for the Exhibition of 1851 have made appointments to Science Research Scholarships for the year 1899, on the recommendation of the authorities of the respective universities and colleges. The scholarships are of the value of £150 a year, and are ordinarily tenable for two years (subject to a satisfactory report at the end of the first year) in any university at home or abroad, or in some other institution approved of by the Commissioners. The scholars are to devote themselves exclusively to study and research in some branch of science, the extension of which is important to the industries of the country. A limited number of the scholarships are renewed for a third year where it appears that the renewal is likely to result in work of scientific importance. There were this year six students appointed for a third term, twelve reappointments and sixteen new appointments. Of the two classes first mentioned the place of study is designated. This is as follows: Cambridge University, 6; Owens College, Manchester, 3; Leipzig University, 3; Central Technical College, London; University College, London; Harvard University, Berlin University and the Marine Biological Laboratories, each 1.

The Labrador mail steamer reports that the Peary expedition steamer *Diana* passed Domino Run, northern Labrador, at two o'clock in the afternoon of July 24th. All on board were well at that time. The *Diana* hoped to reach Disco, Greenland, by July 29th.

A reunion of the British Institution of Electrical Engineers is arranged to be held in Switzerland from the 1st to the 9th of September inclusive. The *Times* states that the members will assemble at Basle, and on September 2d will visit the Rheinfelden electrical power station, and will proceed on the same day to Zurich, where they will remain until September 6th. During that time visits will be made to establishments and places of electrical interest, including the works of the Oerlikon Company, those of Messrs. Brown, Boveri & Co., the Dowson gas-generating station of the Zurich-Oerlikon Street Railway, Messrs. Escher, Wyss & Co.'s works, the municipal central electric lighting station and sub-station of Zurich, the new electrical power station at Schaffhausen, and the Falls of the Rhine. There will also be a visit to the iron and steel works of Messrs. George Fischer and to the National Museum at Zurich. In the evening of September 5th a banquet will be given to the visitors by the Swiss firms and the Schweizerischer Elektrotechnisher Verein. On the evening of September 6th the members will leave for Lucerne, where they will inspect the street railways, the Rathhausen Works, and the Stansstad-Engelberg Railway. They will then proceed direct to Interlaken, via the Brünig Pass, and on September 8th will visit the Jungfrau Railway, via Lauterbrunnen and the Wengern Alp Railway, the power station at Lauterbrunnen also being inspected. On September 9th there will be a visit to the Kander Werk at Spiez (central station for light and power distribution) and to the Burgdorf-Thun Electric Railway, which will bring the reunion to a close. In order to con-

tribute to the comfort of the members, especially the ladies of the party, it has been arranged that evening dress will not be required during any portion of the visit.

THE opening meeting of the Sixth International Otological Congress took place in London on August 8th, under the presidency of Professor Urban Pritchard, who delivered an address on the 'Birth and Growth of Otological Science.'

RICHARD ANDRE, in an editorial note in a recent issue of *Globus* deprecates the term 'Amerind' that has been proposed by the Anthropological Society of Washington in place of the current terms 'American Race,' 'Indians' and 'Red Men.' He doubts the necessity of introducing a new term and considers the change as arbitrary and as 'unhistorical.'

AN extensive series of experiments has been in progress during the summer, in the neighborhood of Shelter Island, by Mr. John P. Holland, the inventor of the Holland Torpedo Boat, in the investigation of the various problems of submarine navigation and warfare. The Holland submarine boat has been kept busy in these experiments, and it is said has performed remarkably well. This is the craft lately built at Mr. Nixon's shipyard at Elizabethport.

Nature quotes from the special number of the *Atti*, containing the report of the anniversary meeting of the Reale Accademia dei Lincei, announcing the annual awards of prizes. The Royal prize for astronomy for 1896 remains unawarded. The Royal prize for philology and languages is divided equally between Professor Pio Rajna, for his critical edition of Dante's 'De Vulgari Eloquentia,' and Professor Claudio Giacomino, for his studies on the Basque language. The prize for history and geography is unawarded, and the same is true of a prize offered for 1898 for perfecting the theory of motion of a rigid body. The Ministerial prize of 3,400 lire for history for 1898 is divided, a prize of 1,700 lire being awarded to Professor Gaëtano Salvemini, and smaller awards being made to Professors Alberto Birro, Niccolò Rodolico and Michele Rosi. Of the Ministerial prize of 3,400 lire for mathematics for 1898, a prize of 2,000 lire is awarded to Professor Ettore Bortolotti, and awards of 700 lire each are made to Professors Federico Amodeo and Francesco Palatini. The adjudicators state that the works of Professor Pirondini would have gained an award had not some of them received recognition on a previous occasion. The adjudicators of the Ministerial prize for philosophical and social sciences for 1897 award 500 lire each to Professors Albino Nagy, Luigi Ambrosi and Tarozzi. The Mantellini prize is unawarded. Of the Santoro prize for electro-technics, one-half is awarded to Signor R. Arnò, for his share in the joint invention with the late Professor G. Ferraris of a new transformer. The Santoro prize for chemistry as applied to agriculture is unawarded, and from the Carpi prize for mathematical physics for 1897–8 a sum of 500 lire is awarded to Signor C. Canovetti, for his papers on the direction of aërostats and on the the resistance of the air.

THE London *Times* reports that the city and environs of Rome were visited on July 19th by a prolonged and relatively severe shock of earthquake, which, while damaging various edifices in Rome itself and doing considerable harm at Frascati, Rocca di Papa and other towns on the Alban Hills, fortunately passed without causing loss of human life. The shock occurred between 2:19 and 2:20 p.m., lasting with minor intensity for twenty-five and with major intensity for about six seconds. A dull noise like the sound of a heavy dray being driven rapidly under an archway accompanied the phenomenon, which was mainly undulatory in character. In many parts of the city the terror-stricken inhabitants rushed into the streets and public gardens, where they were soon drenched by a deluge of torrential rain from light gray clouds which gathered almost instantaneously in what had previously been a perfectly clear sky. The city did not regain its normal aspect until 5 p. m. Several minor casualties are reported. A workman was injured by a falling brick; a horse was killed by the collapse of a stable; a fragment of masonry fell from a church, smashing four paving-stones and narrowly missing a passer-by. The Palazzo Sciara and the Palazzo Chigo in the Corso were slightly damaged; a large stone fell

from the Colosseum; the columns in the Forum were seen to rock, but remained intact; a small fissure appeared in the recently-discovered Lapis Niger, but quickly closed again; some unfinished jerry-built houses collapsed in an outlying quarter of the city.

Though the matter is not one of special scientific interest, it may be mentioned that Mr. J. C. Stevens, London, sold recently a good specimen of the egg of the great auk (*Aleca impennis*), which was one of the three formerly in the collection of the Comte Raoul de Berace. This specimen, which is slightly cracked, was figured in the Memoirs of the Société Zoologique de France in 1898, and with additional notes on its history, it also appeared in the *Bulletin* of the Société in 1891. Bidding started at 100 guineas, and at 300 guineas it became the property of Mr. Middlebrook, of Regent's Park. This is the same price which Sir Vauncey Crewe paid for his specimen in 1894. There are in existence about 51 recorded specimens of the great auk's egg.

The India-European Telegraph reports from Allahabad that a case of scientific interest has occurred at Meerut, where a snake-bitten patient was cured by the injection of Calmette's serum, the efficacy of which had already been made probable by laboratory experiments. The patient had all the symptoms of colubrine poisoning fully developed, and the case was so critical that artificial respiration was found necessary until the serum had time to take effect.

Experiments by Professor Tuma and a number of officers of the Vienna garrison to test the possibility of wireless telegraphy between two balloons on July 14th, says the London *Times*, were attended with a certain degree of success. A balloon held captive at a height of 150 metres served in place of the mast used in the Marconi experiments, being connected with the despatching instruments on the ground by a copper wire. The second free balloon carried a receiving instrument and a wire which hung loose 20 metres below the car. In these conditions it was found possible to communicate with the three officers in the free balloon, who signalled with flags that they had received and understood the telegraphic messages. These signals were observed at an estimated height of 1,600 metres and a distance of about 10 kilometres from the despatching station. Owing to the size and weight of the accumulators and the great danger of bringing them into close proximity to a large volume of explosive gas, it is thus far impossible to telegraph from a balloon to the ground or from one balloon to another. On the return to Vienna of the officers a comparison will be made between the detailed particulars noted by them and the report of the actual messages despatched.

An interesting experiment, says the *British Medical Journal*, which was made in Mentone last autumn with the view of diminishing, if not of exterminating, the mosquito—one of the pests of some parts of the Riviera, especially in October and November—is related by Dr. Samways. In an article published in the *British Medical Journal* last September an account was given of a method of using kerosene recommended by Mr. L. O. Howard, Entomologist to the United States Department of Agriculture, for this purpose. The plan depends upon the fact that kerosene, commonly called paraffin in Great Britain, is fatal to at least some of the species which are called mosquitos. A very small quantity dropped on a pool quickly spreads itself over the surface, and, it is alleged, destroys the larvæ, while at the same time it kills any adult female which attempts to alight with the object of depositing her eggs. The efficacy of kerosene has been disputed, as it has been asserted that the immature mosquito is able to thrust the tip of its respiratory apparatus through the thin film of paraffin. The species of mosquito upon which the experiment was made does not appear to have been identified, but it was probably a culex. The larva of culex floats head downwards, while that of anopheles, which is believed to be the bearer of the malarial parasite, floats horizontally, so that there would be, *a priori*, some ground for expecting that the latter would be more easily killed than the former. It was estimated that there were as many as 400 or 500 larvæ in a bucket of water from the tank in Sir Samuel Hayes's villa, where the experiment was made. All were found to be

killed within an hour or two of the addition of five drops of kerosene, and the many thousands in the tank, which was of nearly 300 cubic feet capacity, were killed by a teaspoonful in a few hours. The experiment is so simple and inexpensive that there seems no reason why it should not be tried on a more extensive scale in other places.

ACCORDING to private advices received from India, says the London *Times*, the Board of Trustees constituted last spring to carry out the scheme approved by the Bombay Legislative Council for preventing a recurrence of the plague has already notified for execution four plans of reconstruction affecting a large insanitary section of the city and involving the laying-out of six miles of new streets. The estimated cost of these projects is Rx.1,820,000. They are designed on the recoupment principle, which was essential in view of the magnitude of the building operations which will have to be carried out on both sides of the new thoroughfares. The general idea of the scheme, the initiation of which was due entirely to Lord Sandhurst, who has devoted much time and personal attention to the city of Bombay, is to deal effectually with the insanitary conditions of the place by removing 'rookeries' and 'slums,' and by providing wide thoroughfares in over-crowded localities very much on the lines which have been so successfully followed in Glasgow, Birmingham and other British towns. The Bombay scheme, however, goes further and deals also with a more serious condition of affairs. It includes provision for the extension of the city by reclaiming large areas on the foreshore of the island as well as the opening out of wide roads, the removal of insanitary dwellings, and the erection on a very extensive scale of new dwellings for the working classes. The Board of Trustees, to which is entrusted the task of carrying out this work, is subsidized by the Corporation of Bombay and endowed with the usufruct of certain valuable building areas belonging to government and the corporation, within the city limits; also with the right of reclamation on the foreshore outside the limits of the port. The Board consists of 14 Trustees, partly *ex officio*, partly elected and partly nominated, and all the chief interests concerned are fully represented. It has special powers to acquire property required for or in connection with the several schemes to be undertaken, and power, with the sanction of the government, to raise loans. The scheme involves a new departure of some moment, and its operation will be watched with considerable interest. In a Western city the project would undoubtedly have been left to the ordinary municipal organization, but in India, although local self-government has developed amazingly, it is no disparagement of that principle to question its efficiency for carrying out improvements dealing with vested interests on an enormous scale, and requiring years of persistent effort on systematic lines for their due accomplishment, in addition to the task of administering the ordinary affairs of a great city.

SIR ROBERT S. BALL, in his annual report of proceedings in the Cambridge Observatory for the year ended May 25, 1899, states, according to the report in the London *Times*, that during this period the meridian circle has been used, as in the previous year, for the perfection of the catalogue by re-observing stars, of which not more than two observations had been obtained, in order to carry out the original design that each place should depend on not less than three observations. To this end 2,241 observations have been taken of 1,429 stars; 58 are still insufficiently observed, and five have not yet been re-observed. The intervals of the transit wires were determined afresh, at the beginning of this year, from 115 observations of Polaris made in 1898, and tables were constructed for facilitating the reductions to center wire. These intervals have been used since the beginning of 1899. A very important addition to the instrumental equipment of the Observatory has been made during the past year by the erection of the new equatorial, which will be known as the Sheepshanks equatorial. A machine for measuring the photographs has been designed, and is now being constructed by the Cambridge Scientific Instrument Company. It is essentially a form of the instrument designed by Professor Turner for the work of the astrographic chart, modified to give the greater accuracy required in stellar parallax work. The syndicate have pleasure in announcing that they have re-

ceived from a donor, who wishes to remain anonymous, a donation of £50 towards the expenses of making a catalogue of books in the library. Preparations have been made for the complete arrangement and cataloguing of the books during the present summer. The number of members of the University attending Mr. Hinks's classes in practical astronomy shows an encouraging increase. The Newall telescope has been used for observations on 96 nights in the course of the year 1898 (May 19th)–1899 (May 19th). In November and December there were 33 consecutive nights on which clouds rendered it useless to attempt observations. In continuation of the work referred to in last year's report the instrument has been employed in connection with the Bruce spectroscope in taking photographs of stellar spectra for the determination of velocity in the line of sight. In the course of the year 150 photographs (in addition to many others rejected for various reasons) have been obtained, giving material available for the determination of the velocity of 60 stars. Preparations are well advanced for converting the Bruce spectroscope into a powerful four-prism instrument, which is to be used in securing material for a detailed examination of the spectra of a few of the brightest stars.

UNIVERSITY AND EDUCATIONAL NEWS.

Dr. Arthur T. Hadley will be formally inaugurated President of Yale University on October 18th. The occasion will be of special interest, as Dr. Hadley will deliver an address, which will doubtless outline the policy of the University for many years to come.

The University of Berlin celebrated on August 3d the 90th anniversary of its foundation by Frederick William III. The oration was delivered by the retiring rector, Dr. Waldeyer, professor of anatomy, who took as his subject, 'Does the University of Berlin fulfill the mission entrusted to it by its founder?' Dr. Waldeyer is succeeded as rector by Professor Fuchs, the distinguished mathematician.

Nature states that the Research Fellowships founded by the Salters' Company and the Leathersellers' Company for the encouragement of higher research in chemistry in its relation to manufactures tenable at the City and Guilds Central Technical College, being now vacant, the Executive Committee of the City and Guilds of London Institute will, before the commencement of next session, consider applications and elect candidates. The grant made by each of the companies to the Institute for this purpose is 150*l.* a year. Copies of the schemes under which the Fellowships will be awarded may be had on application to the Honorary Secretary of the Institute, Gresham College, Hasinghall Street, London, E. C.

Mr. Mark W. Harrington will return to his professional work, and would accept a call to a chair of astronomy or mathematics. He could not fail to build up a good department in any of the lines coming under these heads—as in polytechnic schools, or in universities, or in colleges, where new developments in the direction of an observatory or a branch of engineering are contemplated.

The following new appointments and promotions have been made in the French universities: M. Haller, professor at Nancy, to be professor of organic chemistry at Paris; M. Pellat, to be professor of physics at Paris; M. Chatin, to be professor of histology at Paris; M. Cannien to be professor of anatomy at Bordeaux; M. Künstler to be professor of comparative anatomy and embryology at Bordeaux; M. Picart to be professor of astronomy at Lille; M. Ardaillon to be professor of geography at Lille; M. Guitel to be adjunct professor of zoology at Rennes.

Professor v. Frey has been called to the professorship of physiology at Würzberg.

Dr. Hans Battermann, Observer in the Observatory at Berlin, has been promoted to a professorship.

The following have qualified for docents in the German universities: Dr. Somner for physiology in Würzburg, Dr. Schwarzschild for astronomy in Munich, and Dr. Stolle for chemistry in Heidelberg.

Dr. A. C. Houston has been appointed lecturer in bacteriology at Bedford College, London.