cipal guests were Professors Clarke and van't Hoff, Professor A. E. Armstrong, Mr. Brereton Baker, Professor P. F. Frankland, Mr. Vernon Harcourt, Dr. Harden, Sir James Hoy, Professor Kipping, Dr. W. H. Perkin, Sr., Sir William Ramsay, Professor Emerson Reynolds, Sir Henry Roscoe, Professor Smithells, Dr. Scott, Professor Thorpe and Professor Tilden.

In proposing the toast of the evening, the 'Wilde' medallist—Professor Clarke—and the Dalton medallist—Professor Osborne Reynolds—Sir Henry Roscoe said that Dalton's atomic theory and Joule's discovery of the mechanical equivalent of heat reflected more distinction on Manchester than the city's association with the cotton industry or with the Ship Canal.

On Wednesday morning a special meeting of the Owens College Chemical Society was held to offer an address to the great Dutch chemist, J. H. van't Hoff, now professor at the Berlin University. Professor Dixon was in the chair. The address was presented by Mr. Norman Smith, a former student under Professor van't Hoff. The professor, who was enthusiastically received, said the question was often asked, nowadays, whether the atomic theory had not outlived its utility. His reply was that, in dealing with natural phenomena, with states of unstable equilibrium, the atomic theory was indispensable for essential explanations. He had come to regard the conception of the carbon atom as the center of a tetrahedron as childish, but it contained the germ of a profound truth, the solution of which must be left to the future. He suggested that valency was due to an equilibrium. The four mutually repellent 'electric atoms' of Helmholtz were kept in equilibrium by their attraction for the carbon atom at the center.

Later in the morning Earl Spencer, Chancellor of the Victoria University, conferred the honorary degree of Doctor of Science on Professor Clarke and Professor van't Hoff, who were presented by Professor Dixon. After the conclusion of the ceremony Professor van't Hoff laid the first stone of the proposed extension of the Owens College Chemical Laboratories, and was presented, as a memento of the occasion, with a silver trowel by the College Chemical Society. The celebrations were concluded by a soirée held at the Owens College on Thursday night, when Dr. Harden gave an interesting account of John Dalton, and many Dalton relics were exhibited by the Manchester Literary and Philosophical Society, Professor H. B. Dixon, Mr. Theodore Neild, Mr. G. W. Graham and Mr. G. S. Woolley.

TRIGONOMETRIC SURVEY OF BRAZIL.

THE Brazilian government has provided for the mapping of its territory on a scientific basis. Last year the congress appropriated the necessary funds for commencing the work, and a commission of which Colonel Francisco de Abreu Lima is President, was to leave Rio early in May for the state of Rio Grande do Sul to make a reconnaissance of the first zone to be triangulated.

The scheme as far as at present outlined, includes the measurement of bases at Porto Alegre and Uruguayana, and the connection of these two cities by triangulation. This will give an arc of about six and one quarter degrees of longitude in about latitude 30° south.

The Superintendent of the U. S. Coast and Geodetic Survey has been requested by the commission to supervise the preparation of the necessary tapes and accessories for the measurement of the bases.

SCIENTIFIC NOTES AND NEWS.

DR. W J MCGEE has been appointed chairman of the committee of the International Geographical Congress of 1904, succeeding General A. W. Greely, who has resigned owing to ill health and the pressure of official duties.

THE University of Marburg has conferred its honorary doctorate on Mr. Geo. F. Kunz, of New York City.

M. HENRI BECQUEREL, Paris, and Professor A. Righi, Bologna, have been elected honorary fellows of the Physical Society of London.

DR. MAX NOETHER, professor of mathematics at Erlangen, has been elected a foreign member of the Academy of Sciences at Buda Pesth.

Lady Huggins and Miss A. M. Clerke have been elected honorary members of the Royal Astronomical Society.

The commencement address at the graduating exercises of the Worcester Polytechnic Institute is to be given by O. H. Tittmann, director of the United States Coast and Geodetic Survey.

At a special meeting of the Physical Society, London, held on June 5, at University College, Professor E. Rutherford, of McGill University, read a paper on radioactive processes.

Mr. Andrew Graham, who has for nearly forty years held the office of chief assistant at the Cambridge Observatory, is retiring at the age of eighty-eight.

Dr. Otto Bütschli, professor of zoology and paleontology at Heidelberg, has celebrated the termination of his twenty-fifth year of service as professor at the university.

Dr. William Osler, professor of medicine at the Johns Hopkins University, sailed on May 29 to England, where he will remain until the end of September.

The National Geographic Magazine states that Dr. A. Graham Bell resigned the presidency of the National Geographic Society at a meeting of the board of managers, on May 15. Dr. Bell stated that owing to the pressure of work he found it impossible to give to the society the thought that the position of president demanded. The resignation of President Bell was accepted by the board with profound regret, to take effect on the election of his successor. Dr. Bell was appointed chairman of a committee of three to consider and nominate a successor. The other two members of the committee, appointed by the president, are Dr. Willis L. Moore, chief U. S. Weather Bureau, and Mr. G. K. Gilbert, U. S. Geological Survey. As no election will be made until the fall, Dr. Bell will continue as president of the society for some months.

A statue of the chemist, Kekulé, by the sculptor Heinz Everding, has been unveiled this month at Bonn.

John F. Hicks, assistant botanist of the Ohio Agricultural Experimental Station, died at Wooster, Ohio, on June 1.

Dr. Milan Sachs, a young Viennese physician, has died from plague at Berlin. He had studied the disease at Agram and other Balkan cities, and went to Berlin a few weeks ago to continue his researches at the Bacteriological Institute, where he became infected.

M. Gaston Dubois Desaulle, who was on a voyage of exploration to the West Coast of Africa, has been killed by the Galadils.

We regret also to record the deaths of Dr. Friedrich Deichmüller, professor of astronomy at Bonn, and of M. François Crépin, director of the Botanical Garden at Brussels.

There will be a civil service examination on July 15 for the position of chief of the Division of Pharmacology, Bureau of Public Health and Marine Hospital Service, the salary of which is $3,600. There will be no scholastic tests, and competitors will not be required to be assembled for examination, which will be based on technical training, professional experience and publication.

There will also be a civil service examination on June 3 for the position of illustrator in agrostology in the Bureau of Plant Industry, Department of Agriculture, with a salary of $720.

Mr. Carnegie's gift of $1,000,000 to the four national engineering societies and the Engineers' Club for a building has been accepted at a meeting of the representatives of the five organizations, and plans have been made for a joint committee consisting of three members from each organization. This committee will prepare plans for a building to be erected on Thirty-ninth St. Efforts are being made to secure funds for the purchase of the land, and we learn from *The Electrical World* that a number of subscriptions have been received by the American Institute of Electrical Engineers including $5,000 from Dr. Elihu Thomson and the Westinghouse Electrical Company, $2,000 from Mr. Frank S. Sprague and $1,000 with a contingent $1,500 from Mr. J. G. White.

THE College of Physicians of Philadelphia will remove from its present building on Thirteenth and Locust Sts., and will erect a new building on Twenty-second St.

THE corner stone of the new observatory at Amherst College will be laid at noon on June 23, in connection with the commencement exercises.

THE steamship *Gauss* of the German Antarctic Expedition, under the command of Professor von Drygalski, has arrived at Natal on the way to Cape Town.

THE forty-first Annual Convocation of the University of the State of New York will be held in the Senate Chamber, Albany, June 29 and 30.

IT is stated in *Nature* that the annual congress of the Southeastern Union of Scientific Societies will be held at Dover, June 11–13. On Thursday evening, June 11, the president-elect, Sir Henry H. Howorth, F.R.S., will deliver the annual address. The following papers will be read on June 12: 'Atmospheric Moisture as a Factor in Distribution,' by Mr. A. O. Walker; 'Experiences of Leprosy in India,' by Dr. Jonathan Hutchinson, F.R.S.; 'The Diminution and Disappearance of Southeastern Flora and Fauna within the Memory of Present Observers,' by Captain McDakin and Mr. Sydney Webb; 'The Seedlings of Geophilous Plants,' by Miss Ethel Sargant; 'The White Chalk of Dover,' by Dr. Arthur Rowe; 'A Late Keltic Cemetery at Harlyn Bay,' by Rev. R. Ashington Bullen. On June 13 Mr. A. T. Walmisley will lecture on 'International Communication.'

THE Lake Laboratory of the University of Montana will open on July 13 and will continue for five weeks, after which opportunity will be given for research work. Professor M. J. Elrod is director of the station and has charge of the work in botany and entomology. Mr. Morris Ricker has charge of zoology and photography and Mr. P. M. Silloway of ornithology and nature study. The field laboratory is located on the bank of Swan River at its outlet into Flathead Lake. This location affords a harbor for boats and a camping site for the tents of those attending. The adjacent region contains forests, ponds, lakes, swamps, cultivated fields, mountains, rivers and ravines. It is rich in animal and vegetable life. The lake offers opportunities for collecting, and presents some beautiful scenery. East of the lake the Mission range comes abruptly to the water's edge. The range slopes from the Swan River on the north to the high peaks, ten thousand feet, at the southern end, and its scenery is wild, rugged and grand, truly Alpine in character. West of the lake are the Cabinets. Near the station Swan Lake, Rost Lake, Echo Lake, and other waters, are easily accessible. Daphnia Pond, a few minutes' walk from the station, is rich in pond life, while Estey's Pond, about as far again, is fully as productive. The Swan range is easily accessible from the station, and Alpine summits are annually visited. The station is not difficult of access. The stage and boat rides are easy, with charming scenery constantly in view. The building is a convenient out-door laboratory, with tables for a dozen students. The station work has entirely outgrown the building. Many of the lectures are given out of doors in the yard, and the fine summer weather permits of much laboratory work out of doors.

LORD AVEBURY read a paper at the meeting of the Geological Society, London, on May 27, on the formation of mountains. According to the report in the London *Times* he said that experiments had been made long ago by Sir J. Hall, and afterwards by Daubree, Ruskin, Cadell and others, by arranging layers of cloth, clay, cement, etc., and studying the folds and fractures which resulted when they were compressed. In all these experiments, however, the pressure was in one direction only, whereas it was obvious that if mountains were due, at any rate in part, to the contraction of the earth, in nature the contraction and consequent pressure took place from all sides. Lord Avebury said that he, therefore, provided himself with a square case compressible on all four sides at once. In the central space he arranged layers of sand, cloth, etc., and compressed them, thus throwing them into folds. He then took in each experiment

four casts in plaster of Paris, beginning from the top, and these casts were exhibited to the society. They presented an interesting analogy to actual mountain districts, though, of course, they did not show the results of subsequent denudation due to rain and rivers. It had long been observed that mountainous districts showed two sets of lines at right angles to one another. Any one who would glance at a map of Scotland would see this clearly. One set was represented by the Great Glen, with the lochs and valleys parallel to it, such as the Minsh, Loch Awe, Loch Fine and many others; the second series at right angles to it by Loch Shin, Loch Moree, the Sound of Mull, etc. This characteristic of mountain regions had long been known, and there had been discussions as to whether the folds were simultaneous or successive. Lord Avebury's casts showed this feature very clearly, and it was evident that the cross foldings took place simultaneously.

Investigations of artesian and other underground waters and of springs will be conducted in the following states during the coming field season: *Maine*—Professor W. S. Bayley will collect data in regard to deep wells by correspondence and by field work in the islands along the coast. He will be assisted by Mr. W. C. Washburn. *New Hampshire*—The occurrence of underground waters and of springs will be studied by Mr. J. M. Boutwell, who has already entered into communication with well owners at many points in the state. *Vermont*—Work on underground waters and springs in this state will be conducted by Professor George H. Perkins in connection with his work as state geologist. *Massachusetts and Rhode Island*—These states have been divided into two districts, the northern district including the northern and western portions of Massachusetts, and the southern including southeastern Massachusetts and Rhode Island. The wells and springs of the former will be investigated by Mr. Lawrence LaForge, and those of the latter by Professor W. O. Crosby. *Connecticut*—The services of Professor H. E. Gregory have been secured for the investigations of underground water and springs in this state. He will probably have one or more assistants in the work. *New York*—Two problems are under investigation in this state; the first is an investigation of the geology and water resources of Long Island by Messrs. M. L. Fuller, A. C. Veatch, W. O. Crosby, and several assistants; the second relates to the occurrence, composition and economic value of the spring waters of the state. The latter investigation will be conducted by Mr. F. B. Weeks, in cooperation with Dr. A. C. Peale on the statistical and chemical sides of the problem. *New Jersey*—The work in this state is being conducted in cooperation with the State Geological Survey. It is expected that the artesian well investigations will be completed during the summer, and that a report will be prepared by Mr. G. N. Knapp during the fall and winter. *Georgia*—Mr. S. W. McCallie, assistant state geologist, will probably complete his investigations and prepare a report on artesian and underground waters in the state. *Alabama*—Professor E. A. Smith, state geologist, will continue his investigations of the occurrence of underground waters. *Mississippi*—The work in this state, which has been going on for some time, will be continued by Mr. L. C. Johnson. *Kentucky and Tennessee*—Dr. L. C. Glenn will undertake an examination of the portion of the Mississippi embayment area lying within the limits of these states, with the special object of determining its underground water resources. *Arkansas*—The investigations in this state consist of correspondence with well owners and drillers and of field work along the contact of the Paleozoic rocks with the embayment deposits in the northern part of the state. *Missouri*—Professor E. M. Shepard will carry on investigations relating to deep wells and springs, with a view to preparing a report at an early date. *Iowa*—Professor W. H. Norton will continue his studies on deep wells, and will prepare a report on the artesian waters of the state. *Minnesota*—Professor C. W. Hall will complete a report on the water resources of Minnesota, and will probably investigate new developments along similar lines, as they occur. *Wisconsin, Illinois and Upper Michigan*—The

investigations in these states will cover all those areas in which artesian waters are known to occur, as well as adjacent portions of Illinois and the Upper Peninsula of Michigan. Mr. A. R. Shultz will have charge of the work and will probably have one or more assistants. *Michigan*—The work in this state is conducted in cooperation with Dr. A. C. Lane, state geologist, the field work being in charge of Mr. W. F. Cooper, who will spend a considerable part of the summer in investigation of the underground waters of the state.

UNIVERSITY AND EDUCATIONAL NEWS.

AT the meeting of the board of trustees of the Leland Stanford, Junior, University, held on June 1, Mrs. Leland Stanford resigned and surrendered all the powers and duties vested in her by the terms of the grant founding the university, under which she had complete control. That control is now vested in the board. Mrs. Stanford will be elected a trustee, and will be elected president.

THE total appropriation made to The Pennsylvania State College by the legislature of 1903 and recently approved by the governor was $250,805.55. Of this amount $100,000 is for the purpose of assisting in the erection, equipment and furnishing of a building for the Department of Agriculture, while $150,000 additional are virtually pledged by the attachment of a proviso requiring the trustees of the college to file with the auditor general plans, specifications and estimates satisfactory to him showing that the entire cost of the building and equipment will not exceed $250,000.

THE plans of Messrs. Cram, Goodhue and Ferguson, of Boston, have been accepted for the new buildings of the West Point Military Academy, which are to number twenty-one.

LORD IVEAGH has given £40,000 to Trinity College, Dublin, for building and equipping scientific laboratories.

ACCORDING to the London *Times*, after a great deal of consideration and many consultations with the colleges at Manchester and Liverpool, the council of the Yorkshire College have at last agreed upon the principles upon which the charter for the proposed new Yorkshire University should be based. These are that the Yorkshire College be merged in the university; that the university be founded on a non-federal basis, but that it be empowered to affiliate other institutions; and that the university be governed by a court of governors and by an executive council. Substantial agreement has been arrived at between the three colleges on some important matters, such as that of a common matriculation examination for all the three universities of Yorkshire, Manchester and Liverpool, and provision has been made for a joint board to be constituted from the three universities to deal with such questions. With regard to affiliated institutions, it is provided that attendance at courses of study in such institutions may be accepted by the university in place of such part of the attendance or courses of study at the university as may from time to time be determined. It is considered that the additions to the staff and equipment of the college essential to the proper carrying on of an independent university will require a minimum additional expenditure of about £7,000 a year, while extensive additions will also be required to the college buildings for the proper housing of some of the departments. The coal-owners of Yorkshire have decided to erect a separate building for the mining department, and have collected a sum of £5,500 for the purpose. The council of the college are desirous also of completing the main block of the college, and it is estimated that this would cost about £60,000. Though a canvass for the necessary funds has not yet been instituted, three friends of the college have each promised £5,000, while a fourth has promised £2,000. The Clothworkers' Company of London, who have already proved munificent benefactors of Yorkshire and the Yorkshire College, have added to their previous generosity by offering to transfer to the new university as its absolute property the whole of the buildings and equipment of the textile industries dyeing and art departments, which are at present held in trust by the college for the Clothworkers' Company, and which have cost that company about £70,-