

velocity of eight kilometers per second. This will increase in two days to fourteen kilometers, and in the next two days will decrease again to eight kilometers. This cycle of change is repeated every four days. The bright Polaris, therefore, revolves about the centre of gravity of itself and its invisible companion once in four days. The orbit is nearly circular and is comparable in size with the moon's orbit around the earth.

This centre of gravity, and therefore the binary system, is approaching the solar system at present with a velocity of eleven and a half kilometers per second. A few measures of the velocity of Polaris made here in 1896 gave its approach at the rate of twenty kilometers per second. Part of this change since 1896 could be due to a change in position of the orbits of the binary system, but most of it must have been produced by the attraction of a third body on the two bodies comprising the four-day system. The period of revolution of the binary system around the centre of gravity of itself and the third body is not known, but is probably many years.

Both companions of Polaris are invisible, but their presence is proved by disturbances which their attractions produce in the motion of the bright Polaris.

SCIENTIFIC NOTES AND NEWS.

THE British Association for the Advancement of Science has held a successful meeting at Dover. We publish this week the address of the president, Sir Michael Foster, and hope to be able to publish shortly some account of the meeting and several of the addresses given by the presidents of the sections.

THE International Geographical Congress began its meeting at Berlin on September 27th, with about 1200 members in attendance. Baron von Richthofen presided, Prince von Hohenlohe, the imperial Chancellor being the honorary president. The sections were as follows: (1) mathematical geography, geodesy, cartography, geophysics; (2) physical geography (geomorphology, oceanology, climatology); (3) biological geography; (4) industrial and commercial geography; (5) ethnology; (6) topical geography, exploring travels; (7) history of geo-

graphy and of cartography; (8) methodology' school geography, bibliography, orthography of geographical names. Among the Americans in attendance were General A. W. Greely, of the U. S. Signal Service, Professor W. M. Davis, of Harvard University, and Mr. A. L. Rotch of the Blue Hill Observatory.

It has been decided that the Zoological Park of New York will be opened to the public either on October 18th or October 25th.

THE commission from the Johns Hopkins University, under the direction of Dr. Simon Flexner, has returned from Manila where the summer has been spent in the study of tropical diseases.

MR. WALTER WELLMAN arrived in London on August 28th and gave at the British Association an account of his Polar expedition. He sailed for New York on September 30th.

THE freedom of the borough of Carnarvon was conferred upon Sir W. H. Preece, the eminent engineer, on September 21st. He was also presented by the Town Council with a silver casket and entertained at a banquet.

DR. ANTON FRITSCH, director of the zoological and paleontological collections of the museum at Prag, has published in a local paper an account of his recent visit to America. He speaks in high praise of the museums, institutions and collections, and recommends younger men of science to follow his example and visit the scientific institutions of the United States.

DR. GEORGE A. HENDRICKS, professor of anatomy in the College of Medicine and Surgery of the University of Minnesota, died in Minneapolis on September 24th.

SIGNOR MARCONI has been able to report successfully by wireless telegraphy the international yacht races. The messages were sent from the steamship *Ponce* to a station at Navesink Highlands.

A TELEGRAM has been received at the Harvard College Observatory from Professor Krentz at Kiel Observatory, stating that a comet was discovered by Giacobini at Nice, Sept. 29, 313 Greenwich Mean Time, in R. A. 16^h 26^m 32^s and Dec. — 5° 10'.

Daily motion in R. A. + 2^m 0^s

Daily motion in Dec. + 0° 10'.

WE learn from the *Botanical Gazette* that Dr. Henry C. Cowles of the University of Chicago has spent several weeks with a party of advanced students at Marquette, Mich., prosecuting ecological studies on the adjacent flora.

THE executors of the late Professor O. C. Marsh, of Yale University, will sell for the benefit of the University his valuable collection of orchids, objects of art, antiques, etc. The sale will take place during the present month but the exact date is not yet fixed.

THE first meeting of the International Congress of Life Assurance will be held in Brussels from September 25th to the 28th.

THE American Institute of Mining Engineers held last week its annual meeting in San Francisco. At the adjournment a two weeks' visit through the mining regions of the State was begun.

THE tenth annual general meeting of the British Institution of Mining Engineers met at University College, Sheffield, on September 19th, with Mr. C. H. Peak, of Walsall, presiding. It was reported that the number of members is now 2,075, a slight decrease compared with last year.

AT the annual meeting of the American Otolological Society, Dr. Blake presented a resolution asking for coöperation with the National Association of Teachers of the Deaf and Dumb, to secure systematic examination of the pupils in deaf-mute schools throughout the United States, explaining the necessity of thorough and qualified investigation in order to select those pupils who could be most benefited by special teaching, or who perhaps by some treatment could be made better able to accept teaching.

THE Chambers of Commerce that met recently at Belfast, Ireland, urged upon the British Government the necessity of making [the metric system compulsory. It was pointed out from consular reports, that much loss of trade has resulted in South America and elsewhere from Great Britain's adherence to the antiquated system.

MR. H. M. WHELPLEY, of St. Louis, has been collecting statistics in regard to the use of the metric system in physicians' prescriptions.

It appears that of 1,008,500 prescriptions that have been examined, 6 per cent. were in the metric system. Reports were received from apothecaries in forty-two States and Territories. *The Pharmaceutical Era* from which we take this information earnestly advocates the metric system in medical prescriptions. It states that the system is taught in all pharmaceutical colleges but only in very few medical colleges.

THE city of Ithaca, N. Y., at the meeting of its Common Council, September 20th, followed the example of some of the largest cities of the State, including Buffalo, Rochester, Utica and Binghamton, and adopted voting machines. The contract guarantees their reliability and accuracy, is accompanied by a bond, not only for fulfillment of the contract in other respects, but also in the matter of possible patent litigation, makes the compensation payable out of the savings effected by use of the machines costing the city, in fact, nothing; while, in the end, not only providing what is claimed to be absolute insurance that no man shall lose his vote by defective or spoiled ballot, but also yearly profit by the change which, if capitalized at the city's rate of credit, 4 per cent., would amount to about one-half the city budget as fixed by its charter.

ADVICE has been received at Liverpool from the Malarial Investigation Expedition in West Africa, that the members of the Liverpool Commission, with the assistance of the colonial medical staff and others, have now started the operation of hunting for the anopholes (malarial mosquito) grub in water. This is a tedious but most important task, and necessitates a very careful inspection of all the ground in Freetown. So far these grubs have only been found in a shallow puddle and two tubs of stagnant water, but it is hoped that the minute inspection of the ground that is now being conducted will have satisfactory results. Dr. van Neck, the official delegate of the Belgian Government, who started from Antwerp after the English members had sailed, has now joined the expedition. In view of the importance of completing the expedition's researches, instructions have been cabled to Major Ross to use his own discretion as regards the date of his return. It is hoped that this

extension of time will enable the commission to complete its labors satisfactorily. The Secretary of State, of the Treasury of the United States, has written stating that he regrets that the invitation to send an American delegate was not received in time for the detail of an officer of the Marine Service Hospital to accompany the expedition.

A CORRESPONDENT of *Industries and Iron* of London, for whom its editor vouches as a competent judge, gives the following hindrances to introduction of the Nernst lamp: (1) There is no automatic heating arrangement to the small power lamps, and they each require about eight seconds in artificial heating to be brought to incandescence; (2) No small lamps of small candle power have yet been produced; (3) There are three wires to each, and the lamps cannot therefore be connected without inconvenience to existing standards; (4) Excepting mere laboratory tests there is no *practical* experience of the life of the lamp; (5) It has never yet been attempted to manufacture the lamp on a commercial scale, and not one lamp on the Nernst principle is yet in commercial use; (6) More than one firm of eminence have adopted the opinion that the principle of the lamp has been anticipated by the Jablochhoff candle, thus impeaching the validity of the Nernst patent.

UNIVERSITY AND EDUCATIONAL NEWS.

WE are glad to be able to give a correct account of Mrs. Hearst's plans for the University of California. Mrs. Hearst has not made any official announcement, and is not likely to do so, because she intends to superintend the use of her gifts herself. But the following may be considered as certain: She has by *will* devoted her fortune to the University—this in case of her death. But she intends to give during her lifetime all or the greater part, and from time to time as necessary to carry out her plans. She intends to commence next spring to put up two buildings, one of which is to be the mining building. It is not certain what the other will be. Besides there are good grounds for the belief that other wealthy residents of California, incited by Mrs. Hearst's example, will next year put up three other buildings. Mrs.

Hearst has determined to live in Berkeley in order to be in closer touch with the University. It is expected that M. Bénard, the architect, will go to Berkeley to superintend the work. Negotiations to that effect are going on. Finally, it may be stated that Mrs. Hearst understands perfectly well that buildings require a corresponding endowment.

CORNELL UNIVERSITY opens with an entering class membership above 600. Sibley College has a freshman class of about 200 and many new men in the upper classes and graduate departments.

THE third course in advanced agricultural chemistry, in the School of Graduate Studies, of the Columbian University, Washington, D. C., will begin September 27th, under the direction of Dr. H. H. Wiley. Graduates of agricultural colleges and other institutions of good standing, are eligible for admission to this course. Under certain restrictions graduates are admitted to the chemical laboratory of the department of agriculture. Advanced courses in soil studies, agricultural technical chemistry and in the study of food will be begun at once with laboratory practice. This school offers special advantages to the graduates of agricultural colleges who wish to complete their advanced studies in agricultural sciences.

A CHAIR of the theory, art and practice of education has been established in Owen's College, Manchester, and Mr. H. L. Withers, now principal of the training college at Isleworth, has been called to be the first incumbent.

DR. C. B. DAVENPORT, of Harvard University, has been called to the zoological department of the University of Chicago to fill the place left vacant by the removal of Professor Wheeler to the University of Texas.

W. D. MERRILL, PH.D. (Chicago), has been appointed instructor in biology, with special reference to botany, in the University of Rochester.

DR. CHARLES G. SHAW has been appointed to the position in the department of philosophy in New York University made vacant by the resignation of Dr. J. H. McCracken, to accept the Presidency of Westminster College, at Fulton, Mo.