

ships. The ship is of the twin-screw, single-deck type, and is designed for a speed of 14 knots when at a loaded displacement of 19,230 tons. In addition to having interesting equipment for the handling of coal and oil fuel, the vessel is notable, as the propellers are driven by electric motors, current being supplied to these by turbine-driven generators, the shaft-horsepower available for propulsion being 5500. The total cargo capacity is 966,260 gallons of oil and 9856 tons of coal, or, alternatively, 405,620 gallons of oil and 11,380 tons of coal. The coal handling gear was supplied by the Mead Morrison Manufacturing Company, and the stipulation of the contract was for the delivery of 100 tons per bucket per hour when the gear was operated by winchmen of one week's experience. Owing to the large number of towers supporting the booms and rigging of the coal handling plant, the appearance of the vessel is somewhat unusual.

THE *Scientific American* for October 3 draws a contrast between the ordinary European frontier with its enormous forts and lines of strategic railways, and the Canadian frontier. On the continent of America, the two greatest nations of the world have a common frontier which extends, unbroken, for some 4000 miles. Throughout the whole of this frontier there is not to be found, on either side, a single fortification, or any offensive or defensive military work of any kind whatsoever, and this is the case despite the facts that this far-flung frontier was the eventual outcome of a fierce war, and that these two powerful nations have always been engaged in keen commercial rivalry. That heavily fortified frontiers, backed by military railways, are a menace to a friendly neighbouring State, and provocative of responsive military works, and that they produce an atmosphere of international suspicion and dislike cannot be disputed. There is a growing conviction that the failure of the Teutonic attempt to establish a military dictatorship in Europe will be followed by the final subjugation and control of militarism. Our contemporary can think of no guarantee that would be more effective than the complete obliteration of these fortifications, modern in construction, but essentially medieval in conception, which disfigure European frontiers.

MESSRS. JOHN BARTHOLOMEW AND CO., of the Geographical Institute, Edinburgh, have published a new reduced survey map of north-eastern France, Belgium, and the Rhine. The map is coloured orographically, and is on the scale of sixteen miles to an inch. This scale makes it possible to show with clearness the railways, fortresses, main and secondary roads, and frontier custom-houses. Heights are given both in metres and feet, and the distances between road junctions are marked. The price of the map is 2s. on paper, and 3s. mounted on cloth.

THE following forthcoming books of scientific interest are announced by *Messrs. G. Bell and Sons, Ltd.*:—*X-Rays and Crystal Structure*, by Prof. W. H. Bragg; *Quantitative Laws in Biological Chemistry*, by Prof. Svante Arrhenius; *Tuberculosis: a General Account of the Disease, its Treatment, and Prevention*, by Dr. A. J. Jex-Blake; *Woollen and Worsted Cloth*

Manufacture, by Prof. R. Beaumont, illustrated; *Buddhist Psychology*, by Mrs. Rhys Davids. The list of *Messrs. Methuen and Co., Ltd.*, includes:—*My Life*, by Sir Hiram S. Maxim; *On Alpine Heights and British Crags*, by G. D. Abraham, illustrated; *How to Know the Ferns*, by S. L. Bastin, illustrated; *British Insects and How to Know Them*, by H. Bastin, illustrated; *The Mammary Apparatus of the Mammalia in the Light of Protogenesis and Phylogenesis*, by Prof. E. Bresslau, illustrated; *Mind Cures*, by G. Rhodes; and the following first volumes of *Methuen's Health Series*:—*The Eyes of Our Children*, by N. B. Harman; *Throat and Ear Troubles*, by M. Yearsley; *The Teeth*, by A. T. Pitts; *The Care of the body* by Dr. F. Cavanagh; *The Health of a Woman*, by Dr. H. J. F. Simson; *Health for the Middle-Aged*, by Dr. S. Taylor; *The Prevention of the Common Cold*, by Dr. O. K. Williamson; and *The Hygiene of the Skin*, by Dr. G. Pernet.

OUR ASTRONOMICAL COLUMN.

THE ROTATION PERIODS OF TWO OF SATURN'S SATELLITES.—In the *Bulletin* (No. 64) of the Lowell Observatory Prof. Lowell and Mr. Slipher publish their observations in relation to two of the satellites of Saturn, namely, Mimas and Enceladus, which have led them to deduce that the revolutions and axial rotations of these bodies are synchronous. This investigation on the brilliancy of these satellites was carried out in December, 1913, and the first three months of the present year, and resulted in finding out that these bodies are of very unequal albedo in different parts of their apparent orbits, and the variations recur *in situ* showing that the satellites always turn the same face to their primary. Both the moons appear brightest near their western elongations and faintest near their eastern. Their magnitudes and ranges are given as follows:—Mimas, 12.90 to 13.33; Enceladus, 12.33 to 12.67. Both these bodies are too small to show a disc, so their size has been inferred from their brilliancy relative to Tethys. Two figures accompany the text, in which the observations are plotted diagrammatically.

DIFFERENCE OF LONGITUDE BETWEEN PARIS AND NICE.—In a communication by M. B. Jekhowsky, presented to the Paris Academy of Sciences (*Comptes rendus*, vol. clix., No. 15, October 12) by M. P. Appell, a brief summary is given of the determination of the difference of longitude between Paris and Nice. The astronomical observations have been made at both these stations with the "modèle géodésique de l'astrolabe a prisme," by the eye and ear method, and the chronometric comparisons were made by wireless after the method of MM. A. Claude, G. Ferrié, and L. Driencourt. The chronometer rates were controlled both before and after the astronomical observations by pendulums, and comparisons were made at the beginning and end of each series of observations. The daily wireless time signals from the Eiffel Tower were utilised as a check on Paris and Nice chronometers between the two series of evening observations. The observations were made on the evenings of May 3, 6, 31, and June 5, and the final result of the difference of longitude between Paris and Nice is given as oh. 19m. 51.204s. ± 0.06s.

EFFECT OF HUMIDITY ON PHOTOGRAPHIC PLATES.—It has been previously pointed out that when a photographic plate has been exposed in a telescope for some time the plate gradually loses some of its sensitiveness.

This question is the subject of a short communication to the *Astrophysical Journal*, September, vol. xl., No. 2, by Dr. C. E. Kenneth Mees, of the Kodak Research Laboratory, who, thinking that the cause was due to a change in humidity, made experiments to determine the effect of varied humidity on the sensitiveness and development factor of Seed 23 and Seed 30 plates. Experimenting within a range of 0.5 to 85 per cent. of humidity, and giving the emulsion film time to come into equilibrium with the air, he found that both sensitiveness and development factor decreased about 25 per cent. when the humidity was increased from 0.5 to 85 per cent. This result seems very conclusive, and shows the restraining action of a change of moisture on the sensitiveness of photographic film. Dr. Mees suggests that all photographic materials used for photometric work should be brought previously into equilibrium with the atmosphere in which they are to be used.

TESTS OF A 24-IN. OBJECTIVE.—At the end of the year 1911 the erection of a 24-in. refractor was completed for the Sproul Observatory, U.S.A. The objective was made by Brashear, the crown disc being furnished by the Parra-Mantois firm of Paris, and the flint disc by Schott and Genossen, of Jena. In 1912 the objective underwent a series of tests at the hands of Profs. John A. Miller and Ross W. Marriott, who used the method of extra-focal images devised by Hartmann. In 1913 a final series of tests was made, and this, with the foregoing, are described by the authors in the October number (vol. clxxviii., No. 4, p. 465) of the *Journal of the Franklin Institute*. It seems that in the first tests measures of photographs of star images taken through a screen containing circular holes showed certain discrepancies among the focal distances of different parts and zones of the lens, which, while not excessive, were absent before the mounting of the lens. The cause of these discrepancies was traced to a side pressure spring to prevent the objective from sliding in its cell. After a reduction of the pressure further tests were completed with screens containing different numbers of holes. The result was to show that "from every standpoint the lens is an excellent one."

THE RECTORSHIP OF THE UNIVERSITY OF GLASGOW.

THE matriculated students of the University of Glasgow, divided into four "nations" under the ancient constitution derived from Bologna and Paris, have unanimously elected M. Raymond Poincaré, President of the French Republic, and member of the academy, to be their rector for a term of three years. For a long time past the recurring elections to the rectorship have been conducted on purely political lines, and the result was always hailed as a party triumph for one side or the other. Mr. Disraeli (1871) was succeeded by Mr. Gladstone (1877), and Mr. Bright (1880); Mr. A. J. Balfour (1890), Mr. J. Chamberlain (1896), Lord Rosebery (1899), Mr. Asquith (1905), and Lord Curzon (1908), were followed by Mr. Birrell (1911).

Before the present national crisis arose, Lord Strathclyde, Mr. Bonar Law, and Mr. R. B. Cunninghame Graham had been selected as their champions by the several political groups. But the students speedily recognised that in the actual situation of the country a party contest was out of place, and the candidates first chosen were withdrawn. The political leaders thereupon, in token of "the close bond of union between France and Great Britain," addressed a joint invitation to M. Poincaré, which the President was pleased to accept. The proposal was received with

enthusiasm, and unanimously endorsed by the students. In the absence of any other nomination, the Principal, Sir Donald MacAlister, K.C.B., on behalf of the Senate, at noon on Saturday, October 24, declared M. Poincaré duly elected by the votes of all the "nations."

The rector is the official President of the University Court. He appoints an assessor, who is *ex officio* a member of the governing body. He is "installed," and delivers a rectorial address, at a solemn assembly of the University during the period of his tenure. Otherwise his position is honorary. In the present case the "installation" will have to await the termination of the war.

The names of two relatives of the new rector, Dr. Henri Poincaré and Dr. Boutroux, already appear on the University's roll of honorary graduates. From the beginning of the sixteenth century onwards a Glasgow graduate has from time to time been chosen as rector of the University of Paris. This is the first occasion on which a French scholar has held the rectorship of Glasgow.

THE ROYAL ANTHROPOLOGICAL INSTITUTE.

PROF. ARTHUR KEITH publishes in the *Journal of the Royal Anthropological Institute* for January-June, 1914, his presidential address on the reconstruction of fossil human skulls. This is, to a large extent, the outcome of the controversy which arose on the reconstruction of the Piltdown skull, in which his scheme differed from that suggested by Dr. Smith Woodward. As a practical test of his methods Prof. Keith invited Dr. Douglas Derry to furnish him with fragments of a specimen skull, which he engaged to reconstruct and to publish the results of his experiment, whatever might be the result. The reconstruction of this skull by Prof. Keith so closely, in his opinion, resembles the cast of the original skull from which the fragments were taken as to confirm the validity of his methods. He is thus led to deny that the architecture of the human skull lies outside the limits of true science. He asserts that it is framed according to definite principles, that all its parts are correlated, and that it is possible from a part—if our knowledge is accurate and full—to reconstruct the whole. The address marks a decided advance in our knowledge of the science of craniometry.

Mr. Henry Balfour contributes to the journal an interesting paper on the art of fire-making with a flexible sawing-thong. This method of fire-production has been traced in three distinct localities: an eastern area extending from Assam to New Guinea; by Miss Mary Kingsley among the Ba-Kele of the Ogowe River in West Africa; and in Sweden, Germany, and Russia, where it is used as a means of procuring need-fire. This strange distribution of the art raises many interesting questions, particularly in relation to the theories of Graebner and his school, who postulate the derivation of these and similar ideas from a single well-defined area, whence they are generally transmitted. In the eastern area it seems to be associated with the Negrito culture, and is possibly a variant of the better known rigid, blade-like fire-saw. In Africa, again, an independent origin is strongly suggested, although the possibility of transmission from the east cannot be quite ignored. In Europe the theory of transmission from the Negritic, Indonesian, pre-Malayan, or Bantu culture can be accepted only with much reservation, and here, too, the inference is that it was independently discovered. Much still remains to be done by examining museum specimens and by the collection