stable equilibrium, and a third intermediate distance at which they are in unstable equilibrium. As Prof. Pictet's definitions differ so materially from those generally accepted at the present time, and his method of deduction is not very conclusive, or even at times clear, the theoretical portion of his address falls far behind the experimental in point of interest and importance.

THE launch of the *Titanic* took place at Belfast on May 31, and forms the subject of an illustrated article in *The Engineer* for June 2. The arrangements for launching were similar to those of the *Olympic*, and the ship took sixty-two seconds from the first movement until she was afloat. The launching weight was 25,000 tons. The hydraulic rams fitted in order to start the ship were not requisitioned. We understand that the *Olympic* has completed most satisfactory trials, and has been handed over to her owners a month before her time.

Engineering for June 2 contains an illustrated description of the yacht *Progress*, fitted with 100 indicated horse-power gas engine and produced and owned by the Empire Oil Engine Syndicate, Ltd., of London. Owing to the cost of oil fuel in many parts of the world, it seems certain that marine internal-combustion engines must be capable of using gas derived from ordinary coal. The engines of this yacht are on the two-cycle double-action principle, driving the propeller direct without the interposition of any gearing. The gas supply is from a suction producer, which has been worked with anthracite, with coke, and with coalite. The patentees are convinced that their accumulated experience will enable them to supply a producer capable of working satisfactorily with ordinary steam coal. The engines are so arranged as to secure great ease in manipulation; as instancing the handiness of the engines, it may be stated that, on coming out of dock on one occasion, twenty-six different movements were made in the course of twenty-one minutes. The time taken to reverse has been found to be from three to four seconds after the order is given. It is intended to build a second engine to develop from 350 to 400 horse-power, and a corresponding gas plant, in both of which a number of improvements in detail will be embodied. This plant will be fitted on board a vessel of the commercial type.

A "GRAPH TEMPLATE," designed by Mr. J. T. Dufton, by means of which standard rectangular hyperbolas and parabolas of large size can be drawn readily on squared paper, has been put upon the market by Messrs. Macmillan and Co., Ltd. The price of the template in transparent celluloid, with instructions, is 6*d*. net, and in nickel-plated metal 3*d*. net.

BY a printer's error, the inscriptions of the two illustrations from "Kearton's Nature Pictures" reproduced in last week's NATURE (p. 450) were unfortunately transposed.

OUR ASTRONOMICAL COLUMN.

NOVA SAGITTARII No. 4.—Circular 164 of the Harvard College Observatory announces the discovery of yet another nova in the constellation Sagittarius. This object was found by Miss Cannon during a rapid comparison of various photographs of the Harvard Map of the Sky on Map 43. It appears on eleven photographs taken between May 22 and July 9, 1901, but no trace of it can be found on 148 other plates taken in 1892, 3, 5, 6, 7, 8, and 9, and each year from 1900 to 1910 inclusive; each of these shows the C.D.M. star −27°12411, of magnitude 9·7, with which the nova at its maximum was equal in photographic magnitude. The exact date of the nova's appearance cannot be fixed, but the greatest observed brightness was 10·3 on May 22, 1901, and it is not shown on a plate taken on April 10, 1901, although this plate shows a fourteenth-magnitude star 0·3′ south of the nova. The fluctuations of brightness appear to be somewhat similar to those of Nova Persei (2). It is of interest to note that seven novæ are now known to have appeared in the region covered by Map 43.

THE MECHANICAL PRODUCTION OF THE STREAMERS SEEN IN THE SOLAR CORONA.—In order to test the theory that the shapes of observed coronal streams may be accounted for on the assumption that they are the natural production of certain defined mechanical forces, Prof. J. A. Miller examined the excellent series of corona photographs now available at the Lick Observatory, and he publishes the results of his discussion in No. 4, vol. xxxiii., of *The Astrophysical Journal*.

If the streamers are formed of particles ejected from the sun under the influence of the solar rotation, of the attraction and of the radiant pressure of the sun, certain shapes should theoretically ensue, and the velocity and direction at any point of the stream can be calculated. Prof. Miller has done this, and finds that not only do the observed streamers largely conform with his theoretical results, but he is able to compute and draw theoretical streamers, for the conditions obtaining at any one eclipse, which agree with those actually observed. Various modifications occur, but may be accounted for by reasonable assumptions of modified conditions; for example, the particles at the end of a stream are probably finer than those at the base, and therefore the sun's radiant pressure would act more strongly on them, or it may be that the particles of a stream are moving in a resisting medium which is denser in the inner than in the outer corona, and each of these causes would produce the differences observed between the computed and the observed results.

THE GENERAL PERTURBATIONS OF EROS.—A lengthy discussion of the general perturbations of the planet Eros is published by Herr H. Samter in No. 4498 of the *Astronomische Nachrichten*. The author tabulates his results for the combined perturbations by Jupiter, Saturn, and Venus, which were easily determined by Hansen's method, and in further tables gives the results of the earth's perturbations and those of Mars.

DETERMINATION OF THE APEX.—From the study of 620 stars having large proper motions, Dr. A. Wilkens has made a new study of the position of the apex. The stars are given in the Wilkens catalogue of 620 stars between 29° 50′ and 35° 10′ N., for 1875, and the Leyden A.G. catalogue, and include 267 having proper motions of 0″–5″; 173, 5″–10″; 76, 10″–15″; 35, 15″–20″; and 69 greater than 20″ per century. They also include 233 stars brighter than 8·5, but mostly fainter than 7·5, mag., 282 between 8·5 and 9·0 mag., and 105 fainter than the ninth magnitude. The resulting value for the position of the apex is A=286°, D=+37°, which is in good agreement with most modern estimations (*Astronomische Nachrichten*, No. 4499).

THE SPECTRA OF COMETS.—Visual observations of the spectra of comets 1908 III. (Morehouse), 1909*c* (Halley), and 1910*a*, are recorded by Herr von Konkoly in No. 4499 of the *Astronomische Nachrichten*. Bands were measured at 561·0 $\mu\mu$, 544·0 $\mu\mu$, and 515 $\mu\mu$ in the spectrum of 1908 III. on September 18, 1908, their respective intensities being 0·4, 0·6, and 1·0; the same bands were seen on September 22, but the wave-length in each of the last two was 1 $\mu\mu$ less. The red end of the spectrum was much brighter than the violet, and of the band at 470 $\mu\mu$ there was no trace.

Halley's comet on February 12 and May 26, 1910, gave a faint spectrum in which the same bands, with slightly varying wave-lengths, were seen. With a larger instrument, two other bands at 586·0 $\mu\mu$ and 472 $\mu\mu$ were seen, and possibly a third at 482 $\mu\mu$. The bands were very bright while the continuous spectrum was abnormally faint. From nineteen separate observations, the wave-lengths of the bands in Halley's comet were found to be 586·0, 561·5, 543·7, 514·7, and 472·0 $\mu\mu$.

The spectrum of comet 1910*a* gave bands at 556·0, 537·0, 512·0, and 481·0 $\mu\mu$.