K.C.I.E., has just been issued by Mr. Francis Edwards, 83 High Street, Marylebone, London, W.

A SECOND edition of Mr. A. H. Mackenzie's "Theoretical and Practical Mechanics" has been published by Messrs. Macmillan and Co., Ltd. The first edition was reviewed in our issue of May 16, 1907 (vol. lxxvi., p. 50). While the general character of the book has been preserved, the new edition has been much enlarged, and in its preparation Mr. Mackenzie has had the cooperation of Mr. A. Forster. The price of the volume remains 1s. 6d.

OUR ASTRONOMICAL COLUMN.

A NEW COMET, 1912c.—A telegram from the Kiel Centralstelle announces the discovery of a new comet by M. Borrelly at Marseilles on November 2. The position at 7h. 39·9m. (Marseilles M.T.) was:—

R.A. = 17h. 47m., decl. = 38° 57′ N.,

which lies about 2° N.W. of θ Herculis. The motion is said to be south-east, the magnitude 10, and the comet transits at about 3 p.m.

A second telegram from the Centralstelle states that the comet was observed by M. Abetti, at the Arcetri Observatory, on November 3, when its position at 7h. 7·6m. (Arcetri M.T.) was:—

R.A. = 17h. 55m. 12·8s., decl. = 37° 21′ 5″,

and the magnitude was estimated at 9·5. The position, at present, is favourable for observations during the evenings, when the comet is fairly high up in the north-west sky.

GALE'S COMET 1912a.—Photographic observations made at the Hamburg Observatory, Bergedorf, on October 9 showed the coma of Gale's comet to be elongated in the direction of the chief tail, position angle 79°, and to be about 1·1′ in diameter; a plate taken with a 5-inch objective of 25-inch focal length showed a tail 5·4° long, which was 2′ broad until it reached about 1° from the head, and then broadened out to 11′ at a distance of 5°. A shorter tail emerged in position angle 122°, and another was suspected at position angle 50°; the magnitude of the whole comet was about 5·5.

Spectrographic observations on October 10 and 15 showed a bright image of the head at 387 μμ ±, and the bands at 474 and 563 μμ, the blue band being essentially brighter than the yellow; the band at 516 μμ was much fainter. The continuous spectrum was much fainter than the bands named, but could be seen extending right along the spectrum from 387 to 563 μμ, and was brightest between 397 and 410 μμ. Prof. Schwassmann states that on the whole the spectrum obtained is very similar to that given by Kiess's comet at the beginning of July, 1911. (*Astronomische Nachrichten*, No. 4608.)

SCHAUMASSE'S COMET 1912b.—In No. 4609 of the *Astronomische Nachrichten*, M. Fayet shows that if the comet recently discovered by M. Schaumasse is not identical with Tuttle's comet, the two objects are moving in very similar orbits. If the identity is accepted, there is an error of about 5° in the mean anomaly, and nearly 4″ in the mean motion, according to M. Raht's elements for Tuttle's comet as given in these columns last week. A tentative calculation by M. Fayet does not indicate the near approach of the comet to any great planet during the recent revolution, and he suggests the possibility that the comet may have split up, the object discovered by M. Schaumasse being only one part. It would be of interest to search for the main body near the calculated positions given in M. Miličevič's recently published ephemeris; on October 20 the position of comet 1912b was α = 10h. 3m., δ = −0° 43′, whereas the ephemeris position for Tuttle's comet was α = 9h. 37m., δ = +73° 27′.

In a later note (*Astronomische Nachrichten*, No. 4610), M. Fayet states that he finds that near the end of 1900 Tuttle's comet was near Jupiter, the minimum distance being 0·8, and a rough calculation gives October 9, 1912, as the resulting date of perihelion passage, three months earlier than the date indicated by the 1899 orbit; the new value for the mean motion (μ) is 263·94″. M. Fayet concludes that the identity of 1912b with Tuttle's comet is very probable, but his hurried calculations of the Jovian perturbation are necessarily only approximate. M. Schaumasse's new ephemeris gives the following positions and distances:—

Ephemeris 12h. (M.T. Paris).

1912	α	δ	log r	log Δ
	h. m.	° ′		
Nov. 7 ...	10 54·5 ...	−22 2		
11 ...	11 6·7 ...	−26 27 ...	0·0371 ...	0·1040
15 ...	11 19·1 ...	−30 41		
19 ...	11 31·9 ...	−34 39 ...	0·0536 ...	0·1218

SUNDIALS.—Several interesting articles on sundials are published in the October number of *L'Astronomie*. M. Roguet describes an elaborate dial recently erected on the south façade of Juvisy Observatory, and also discusses the history of this instrument, which he believes was invented about 550 B.C.; this article is illustrated by several interesting photographs and diagrams, the former depicting a large number of ancient, or especially interesting, dials. M. d'Aurelle Montmorin describes the "Auto," a new portable sundial, and M. Joyeux gives an interesting and detailed description of the sundial erected on the communal school at Sèvres.

VARIABILITY OF SOLAR RADIATION.—Mr. C. G. Abbot, director of the Smithsonian Astrophysical Observatory at Washington, has just returned from a five months' astronomical expedition to Bassour, Algeria. The object of the expedition was to confirm or disprove the supposed variability of the sun. The Astrophysical Observatory has been for seven years making observations on Mt. Wilson, in California, on the daily quantity of heat received from the sun. The observations are arranged in such a manner as to indicate not only the quantity of solar heat reaching the earth, but also the quantity of heat which would reach a body like the moon, which has no appreciable atmosphere.

The observations have indicated that the sun is probably a variable star having a range of variation amounting to from 5 to 10 per cent. within an irregular interval of from five to ten days. Last year Mr. Abbot observed in Algeria, while his colleague, Mr. Aldrich, observed on Mt. Wilson, in California. The object of thus duplicating the measurements was to avoid being misled by any local atmospheric conditions which might have affected Mt. Wilson observations. As nearly one-third of the circumference of the earth lies between Mt. Wilson and Algeria, it could not be expected that a similar local disturbance could affect both stations on the same day in the same manner. The observations of 1911 supported the belief that the sun is variable, but owing to cloudiness their number was not sufficient fully to establish this point. Hence it was thought best to return to Algeria this year.

The observations made by the Smithsonian party in Algeria this year were apparently very satisfactory. They occupied sixty-four days, and on more than fifty of these days Mr. Fowle made similar observations on Mt. Wilson, in California. The results of the work of 1911 and 1912 are expected to establish the supposed variability of the sun, or to show conclusively that this hypothesis can no longer be held.