OUR ASTRONOMICAL COLUMN.

COMET 1905*b*.—Further observations of this comet are recorded in No. 4056 of the *Astronomische Nachrichten*. As an error was made in the Bamberg record of R.A. on November 18, it became necessary for Herr Ebell to recalculate his elements and ephemeris, and the amended results are contained in Circular No. 81 from the Kiel Centralstelle. The corrected elements are as follows:—

T = 1905 October 25·7163 (Berlin).

$$\left.\begin{array}{l} \omega = 132^\circ\ 34'\cdot9 \\ \Omega = 222\ 55\cdot0 \\ i = 140\ 37\cdot1 \end{array}\right\} 1905\cdot0$$

$\log q = 0\cdot02188$

The new ephemeris gives the position of the comet, at 12h. M.T. Berlin, on December 10 as $\alpha = 23$h. 30m. 53s., $\delta = -7^\circ\ 24'\cdot1$, but, as its brightness at that time will be only 0·07 of its brightness when discovered (mag. 7·5), the object will be a very difficult one to observe.

THE ANOMALOUS TAILS OF COMETS.—In No. 4, vol. xxii., of the *Astrophysical Journal* Prof. Barnard discusses the anomalous forms presented by the tails of comets. The generally accepted idea is that the tails are produced by the sun's repulsive force acting on the cometary matter, but, from a study of a number of photographs—more especially of Brooks's (1893) comet—Prof. Barnard has arrived at the conclusion that too much importance is attached to this cause, and that the eruptive action of the comet itself, and the active interference of external matter, should also be included amongst the tail-producing causes. Short, straight, minor tails, issuing from the nucleus at considerable angles to the main tail, seem to corroborate the existence of the comet's own eruptive force, or, at least, of some force in addition to that supplied by the sun.

The rapid deflections and distortions of the tail or tails, as in Brooks's comet, suggest the existence of some resisting medium which is not evenly distributed throughout interplanetary space, and such a medium would also explain the anomalous brightening up of some comets (*e.g.* Sawerthal's, May, 1888) and the disruption of such a comet as Biela's.

Finally, Prof. Barnard suggests that all bright comets possessing tails should be photographed hour by hour, as the day by day photographs hitherto obtained are separated by intervals so long that the changes recorded are not necessarily connected.

NOVA AQUILÆ NO. 2.—A number of photographs of the region about Nova Aquilæ, taken with the Bruce telescope, and with the 24-inch reflector of the Yerkes Observatory, are discussed by Mr. J. A. Parkhurst in the November *Astrophysical Journal*. These show that in the spring and summer of 1904 the Nova was at least fainter than the fifteenth magnitude.

The final mean value obtained for the position of the Nova for 1900 was

R.A. = 18h. 56m. 48·96s., dec. = $-4^\circ\ 35'\ 20''\cdot3$,

and a comparison of the images on different plates showed that the Nova was only slightly coloured.

A reproduction of one of the photographs taken with the 24-inch reflector (exposure, three hours) shows that the Nova is situated in a dark lane, almost devoid of stars, in a very rich field in the Milky Way, and also illustrates, in a very striking manner, the connection of Novæ with the galaxy.

CATALOGUE OF BINARY STAR ORBITS.—The results of a critical study of all published double-star orbits are published in Bulletin No. 84 of the Lick Observatory by Prof. R. G. Aitken.

The catalogue is divided into two lists, of which the first, relating to fifty-three stars, contains the elements of those orbits which Prof. Aitken considers to be fairly trustworthy. The second contains the names, the period, and the name of the computer of ninety-one stars of which Prof. Aitken considers the published orbits are too untrustworthy to be of any practical value.

A number of critical and explanatory notes relating to some of the individual stars accompany Prof. Aitken's catalogue.

INDIAN METEOROLOGY, 1892–1902.[1]

SIR JOHN ELIOT, in discussing recent meteorological phenomena, says:—"The period 1892–1902 was unique in the meteorology of India for the magnitude and persistence of the variations of rainfall, cloud, humidity and temperature from the normal."

This period can be divided into two parts, abnormal in opposite directions:—1892–4 characterised by excess of rain, cloud and humidity, and a reduced temperature, and 1895–1902 characterised by deficient rainfall, less cloud, drier air, and an average temperature above the normal.

The normal rainfall for three years (taking the average of 450 selected stations) is 123 inches, while the total rainfall for the period 1892–4 was 143·5 inches, an excess of 20·5 inches. The actual rainfall for the eight years 1895–1902 was 303·8 inches against the normal 328·7 inches, a deficiency of 24·9 inches.

During two years of this dry period the deficiency was so great over certain areas as to cause very severe droughts, which in turn caused famines. These two famines were, both in affected area and affected population, the worst during the last 150 years. The drought of 1896 and the famine of 1897 afflicted the United Provinces, Central Provinces, Central India, and Rajputana, an area of 300,000 to 400,000 square miles, 3,000,000 persons receiving relief. The drought of 1899 and the famine of 1900 affected South Punjab, Rajputana, Central India, Berar, Central Provinces, Hyderabad, Bombay Presidency and part of Orissa, Chota Nagpur, and Madras, an area of 600,000 to 700,000 square miles, and 6,500,000 persons required relief.

In discussing the meteorology of so large an area as India, it is impossible to detail all the local variations, but from among some examples given, Kilba, a station in the Simla district, may be mentioned. During the eleven years under discussion, Kilba for ten years received deficient rainfall, and instead of the normal 441·9 inches received 304·4 inches, the deficiency being equal to 3½ years' normal fall.

Using the data from 450 stations selected by the late Mr. Blandford as most trustworthy and representative, and giving due weight according to the area represented by each station, the average rainfall over India is given in inches:—1892, 46·18; 1893, 50·16; 1894, 47·56; 1895, 38·90; 1896, 36·26; 1897, 40·94; 1898, 41·52; 1899, 29·85; 1900, 40·52; 1901, 36·86; 1902, 39·04, the normal annual rainfall being 41·09 inches. The division of these years into a wet and a dry season is obvious.

On examining the amount of rainfall during the different seasons of the year, the fact is brought out clearly that all the seasons were affected by the abnormal conditions. During 1892–1894 all parts of the year had a tendency to excess rain. In 1893 the dry season had relatively more excess rain than the wet season. During the dry period 1895–1902 there was a tendency to deficiency of rain during all the seasons. Yet during a normal year the meteorological conditions which obtain during the wet season and the dry season are quite inverse of each other.

The persistence of the abnormalities through the seasons is also shown by the observations of cloud amount, humidity and temperature.

Discussing the geographical distribution of the rain, Sir John Eliot points out that during the wet period 1892–4 all parts of India received excess rain except in 1894, when the Bombay and Malabar district and the Madras district were deficient by 2 per cent. and 3 per cent. of the normal respectively. In 1892 the excess was more marked in those areas which received their south-west monsoon rain by the Bombay or Arabian Sea current, in 1893 and 1894 in those areas supplied by the Bay of Bengal current, and the excess was relatively greater in those areas which are near the interior limits of the fields of the two currents. The abnormal extension and strength of the monsoon currents are indicated by this excess in the interior.

During the period there was generally excess rain in

[1] "A Preliminary Investigation of the more Important Features of the Meteorology of Southern Asia, the Indian Ocean, and Neighbouring Countries during the Period 1892–1902." With Appendices. By Sir John Eliot, M.A., F.R.S., K.C.I.E. (Indian Meteorological Memoirs, vol. xvi. part ii.).

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