

*Dr. Doberck's Observatory, Sutton, Surrey.*

A  $7\frac{1}{4}$ -inch equatorial telescope was erected by Messrs. T. Cooke and Sons, of Buckingham Works, York, in an observatory built by the Berthon Boat Co., Romsey, Hants. It was ready for use on the 25th April 1908. The object-glass is of the finest quality: bright double stars with a distance of  $0''.3$  between the components are seen elongated.

With the co-operation of Mrs. Doberck, 939 measures of double stars had been secured by the end of the year, but the final value of a screw-revolution has not yet been fixed, as this instrument (like the one at Markree used by the writer 1875-1883) is not suited for the determination of this value by transits without sacrificing several fine nights. It is being determined by the measure of large arcs in the sky. The working catalogue has been supplemented by objects taken from Burnham's great general catalogue, and contains now almost 800 entries. Use is also made of Mr. Maw's excellent suggestion to observe the position-angle of stars placed at right angles to the wires.

A paper was published on the 26th. April 1896 in *Ast. Nach.* No. 3370 on the probable errors of double star observations made by different observers. This has been followed by over thirty papers on the same subject, and the average results are published in *Ast. Nach.* No. 4229. As stated in that paper, the writer is continuing and extending these researches on the basis of other data than those used in that paper. Papers on the hypothetical parallaxes of double stars, and their connection with the elements of the orbits and also with proper motion, were published in the *Ast. Nach.* Nos. 4271 and 4291. An orbit of  $\gamma$  Virginis was published in *A.N.* No. 4235. As perturbation of the elliptic motion is indicated, this star is still under investigation, as well as  $\alpha$  Centauri (*A.N.* No. 4189) and  $\zeta$  Aquarii. The writer suspects that one of the components of the latter has a very close companion. The orbit of  $\lambda$  Ophiuchi has been computed, but the result is different according as the angles or the distances are represented by the orbit: they cannot both be represented at the same time. However, the components differ greatly in brightness, which may account for a portion, if not the whole, of the difficulty. A paper on  $\zeta$  Cancri C (*A.N.* No. 4273) proves this star to move round an invisible companion, as maintained by Seeliger against Burnham. The existence of the invisible star is indicated by Burnham and Barnard measures instituted to settle the question. The poles of the orbits of double stars have been investigated by the writer for over thirty years. In a paper in *A.N.* No. 4291 it is indicated that they are scattered at random. New orbits have been published also for 42 Comæ Berenicis (*A.N.* 4276),  $\eta$  Cassiopeiæ (*A.N.* 4296), and  $\gamma$  Corouæ Borealis (*A.N.* 4296). An orbit of the latter is being calculated by the method of least squares from both angles and distances.

At the time of his discovery of double stars, Sir William Herschel estimated the distances between the components in star diameters. These records have now been reduced. Herschel's observations in case of stars below 2" in distance are more accurate than any made before W. Struve commenced to use his 9-inch equatorial, but above 3" they are not accurate. A paper on the subject is now in the press.

The co-ordinates of the observatory are: — longitude  $0^h 0^m 44^s.53$  W., latitude  $51^\circ 22' 19''.8$  N., altitude 167 feet above M.S.L. The geographical co-ordinates were determined by the Ordnance Survey, the altitude by the writer.

*Wolsingham Observatory (Rev. T. E. Espin's).*

The work of measuring Sir John Herschel's double stars in the selected zones has been continued during the year, and also of measuring various miscellaneous pairs. The search for new pairs has also been continued, and the results communicated to the Society.

*Mr. Franklin-Adams' Astrographic Laboratory.*

All possible work, even routine work, not absolutely necessary, was suspended in the autumn in order to make sure of the completion of the 412 charts before October 7th., the first day upon which the completion could reasonably be expected: not only was this not accomplished, but on the 31st. December there still remained twenty regions to photograph. Every hour of every night has been watched, but spells of  $2^h 20^m$  have been few and far between; the British climate is very trying for a series of long exposures on the meridian; the 200 plates were begun in October 1904 and are still unfinished; one great hindrance has been dew on the object-glass. Upon one night in November, which was truly magnificent, five plates—a record—were all spoilt by dew. A long search in the Library of the Royal Institution and many inquiries from friends yielded no information as to dew precaution; experiments were then started, and it is believed that these have been perfectly successful. The writer hopes shortly to communicate this success to the R.A.S.

Collotype proofs are now being prepared of a pair of charts for distribution to observatories and libraries, with a view of ascertaining the demand for complete sets of collotypes at the price of printing, distribution, and materials.

The production of the necessary positives for this work has entailed months of labour in experiments, no precedents having been found for such star-work upon plates of 15 inches  $\times$  15 inches, the difficulty being even coating in wet collodion or emulsion; at the time of writing a Taylor & Hobson Cooke lens is being tried, with exposure to fifty filament metallic lamps.