

THE efficient equipment of observatories calls for the services of the engineer as well as the scientific-instrument maker and the optician. The firm of Messrs. Cooke, Troughton and Simms, Ltd., Buckingham Works, York, are fortunate in having at their command facilities for the production of all the apparatus and equipment required for astronomical observation. Several well-known observatories have been built and equipped by the firm, and this branch of their production is now being further developed. A recently issued catalogue, No. 570, contains a full list of astronomical instruments and apparatus manufactured by them, including domes from 10 to 40 feet in diameter, telescopes with objectives up to 20 inches in aperture, a full range of eyepieces, photographic and spectroscopic accessories and position micrometers. Portable equatorial and alt-

azimuth stands, semi-portable and fixed equatorial telescope mountings and transit instruments, of various types, are described and illustrated, as well as mechanical and electrical accessories. The articles included in the catalogue are all standard apparatus and instruments, for which prices are quoted; but the firm undertakes also the design and construction of instruments for special purposes.

Two important catalogues of second-hand books of science have just been issued by Messrs Wheldon and Wesley, Ltd., 2 Arthur Street, W.C.2, viz. No. 15, Zoology, Part 2—Vertebrate Faunas, containing nearly 1500 titles, and No. 16, Lepidoptera, with some 262 titles. A number of scarce works are offered for sale, and the catalogues should appeal to many readers of NATURE.

### Our Astronomical Column.

MIRA CETI.—There have been three interesting discoveries made concerning this famous variable in recent months. The finding of the faint companion, that is responsible for the bright lines seen in the spectrum at minimum, has already been reported in this column. The next step was the investigation of its heat radiation by the thermocouple by Messrs. Nicholson and Pettit at Mt. Wilson; this was described by Prof. Eddington at the February meeting of the Royal Astronomical Society (see *Observatory* for March, p. 58). While the visual magnitude varies from the third to the ninth, a 200-fold range, the "heat magnitude" varies only from 1.5 mag. to 3 mag., a 4-fold range. This shows that the loss of light is almost wholly in the short wave-lengths.

The third discovery, reported in the *Times* of March 12, is that Dr. F. Pease has successfully applied the 20-ft. interferometer on the 100-inch reflector at Mt. Wilson to the measurement of the angular diameter of Mira, obtaining the value of 0.06", which is the largest yet found for any star, though its linear diameter would be about equal to that of Betelgeuse, each being about 250 million miles, assuming that their adopted parallaxes are correct.

It is evident that the surface brightness of Mira must be very low, since in spite of its greater angular diameter it is some two magnitudes fainter than Betelgeuse even when at its maximum light. It will probably be followed for as long a portion of the light curve as the interferometer method permits, in order to see whether the diameter varies periodically. Such a variation was strongly suspected in the case of Betelgeuse, itself a variable but with a much smaller range.

Mira is probably the nearest to us of the long-period variables, and anything found about it may be applicable to the whole class. They were formerly thought to be expiring suns, but are now considered to be at an early stage of star-life.

A NEW APPLICATION OF THE SPECTROHELIOGRAPH.—Mr. Royds, Director of the Kodaikanal Observatory, described at the meeting on March 13 of the Royal Astronomical Society, a new method of using this instrument. Instead of placing the second slit wholly on the H<sub>α</sub> line of hydrogen, it was made to project on to the light spectrum; the character of the image was then found to be entirely different. Instead of measuring the amount of light from glowing hydrogen in different regions, it now measures the varying

pressure of the gas by the varying width of the line, and consequent reduction of light where it is broadest and the pressure greatest.

Each sunspot is found to be surrounded by a narrow bright ring; outside this there is a large dusky region, showing a good deal of structure. The general mottling of the whole disc is very clearly brought out, and seems to have more regularity than in ordinary pictures. The method is quite a hopeful one for bringing out some new points concerning the distribution of gases over the sun's surface.

THE SYSTEM OF β-LYRÆ.—Prof. H. H. Turner, at the meeting on March 13 of the Royal Astronomical Society, announced an interesting result which Miss Blagg has obtained. She finds that there is a small subsidiary variation of light, the amplitude of which is about 0.1 magnitude, and period 6.595 days, very little in excess of the 6.454 days which is the half period of the main variation. It is this approach to synchronism that has prevented the new term from being detected earlier. It shows itself not as a separate curve, but as a slow alteration in the amplitude of the principal curve. No suggestion was made of the explanation of this new term. As the two stars are supposed to be almost in contact, there would not seem to be room for a third orb in their immediate vicinity.

THE DISTANCE OF THE ANDROMEDA NEBULA.—Prof. H. N. Russell gives some further details in *Scientific American* for March of Prof. Hubble's investigation of the distance of this nebula by photographing the Cepheid variables in it. He mentions the possibility that was alluded to in NATURE of March 7, p. 349, that absorption by the nebula might diminish the stars' light and so give too large an apparent distance. But he says that several stars in different parts of the nebula agreed in giving the same distance, thus showing that the absorption effect must be very small, since otherwise it could scarcely be the same for all the stars. Prof. Russell also notes that stars that are individually visible in the nebula must be a thousand times as luminous as the sun; hence only the extreme giants are separately visible, and the great mass of the stars in it are only seen as a general glow. There is still something of a puzzle about the very rapid diminution of light as we pass away from the centre that was found by Mr. Reynolds's photometric measurements. This seems to indicate a different structure from that in our sidereal system.