

## OUR ASTRONOMICAL COLUMN.

TUTTLE'S NEBULA, N.G.C. 6643.—In this column for September 25 last attention was directed to M. Borrelly's observation of Hind's nebula indicating its variable nature. M. Borrelly has recently been making observations on the nebula of Tuttle, N.G.C. 6643, at the Marseilles Observatory, and has communicated the results to the *Comptes rendus* for December 22, 1913 (vol. clvii., No. 25, p. 1377). He brings together all the observations made since its discovery in 1859, and the evidence is distinctly in favour of its variability. In very recent years, *i.e.* in 1909, its light appeared to diminish considerably. From 1910 to 1912 it was feeble, but still to be seen in the comet-seeker (mag. 11). On July 10, 1913, M. Borrelly says it was scarcely visible in the instrument; on August 26 it was at the limit of visibility, while on August 27 it was practically invisible (mag. 11.5). From the observations M. Borrelly concludes that changes have taken place.

BRIGHT HYDROGEN LINES IN STELLAR SPECTRA AND P CYGNI.—Mr. Paul W. Merrill communicates two papers to the Lick Observatory Bulletin, No. 246. The first is the description of a series of spectrograms of stars the spectra of which contain bright hydrogen lines, and is a continuation of the work described in the previous bulletin, No. 162 (1913). The spectra are confined to the H $\alpha$  region, and were obtained with the 36-in. refractor and a one-prism spectrograph previously described. The stars here dealt with belong to classes B and A, but stars of class Oe $\gamma$  were photographed to test their relation to class B. In the last-mentioned case, although only a few stars were photographed, the evidence was negative, out of nine stars none of them indicated bright hydrogen lines. The second paper is on the spectrum of P Cygni between  $\lambda 4340$  and  $\lambda 4650$ , taken with the three-prism spectrograph. Twelve photographs are discussed, having been taken between August, 1907, and September, 1913. Tables are given showing the determined displacements for numerous lines of H, He, O, N, and Si, from each of the photographs. Attention is directed to the resemblance between the hydrogen lines of P Cygni, and those of an ordinary Nova. It is stated that the measurements given in the tables show good agreement with those of Frost.

MEASUREMENT OF SMALL DISPLACEMENTS OF SPECTRUM LINES.—Bulletin No. 32 of the Kodaikanal Observatory contains an important communication by Mr. J. Evershed on a new method of measuring small displacements of spectrum lines. The main idea of the method consists in placing a positive copy of the plate to be measured reversed, and almost in contact with the negative, film to film, and moving one with reference to the other, so that the positive images are made to coincide successively with the negative images of the corresponding lines. No spider thread is used, and the accuracy of the adjustment for coincidence depends on the sensitiveness of the eye in estimating the change from the bright and dark contiguous images of a line, to the perfectly uniform density which results when the positive image exactly coincides with the negative, and the positive copy has the same gradation of tone as the negative. Mr. Evershed describes and illustrates the method and machine employed, and points out its advantages and disadvantages. He also gives two examples of measures made in the ordinary way and by the new method to show the relative accuracy obtained; these represent two series of solar rotation plates. The results indicate that the probable error is about halved in the positive on negative measures as compared with the ordinary measures, and the gain in accuracy is

NO. 2306, VOL. 92]

about the same whatever way the probable errors are estimated.

ASTRONOMICAL ANNUALS AND STAR CHARTS.—The annual "Companion to The Observatory" has nearly become standardised in form, and the present issue will be found as useful as ever. The favourable and accessible total eclipse of the sun on August 20-21 next calls for extra information, and this has been given in the form of the sun's altitude, azimuth, and parallactic angle for the more accessible part of the line of totality in addition to the usual data. For the fiftieth year the handy astronomical and meteorological annual, edited by M. Camille Flammarion, makes its appearance, and the great amount of interesting matter contained within its covers is as complete and useful as in previous issues. Space does not allow one to enter into any detail regarding the wide range of the information here brought together, but astronomical readers are sufficiently acquainted with previous volumes to know the utility of the information displayed. As is usual, a number of excellent illustrations and figures accompany the text. Mrs. H. Periam Hawkins's "Star Almanac for 1914" and "Revolving Star Map" will be found very useful to astronomers generally. The former consists of a large sheet to be hung up on a wall, and contains much useful matter relative to the apparent stellar movements, meteor showers, planets, &c. The latter is a well-constructed planisphere for stars seen from the northern hemisphere, and has a movable declination scale.

## PRIZE SUBJECTS PROPOSED BY THE PARIS ACADEMY OF SCIENCES FOR 1915.

*Geometry.*—Francœur prize (1000 francs), for discoveries or works useful to the progress of pure or applied mathematics; Bordin prize (3000 francs), to make notable progress in the study of curves with constant torsion; to determine, if possible, which of these curves are algebraic, at least those which are unicursal.

*Mechanics.*—A Montyon prize (700 francs), for the invention or improvement of instruments useful to the progress of agriculture, the mechanical arts or science; Poncelet prize (2000 francs), for work on applied mathematics; Boileau prize (1300 francs), for researches on the motion of fluids contributing to the progress of hydraulics.

*Navigation.*—The extraordinary prize of 6000 francs for work leading to increased efficiency of the French naval forces; Plumey prize (4000 francs), for improvements in steam engines or any other invention contributing to the progress of steam navigation.

*Astronomy.*—Pierre Guzman prize (100,000 francs), to anyone finding a means of communication with another planet other than Mars. Failing the above, the accumulated interest of five years will be awarded for an important astronomical discovery. Lalande prize (540 francs), for memoir or work useful to the progress of astronomy; Valz prize (460 francs), to the author of the most interesting astronomical observation during the year; G. de Pontécoulant prize (700 francs), for researches in celestial mechanics.

*Geography.*—Tchihatchef prize (3000 francs), as recompense or encouragement to naturalists of any nationality distinguished in the exploration of the lesser-known parts of Asia; Gay prize (1500 francs), for a study of the distribution of plants in Indo-China.

*Physics.*—Hébert prize (1000 francs), for a treatise or discovery in connection with the practical use of electricity; Hughes prize (2500 francs), for discoveries or works contributing to the progress of physics; Henri de Parville prize (1500 francs), for original work

in physics; Gaston Planté prize (3000 francs), for the French author of an important discovery, invention, or work in the field of electricity.

*Chemistry.*—Jecker prize (10,000 francs), for work conducing to the progress of organic chemistry; Cahours prize (3000 francs), for the encouragement of young chemists; Montyon prize (unhealthy trades; one prize, 2500 francs, a mention of 1500 francs), for the discovery of a means of rendering an art or trade less unhealthy; Houzeau prize (700 francs), for a young chemist.

*Mineralogy and Geology.*—Delesse prize (1400 francs), for work in geology, or, failing that, in mineralogy; Joseph Labbé prize (1000 francs), for geological researches contributing to the development of the mineral wealth of France, its colonies, and protectorates.

*Botany.*—Desmazières prize (1600 francs), for the best publication during the year on Cryptogams; Montagne prize (1500 francs), for work on the anatomy, physiology, development, or description of the lower Cryptogams; de Coincy prize (900 francs), for a work on phanerogams; Thore prize (200 francs), for work on the cellular cryptogams of Europe; Jean de Ruz de Lavisson prize (500 francs), for work on plant physiology.

*Anatomy and Zoology.*—Savigny prize (1500 francs), for the assistance of young travelling zoologists, not receiving Government assistance, who work on the invertebrates of Egypt and Syria; Cuvier prize (1500 francs), for work in zoological palæontology, comparative anatomy, or zoology; da Gama Machado prize (1200 francs), for memoirs on the coloured parts of the tegumentary system of animals.

*Medicine and Surgery.*—Montyon prize (2500 francs, mentions of 1500 francs), for discoveries or inventions in medicine and surgery; Barbier prize (2000 francs), for a discovery in botany in relation to medicine, or in the sciences of surgery, medicine, or pharmacy; Bréant prize (100,000 francs), for a specific cure for Asiatic cholera; Godard prize (1000 francs), for the best memoir on the anatomy, physiology, and pathology of the genito-urinary organs; Baron Lorrey prize (750 francs), for a work treating of military hygiene, medicine, or surgery; Bellion prize (1400 francs), for medical discoveries; Mège prize (10,000 francs); Argut prize (1200 francs), for the discovery of a remedy for a disease at present not capable of treatment; Chausier prize (10,000 francs), for the best book or memoir published during the last four years on legal or practical medicine; Dugate prize (2500 francs), for a work on the signs of death and the means of preventing premature burial.

*Physiology.*—Montyon prize (750 francs), for work in experimental physiology; Philipeaux prize (900 francs), for experimental physiology; Lallemand prize (1800 francs), for work relating to the nervous system; Pourat prize (1000 francs), for a memoir on the relations between the combined sugar of the blood and the albuminoid materials.

*Statistics.*—Montyon prize (1000 francs, and two mentions of 500 francs), for works dealing with statistical questions.

*History of Science.*—Binoux prize (2000 francs).

*General Prizes.*—Arago medal; Lavoisier medal, for work in chemistry; Berthelot medal, to persons taking prizes in chemistry or physics; Henri Becquerel prize (3000 francs); Gegner prize (3800 francs); Lannelongue prize (2000 francs); Gustave Roux prize (1000 francs), Tremont prize (1100 francs); Wilde prize (4000 francs), for a work or discovery in astronomy, physics, chemistry, mineralogy, geology, or experimental mechanics; Lonchamp prize (4000 francs); Saintour prize (3000 francs), for work in mathematics; Henri de Parville prize (2500 francs); Victor Raulin

prize (1500 francs), for facilitating the publication of works relating to geology and palæontology; Vaillant prize (4000 francs), for the discovery of a photographic plate free from grain, and as sensitive as the gelatino-bromide in current use; Fanny Emden prize (3000 francs), for work dealing with hypnotism and suggestion; Grand prize of the physical sciences (300 francs), for the study of a French colony from the point of view of its geology, mineralogy, and its physical geography; Leconte prize (50,000 francs), for new and important discoveries in mathematics, physics, chemistry, natural history, and medical science; Petit d'Ormoy prize (10,000 francs), for work in pure or applied mathematics or in natural science; Pierson-Perrin prize (5000 francs), for a discovery in the field of mechanics or physics.

### THE ASSOCIATION OF ECONOMIC BIOLOGISTS.

THE twelfth annual Congress of the Association of Economic Biologists, held at the Liverpool School of Tropical Medicine, last week, marked off a distinct era in the progress and development of economic biology in the United Kingdom.

Founded in November, 1904, with a membership of twenty-four, it seemed doubtful for a time whether what Prof. Fred V. Theobald aptly christened "Mr. Collinge's healthy infant," would weather the storms of its early days. At that time economic biology was looked askance at in all our universities, and regarded as something ultra-scientific, and could only be said to be taught and studied in any detail at the South-Eastern Agricultural College, Wye.

Even at a later date professors of biology were interested only in the morphological or systematic aspects of biology, and dreaded the intrusion of applied biology. Happily these views have all passed away, and the association may very rightly claim to have had a large share in bringing about a more reasonable and truly scientific spirit.

Meeting first in the University of Birmingham, the association has held meetings in the Universities of Liverpool, Cambridge, London, Edinburgh, Oxford, Manchester, and Dublin. From each of these centres of learning it has gathered strength, leaving behind some record of the really valuable work which its members have been engaged upon, and indirectly tending to gain the sympathies of those who originally regarded the organisation from an entirely mistaken point of view. Gradually biologists in this country were beginning to realise that, as stated by Prof. Miall, "a practical purpose is, in my opinion, not a hindrance but a powerful motive to the acquisition of scientific knowledge. If not too narrowly prosecuted, the practical purpose may be a means of distinguishing knowledge, which is really useful from knowledge which is merely curious."

Since 1904 departments of economic biology have been founded in nearly all our universities, which has meant an increase in the number of workers, and has made the association still more necessary for such investigators to possess an organisation wherein they could "discuss new discoveries, exchange experiences, carefully consider the best methods of work, give opportunity to individual workers of announcing proposed investigations, so as to bring out suggestions and prevent unnecessary duplication of work, and to suggest, when possible, certain lines of investigation upon subjects of general interest."

The outstanding feature of the Liverpool meeting was the decision of the council to increase the number of meetings to four per annum, three of which will be held in London, and one in the provinces; coupled