

but that in the second wall was 0.7 in. From this it follows that a man hit after a full meal would have less chance of recovery than had this occurred when the organ was empty. Bullet wounds of the lung, provided no large vessels are touched, are seldom fatal in man or beast. The author has seen as many as a dozen men in one ward of a base hospital all convalescent from lung injuries.

In an article in *Engineering* for September 3, Mr. William Hovgaard discusses the *Lusitania* disaster, and draws therefrom the following conclusions:—(1) The principle of transverse subdivision should be considered as fundamental in the design of all vessels, merchant ships as well as warships, simply because the longitudinal stability is always much greater than the transverse, and in sea-going ships is generally about one hundred times as great. (2) Longitudinal subdivision is intrinsically pernicious, on account of the small transverse stability of all ordinary vessels, and should be used only where absolutely necessary. (3) All wing compartments, where such must be fitted, should either be so small that their heeling effect when flooded will be negligible, or, if that is impracticable, as may be the case in warships and auxiliary cruisers, they should be in permanent connection with corresponding compartments on the other side of the ship, so as to eliminate the heeling effect automatically. Provision may be made, in addition, for pumping water into the side compartments. In pure merchant vessels, no side bunkers or other longitudinal compartments of so large a volume as to require such means of compensation should be allowed.

THE *Engineer* for September 3 has an article on the employment of women as machinists, with special reference to the various shell factories organised by Sir William Beardmore. About 800 girls are now employed in these factories, and the number will shortly be very largely increased. Some of these girls have now been at work for about four months, and were first trained by special instructors selected from men employed in other departments of Messrs. Beardmore's works, assisted by skilled operators sent down by the makers of several of the machines. These girls were found to be capable of a good output on many of the operations after only a week's instruction. Lady superintendents are in charge of the place night and day, and a good mess-room is provided for meals. All the operations, with one exception, in the making of 18-pounder shells are carried out by the girls. The output on some of the operations exceeded expectation owing to the keenness of the girls, so much so that some of the machines provided have actually been found to be superfluous, and other machines have been shown to be capable of more work than had ever been believed to be possible. There is plenty of such labour available in the country, and all the women are moved by the keenest spirit of patriotism. We trust that employers will not hesitate to fill in their blanks from this source.

MOTOR barges, which stir up the mud and discharge large quantities of oil in the Grand Canal, in the

neighbourhood of Ballinasloe, Co. Galway, will apparently soon bring about the extinction of some of the rarer aquatic mollusca. This at any rate is the opinion, founded on experience, of Mr. R. A. Phillips, who contributes a short but valuable account of the mollusca of South Galway to the *Irish Naturalist* for August.

#### OUR ASTRONOMICAL COLUMN.

COMET NOTES.—Comet Mellish (1915 *a*) is moving north and towards the earth, and will be nearest about October 26 (47 million miles). It is also rapidly getting away from the sun, and its brightness is diminishing. J. Braae and J. Fischer-Petersen have extended the ephemeris given in *Astronomische Nachrichten* 4802. The comet is apparently moving nearly parallel to and only slightly S. of the line joining  $\beta$  Canis Majoris and  $\beta$  Orionis. It will make very close approach to each of these stars on September 27 and November 5 respectively. During this time its magnitude will have reduced from 7.7 to nearly 8.3. J. Braae also supplies a continuation of the ephemeris for the periodic comet Tempel II. (1915 *c*). Dr. H. Thiele, of the Bergedorf Observatory, publishes (*Astronomische Nachrichten* 4811), positions measured on August 9 and 10. It is now somewhat distant and retiring. Its declination is slowly decreasing on a path in Taurus, practically at right angles to that of 1915 *a*. For the other periodic comet at present in apparition, Winnecke's comet (1915 *b*—this return was first observed by Dr. Thiele just mentioned), K. Hillebrand has extended the ephemeris given in *Astronomische Nachrichten* 4787, using slightly improved places (*Astronomische Nachrichten*, 4810). This comet has also passed perihelion, and does not come nearer than the sun's distance (about September 25). Its apparent path passed near  $\kappa$  Virginis (August 31), and from Virgo passes through Libra and centrally through Scorpio, bringing it near  $\epsilon$  Scorpionis on October 4. During the last apparition (as 1909 *d*) it remained very faint and without observable tail or nucleus.

THE TOTAL SOLAR ECLIPSE, AUGUST 21, 1914.—Several publications dealing with this eclipse have lately come to hand. In one of these, MM. C. Benedicks and I. Fredholm describe (Ark. K. Svenska Vet' Acad., Band 10, No. 24) some photographs taken at Lundsvalld with a telephoto combination (Goerz anastigmat and Zeiss teleansatz). They have devised a laboratory experiment reproducing the effect of shadow-bands which they ascribe simply to an effect of refraction in a non-homogeneous medium. Senor P. Carrasco forwards a reprint of a note referring to his observations made at Theodosia of the red line at  $\lambda$  6373 (Revista R. Acad., Ciencias, January, 1915, Madrid). From Prof. Guglielmo Mengarini we have received a copy of an article which appeared in the *Nuova Antologia* (fasc. 1039, Rome), describing the operations of the Italian expedition to the Crimea. Although occupying a station in the neighbourhood of Theodosia, a fortunate break in the clouds permitted observations of totality, and the corona was photographed by Prof. Mengarini on a Lumiere autochrome plate, exposed at the focus of the Fraunhofer equatorial (3 metres f. l.) loaned by Prof. Bemporad. Illustrations include reproductions of two composite corona photographs and some prominence pictures. Prof. Ricco made visual and spectroscopic observations. Prof. Palazzo employed a series of recording instruments in observations of solar radiation, terrestrial

magnetism, electric potential, and earth temperature. From the *Astronomische Nachrichten* (No. 4811) we learn that the 6-in. Repsold heliometer of the Leipsic Observatory was employed by Von Naumann, assisted by Frl. Kuschel, for measures of the position angles of the cusps at chronographically recorded instants through the greatest phase; 150 measures were obtained in about fifty-two minutes. The following corrections to the ephemerides were obtained:—

$$\delta\alpha = +11.4'' \pm 0.12'', \quad \delta\delta = -3.6'' \pm 0.08''.$$

The solar co-ordinates were taken from the *Berliner Jahrbuch*; the moon's position was derived from the Nautical Almanac.

**COLOUR INDEX AND DISTANCE OF STARS.**—Mr. P. J. van Rhijn, who has been working at the Mount Wilson Observatory, has presented an important memoir to the University of Groningen as thesis for doctorate dealing with the change of colour with distance and apparent magnitude, including a new determination of the mean parallaxes of the stars of given magnitude and proper motion. The stellar data employed in the paper are:—(1) Colour or photographic and visual magnitude; (2) spectral type; (3) distance. Colour and spectral type have been taken from the Yerkes actinometry. Distance has been determined according to Kapteyn's method of deriving mean parallaxes from proper motions and magnitudes, and then calculating the mean distances on the hypothesis that the logarithms of the ratio of true parallax to the most probable parallax of stars having the same magnitude and proper motion are distributed according to the law of errors. The data permitted these values to be satisfactorily obtained for the helium and second-type stars, but for the A-type paucity of parallaxes necessitated different treatment. As would be expected, Mr. van Rhijn has obtained results in good accord with those of Kapteyn, whilst the exclusion of stars with large angular motions is shown to be responsible for the opposed conclusions reached by Dr. Campbell.

Having obtained numerical expressions for the mean distances of the stars, Mr. van Rhijn proceeds to deal with the colour index. This has been taken as the summation of the effect of distance and apparent magnitude, the effect of absolute magnitude for various reasons having been given a zero coefficient. Out of the laborious calculations involved in the solution of the colour index equations the following results have emerged. The faint stars, and also the distant stars, are, *ceteris paribus*, redder than the bright stars and the near stars respectively. The increase of the colour index found being  $+0.025m. \pm 0.004$  per cent. per unit of visual magnitude, and  $+0.00015m. \pm 0.00003$  per cent. per unit of distance (parsec).

It is possible that the B stars and also the early A stars are immune from the distance effect. If that were so, the coefficient for the remaining spectral types would be increased to a value 6.5 times its probable error. The effect may be due either to an absorption of light in interstellar space or to an influence of absolute magnitude on colour.

#### RECENT STUDIES OF CERTAIN TROPICAL DISEASES.

**M**ANY features of much interest are presented in the current number of the *Annals of Tropical Medicine and Parasitology* (vol. ix., No. 2, June 30). The opening article, by Dr. Breinl, deals with the ulcerative disease known as Gangosa, or Rhinopharyngitis mutilans, as observed by him in New Guinea. The causal agent of the disease is considered to be

a new species of *Cryptococcus* (*C. mutilans*), of which illustrations are given in a coloured plate. The ravages due to Gangosa are forcibly demonstrated by three plates of photographs of different cases. The second paper, by Dr. H. Priestley, deals with *Theileria tachyglossi*, a protozoan parasite found in the blood and internal organs of an Echidna, *Tachyglossus aculeatus*, from the neighbourhood of Townsville, Queensland. This article is of interest as being the first record of the organism from marsupials. The parasite closely resembles *Theileria parva* of African East Coast fever in cattle. A coloured plate depicts the forms of the parasite observed.

The investigation into the causes of the prevalence of typhoid or enteric fever in Kingston, Jamaica, is ably set forth by Dr. H. H. Scott in the third paper. The mode of infection of food and milk supplies and the means of detection of unrecognised carriers of the typhoid bacillus are described, and should be of service to workers both at home and in the tropics. Water supplies and sewage disposal are also considered. The post-mortem findings and the results of cultivation of the bile from 120 consecutive autopsies are given in tabular form. Eighty more cultivations have since been made. From the total of 200 there have been six cases from which the bacillus has been isolated, apart from those subjects who showed post-mortem signs of enteric fever. There are also numerous charts showing the seasonal prevalence of the disease in Kingston.

Another paper by Dr. Breinl deals with the occurrence of various diseases prevalent on the coastal belt of British New Guinea. Eight plates of photographs illustrate the article. Certain diseases, such as malaria, are already known there, but less work has been done on others. Leprosy, filariasis, various curious fevers, juxta-articular nodules, yaws, tropical ulcers, contracting sores, destructive interdigital ulcers, and gangosa have been found among the natives. Only the regional distribution of the maladies has so far been attempted in any detail. New Guinea should provide a rich field for further research in tropical medicine.

The concluding paper is by Dr. Fantham, and deals with insect flagellates and the evolution of disease, with a plea for the recognition of the importance of comparative methods in the study of protozoology. The leishmaniases are used in illustration, and their origin from insect flagellates which are able to adapt themselves to life in vertebrates is discussed. The significance of the herpetomonad flagellate stage of Leishmania, and the existence of such a stage in man, at any rate in *L. tropica*, is indicated. The discovery of natural herpetomonads in mice by Dutton and Todd and by Fantham and Porter is recalled, as well as the occurrence of herpetomonads pathogenic to plants (*Euphorbia* spp.). The recent striking experiments of Laveran and Franchini on the introduction of herpetomonads into mammals, and of Fantham and Porter on the introduction of these flagellates into mammals, reptiles, amphibia, and fishes are summarised. In these experiments the evolution of the disease, that is, "leishmaniasis in the making," is revealed.

#### THE TALGAI SKULL.

**P**ERHAPS the most remarkable incident of the meeting of the British Association in Australia last year was the demonstration given by Profs. Edgeworth David and Wilson to Section H in Sydney of a completely mineralised skull found in the neighbourhood of Talgai in the Darling Downs, Queensland. When war broke out and Prof. Wilson