

## OUR ASTRONOMICAL COLUMN.

## ASTRONOMICAL OCCURRENCES IN NOVEMBER :—

- Nov. 2. 13h. 6m. Minimum of Algol ( $\beta$  Persei).  
 4. 1h. 0m. Mercury at greatest western elongation ( $18^{\circ} 50'$ ).  
 5. 9h. 55m. Minimum of Algol ( $\beta$  Persei).  
 6. 5h. 0m. Saturn in conjunction with the moon. Saturn  $5^{\circ} 33' S$ .  
 9. Predicted perihelion passage of Swift's comet (1895 II.).  
 14-15. Epoch of Leonid meteoric shower.  
 15. Venus. Illuminated portion of disc = 0.998, of Mars = 0.914.  
 20. 12h. 6m. to 13h. 7m. Moon occults  $\delta$  Cancr (mag. 5.7).  
 20. 18h. 42m. to 19h. 51m. Moon occults  $\kappa$  Cancr (mag. 5.0).  
 23. Epoch of Andromedid meteoric shower.  
 23. Perihelion passage of Perrine's comet (1902  $\delta$ ).  
 23. 14h. 14m. to 15h. 0m. Moon occults  $\nu$  Leonis (mag. 4.5).  
 24. 2h. 21m. to 6h. 4m. Transit of Jupiter's Sat. III. (Ganymede).  
 25. 11h. 37m. Minimum of Algol ( $\beta$  Persei).  
 28. 8h. 26m. Minimum of Algol ( $\beta$  Persei).  
 28. 14h. 0m. Venus in superior conjunction with the sun.  
 29. 7h. 43m. to 12h. 37m. Transit of Jupiter's Sat. IV. (Callisto).

THE LEONID SHOWER.—Two articles in *Popular Astronomy*, No. 98, by Prof. Pickering and Mr. R. B. Taber respectively, deal with the reports of different observers of the Leonids during the shower of 1901, which, although not seen in this country, appears to have been a brilliant one as seen by the observers in the United States on the morning of November 15. Prof. Pickering records the following six observations :—

Station.	Latitude.	Longitude.	No. of meteors per hour.
Trinidad, W.I. ...	$10^{\circ}$ ...	$63^{\circ}$ ...	290
Steamer <i>Admiral Dewey</i> ...	$26^{\circ}$ ...	$73^{\circ}$ ...	420+
Tuape, Sonora, Mex. ...	$30^{\circ}$ ...	$110^{\circ}$ ...	countless
Tucson, Arizona ...	$32^{\circ}$ ...	$111^{\circ}$ ...	225
Claremont, California ...	$34^{\circ}$ ...	$118^{\circ}$ ...	800
Mount Lowe Observatory ...	$34^{\circ}$ ...	$118^{\circ}$ ...	300

The position of the radiant point seems unchanged, the Harvard report giving it as R.A. = 10h. 6m., Dec. =  $22^{\circ} 16'$ . Mr. Upton, of Providence, estimated it to be R.A. = 10h. 2m. 8., Dec. =  $21^{\circ} 19'$ , whilst M. Eginitis, director of the Athens Observatory, suggests "a sensible displacement in right ascension." Mr. Upton thinks that "the radiant is probably a point, rather than a spot  $2''$  or more in diameter."

OBSERVATIONS OF  $\zeta$  GEMINORUM.—During the period March 10 to May 23 of this year, forty-two observations of the variable star  $\zeta$  Geminorum were made, by Argelander's method, at the Princetown University Observatory by Mr. F. P. McDermott, junior.

The observations indicate that there is a secondary maximum about 3.0d. before the principal maximum, and that the object attains a brightness of 3.88m.; a secondary minimum, when the object has a magnitude of about 3.93, is also indicated 1.6d. before the principal maximum.

THE FIFTH SATELLITE OF JUPITER.—Writing to *Popular Astronomy* (No. 98) on September 9, Prof. Barnard recalls the fact that it is exactly ten years since Jupiter's fifth satellite was discovered.

From the spring of 1899 until the spring of this year, Prof. Barnard was unable to see this object, but several good elongations have been observed this year; the satellite can, however, only be seen under very good observing conditions and with large instruments.

SEARCH FOR AN INTRA-MERCURIAL PLANET DURING THE TOTAL SOLAR ECLIPSE OF 1901.—In *Bulletin* No. 24 of the Lick Observatory, Prof. Perrine describes the photographic search for the intra-Mercurial planet which, according to Leverrier and others, might be the disturbing influence that

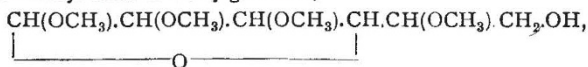
causes the considerable motion observed in the line of apsides of the orbit of Mercury.

Reduction of the negatives obtained during the 1901 eclipse has led to a negative result. There is just a possibility that at the time of the eclipse the hypothetical planet may have been in a direct line with the bright corona, and so have escaped notice; but, as the corona only covered 1/200th of the area photographed, this is not very probable.

A planetary body 34 miles in diameter would have appeared as having a magnitude of  $7\frac{3}{4}$  in the existing circumstances, and, as it would need seven hundred thousand such bodies, each having the same density as Mercury, to produce the observed movement in the orbit of the latter, it seems highly improbable that these changes are due to the interference of an intra-Mercurial planet. Prof. Perrine suggests that perhaps the finely divided matter which produces the zodiacal light may, when considered in the aggregate, be sufficient to cause the perturbations in the orbit of Mercury.

## CHEMISTRY AT THE BRITISH ASSOCIATION.

IN a paper on experiments to ascertain the amount of carbonic anhydride absorbed from sea water, Prof. E. A. Letts and Mr. W. Caldwell stated that they are experimentally testing the validity of Schloesing's theory that the ocean serves as the regulator of atmospheric carbonic anhydride, with the aid of a specially devised piece of apparatus. Prof. E. A. Letts also read a paper on the corrosion of copper by sea water and on the detection of traces of impurity in the commercial metal, in which it was suggested that rapid corrosion of copper by sea water may be due to electrolytic action between particles of a copper-arsenic alloy embedded in the copper plates and the copper itself. Prof. F. Clowes, in a paper on the action of distilled water upon lead, showed that dissolved oxygen first acts upon the lead, and the oxidation product is subsequently converted into a hydroxy-carbonate by carbonic acid. Dr. C. E. Fawsitt gave a paper on the decomposition of urea, showing that on heating urea in aqueous acid or alkaline solution at  $99^{\circ}$ , the decomposition does not proceed in accordance with a bi- or tri-molecular reaction as would be expected theoretically, but in accordance with the formula of a monomolecular reaction. The apparent anomaly is explained by the formation of ammonium cyanate as an intermediate product; on heating with water, urea first undergoes isomeric transformation into ammonium cyanate, and this then decomposes into ammonia and carbonic anhydride. In a paper on the telluric distribution of the elements in relation to their atomic weights, Mr. W. Ackroyd employs the purchasing power of a given sum as an indication of the abundance or rarity of the different elements; he shows that in each of the natural groups the rarity of the element increases with the atomic weight. In a paper on the proposed standardisation of methods of chemical analysis, Mr. B. Blount protested against the growing tendency to apply the principle of standardisation to analytical methods for the determination of chemical entities, such, for instance, as the constituents of steel; at the same time, he agreed that arbitrary methods, such as those applied to the examination of waters, oils, milks, &c., should be standardised. Prof. T. Purdie, F.R.S., and Dr. J. C. Irvine, in a paper on the alkylation of sugars, described a method for alkylating hydroxyl groups in methylglucosides. On boiling methylglucoside in methyl alcohol with methyl iodide and dry silver oxide, the trimethyl ether of methylglucoside,



is produced; on further heating with methyl iodide and silver oxide, it is converted into a tetramethyl ether. Under similar treatment, acetonehamnoside yields a dimethyl ether. In dealing with the synthetical action of enzymes, Dr. E. F. Armstrong showed that the enzyme lactase is capable of converting glucose into a disaccharide, to which the name isolactose was given. The same author gave a paper on recent synthetical researches in the glucoside group; the pentacetylglucosides are converted into aceto-halogen-glucosides by anhydrous hydrogen chloride or bromide, the acetyl group attached to the aldehyde group being replaced by halogen. These substances are converted into alkylglucosides by treatment with alcohols. A report of the committee appointed to collect

statistics concerning the training of chemists employed in English chemical industries, of which Prof. G. G. Henderson is secretary, was read; information concerning their course of training had been received from 502 managers and chemists employed in English chemical industries, 111 of whom are fellows or associates of the Institute of Chemistry. The following figures give more detailed information:—

Number of graduates of a British University .....	59
Number of graduates of both a British and a foreign University .....	16
Number of graduates of a foreign University.....	32 <sup>1</sup>
	107
Number of non-graduates trained in a British University or University College .....	137 <sup>2</sup>
Number of non-graduates trained in a British Technical College .....	165
Number of non-graduates trained in a foreign University or Technical College .....	8
Number of non-graduates trained in Evening Classes, analysts' laboratories, works' laboratories, or otherwise .....	85
	395

The committee on isomorphous sulphonic derivatives of benzene, of which Prof. H. E. Armstrong, F.R.S., is secretary, reported that Dr. Jee has completed the crystallographic study of the 1:3-dichloro-, chlorobromo- and dibromo-benzene 5-sulphonic chlorides and bromides, and finds that this group of compounds constitutes an isotetramorphous group. In discussing the colour of iodine-containing compounds, Miss Ida Smedley called attention to the fact that two classes of such compounds are known, namely, colourless and coloured. In a paper on colloids of zirconium compared with those of other metals of the fourth group, Dr. J. H. Gladstone, F.R.S., and Mr. W. Hibbert stated that zirconium gives a colloid of well-marked properties resembling those of silicon, tin, titanium and thorium; Dr. J. H. Gladstone also gave a paper on fluorescent and phosphorescent diamonds. The following papers were also read:—Note on a fourth methylmorphimethine, by Mr. J. Hawthorne; on the absorption of ammonia from water by algae, by Prof. E. A. Letts and Mr. J. S. Totton; on determinations of atmospheric carbonic anhydride made on board the *Discovery* on the voyage to the Cape and thence to New Zealand, by Prof. E. A. Letts; a new method of causing isomerisation, by Prof. R. Meldola; acid esters of methylsuccinic acids, by Prof. J. J. Sudborough and Mr. W. A. Bone; compounds of trinitrobenzenes and alkylated naphthylamines, by Mr. H. Hibbert and Prof. J. J. Sudborough; action of alkalis on cinnamic acid dibromide and its esters, by Prof. J. J. Sudborough and Mr. K. J. Thomson. An interesting feature of the proceedings of Section B was the reading and discussion of two important monographs, one on our present knowledge of diazo-compounds, by Dr. G. T. Morgan, and the other on hydro-aromatic compounds with single nucleus, by Dr. A. W. Crossley.

#### ANTHROPOLOGY AT THE BRITISH ASSOCIATION.

THE papers read before the Section covered, as will be seen, a considerable portion of the field that is usually embraced by anthropology.

*Archæology*.—Mr. W. J. Knowles exhibited some Irish flints mostly with a dark brown patina and "the fashion of chipping the flint perpendicularly through the thickness," some of which came from "interglacial gravels." Two questions were asked: (1) What useful object could the perpendicular chipping serve to man? (2) If not artificial, what force in nature can dress so many objects alike with chipping that has all the appearance of being artificial in character? Miss Nina F. Layard described and exhibited a number of variously shaped Palæolithic implements from a small pit in the plateau gravels of Ipswich, and Messrs. W. and W. A. Cunningham

<sup>1</sup> Thirteen of whom studied also in a British University or Technical College.

<sup>2</sup> Twenty of whom studied also in a foreign University or Technical College.

gave an account of the recent discovery of Palæolithic implements from Knowle, Wiltshire; these implements and the ordinary flints of the gravel pit are remarkable for the very high polish that many exhibit, and some are marked with peculiar striæ. There are two views to account for the polishing, (1) a redeposit of silica, which was favoured by the authors, and (2) sand action, which was emphatically advocated by Prof. Boyd Dawkins; as a matter of fact, the sand of this quarry is exceptionally fine and entirely siliceous. Mr. S. B. Dixon also exhibited some of these polished implements. No satisfactory explanation was given of the striæ. Mr. W. J. Knowles described some important stone-axe factories that he had discovered near Cushendall, co. Antrim; axes in all stages of manufacture and innumerable chips were found where boulders of a certain rock occurred in the drift. The conditions were somewhat similar to those Mr. W. H. Holmes has described in the United States. Mr. Knowles also exhibited leaf-shaped stone blades from co. Antrim, which were probably a stage in the manufacture of spear- and arrow-heads, like the stone blades from America.

A remarkable series of underground, tunnel-like dwellings (souterrains) in Ulster was shown in lantern slides by Mr. W. J. Fennell, and similar remains from various parts of the British Isles were copiously illustrated by Mr. D. MacRitchie. Mr. G. Clinch also described the subterranean dwellings recently discovered at Waddon, near Croydon.

The report on the excavations at Arbor Low Stone Circle in Derbyshire was read by Mr. H. Balfour. The evidence as to its age was not decisive, but it pointed to the monument having been erected at the close of the Neolithic period, or at the beginning of the Bronze age. A Belfast antiquary endeavoured to prove that the Irish elk survived into the Bronze age, but the bones exhibited belonged to oxen, not to deer.

A note from Mr. R. A. S. Macalister on a prehistoric cemetery-cave in Palestine recorded the first discovery yet made of the pre-Israelite inhabitants of Palestine who burnt their dead; above these were found unburnt remains of the earliest Semitic stock. The recent Cretan excavations at Knossos by Mr. A. Evans and those at Palæokastro by Mr. R. C. Bosanquet were illustrated by lantern slides; at the latter site there is an exceptional opportunity for a craniological study of Mycæan and recent Cretans.

The Hon. John Abercromby read a very important paper on the oldest Bronze age earthenware vessel, which is usually called a "drinking cup" and for which he proposed the term of "beaker." By the aid of numerous photographs, he demonstrated that it came into Britain from the Rhine and in all probability had its origin in Central Europe. Bronze objects of the Hallstatt culture phase have been recognised in Ireland, but it was not until Mr. G. Coffey drew the attention of the Section to the fact that the abundance of them was realised. This he did in a very convincing manner, drawing his examples mainly from the wonderful collection of the Royal Irish Academy in Dublin. Iron was probably known before the close of the Hallstatt period in Ireland. Mr. Coffey also exhibited lantern slides of some remarkably fine carved Irish monuments belonging to the La Tène, or so-called Late Celtic, period. These stone monuments, which are ornamented with the "trumpet" design, are unique. Reports were read on excavations in the Roman fort at Gellygaer, near Cardiff, and in the Roman city of Silchester. The survival of certain Pagan sepulchral symbols on early Christian monuments in Ireland was abundantly illustrated by lantern slides by Mr. P. J. O'Reilly. The significance of these symbols is, however, unknown. A note was presented by Mr. F. P. Hennell on the Khami ruins twelve miles from Bulawayo, Rhodesia. It is satisfactory to find that these monuments are being investigated and the specimens preserved in the Rhodesia Museum.

*Anthropography, or Physical Anthropology*.—A new departure was made at this meeting in the formation of a subsection to discuss matters relating to this branch, and a demonstration was made by Prof. Symington in the anatomical museum of the College. Mr. J. F. Tocher read his report on the pigmentation survey of Scottish school children. Preparations are now being made for an exhaustive inquiry into the distribution of the hair and eye colour of Scottish children analogous to that made by Virchow for German children. Mr. Tocher also presented a note on some measurements of Eskimo. Mr. J. Gray gave measurements of the Indian Coronation contingent, and drew therefrom some interesting conclusions. Dr. C. S.