

was getting low at the time—between 5 p.m. and 6 p.m.—Captain Daunt believes that the line seen was not of atmospheric origin, for he was unable to see it anywhere else on the disc, and it stopped short a little way on either side of the penumbra.

**THE SPECTRUM OF THE NEBULA HV 15 CYGNI.**—The spectrum of the Milky Way nebula HV 15 Cygni was photographed by Prof. Max Wolf with the Waltz reflector on August 3. An exposure of  $3\frac{1}{2}$  hours was given, and the resulting spectrum shows the light-source to be gaseous.

By far the brightest line is that at the violet end of the spectrum,  $\lambda$  373; the line at  $\lambda$  434, the band at  $\lambda$  500, and the lines at  $\lambda\lambda$  369, 397, and 411 are also present, but faint, their intensities being in this order. Possibly there is also a line at  $\lambda$  360, but this is doubtful. Prof. Wolf hopes that by having his mirror re-silvered he will be able to obtain a much stronger spectrum (*Astronomische Nachrichten*, No. 4271, p. 379, August 29).

**THE PARIS OBSERVATORY.**—M. Baillaud's first report as director of the Paris Observatory gives an account of the work performed during 1907, and follows its predecessors in general form. Among the records of a vast amount of routine work performed there are one or two points of general interest which call for special remark.

During 1907 the "cercle meridiem du jardin" was employed solely for the study of recent improvements to the instrument, and the report gives the results at some length. The automatically registering micrometer has given unhoped-for precision; the difference of personal equation amongst the observers is practically absent, and shows no variation with the magnitude or with the amount or direction of the motion of the observed object. The mean error of a passage is reduced to  $\pm 0.03s$ . instead of the  $\pm 0.05s$ . obtained by practised observers using the electric method and  $\pm 0.07s$ . with the eye and ear method. It is hoped to complete the tenth fascicule of the "Atlas photographique de la Lune" during the current year, and it appears necessary that, in order to complete the work satisfactorily, two more fascicules must be issued.

The new stellar spectroscope, of which M. Baillaud gives an illustrated description, is used, in conjunction with the equatorial *coudé*, for the determination of radial velocities, and, with its greatest dispersion, gives a spectrum in which, at H $\gamma$ , each millimetre includes four Ångström units. The time service and the *carte du ciel* work have been carried on as usual, and for the latter full statistics are given showing the progress made.

#### INSTITUTION OF MINING ENGINEERS.

THE nineteenth annual general meeting of the Institution of Mining Engineers, which was held in Edinburgh on September 2-4, was largely attended, and was altogether a most successful gathering, the papers, discussions, and excursions being all of more than ordinary interest. Dr. R. T. Moore (Glasgow) was elected president for the ensuing year. The annual report showed that the membership was considerably more than 3000. It was announced that owing to the death of the secretary, Mr. M. Walton Brown, various changes had been found necessary. The headquarters of the institution would be moved from Newcastle to Westminster, and Prof. L. T. O'Shea (Sheffield University) was appointed honorary secretary and Mr. P. Strzelecki assistant secretary.

Of the five papers on the programme, the first read was by Mr. Henry Hall, H.M. Inspector of Mines, on coal-dust and its treatment with calcium chloride. He dealt first with the history of coal-dust in relation to colliery explosions. The first reference to the matter was in a report by John Buddle in 1803, but it was not until 1874 that it began seriously to be argued that coal-dust could of itself cause a colliery explosion in the absence of fire-damp. At the present time coal-dust is regarded as the chief agent of destruction. Experiments made by the author showed that the quantity of coal-dust deposited day by day in a mine is much less than is usually thought. When once the roads have been made clean it is easy to

keep them so. Watering with the view of laying the dust is impracticable where the rocks are friable shales, as it tends to cause accidents from falls of roof and side. Calcium chloride promises to obviate the difficulty. The application of the solution, or, better still, of the dry powdered salt, is effective for three months. The discussion was well sustained. Mr. H. M. Cadell suggested that a cheaper hygroscopic material, such as common salt, might be tried. Mr. Bennett Brough mentioned that calcium chloride was being successfully used in Washington on macadamised roads to obviate the dust nuisance. Mr. W. C. Blackett stated that calcium chloride had proved efficacious in a Durham colliery.

The next paper read, that by Mr. G. B. Walker, on the practical use of colliery rescue apparatus, embodied a set of rules for the use of such apparatus. He was of opinion that the course that would be adopted in this country was to have central rescue stations maintained by the coal-owners' associations. In the discussion it was suggested that there was a danger of the possibilities of rescue apparatus being exaggerated. Mr. W. E. Garforth, however, strongly supported the views expressed in the paper, and Mr. C. E. Rhodes believed that, apart from the humanitarian aspect of the question, there was great use for the apparatus in saving property in mine fires.

The paper by Mr. John Gemmell on the Wemyss coal-field contained much interesting historical detail compiled from the journals of the second Earl of Wemyss (1610-1679), who devoted careful thought to the development of the coal seams on his estates. The review of the present condition of the mines contained much information of value. A diamond bore has just been put down on the estate to the enormous depth of 4534½ feet. Temperature observations were made, the lowest reading taken being at a depth of 3955 feet, where the temperature was 92°·2 F., giving an average thermal gradient from the surface of 1° F. in 87½ feet. In the discussion Mr. Brough emphasised the value of the temperature observations in this bore-hole, as it was probably the deepest in Great Britain. The temperature increase was lower than the average of the observations collected by the British Association Underground Temperature Committee. Mr. J. S. Dixon suggested that this discrepancy could be explained by the cooling action of the flow of water encountered at depths of 1577 feet and 1827 feet. Papers by Mr. J. G. Thomson on the deep diamond boring at Balfour Mains, Fifeshire, and by Mr. William Caldwell on the working of oil shale at Pumpherston, were taken as read, and the proceedings terminated with the usual votes of thanks. On September 3 the members visited the Wemyss collieries and the Pumpherston oil works and shale mines, and on September 4 there was a steamer excursion to the Kyles of Bute.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

**DUBLIN.**—In connection with the meeting of the British Association, the following honorary degrees have been conferred:—D.Sc., Mr. Francis Darwin, F.R.S., Sir David Gill, K.C.B., F.R.S., Dr. William Napier Shaw, F.R.S., Captain Henry George Lyons, F.R.S., Prof. Horace Lamb, F.R.S., Prof. Charles Scott Sherrington, F.R.S., Prof. Ernest Rutherford, F.R.S., Prof. Archibald Byron Macallum, F.R.S., Dr. Albert Kossel, and Dr. Ambrose Arnold William Hubrecht; M.D., Sir Thomas Lauder Brunton, Bart., F.R.S.; LL.D., Sir James Augustus Henry Murray.

The new building of the engineering laboratory of the Heriot-Watt College, Edinburgh, will be opened by the Earl of Rosebery on September 16.

The Board of Education has issued (Cd. 4288) the first part of "Statistics of Public Education in England and Wales, 1906-7-8." The present part is confined to educational statistics; the second part, which will appear later, will deal wholly with financial statistics. The number of technical institutions in England recognised by the Board during 1906-7 was 31, and the number of teachers

therein 521. The Board defines a technical institution as one giving an organised course of instruction in day classes, including advanced instruction in science or in science and art, and provided with a staff and equipment adequate for the purpose. The number of students who attended these institutions at any time during the year was 2655 (including 325 girls and women), and 1446 of these attended a full course of instruction. Of the 2330 boys and men attending, 542 were under seventeen years of age, and 469 were twenty-one years of age or more. The number of evening schools and classes in England recognised by the Board for the education of persons already engaged in some occupation which takes up the greater part of their time was 5368 in 1906-7. These classes varied very widely in character and scope; 29,946 teachers were employed in them, and 687,681 students attended during the year, and the Board paid grants on account of 515,897. There were in the same year 676 secondary schools in England recognised by the Board as eligible for grants as compared with 600 in the previous year. These schools accommodated 62,712 boys and 50,877 girls, the numbers in the preceding year being respectively 60,353 and 44,681.

THE regulations which deal with the position of *agrégé* in the Paris faculty of medicine and the joint faculty of medicine and pharmacy have, according to the Paris correspondent of the *Lancet*, recently been modified by the Minister of Public Instruction. The new regulations will not, however, come into force until the commencement of the scholastic year 1909-10. The qualifying examination consists of three sections:—(1) anatomy, physiology, physics, chemistry, and natural science; (2) medicine; and (3) surgery and obstetrics. In the first and third sections special branches may be taken according to the particular branch to which the candidate has devoted himself. The course of the examination is as follows:—(1) a written essay in anatomy, physiology, and histology; (2) a *visa voce* examination, lasting three-quarters of an hour, in general pathology; (3) a clinical examination; and (4) an examination in practical pathological anatomy. Once a candidate has been declared qualified he maintains his position for life, and all candidates who were qualified in examinations held previously to November, 1907, are dispensed from the above-mentioned examinations. For admission as *agrégé* the following tests have to be passed:—(1) The candidate must hand in his testamurs and other documents (*titres*). (2) He must give a lecture of one hour's duration without an assistant or notes. Four hours are allowed for the preparation of this lecture. (3) Practical work.

PROF. JOHN W. GILMORE, of the Pennsylvania State College, has been chosen president of the College of Agriculture and Mechanic Arts of Hawaii, situated at Honolulu, which was opened on Friday last.

THE report for 1908 of the president of Yale University states that plans for the immediate future at the University involve the development of courses in regional geography until there are instructors who are authorities on the geography of each of the continents. This will eventually necessitate the erection of a separate department of geography, which will not only offer courses, but will also conduct explorations in the less known parts of the world, particularly those parts where the character of the physical features has been a prominent factor in the life of a race, such expeditions being in charge of officers of the department, and including advanced students.

MR. A. H. MACKENZIE, of the University of Aberdeen, has been appointed professor of science and manual training at the Allahabad Training College for Secondary Teachers.

AN exhibition of the work of teachers and pupils of Indian schools of general education is to be held in Mysore on October 6-12 next. Five classes of exhibits are to be arranged for, namely, infant and primary schools; secondary schools for boys; secondary schools for girls; collections of objects suitable for school museums; and records of teachers' work. A number of English exhibits are to be sent by the English Board of Education and the Director of Public Instruction, Madras.

## SOCIETIES AND ACADEMIES.

## PARIS.

**Academy of Sciences, August 31.**—M. Bouchard in the chair.—Concerning *Trypanosoma congolense*: A. Laveran. Details are given of experiments on goats. In one case the animal acquired complete immunity against *T. congolense*, but this immunity did not extend to infection by *T. dimorphon*. In the second case, immunity against *T. congolense* was also attained, and experimental inoculations with *T. dimorphon* are in progress.—Pfaff's problem: A. J. Stodolkievitz.—Periodic functions: P. Cousin.—The temperature of dissociation of ammonia and carbon monoxide: Herman C. Wotereck. Ammonia, carefully purified from moisture and traces of organic matter, was passed through a Jena glass tube, the temperature of which was controlled by a Le Chatelier pyrometer. The first traces of dissociation were observed at 620° C.; the lower temperatures noted by other investigators are probably due to the presence of traces of impurity. Carbon monoxide commences to dissociate between 570° C. and 580° C.—The white disease of the oak and *Erysiphe quercus*: M. Boudier.—The action of human serum on *Trypanosoma pecaui*. The differentiation of *T. pecaui* and *T. gambiense*: A. Thiroux and L. d'Antreville. From experiments on apes it is concluded that human serum exerts a preventive and curative effect as regards infection with *T. pecaui*, and this effect falls off very slowly.

## NEW SOUTH WALES.

**Royal Society, June 3.**—Mr. W. M. Hamlet, president, in the chair.—The viscosity of water: Richard Hosking.—Note on a cupriferous porphyry and quartz veins in the Nelligen district: Dr. H. I. Jensen. The author briefly describes a curious basalt formation between Nelligen and Braidwood which contains inclusions of schist, limestone, reef quartz, and quartz porphyry, and in addition small bunches of native copper and copper ores. Unlike the Bumbo basalts, this basaltic rock contains no copper at all except in the vicinity of the other inclusions. It is inferred that the copper, in common with the other xenoliths, has been torn out of a mineral vein along which the magma found egress to the surface. A number of quartz veins which cut out in both directions, or in depth, occurring in the same district, are attributed to pneumatolytic processes in the period in which the ancient palaeozoic rocks underwent metamorphosis.

## CONTENTS.

	PAGE
New Edition of Strasburger's Botany. By L. B. S.	441
Forest Entomology. By Fred. V. Theobald . . .	441
Our Book Shelf:—	
Hilton: "An Introduction to the Theory of Groups of Finite Order."—G. B. M. . . . .	442
Alexander: "A Short History of Philosophy" . . .	443
Letter to the Editor:—	
The Size of the Mammoth.—F. A. Lucas . . . .	443
Surveying for Archæologists. II. (Illustrated.)	
By Sir Norman Lockyer, K.C.B., F.R.S. . . . .	444
International Congress on Tuberculosis at Washington . . . . .	445
The late M. Mas'art . . . . .	446
The late Earl of Rosse . . . . .	448
The Dublin Meeting of the British Association.	
By E. E. Fournier . . . . .	449
Section B.—Chemistry.—Opening Address by Prof. F. S. Kipping, D.Sc., Ph.D., F.R.S., President of the Section . . . . .	450
Section C.—Geology. (Illustrated.)—Opening Address by Prof. John Joly, M.A., D.Sc., F.R.S., President of the Section . . . . .	456
Notes. (Illustrated.) . . . . .	466
Our Astronomical Column:—	
Discovery of a Comet, 1908c . . . . .	470
Large Sun-spots . . . . .	470
Recent Meteors . . . . .	470
D <sub>2</sub> (Helium) Absorption in the Solar Spectrum . . . .	470
The Spectrum of the Nebula HV 15 Cygni . . . . .	471
The Paris Observatory . . . . .	471
Institution of Mining Engineers . . . . .	471
University and Educational Intelligence . . . . .	471
Societies and Academies . . . . .	472