

the most complete memoir on the subject, and is of special interest at the present time, when growing uneasiness prevails that many of the world's best tin deposits are becoming exhausted, and that the price of the metal may possibly become quite prohibitive for many industrial purposes before long. In Bolivia it is evident that the prospects are good. That country now ranks second only to the Federated Malay States as a tin-producing district, and it is probable that the production will continue to increase. Careful exploration has been made in Peru in the provinces of Huancané and Chucuito, which are the nearest to the Bolivian tinfields, but with the exception of some samples of stanniferous lead ore found at Vilque Chico, no indications of tin were discovered. Another *Boletín* (No. 56) issued by the Corps of Mining Engineers of Peru deals with the problem of the irrigation of the valley of Ica.

The records of the Mysore Geological Department (vol. vii.), which have just been received, contain general and special reports of work done from July, 1905, to June, 1906. The year was an eventful one in the history of mining in Mysore owing to the attention devoted to the mineral resources by European and native capitalists. Chief among the ores sought were those of manganese and chromium. Other minerals which engaged attention were magnesite, asbestos, and chromium. The new goldfield near Lingadhalli gave good indications. The value of the gold raised in the Kolar area during the year was 2,274,786*l.* The results of the work of the Geological Survey during the year are given in special reports by Mr. H. Kelsall Slater and Mr. P. Sampat Iyengar. The former made a geological survey of 180 square miles in the Kadur district. The boundary of the granite extending from Tarikere westward was mapped, and found to conform generally with the base of the hills. The schists composing the hills are invariably associated with the occurrence of gold. Numerous old workings were discovered, and the area deserves careful prospecting, as it bids fair to prove another valuable goldfield. In the Mysore district the felsite and porphyry dykes of Seringapatam were mapped. In the Tumkur district traces of gold were found, and the native workings of grey corundum are described. Reports are also given on the geology of the Srinivasapur and Kadri Taluks, and of parts of Challakere and Sira Taluks. An appendix is devoted to a detailed description of important felsite and porphyry dykes in the neighbourhood of Seringapatam. When polished they yield very handsome ornamental and building stones.

In his "Studies on the Thermodynamics of the Atmosphere," published under the auspices of the Weather Bureau, U.S. Department of Agriculture, Prof. F. H. Bigelow collects nine papers which he had contributed during 1906 to the *Monthly Weather Review*. They deal with a variety of subjects, including the meteorological conditions characteristic of different parts of cyclones and anticyclones in Europe and America during summer and winter. The temperature gradient at different levels receives special attention. The last four papers deal with a waterspout, or waterspouts, seen near Cottage City, Mass., in August, 1896. In most of the papers, even those relating to the waterspout, there is a rich profusion of statistical data, conversion factors, and mathematical formulæ. There are sixty-seven tables and forty illustrations, including ten full-page photographs of the Cottage City waterspout at different stages of development. A large number of conclusions are also drawn. The papers

provide evidence of industry and imagination, and the conclusions and observational data will no doubt receive the critical examination of meteorologists.

A CORRESPONDENT has written to point out that Prof. von Thán, to whose memory a monument is to be erected at Ó-Becse, Hungary (see *NATURE*, August 27), held the chair of chemistry from 1862 in the University of Budapest, and not that of the University of Vienna.

OUR ASTRONOMICAL COLUMN.

DISCOVERY OF A COMET, 1908c.—A telegram received from the Kiel Centralstelle announces that a new comet was discovered by Prof. Morehouse, of the Drake University Observatory, Des Moines, Iowa (U.S.A.), on September 1. At 8h. 40m. (Yerkes M.T.) on that date the position of the comet was

R.A.=3h. 20m., dec.=66° 15' N.,

and it was reported as moving rapidly in either a south-east or north-west direction. It was also said to possess a long, conspicuous tail.

A second telegram states that this object was observed by Prof. Thiele at Copenhagen on September 3, its position at 10h. 29.6m. (Copenhagen M.T.) being

R.A.=3h. 19m. 43s., dec.=67° 14' 42" N.,

so that the motion is north-west. This observation gave the magnitude of the comet as 9.0. The present apparent path lies through Cassiopeia towards Cepheus, and the comet does not set below the horizon in London; it reaches the zenith about 4 a.m., and should therefore be an easy object for telescopic observation.

The comet was quite easily found with a 3¼-inch equatorially-mounted finder at South Kensington on Friday night, September 4, and in the 10-inch refractor, with a power of 100, appeared as a very diffuse, nebulous patch with scarcely a trace of any stellar nucleus.

LARGE SUN-SPOTS.—The large sun-spots illustrated in these columns in our issue of August 13 have again appeared round the eastern limb of the sun. They were first re-observed at South Kensington on August 27, and have since been visible to the naked eye. On August 29 a new, large spot followed, and on September 1 the large group, two large single spots, and a smaller group were to be seen on the disc. For the actual epoch of solar activity the disc is, therefore, displaying a remarkable amount of spotted area.

RECENT METEORS.—Some interesting notes on meteors recently observed are published by Mr. Denning in No. 400 of the *Observatory* (p. 350, September). Mr. Denning remarks on the favourable conditions for meteor observations that obtained during the present summer, and states that on fifteen dates between July 18 and August 8 he observed 204 meteors during 20½ hours. Of these, more than half were traced to known radiants, forty-two of them being Perseids. During the period July 26 to August 7, the Perseid radiant moved from 25°, +53°, to 41°, +56°; a late Perseid was seen, on August 17 at 9h. 25m., which left a fine streak, and was directed from 51°, +58°; another, of the first magnitude, was seen on August 19d. 9h. 44m., and its direction was from a point at 56°, +60°.

For the period June 25 to August 10, Mr. Denning received duplicate observations of ten meteors, for which he gives the particulars of the real paths.

D₃ (HELIUM) ABSORPTION IN THE SOLAR SPECTRUM.—In a letter to the *Observatory* (No. 400, September, p. 353) Captain Daunt reports that he believes he observed D₃ dark in the solar spectrum when making visual spectroscopic observations of the large sun-spot group which was near the eastern limb on August 1. The line had much the same appearance as that shown on the photograph taken by Mr. Nagaraja at Kodaikánal last year, running as a fairly fine dark line, somewhat thickened in the centre, right across the group. Although the sun

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, λ 373; the line at λ 434, the band at λ 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 λ 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 γ , 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 4534 $\frac{1}{2}$ 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 87 $\frac{1}{2}$ 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