baryta, on circulating repeatedly by means of a mercury circulator through a fresh quantity of baryta, gave appreciable amounts of barium carbonate corresponding to the production of amounts of carbon dioxide of an order nearly approaching, in some cases, the amount of carbon dioxide originally in the air. These facts were so extraordinary that the Academy appointed a commission, consisting of MM. Armand Gautier, Haller and Ad. Carnot, to repeat and report on this work. Their report is published in the current number of the *Comptes rendus*, and they confirm in every particular the views originally stated by MM. Henriet and Pécou. M. Henriet also publishes in the same number an account of an attempt made to determine the nature of the gaseous substance present in the air capable of giving these results, and comes to the conclusion that there is present in the air of Paris the vapour of a substituted formamide, the slow hydrolysis of which by the baryta furnishes the carbon dioxide originally found.

THE additions to the Zoological Society's Gardens during the past week include a Black Lemur (*Lemur macaco*) from Madagascar, presented by Mr. Thomas Watson; a Hybrid Zebra (between *Equus burchelli* and *E. caballus*) from South Africa, presented by H. M. The King; a Caracal (*Felis caracal*) from South Africa, presented by Regimental Quatermaster-Sergeant Glenton, L.R.; two Javan Peafowls (*Pavo spicifer*) from Burmah, presented by Mr. O. F. Wheeler Cuffe; a — Ouzel (*Merula*, sp. inc.) from India, presented by Miss Porter; thirteen Slow-worms (*Anguis fragilis*) British, presented by Mr. C. J. Frieland; a Mongoz Lemur (*Lemur mongoz*) from Madagascar, seven Cunningham's Skinks (*Egernia cunninghami*) from Australia, four Amphiumas (*Amphiuma means*), a Corn Snake (*Coluber guttatus*) from North America, two Ruddy Sheldrakes (*Tadorna casarca*) European, deposited; a Wapiti Deer (*Cervus canadensis*, ♂) from North America, purchased.

OUR ASTRONOMICAL COLUMN.

BRIGHT METEOR OF JULY 13.—Several letters referring to observations of the bright meteor of July 13 have been received, in addition to those mentioned last week (p. 281).

Mr. O. J. R. Howarth observed the meteor at Chelsea, his attention being attracted by a flash resembling a very powerful searchlight, of a bluish hue, which lit up the sky and street brightly for an instant. "On turning to discover the cause a trail of light of considerable breadth (perhaps 1°) was observed. It was of serpentine form, about 10° in length, of a granulated appearance, and gradually faded from a bright golden colour, remaining visible from eight to ten seconds. Its elevation was estimated at 60°, and its direction was about S.E. from Chelsea."

Mr. W. Gilles, observing at Deal, says:—"The meteor became visible about 10° S. of the zenith and left a luminous trail of a remarkably sinuous character at its commencement, which was visible for about one minute afterwards."

RADIAL VELOCITY OF THE ORION NEBULA.—In No. 5, vol. xv. of the *Astrophysical Journal*, Prof. H. C. Vogel gives an interesting description of the methods employed, and the results obtained, by Dr. Eberhard and himself in determining the radial velocity of the Orion nebula.

The spectrograms were obtained by Dr. Eberhard with a photographic refractor of the Potsdam Observatory, which has an aperture of 32.5 cm. and a focal length of 343 cm. Owing to the lens not being fully corrected it was impossible to photograph lines of greater wave-length than H γ . An exposure of 180 minutes, using a three-prism spectrograph, gave a spectrum in which, at H γ , 0.25 mm. corresponds to a difference of 0.424 μ , whilst an electrical heating apparatus enables the observer to maintain a constant temperature in the prism box within a tenth of a degree for several hours.

Seven spectrograms, taken between November 22, 1901, and February 22, 1902, each showing two iron comparison spectra in addition to the nebula spectrum, gave very uniform results, the mean of which, as measured by both observers, indicates a

velocity of recession, relative to the sun, of 17.4 ± 1 km., and this agrees very well with the 17.7 ± 1.28 km. obtained by Keeler as the velocity of this object in his classical researches on the velocities of nebulae.

Several drawings of the H γ line which are given plainly indicate the existence of differential velocities in various parts of the nebula.

MOTION OF THE POLE.—In No. 523 of the *Astronomical Journal*, Dr. J. C. Chandler directs attention to the apparent existence of a fifteen months' periodical motion of the pole, which has not yet been identified. This apparent motion is so minute (0".05) that Dr. Chandler hesitates to assert its real existence, but at the same time he cannot account for the constant differences in the coordinates by any other supposition, and he summarises his article with the following statement:—"In dealing with a phenomenon so obviously complex as these motions of the earth's axis are, and until we are certain of the superior limit of precision in astronomical measurement, it would be unphilosophical to ignore without examination such indications as these."

PHOTOGRAPHS OF THE PERSEIDS IN 1901.—M. J. Sykora communicates to the current number of the *Memorie della Societa degli Spettroscopisti Italiani* the results obtained by the staff of the Jouriew Observatory (Dorpat) in photographing the Perseid trails in August, 1901.

Seven meteor trails were found on the negatives obtained, but of these two were evidently not due to Perseids. Of the remaining five, two were remarkable, inasmuch as they show the explosion of meteors, one in the middle of its trail, the other at the end of its trail; drawings of these accompany the article.

Measurements of the trails in regard to the coordinates obtained from stellar images on the same negatives give the radiant point for August 11 as

$$\alpha = 43^\circ 55' 8'' \quad \delta = 57^\circ 10' 3''$$

whilst the radiant point for August 12 is evidently slightly east of this position.

VARIABLE STARS.—2815 *U Geminorum*.—Mr. J. A. Parkhurst has observed the latest maximum of 2815 *U Geminorum* with the 12-inch and 40-inch refractors of the Yerkes Observatory, and finds a range of 3.04 magnitudes between April 3 and May 8, the maximum (9.76 m.) being attained at 13.9 h. on April 14.

Mr. Paul A. Yendell, of Dorchester, U.S.A., has made observations of the four following variable stars:—

2279 *T Monocerotis*.—Eleven observations of this star in 1900, and forty-six from December 1, 1901, to April 24, 1902, show four minima and five maxima.

2335 *W Geminorum*.—Fifty-one observations extending from November 24, 1901, to April 28, 1902, indicate five maxima and one minimum.

2509 ξ *Geminorum*.—Four maxima and three minima are deduced from thirty-two observations of this star made between December 27, 1901, and May 2, 1902.

2676 *U Monocerotis*.—Twenty observations from January 13 to April 14, 1902, include a minimum of 7.1 m. on January 30 and a maximum of 6.2 m. on February 12. (*Astronomical Journal*, No. 523).

THE AUGUST METEORIC SHOWER.

LIKE the great majority of meteoric streams, the Perseids return every year, and if they do not compose a really brilliant display they form a very noteworthy shower. An observer attentively watching the firmament on about August 11 may sometimes count 100 meteors in an hour, but the moon must be absent and the atmosphere very clear. In those years when it is most conspicuously exhibited it well repays observation even by those persons who do not specially apply themselves to this department of astronomy. At the close of July and opening of August there are comparatively few Perseids visible, but there is a rich shower of Aquarids at that particular epoch, so that meteors are generally pretty numerous, and occasionally surprisingly so.

Watching for these objects on ordinary nights is sometimes apt to prove tedious even to enthusiasts, but the Perseids are always sufficiently frequent and brilliant on about August 10, 11 and 12 to attract the interested attention of the most casual

stargazers. There are few more alluring spectacles than that afforded by the prolific fall of meteors on a genial August night, and we need not wonder that in the past few years observers of these phenomena have greatly increased, and that a more general interest than formerly is taken in recording apparitions of shooting stars.

This year the conditions will be favourable, for the moon will not offer any serious impediment to observation between about July 28 and August 12. It will be possible, therefore, to watch the progress of the shower through the fortnight comprising its more active stages. The weather is often a great drawback to investigations of this character (and this particularly applies to the English climate), for cloudy skies destroy the continuity of the work and occasion breaks which materially affect the value of the results. In watching a display similar to that of the Perseid stream, which is presented over a comparatively lengthy period, it is most essential to secure observations on many successive nights, so that the relative strength of the shower and the position of its radiant point may be determined at short and regular intervals. This is, however, not often practicable in England, though in exceptional cases there is little to take exception to in regard to prevalent weather. For instance, in August, 1901, thirteen of the fifteen nights from the 10th to 24th inclusive were clear, or partly so, and enabled observations to be obtained.

Everyone who views a meteoric shower would do well to record some of its leading features. One of the most important requirements is that the apparent paths of the meteors amongst the stars be registered. The fainter class of objects may be disregarded, but the lines of flight of the brighter meteors should be marked upon a celestial globe or star chart, and the right ascension and declination of the beginning and end points read off and entered into a book suitably ruled for the purpose. Such records, if carefully and accurately acquired, possess considerable value, as they furnish the materials from which the real paths and radiants of the individual meteors may be ascertained. Even those observers who have had no previous experience in work of this kind should make an effort to record the Perseid shower, for it will furnish an entertaining and instructive employment, and probably intensify their interest in the subject. In spite of the oft-repeated observation of the August display in past years, we have by no means completed our knowledge of its visible behaviour, and it should be further watched for data to enable us to more fully comprehend its various observational and theoretical aspects.

W. F. DENNING.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

It is announced from Berlin that the Academy of Münster has been raised to the *status* of a University.

At University College, London, on July 14, Mr. H. E. H. Smedley gave a demonstration of his methods of wax-modelling as applied to plant structures, more particularly with a view to elucidating complex anatomical relations.

At Bedford College for Women (University of London), Dr. W. H. Willcox has been appointed lecturer in hygiene. The Pfeiffer scholarship in science has been awarded to Miss E. A. Bridger. Six open Pfeiffer scholarships of the value of 15 guineas will be awarded to the best candidates holding a degree, or equivalent, in arts or science wishing to train as secondary teachers. Application should be made to Miss H. Robertson, the head of the training department, not later than December 13, 1902.

AMONG the examiners for the London Matriculation Examinations of September, 1902, and June, 1903, we notice the following:—Mathematics, Mr. W. D. Eggar and Prof. G. B. Mathews, F.R.S.; physics, Dr. A. H. Fison and Mr. D. Rintoul, M.A.; chemistry, Mr. H. B. Baker, F.R.S., and Dr. G. S. Turpin; botany, Mr. H. Richardson and Mr. V. H. Blackman; zoology, Dr. G. Herbert Fowler and Mr. O. Latter; geography, Mr. G. G. Chisholm and Prof. W. W. Watts; geometrical and mechanical drawing, Mr. Walter Hewson and Mr. H. G. Christ.

It will be remembered that in January last the Drapers' Company offered to devote the sum of 30,000*l.* to the extinction of the debt on University College, "provided that the Senate of

the University of London and the Corporation of University College can, before February 28, 1903, agree upon a scheme for the incorporation of the college in the University, and such scheme be approved by the Company." The *University Gazette* of July 19 announces that the Senate has considered the proposal in all its bearings, both administrative and financial, and has approved the outlines of a scheme which had been drafted in conference with the council of the college as a preliminary step towards its realisation. Further negotiations are in progress between the University and the college with respect to certain details, and it is hoped that by the date specified a complete scheme for the incorporation of the college in the University may be agreed upon by both parties. The realisation of the scheme will depend upon whether it is possible to raise the necessary funds.

THE Directory of the Board of Education, South Kensington, has been superseded by "Supplementary Regulations for Secondary Day Schools and for Evening Schools," a copy of which has just been received. The greater part of the volume (pp. 42 to 241) consists of syllabuses of the subjects in which the Board of Education holds examinations. There are, in addition, syllabuses of certain subjects in which the Board does not hold examinations and lists of apparatus suitable for use in science classes. Some of the syllabuses contain very helpful instructions for experiments and other practical work. For instance, the syllabus of practical plane and solid geometry gives outlines and hints for a course of construction and measurement of an original character, much in advance of the traditional plane and solid geometry and geometrical drawing. The syllabuses which were formerly given in the Code for Evening Continuation Schools are now included in the volume before us, among the subjects being general rudimentary science and elementary rural science.

SCIENTIFIC SERIALS.

THE *Journal of Botany* for July opens with an account by Mr. G. S. West of algae obtained from hot springs. One collection from Iceland consisted mainly of filamentous Myxophyceæ and small Diatoms. A new species of the genus *Aulosira* was found in considerable abundance, also *Mastigocladus laminosus*, which is commonly found in all hot springs. Twelve genera of green and blue-green algae are represented. A second collection from Sira Ramau in the Malay Peninsula produced two new species, a *Symploca* and a *Phormidium*. Figures of the more important species are given on an accompanying plate.—Mr. Spencer le Moore describes five new species of Rubiaceæ, and three belonging to the Asclepiadaceæ, occurring in Dr. Rand's Rhodesian collections which are incorporated in the National Herbarium.—In the list of Glamorganshire plants observed by the Rev. E. S. Marshall and W. A. Shoobred in June last year, several new records are given.—The varieties of *Hieracium anglicum* form the subject of a note by Mr. F. A. Williams.—Mr. E. F. Linton contributes an appreciative biography of the late Mr. J. C. Mansel-Pleydell.

American Journal of Science, July.—On spectra arising from the dissociation of water vapour, and the presence of dark lines in these spectra, by John Trowbridge. With powerful discharges in hydrogen, oxygen and rarefied air the same spectrum is obtained, and this is regarded as arising from the dissociation of rarefied water vapour. From a study of the spectrum of powerful spark discharges under water the author concludes that dissociation of water vapour takes place in the atmosphere of the sun; oxygen must therefore be present. The dissociation of water vapour, under the effect of powerful electrical discharges in the presence of small amounts of atmospheric air, results in the production of argon, even in tubes presumably filled with dry hydrogen. The great brilliancy of the dissociation spectrum of water vapour, which obscures the spectra of metallic vapours, and the presence of dark lines due to photochemical reversals, show the need of caution in accepting photographic evidence in regard to the states of development of stars.—The occurrence of Greenockite on calcite from Joplin, Missouri, by H. B. Cornwall. The Greenockite occurs as a bright yellow, dust-like coating on the calcite, which can be easily rubbed off with the finger. Beneath this coating is a thin layer of sphalerite.—A quantitative study of variation in the fossil brachiopod *Platystrophia inyx*, by E. R. Cumings and A. V. Mauck.—Studies of Eocene Mammalia in the Marsh