

and in all other facilities for mountaineering away from crowds of tourists. "In fine," concludes Sir Martin Conway, "no part of the Alps now forms a better training-ground for the youthful would-be mountaineer, none a less vulgarised holiday resort for the man of moderate physical capabilities, simple tastes, or restricted means, than the region comprised in the Austrian and Bavarian Tyrol."

In *Scribner* there is also an article on scientific taxidermy, under the title "A Lost Art," by Mr. J. Carter Beard. The reform in taxidermic methods is said to have begun fifteen years ago. As instances of successful work are cited Mr. W. T. Hornaday's "Fight in the Tree-Tops," illustrating a characteristic episode in the lives of orang-utans, whose habits he had studied in their native forests, and whose skins and skeletons he had himself collected; Mr. Hornaday's group of flamingoes, and groups of bison, in the U.S. National Museum, and New York Museum of Natural History; a group of Rocky Mountain goats, by Prof. L. L. Dyche; a young camel, by Mr. Rowley, in the latter Museum, and the rehabilitation of "Chico," a large ape, done for the same museum by the same taxidermist. Nothing is said of any of the specimens in our own Natural History Museum.

The *Geographical Journal* contains the address delivered by Sir Clements Markham at the recent anniversary meeting of the Royal Geographical Society. There are also contributions on "The Pamirs and the Source of the Oxus," by the Right Hon. George N. Curzon; "Admiralty Surveys during the Year 1895"; "The Indian Surveys 1894-95," by Mr. C. E. D. Black; and "Geography at the Universities." In the *Contemporary*, Mr. A. E. Pease has a short article on the political geography of "Africa North of the Equator." The *Century* contains "Glimpses of Venezuela and Guiana," by Mr. W. N. King; a short paper on Eskimo life, entitled "An Arctic Studio (77° 44' N. lat.)," by F. W. Stokes; and "Impressions of South Africa," by Mr. James Bryce.

A passing mention must suffice for the remaining articles of scientific interest in the magazines and reviews received. Under the title "Stray Thoughts on South Africa," Olive Schreiner contributes to the *Fortnightly* some facts as to the crossing of races in South Africa and the results of the mixture of blood; Prof. Max Müller's paper on "Coincidences," read before the Royal Society of Literature in May last, appears in the same review. Dr. Louis Robinson discusses, in the *National*, some aspects of "The Science of Change of Air," and offers a few sensible and seasonable suggestions on the subject. Mr. F. E. Hewitt has in the *Westminster Review* a historical study entitled "How the First Priests, the long-haired Shamans, and their successors, the Tonsured Barber-Surgeons, measured Time." To *Longman's Magazine* Mr. Grant Allen contributes a popular paper on "Lobsters at Home." Mr. James Buckland describes in the *English Illustrated Magazine* the remarkable mode of nidification of the hornbills, and makes a conjecture why the male bird plasters up the nest and keeps the female a prisoner until the eggs are hatched. Finally, *Chambers's Journal* contains its usual complement of instructive articles, among the subjects being Mr. Carey Lea's work on modifications of silver, and artificial perfumes of flowers.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—An examination in natural science (chemistry and physics) will be held on Wednesday, October 7, for the purpose of filling up a Bristol scholarship (open *pro hac vice*) of the annual value of £100 and tenable (under the usual conditions) for five years; the successful candidate to commence residence immediately upon election.

DR. T. M. LEGG has been appointed Professor of Hygiene in Bedford College, London.

THE widow of the late Dr. Arthur Jackson, of Sheffield, has presented £5000 to the Sheffield School of Medicine to endow a chair of Anatomy, to be named after her late husband.

THE Council of University College, London, have instituted a new Professorship of Pathological Chemistry, and have appointed Dr. Vaughan Harley to the professorship.

THE Cornell University has issued, in the form of a slender brochure, its programme of courses of instruction in physics for

the session 1896-97. The Department of Physics occupies a large building known as Franklin Hall, and the equipment is valued at 50,000 dols. Prof. E. L. Nichols has the services of an efficient staff, consisting of three assistant professors and seven instructors. The curriculum includes elementary courses for senior and junior students, advanced work both for undergraduates and graduates, and courses given in the summer school from July 6 to August 16. Among other encouragements for research, one university fellowship and one graduate scholarship in physics are awarded each year. With a view to affording still further stimulus for research, the University, three years ago, founded the *Physical Review*, which is the only journal in America devoted exclusively to physics. Such enterprise furnishes an example which our older English universities would do well to emulate.

THE Duke of Bedford has placed at the disposal of the Technical Instruction Committee of the Bedfordshire County Council a farm of 275 acres, 149 of which are arable land and the rest grass. In addition to this his Grace has erected the necessary lecture-rooms, dormitories, and other buildings for the accommodation of twenty students. Twenty boys are granted free scholarships by the County Council, entitling them to two years' board, residence, and instruction in the science and practice of farming. On Tuesday, June 30, the members of the Bedfordshire County Council were able, at the invitation of the Duke, to pay a visit of inspection to the farm, and are able to report that every branch of farm and garden practice is efficiently taught by means of models and specimens in school and of actual work on the farm, in the dairy, poultry-yard, and garden. The institution is modelled on the lines of similar school farms on the continent, which were inspected and reported upon by the Organising Secretary of Technical Instruction some time ago.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 4.—"On the unknown Lines observed in the Spectra of certain Minerals." By J. Norman Lockyer, C.B., F.R.S.

In the first note of the series "On the New Gases obtained from Uraninite," by the distillation method, the author remarked¹ "I have already obtained evidence that the method I have indicated may ultimately provide us with other new gases, the lines of which are also associated with those of the chromosphere."

In a subsequent paper "On the Gases obtained from the Mineral Eliasite," he gave a list of several unknown lines, and suggested that they might indicate the existence of a new gas or gases in that mineral, and added² "Although the evidence in favour of a new gas is already very strong, no final verdict can be given until the spectra of all the known gases, including argon, have been photographed at atmospheric pressure, and the lines tabulated. This part of the inquiry is well in hand."

The inquiry above referred to has now been completed and in the following manner:—

Photographs were taken of the spectra at atmospheric pressure of nitrogen, oxygen chlorine, carbonic anhydride, coal gas, sulphuric anhydride, phosphoretted hydrogen, and argon, these being the gases which, from the experience thus far acquired are likely to be associated with those given off by minerals. In addition to these the lines of mercury, potassium, and platinum, were also photographed. The lines of platinum are always present in the spectra for the reason that the spark is passed between platinum poles, while the lines of mercury or potassium frequently appear according as the gases are collected over mercury or potash.

For the wave-lengths thus obtained no greater accuracy than one indicated by four figures is claimed. It was the author's intention, in the first instance, to give five figures from the more elaborate tables of some of the elements given by other observers, but this had to be abandoned in consequence of the considerable variations found in the tables between the results as given by different observers.

A list is given of sixty lines which have been observed and photographed in the spectrum of the gases from eliasite which do not appear in the spectra of the old gases.

¹ *Roy. Soc. Proc.*, vol. lviii. p. 70.

² *Ibid.*, vol. lix. p. 3.

The author also gives a complete list of the unknown lines so far as the observations have at present gone, indicating their mineral origins, and whether or not lines nearly coincident in position have been observed in any celestial body.

This table includes about a hundred lines, a large number of which have celestial coincidences.

June 18.—“Complete Freezing-point Curves of Alloys containing Silver or Copper and another Metal.” By C. T. Heycock and F. H. Neville.

From a study of dilute solutions of metals in copper, the authors arrive at 50 calories as a probable value for the latent heat of fusion of copper. The freezing-point curve of alloys containing silver and copper does not indicate the existence of any chemical compounds of these metals; but the eutectic alloy has exactly the composition Ag_3Cu_4 . Lead copper alloys have a freezing-point curve characteristic of substances which are partially soluble in each other. The tin copper curve is remarkable for a singularity near $SnCu_8$, and another at exactly $SnCu_4$. The compound $SnCu_3$ is not clearly indicated in the curve.

For alloys whose composition is between $SnCu_8$ and $SnCu_4$, the freezing-point curve is perfectly straight, a feature that may be due to the separation of isomorphous mixtures of these bodies. Nickel and iron raise the freezing-point of copper, whilst gold and silver depress it.

Geological Society, June 24.—Dr. Henry Hicks, F.R.S., President, in the chair.—The President referred to the death of Sir Joseph Prestwich, and a resolution was passed assuring Lady Prestwich of the Society's heartfelt sympathy with her in the sad and irreparable loss that she has sustained.—Sir William Dawson, F.R.S., exhibited specimens and lantern-slides illustrating the general form, arrangement of laminae, and distribution of the canals and tubuli in characteristic specimens of *Eozoon canadense*. He pointed out that an examination of these specimens and photographs might prevent mistakes likely to arise from the study of imperfect specimens, or from supposing that laminated rocks resembled *Eozoon*, and also that they exhibited additional peculiarities observed since the original publication of the description of *Eozoon* in the *Quarterly Journal of the Society* in 1865. He did not wish to enter upon any argument as to the nature of *Eozoon*, but merely to show the appearance of the principal structures on which the conclusion that it was of animal origin had been based. He also pointed out that these structures might be misunderstood when studied in imperfectly-preserved specimens, and that the wonder was not that so many specimens were imperfect, but that any structure had been preserved. He also shortly noticed the growing probabilities in favour of the existence of a rich marine fauna in pre-Cambrian times, and some of the discoveries in this direction already made or in progress.—Notes on the glacial geology of Arctic Europe and its islands. Part II. Arctic Norway, Russian Lapland, Novaya Zemlya, and Spitzbergen, by Col. H. W. Feilden; with an appendix by Prof. T. G. Bonney, F.R.S. The author gave an account of observations made in Arctic Norway, which tended to prove that the shell-bearing terraces were true marine deposits indicating uplift since their formation, and that they were not formed by ice-dams. He then described terraces recently formed in Kolguev Island, which illustrated the combined influence of pack-ice, sea-waves, and snow on the formation of terraces in a rising area. The glacial geology of the Kola Peninsula was next considered, and the distribution of the boulders noticed. There was no doubt that these boulders had been derived from local rocks, and that no ice-sheet from the North ever passed through Barents Sea or impinged on the northern coast of Europe. The author saw no evidence of the former extension of an ice-sheet over the now frost-riven rocks of Novaya Zemlya. He found wide-spread deposits of boulder-clay with marine shells in this region, which he attributed to the action of floating ice. In the Kostin Schar many of the islands were connected by ridges covered with rounded stones pushed up by floe-ice, with solid rock beneath glaciated by the floe-ice. Several minor phenomena connected with the glacial geology of Novaya Zemlya were also described. The raised beaches of Franz Josef Land were noticed, and immense deposits occurring in Spitzbergen, which were originally formed under water in front of glaciers, alluded to. These, as well as other submarine deposits of glacio-marine origin seen elsewhere by the author, showed no signs of stratification. Prof. Bonney described specimens brought by Col. Feilden from Norway, the

Kola Peninsula, and Novaya Zemlya. From an examination of the rocks obtained *in situ* in the latter region, Prof. Bonney confirmed Col. Feilden's suggestion that the Kolguev erratics may have come from Novaya Zemlya.—Extrusive and intrusive igneous rocks as products of magmatic differentiation, by Prof. J. P. Iddings. The author, after pointing out the propositions concerning differentiation of magmas, upon which he is in agreement with Prof. Brögger, discussed the points of difference, and described the relation of the igneous rocks at Electric Peak to all of those which took part in the great series of eruptions which occupied almost the whole Tertiary period, and spread themselves over a vast territory in Montana, Wyoming, and Idaho. The author enunciated the principle that in a region of eruptive activity the succession of eruptions in general commences with magmas representing a mean composition and ends with those of extreme composition.

EDINBURGH.

Royal Society, July 6.—The Hon. Lord M'Laren in the chair.—An obituary notice of the late Prof. James D. Dana was read by Prof. Geikie.—Dr. R. H. Traquair, F.R.S., read a paper on fossil-fishes from the Lower Devonian (*Hunsrückschiefer*) of Gmünden, Germany. Two species were described of which the first, *Drepanaspis Gmünderensis*, though named and briefly described by Schlüter in 1887, has hitherto been very imperfectly known. It has a hard and bony carapace composed of many tuberculated bony plates, a tail covered with rhombic sculptured scales, a heterocercal caudal fin bordered above and below with strong fulcra, but so far as can be seen there is no dorsal. There are no pectoral appendages. The position of mouth and eyes is still undetermined. The fish belongs undoubtedly to the *Ostracodermi*, and will form the type of a new family, *Drepanaspidae*, whose position seems to be not far from that of the *Pteraspidae*. The other species, *Cocosteus angustus*, Traq., was described as new—the ventral carapace is rather narrow, and the median dorsal plate shows evidence of an elevated median crest.—In the absence of Prof. Tait, Prof. Crum Brown briefly indicated the nature of his paper, a further communication on the kinetic theory of gases.—Dr. A. Lockhart Gillespie made a preliminary communication on digestion in some carnivorous plants. He gave a short *résumé* of the different classes of carnivorous plants, noting that the chief characteristic of all of them was not the power of converting native proteids into albumoses and peptones, but the complexity of the apparatus devoted to that end. In many plants, perhaps in all plants, peptonising ferments were present, especially in the seedlings, by which native proteids were resolved into diffusible forms which could be utilised in their nutrition. Darwin and others had shown in the case of *Pinguicula* and *Drosera* that many nitrogenous substances caused the glands of these plants to secrete an actively digestive juice. The author had investigated the action of the individual lower proteids on them, and also some of the lower derivatives of proteid digestion. He found that *Pinguicula* grew faster if fed once a week with a small quantity of proto-albumose than if nothing were given it, whilst raw egg-albumin, deuto-albumose, and peptone rather retarded its growth, especially the last. In fact, peptone (pure peptone, free from albumoses) killed the part of the leaf to which it was applied, after a few hours, however small the quantity. This was probably due to over-feeding. Serum globulin was slowly absorbed. Fibrin, coloured with carmine after Grützner's method, was not digestible; but egg albumin, coagulated in a weak solution of carmine, was slowly digested, and the glands could be seen coloured by the ingested carmine. He gave notes of the different times taken to absorb these various substances. *Drosera rotundifolia* reacted in a similar manner to these bodies. Its behaviour towards urea, kreatinin, tyrosin, nucleic acid, glycogen, and asparagin, was also investigated. Of these, only urea and asparagin were absorbed. Crystals of kreatinin were dissolved, but in a few days the leaf dried and the kreatinin could be seen crystallised out again on its surface. Crystals of urea, if very small, were readily absorbed; but, if large, speedily killed the leaf. Large quantities of asparagin were absorbed without detriment to the leaf, but these experiments were still in an unfinished state. With regard to the aggregation of protoplasm, as described by Darwin, Gillespie found that a very good way of obtaining permanent records of the process was to place the whole plant in a solution of some proteid weakly coloured with methylene blue, the protoplasm taking on the stain while the plant

continued to live. Under these circumstances the small sessile glands of *Drosera* stained deeply, showing that they became active in the presence of proteid material. Plants similarly treated with gentian-violet stained red where the glands were active, violet where they were only reflexly stimulated. The paper was illustrated by a number of lantern-slides and microscopic preparations.—Dr. C. G. Knott gave a summary of two papers by Mr. J. C. Beattie. The first was on the relation between the Hall effect and thermo-electricity in bismuth and in various alloys. That there was a connection was established, but what the precise nature of that relation was could not be determined till more definite knowledge of the Hall effect in alloys and with different temperatures, was arrived at. The second paper was on the curves of magnetisation for films of iron, cobalt, and nickel. The films were deposited on platinised glass and oscillated in the magnetic field. The results agreed with those already obtained for these metals in a solid condition.

PARIS.

Academy of Sciences, July 6.—M. A. Cornu in the chair.—The Secretary announced that the Institute would be able to award the Jean Jacques Berger Prize in 1897; the prize will be at the disposal of the Academy of Sciences in 1899.—Remarks by M. Albert Goudry on presenting a work on Philosophical Paleontology.—General laws of uniform flow in channels of large section, by M. J. Boussinesq.—Researches on tungsten, by M. H. Moissan. The pure metal is readily obtained by the reduction of tungstic acid with carbon in the electric furnace. With a large excess of carbon the carbide CW_2 is formed, which, in the fused state, readily dissolves more carbon, graphite crystallising out on cooling. Pure tungsten can be readily filed and forged, it welds easily, has no action upon a magnetic needle, and has a melting point higher than chromium and molybdenum.—On the solubility of carbon in rhodium, iridium and palladium, by the same. These three metals dissolve carbon with ease at the temperature of the electric furnace, and give it on solidifying in the form of graphite. No combination to form a carbide appears to take place.—Physiological action of high frequency currents; practical means for their continuous production, by M. A. d'Arsonval. When animals are placed within a solenoid traversed by currents of high frequency, the respiratory changes go on more rapidly. This was shown very simply by measuring the loss of weight in a given time.—Therapeutic effects of high frequency currents, by M. A. d'Arsonval. Since these currents have been found to cause a large increase in the rate of production of carbon dioxide in the body, it was thought that the application of such currents might give relief in diseases such as diabetes, gout and rheumatism, in which the rate of combustion is reduced. In two cases of diabetes the treatment produced marked relief.—On five photographs of the region round η -Argus, by Mr. David Gill.—Verification of Van der Waals's law of corresponding states, by M. E. H. Amagat.—Mr. Christie was elected Corresponding Member in the Section of Astronomy, in the place of Mr. Hind.—On a new capillary theory, by M. Marcellin Langlois.—A sealed note, by M. D. Loiseau, was opened: On some properties of raffinose, serving to estimate this substance in sugars.—On ordinary differential equations of the first order, by M. A. Korkine.—On the local attractions observed in Eastern Europe, by M. Venukoff. An account of the deviation of the pendulum in the neighbourhood of mountains in Bulgaria and in the Crimea.—On the refraction and diffraction of the X-rays, by M. Gouy. For the substances examined, the index of refraction, if not exactly unity, differs from it by a quantity less than the errors of experiment ($\cdot 000001$). As regards diffraction, none could be established with certainty, and the wave-length must be smaller than $\cdot 005 \mu$, or $1/100$ of the wave-length for green light.—Composition of pendular movements, by MM. Jean and Louis Lecarme.—Comparative experiments on the pitch of cylindrical tubes vibrating transversely, by M. C. Decharme.—Action of zinc on the photographic plate, by M. R. Colson. The action has been traced to the vapour of zinc; it is most energetic after the surface has been cleaned with emery paper, but falls off as the surface oxidises. The practical conclusion is drawn that metallic zinc should not be used in the construction of the camera or dark box.—Action of nitrogen peroxide upon antimony trichloride, by M. V. Thomas. There appears to be no true compound formed, but only a solution of the gas in the trichloride.—The effect of a high temperature upon some sulphides, by M. A. Mourlot. In the electric

furnace the amorphous sulphides of lead, antimony, zinc and cadmium are converted into galena, stibine, wurtzite, and greenockite respectively. The antimony sulphide gave some metallic antimony, but no trace of a sub-sulphide.—On two isomers of anethol (propenylanisol), by M. C. Moureu.—Action of ethoxalyl chloride upon naphthalene in presence of aluminium chloride, by M. L. Rousset. Two naphthylglyoxylic acids are obtained, the oximes of which on distilling *in vacuo* give (α) and (β)-naphthonitriles.—On amorphous greenockite of Laurium, by M. Christomanos.—Experimental researches on the effects of intravenous injections of saline solutions. Determination of their value in therapeutics, by MM. Bosc and Vedel.—Cutaneous evaporation in the rabbit; action of pilocarpine, by M. Lecerclé.—On some points in the histology of the muscles of the Cirrhipedes, by M. A. Gruvel.—On an accidental parasite in man, belonging to the order of the *Thysanoures*, by MM. Frêche and Beille.—Influence of the composition of the water of lakes upon the formation of sublacustrine ravines, by M. A. Delebecque.—On a new sounding machine; portable apparatus with steel wire, by M. E. Belloc.

BOOKS RECEIVED.

BOOKS.—Year-Book of the U.S. Department of Agriculture, 1895 (Washington).—An Index to the Genera and Species of the Foraminifera: C. D. Sherbern, Part 2 (Washington, Smithsonian Institution).—Thirteenth Annual Report of the Bureau of Ethnology, 1891-92 (Washington).—Aus den Alpen: R. von Lendenfeld, 2 Vols. (Wien, Tempsky).—Report of the Chief of the Weather Bureau, 1894 (Washington).—Elementary Practical Chemistry, &c.: Prof. F. Clowes and J. B. Coleman (Churchill).—An Inquiry into the Alleged Liability of Wood Charcoal to Spontaneous Combustion, 3rd edition (A. Gardner).—Flora der Ostfriesischen Inseln: Dr. F. Buchenau (Leipzig, Engelmann).—Grundriss einer Geschichte der Naturwissenschaften: Dr. F. Dannemann, i. Band (Leipzig, Engelmann).—The Collected Mathematical Papers of Arthur Cayley. Vol. x. (Cambridge University Press).—The Official Guide to the Norwich Castle Museum: T. Southwell (Jarrold).—Grundriss einer Exacten Schöpfungsgeschichte: H. Habenchicht (Wien, Hartleben).—A Geographical History of Mammals: R. Lydekker (Cambridge University Press).—Solutions to the Examples in Loney's Plane Trigonometry, Parts 1 and 2 (Cambridge University Press).—Wild Life of Scotland: J. H. Crawford (Macqueen).

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