

polarising light; and he has found also that it contains a certain amount of iron-oxide compounds, which are for the most part in an insoluble condition. He strongly objects to the view that the *Diatomaceæ* are one-celled organisms, but contends that each frustule is composed of numerous very minute but perfectly individualised cells. The different markings on the frustules—areolæ, ribs, crests, &c.—are in no way caused by the contour lines of the several cells of which they are composed. The size of the cells is very variable. In *Triceratium favus* they are as large as 0.008 of a millimetre, whilst in *Hyalosira delicatula* they do not exceed 0.00025 of a millimetre. Each cell is arched, and, as a rule, prolonged into a papilliform process at its centre. The papillæ are the cause of the moniliform or pearl necklace-like markings of diatoms when examined with high powers, and which appear as striæ with low powers. The large cavity between the two frustules is, he thinks, comparable to the embryo-sac of higher plants; and Weiss has succeeded in observing the development of new individuals in it. The product of this new individual indicates the alternation of generations in the *Diatomaceæ*.

SCIENTIFIC SERIALS

THE first number of *Zeitschrift für Ethnologie* for the current year (1872) opens with a paper by A. Bastian on "The Position of the Caucasus in relation to the history of the migration of nations," in which the author points out the importance of studying the hydrography and orography of a country before we attempt to trace the origin of its inhabitants. Mountains and streams afford more stable evidence in regard to ethnological centres of origin than the ever-fluctuating combinations of language. Thus, for the history of our own Continent we can have no more important standpoint than the Caucasian range, which forms the boundary line between Europe and Asia, from which rivers open the way into the Caspian and Black Seas. Herr Bastian next traces the various directions taken by successive waves of population after they reached the Steppes between the Don and the Dnieper, which long formed the meeting-place of the Scythio-Sarmatian races, and often witnessed the fierce encounter of rival hordes, whose defeat or success on that great battle-field of nations decided the fate of future races. The relation of the nomadic races of Asia to the Persian Empire is of special interest to us, since the latter by its control over the destinies of the western half of the Asiatic continent has exerted the most important influence on the ethnological history of Europe. In Asia the course of civilisation has followed the line of the Steppes; and the nomadic tribes who possessed horses have spread themselves through every pastoral district, amalgamating at times with the earlier settlers, but more generally organising themselves into hostile bands, whose leaders became the founders of equestrian dynasties, and raised thrones for themselves in Central and Western Asia. The author follows at length the progress of Parthian and Persian conquests and migrations, and, after considering the anatomical features and cranial dimensions and forms of the various races, which have given conquerors to the world, discusses the probable bastard or mixed origin of those inferior subjected races, who from time to time have risen against their masters, and asserted their right to freedom, as in the case of some of the Servian tribes against their Pannonian lords, and various Mestizoës or Creoles in Africa and America.—The remaining papers in this number are below the usual standard of the *Zeitschrift für Ethnologie*. We have a paper by Dr. E. v. Martens "On the Different Uses of the Conchilia," originally read to the Anthropological Society of Berlin, which is little more than a *résumé* of what G. E. Rumph, P. Bonanni, Johnson, and Mr. Woodward have given in their semi-popular works on subjects of conchological interest. Dr. Martens also contributes a translation of a paper on the geography, history, and statistics of the Island of Puerto Rico, by S. Bello, of Espinosa. We learn that while sugar and coffee constitute the riches of the island, all the tropical fruits abound, and the excessive annual rainfall maintains a vigorous and verdant vegetation. The hot moist climate is unhealthy, and dysentery, yellow fever (vomits), and remittent fevers of various kinds prevail. The population has, however, gone on steadily increasing during the last forty years, notwithstanding the diminution in the numbers of the slaves, amongst whom the deaths have of late years exceeded the births in the ratio of from 5 to 10 per cent. In 1839 the population was 319,000, in 1870 it had risen to 646,360; in the latter year the number of the slaves had fallen to 32,000, after being

42,227 in 1866, thus giving a diminution of 25 per cent. in four years.—M. de Quatrefages' history of Prussian aggrandisement, which first appeared in the *Revue des Deux Mondes* (1871), under the title "*La Race Prussienne*," has called forth an impassioned and indignant rejoinder in this number of the *Zeitschrift für Ethnologie*. We should be more disposed to concur in the line of argument adopted by the writer in refutation of M. de Quatrefages' too sweeping assertion that Prussians are Finno-Slaves with only a slight admixture of French and German blood in the higher classes, if he had not allowed personal rancour and national hate to overweigh every consideration of courtesy, justice, and reason. We think an ethnological journal is not the place for international warfare.

Annalen der Chemie und Pharmacie, viii. Supplementband, 2 Heft.—The first 100 pages of this number are occupied by an important theoretical paper "on a periodical law of the chemical elements," by Dr. Mendelejeff; the author has arranged the elements into eight groups and into twelve series; there seems to be a most curious regular progression, both in the atomic weights, the atomicities, and in the chemical proportion of these groups. To take for example the third series of elements, starting from group 1 to 7, we find the following:—Sodiumⁱ 23, Magnesiumⁱⁱ 24, Aluminiumⁱⁱⁱ 27.3, Silicon^{iv} 28, Phosphorus^v 31, Sulphur^{vi} 32, Chlorine 35.5, it will be seen that the first named is a very positive element, and that the positive character gradually changes through the groups until in the seventh we have a powerfully negative body; the atomic weights and atomicities of the elements also increase in a regular manner. In the other series the same kind of relation seems to exist; the author has left spaces in his table for elements not yet discovered, but for which he gives hypothetical atomic weights. The next paper is by Gorup Besanez "on the dolomite springs of the Jura," and is followed by another "on a new class of platinum compounds," by Schutzenberger; by the action of carbonic oxide on platinous chloride at high temperatures three distinct compounds have been obtained, the first containing one equivalent of carbonic oxide to one equivalent of platinous chloride, the second two equivalents of carbonic oxide, and the third one and a half equivalents of carbonic oxide to one of platinous chloride. Linnemann and Zotta have found that by heating glycerine with calcic chloride, small quantities of phenol are formed, and at the same time there is produced glyceric ether. Phenol is also obtained from glycerine by the action of zinc chloride or potassic bisulphate.

In the *Journal of the Franklin Institute* for April we have the continuation of several papers already commenced, viz.:—Mr. Joseph Harrison's article on the locomotive engine, and Philadelphia's share in its early improvement; of Mr. J. S. Smith's account of the Keokuk and Hamilton Bridge; of Mr. J. F. Henry's paper on the flow of water in rivers and canals; and of Mr. J. Richard's article on wood-working machinery. The only new article of any length is by Lieut. Dutton on the principles of gun construction, and there are the usual paragraphs of Items and Novelties.

THE *American Journal of Science and Arts* for April commences with Prof. Marsh's account of the discovery of additional remains of Pterosauria, with descriptions of several new species, *Pterodactylus occidentalis*, *P. velox*, and *P. ingens*, of which full measurements are given, the last probably measuring nearly 22 feet between the tips of the fully expanded wings.—Prof. A. E. Dolbear describes a new method of measuring the velocity of rotation; and Prof. Dana continues his history of Green Mountain geology, dealing this month with the quartzite.—From Mr. F. B. Meek we have descriptions of two new starfishes and a crinoid from the Cincinnati Group of Ohio and Indiana, which he proposes to name *Palaæster* (?) *Dyeri*, *Stenaster grandis*, and *Glyptocrinus Baeri*.—Prof. Abbe gives an account of his observations on the total eclipse of the sun in 1869; and Prof. Twining of various observations on the aurora of Feb. 4.—Mr. Verrill's series of papers include this month recent additions to the molluscan fauna of New England and adjacent waters, with plate.

In the May number is a valuable epitome of recent geographical work in the United States, deduced from the report of the Corps of Engineers, U.S. Army, the route of the Northern Pacific Railroad, and the map of transportation routes in Minnesota and Dakota.—Prof. W. A. Norton contributes a paper on molecular and cosmical physics, in which he propounds several new theorems: the subject is to be continued.—As the commence-

ment of a series of papers entitled "Contributions from the Physical Laboratory of Harvard College," Prof. Trowbridge has a paper on the electro-motive action of liquids separated by membranes.—Prof. Marsh describes, under the name of *Hesperornis regalis*, his exceedingly interesting gigantic fossil swimming bird discovered in the cretaceous strata, which he considers to belong to the Palmipedes, and to be most nearly allied to the Columbidae, but differing widely in many respects from that group and from all other known birds, recent and extinct. Both in this and the previous number are the usual interesting paragraphs of information arranged under the various natural sciences.

SOCIETIES AND ACADEMIES

LONDON

Zoological Society, May 21.—Mr. R. Hudson, F.R.S., vice-president, in the chair. The Secretary read a report on the additions that had been made to the Society's menagerie during the month of April, amongst which was a young female Baird's tapir (*Tapirus bairdi*) from Nicaragua, and a red-billed flying squirrel (*Pteromys magnificus*) from the Himalayas.—A letter was read from Dr. G. Bennett, of Sydney, N.S.W., giving particulars of the habits of a pair of *Didunculus strigirostris*, and of other birds living in the Botanic Gardens at Sydney. Dr. Bennett also mentioned that a pair of the red-billed curassow (*Crax carunculata*) had built a nest in one of the trees in the same gardens, and had hatched out two young birds, which at the time he wrote were doing well.—Sir Victor Brooke, Bart., read a paper on the royal antelope and allied species of the genus *Nanotragus*.—Mr. A. H. Garrod read some notes on the anatomy of the Huia bird (*Heteralocha gouldi*) as observed in a specimen that had lately died in the Society's gardens, and showed that this form must be referred to the family *Sturnida*.—A communication was read from the Rev. J. E. Semper, containing observations on the birds of St. Lucia, to which were added some notes on the species by Mr. P. L. Sclater.—A communication was read from Dr. J. E. Gray on the sea bear of New Zealand (*Arctocephalus cinereus*) and the North Australian sea bear (*Gypsiphoca tropicalis*).—A communication was read from Dr. A. Günther, F.R.S., containing a note on *Hyla punctata* and *Hyla rhodoporus*.—Mr. P. L. Sclater read a paper on the species of *Quadrumania* collected by Mr. Buckley in Ecuador, amongst which was a specimen of *Ateles fusciceps* Gray, from the western valleys of the Andes.—Dr. Murie read a paper on the osteology of the Tody (*Todus viridis*). He showed that this form comes under the group of *Coccygomorpha* of Huxley, and does not belong to the *Passeres* (*Coracomorpha*). Its nearest allies are the mot-mots and kingfishers, but it must stand as a group of itself (*Todidae*), notwithstanding which it shows some osteological and other points of resemblance to fly-catchers (*Muscipidae*).

Linnean Society, May 24.—Anniversary meeting.—The following were elected Officers and Council of the Society for the ensuing year:—President, Mr. G. Bentham, F.R.S.; Treasurer, Mr. W. W. Saunders, F.R.S.; Secretaries, Mr. F. Currey, F.R.S., and Mr. H. T. Stainton, F.R.S.; Council, Mr. A. W. Bennett, Mr. R. Braithwaite, M.D., Mr. G. Busk, F.R.S., Mr. J. Gwyn Jeffreys, F.R.S., Dr. J. D. Hooker, F.R.S., Mr. M. A. Lawson, Mr. H. Lee, Mr. R. McLachlan, Mr. J. Miers, F.R.S., Mr. D. Oliver, F.R.S., and Rev. Thos. Wiltshire.

Photographic Society, May 14.—Mr. James Glaisher, F.R.S., president, in the chair.—A paper "On Photographic Pictures" was read by John Hubbard, in which the manner of elaborating his photographic studies was gone into at some length. His entire method of operating was described, which, however, differed little from that in ordinary use.—Lord Lindsay exhibited a series of transparent pictures of the last eclipse, five positives from every negative being shown, so as to afford an exceedingly clear representation of the phenomenon.—Major Tennant, R.E., also forwarded a series of eclipse pictures for exhibition to the members.

BRISTOL

Observing Astronomical Society.—*Sun*.—Mr. T. W. Backhouse writes that "there was a fine group of solar spots in the sun's northern hemisphere last month. On the 24th at 5^h there was a largish spot at the preceding end of the group, which on the 23rd, at 3^h, either was small or did not exist at all. On

the 26th, about 4^h, its penumbra was 51,500 miles long, and its umbra 28,000, but it never became such a conspicuous umbra as the one which had all along been the largest in the group. On the 28th, at 4^h 15^m, the penumbrae of the two were united, and 88,500 miles long, while at 20^h I found the penumbra to be 92,000 miles in length. It was then so close to the limb that I could not measure it accurately, the height being extremely foreshortened."—*Jupiter*.—Mr. H. W. Hollis, of Newcastle, Staffordshire, reports that on January 14, 9^h, the disc of the planet appeared very sharp, and he counted twenty-two different bands of colour. "Those visible in the equatorial parts of a beautiful, delicate, pinky brown. I am certain that the belts are visible up to the very edges of the disc, but there is an apparent increase of brightness for a considerable distance round the edge of the planet—probably an effect of contrast—which obliterates the extremities of the belts, unless carefully looked for. Several well-marked and beautifully-defined irregularities in the belts showed the rotation most clearly even in half an hour's watching. Jan. 23, 8^h 15^m.—Satellite I. just entered on disc of Jupiter, and appears as an intensely white spot. 9^h 20^m.—Shadow of I. on centre of disc, black, and sharply circular; the satellite itself cannot be seen." Mr. T. W. Backhouse, of Sunderland, observed the transit of Satellite I. on Jan. 14. At 13^h 54^m it "appeared as a faint white spot." On Feb. 3, 6^h 7^m, he examined Satellite III., and its shadow when in transit. The satellite itself was, at the time mentioned, nearly half across Jupiter, on a darkish belt. "It is much darker than the darkest part of the planet." At 7^h 30^m it was "still very plain, but only the same shade as the darkest part of Jupiter. It was smaller than its shadow, which was very black." *T. Corona Borealis*.—Mr. T. W. Backhouse says:—"A change has taken place in this star. On its fading the second time it became stationary in brightness about the middle of the year 1867, since which time, up the beginning of this year, it continued the same, but with frequent slight fluctuations, which however ceased, so far as I could judge, at the end of 1869. I have suspected fluctuations since 1869, but they were doubtful. On January 14 this year I looked at the star and found it about its usual brightness, or perhaps a little fainter, but certainly not fainter than it had been at times previously. I did not look at it again till March 5, when I found it much fainter than I ever saw it before, perhaps half a magnitude less than usual, and it was the same on the following day." *Nebula in the Pleiades*.—Mr. H. W. Hollis has looked for this nebula with his 8 in. achromatic, but cannot find it. He says:—"There is something peculiar about all the brighter stars of this group, which for months past have appeared to me as if surrounded with nebulous light. Can the nebula have been distributed amongst them?" *Meteors*.—The Rev. S. J. Johnson, of Crediton, witnessed the appearance of "a splendid meteor at 7^h 37^m April 6. Its course was in a straight line downwards from about 15° above the N.W. horizon to about 5°. Colour, white with a greenish tinge. Duration, about 5". Seen against a dark sky, this meteor would have equalled, if not exceeded, the brightness of Venus or Jupiter. I was looking for Mercury at the time." On April 19, 11^h 10^m, Mr. William F. Denning, of Bristol, saw a brilliant meteor. It passed slowly down the N.N.E. sky. It was starlike in appearance, and left no train of light. *Mercury*.—The Rev. S. J. Johnson observed Mercury both with the naked eye and telescope on the evenings of March 25 and April 5. A power of 100 on a small telescope brought out the phase.

CAMBRIDGE

Philosophical Society, April 29.—Mr. Paley, "On certain effects of Light on Portland Stone." The author said that he doubted from the mode in which this occurred whether the blackness of stone seen in towns was due simply to smoke; the black scraped from the stone was unaffected by soap or solution of soda, and presented under the microscope an appearance quite different from that of ordinary soot.—By Prof. Miller, "On Faye's method of comparing Mètres à Traits, and an improvement of it suggested by Prof. Miller."—By Mr. Bonney, "On certain lithodorous Burrows in the Carboniferous Limestone of Derbyshire." The author said that doubts having been thrown upon the accuracy of his statement of the occurrence of these burrows in Miller's Dale, he had again visited the spot, had found his description correct, and had discovered a large number of these burrows in Miller's Dale and in Tideswell Dale. From the positions in which he found them, he was more than ever convinced they were the work of *Helices*.