

entitled "Birds of the North-west, from the pen of Dr. Elliott Coues." There are no illustrations.

WE are glad to see that among the Supplementary Estimates just issued is a re-vote of 1,000*l.* for the Sub-Wealden Exploration.

ON Tuesday, the inaugural meeting of the Royal Archaeological Institute took place at Canterbury.

A FINE male Chimpanzee, which has cut its front permanent incisors and its anterior true molars, has just been presented to the Zoological Society by Captain Lees, Governor of Lagos, West Africa.

THE recently issued part of Dr. H. G. Bronn's *Thierreich* contains an account of the lower jaw and the teeth in the different orders of the Mammalia, together with numerous excellent outline drawings of the skulls of the same groups.

MESSRS. LONGMANS are preparing for publication, in three volumes, copiously illustrated, a treatise on galvanism and electro-magnetism, by Prof. Gustav Wiedemann, translated from the second German edition, with the author's sanction and co-operation, by G. Carey Foster, F.R.S., Professor of Physics in University College, London.

THE same publishers will issue in the autumn, a text-book of Telegraphy, by W. H. Preece, C.E., and J. Sivewright, M.A., forming one of their series of "Text-books of Science."

AMONG the works Mr. John Murray will publish during the ensuing season, the following will probably be found of interest to our readers:—"Habits and Movements of Climbing Plants," by Charles Darwin, F.R.S.—"Eastern Seas, Coasts, and Harbours," being the cruise of H.M.S. *Dwarf* in China, Japan, Formosa, and Russian Tartary from the Corea to the River Amur, by Commander B. W. Bax, R.N. This book will be illustrated by a map and engravings.—"A School Manual of Modern Geography," edited by Dr. William Smith.—"A Popular Account of Dr. Livingstone's Second Expedition to Africa; the Zambezi, Lakes Shirwa and Nyassa, with illustrations."—A new edition, being the twelfth, of Sir Charles Lyell's "Elements of Geology," in two octavo volumes; and "A Natural History of Mammals, including Man," by Prof. St. George Mivart, F.R.S., forming the first part of an introduction to Zoology and Biology.

IN yesterday's *Times* will be found an extremely interesting account from Australia of a Frenchman, Narcisse Pierre Peltier, of about thirty years of age, who has been living for seventeen years among the savages of Night Island, off the north-east coast of Queensland, in lat. 13° 10' S., long. 143° 35' E. He was left on the island by some shipwrecked sailors when twelve years old, was treated kindly by the savages, and soon became identified with them in every respect. He is recovering rapidly the use of his mother-tongue both in speaking, reading, and writing, though he still retains some marked characteristics of savage life. He has given much information concerning the tribe among whom he lived so long; their language does not seem to have anything in common with the Malay or with any of the Papuan dialects. If judiciously treated, Narcisse might be made to yield valuable material to the anthropologist.

THE additions to the Zoological Society's Gardens during the past week include two Suricates (*Suricata zenik*) from South Africa, presented by Mr. F. Ward; two Golden Eagles (*Aquila chrysaetos*) from Scotland, presented by Lord Lilford; a Chinese Water Deer (*Hydropotes inermis*) from China, a Sumatran Rhinoceros (*Rhinoceros sumatrensis*) from Malacca, two Scarlet Ibises (*Ibis rubra*), a West India Rail (*Aramides cayennensis*), a Common Boa (*Boa constrictor*), a Tuberculated Lizard (*Iguana*

tuberculata) from South America, deposited; three Spotted Tinamous (*Nothura maculosa*) from Buenos Ayres, and two Guiana Partridges (*Odontophorus guianensis*) from Guiana, received from Southampton; a Black-billed Sheathbill (*Chionis minor*) from the Kerguelen Island, purchased; a Collared Fruit Bat (*Cynonycteris collaris*), born in the Gardens.

SCIENTIFIC SERIALS

THE *Quarterly Journal of Microscopic Science* may, at the present time, be looked upon as the representative of the most modern phase of biological thought. The current number contains articles of much more than ordinary importance. The first is by Mr. F. M. Balfour, being "A comparison of the early stages in the Development of Vertebrates." The plate which accompanies the memoir is coloured in a particularly instructive manner, which illustrates the ultimate destination of the different elements of the cellular layers of the blastoderm. Mr. Balfour's observations are in favour of the blastopore becoming neither the mouth nor the anus of the adult animal, but of its cicatrix being a weak spot at which one or the other may subsequently be more easily formed than elsewhere. The gap between the observed structure of the developing amphibian and selachian is made more simple by the introduction of a hypothetical intermediate form in which the segmentation cavity is represented as if "it were sunk down so as to be completely within the *lower layer cells*," a condition not quite easy to comprehend. Many other very important theoretical points are discussed in this particularly interesting paper.—The second paper is a reprint from the Privy Council Reports, of Dr. Klein's observations on the pathology of sheep-pox.—Mr. W. H. Jackson describes and figures a new Peritrichous Infusorian, named *Cyclochaeta spongilla*, found in a sponge from the river Chirwell.—Mr. A. A. W. Hubrecht of Leyden makes "some remarks about the minute anatomy of Mediterranean Nemerteans," including notes on the dermal tissues, nervous system, &c., of species of *Meckelia*, *Polia*, *Lineus*, *Ommatopla*, and *Drepanophorus* (n.g.)—Prof. Lankester publishes in full his observations read before the Linnean Society, "On some points in the structure of *Amphioxus*, and their bearing on the morphology of vertebrata." The exact homology of the atrial chamber and of the peritoneal cavity in the Lancelet has been a fruitful source of discussion, and Prof. Lankester's study of the question throws considerable additional light on the subject. The conclusions to which his investigations lead are "first that the peritoneal cavity of the vertebrate is the same thing as the coelom of the worm and of *Amphioxus*; second, that the earlier vertebrate ancestors (represented in a degenerate form by *Amphioxus*) developed epipleura, which coalesced in the median line postorally to form an atrium; third, that whilst *Amphioxus* retains this atrium in functional activity, the other vertebrata have lost it by the coalescence of its outer and inner bounding wall, respectively epipleura and somatopleura; fourth, that whilst the indications of the earlier historical steps of this process are suppressed in all craniate vertebrata at present investigated, yet the Elasmobranchs do continue to present to us an ontogenetic phase in which the somatopleura and the epipleura are widely separated; thus enclosing between them an epicoel (the atrium of *amphioxus*)."—Mr. F. R. Lewis writes on Nematode Haematozoa in the dog, closely allied to *Filaria sanguineolenta*, found in the walls of the aorta. These are figured, as are the parts of *Amphiporous spectabilis* and other Nemerteans, described by Dr. M'Intosh in considerable detail.—There is an admirable paper by Prof. Thiselton Dyer, containing a review of the various modes of sexual reproduction known among Thallophytes, with a sketch of the classification of that section of Cryptogams—including Algae, Lichens, Fungi, and Characeæ—recently proposed by Prof. Sachs.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, June 23.*—Mr. John Evans, V.P.R.S., president, in the chair.—On the superficial geology of the Central Region of North America, by Mr. G. M. Dawson, Geologist to H.M. North American Boundary Commission.

Physical Geography of the Region.—The region under consideration is that portion of the great tract of prairie of the middle of North America from Mexico to the Arctic Sea, which

* Continued from p. 221.

lies between the forty-ninth and fifty-fifth parallels, and extends from the base of the Rocky Mountains to a ridge of Laurentian rocks that runs north-west from Lake Superior towards the Arctic Sea, and is called by the author the "Laurentian axis." This plateau is crossed by two watersheds; one, starting from the base of the Rocky Mountains at about the forty-ninth parallel, runs due east to the 105th meridian, when it turns to the south-east, dividing the Red River from the Missouri; the other crosses from the Rocky Mountains to the Laurentian axis near the fifty-fifth parallel. The whole region between these two transverse watersheds slopes gradually eastward, but is divisible into three prairie steppes or plateaus of different elevations. The lowest includes Lake Winnipeg and the valley of the Red River; its average altitude is 800 feet. The second, or the "Great Plains," properly so called, has an average elevation of 1,600 feet. The third or highest is from 2,500 to 4,200 feet above the sea, and is not so level as the other two.

Glacial Phenomena of the Laurentian Axis.—The neighbourhood of the Lake of the Woods is taken by the author as furnishing an example of the glaciation visible in many parts of the Laurentian axis. This lake is seventy miles long, and has a coast line of three hundred or four hundred miles. The details of its outline closely follow the character of the rock, spreading out over the schistose and thinly cleavable varieties, and becoming narrow and tortuous where compact dioritic rocks, green-stone, conglomerate, and gneiss prevail. The rocks both on the shores and the islands in the lake are rounded, grooved, and striated. The direction of the striae is from north-east to south-west.

Drift Plateau of Northern Minnesota and Eastern Manitoba.—This plateau consists of a great thickness of drift deposits resting on the gently sloping foot of the Laurentian, and is composed to depth of sixty feet or more of fine sands and arenaceous clays, with occasional beds of gravel and small boulders, probably reposing throughout on boulder-clay. The only fossil found was a piece of wood apparently of the common cedar (*Thuja occidentalis*). The surface of the plateau is strewn with large erratics, derived chiefly from the Laurentian and Huronian to the north; but there are also many of white limestone. The fossils in some of the latter being of Upper Silurian age, the author is inclined to believe, with Dr. Bigsby, that an outcrop of Upper Silurian is concealed by the drift deposits in the Lake of the Woods region.

Lowest Prairie Level and Valley of the Red River.—This prairie presents an appearance of perfect horizontality. The soil consists of fine silty deposits arranged in thin horizontal beds resting on till or boulder-clay. Stones were exceedingly rare. The western escarpment was terraced and covered with boulders. It is therefore probable that this prairie is the bed of a pre-glacial lake.

The *Second Prairie Plateau* is thickly covered with drift deposits, which consist in great part of local débris derived from the underlying soft formations, mixed with a considerable quantity of transported material, especially in the upper layers. Large erratics are in places abundant; they consist mainly of Laurentian rocks, but Silurian limestone also abounds. The following is the percentage of the boulders from the different formations present in the drift:—Laurentian, 28·49; Huronian, 9·71; Limestone, 54·01; Quartzite Drift, 1·14. The last is derived from the Rocky Mountains, the other three from the Laurentian axis. There are also on the surface of this plateau some remarkable elevated regions, apparently entirely composed of accumulated drift materials.

Edge of the Third Prairie Plateau, or the Missouri Coteau, is a mass of glacial débris and travelled blocks averaging from thirty to forty miles in breadth, and extending diagonally across the country for a distance of about 800 miles.

Third or Highest Plateau.—There is a marked change in the drift on this plateau, the quartzite drift of the Rocky Mountains preponderating, seldom showing much glaciation. Its general character may be seen from the following percentage of its composition:—Laurentian, 27·05; Huronian, ?; Limestone, 15·84; Quartzite drift, 52·10. Some of the lower parts of this steppe show thick deposits of true till with well-glaciated stones, both from the mountains and the east, and débris from underlying tertiary beds, all in a hard yellowish sandy matrix. On the higher prairie sloping up to the Rocky Mountains the drift is entirely composed of material derived from them.

The *Rocky Mountains* themselves show abundant traces of glaciation. Nearly all the valleys hold remnants of moraines, some of them still very perfect. The harder rocks show the

usual rounded forms, but striation was only observed in a single locality, and there coincided with the main direction of the valley. The longer valleys generally terminate in *cirques*, with almost perpendicular rock-walls, and containing small but deep lakes.

State of the Interior Region of the Continent previous to the Glacial Period.—The author considers that previous to the glacial epoch the country was at about its present elevation, and that its main physical features and river-drainage were already outlined. Subaërial denudation had been in operation for a vast period of time, and an enormous mass of tertiary and cretaceous strata removed.

Mode of Glaciation and Formation of the Drift Deposits.—The author did not find any evidence rendering the supposition of a great northern ice-cap necessary, but suggests that local glaciers on the Laurentian axis furnished icebergs laden with boulders, which were floated across the then submerged prairies towards the Rocky Mountains.

On some important facts connected with the Boulders and Drifts of the Eden Valley, and their bearing on the theory of a Melting Ice-sheet charged throughout with rock-fragments, by D. Mackintosh. In this paper the main object of the author is to defend generally received opinions, especially as regards the great glacial submergence, in opposition to the theory announced in the Quart. Journ. Geol. Soc. for last February (vol. xxxi. p. 55). He brings forward a number of facts and considerations, founded on repeated observations, to show that the dispersion of Criffell granite-boulders is so interwoven with that of boulders of porphyry and syenite from the Lake-district as to be incompatible with the theory of transportation by currents of land-ice; and that the limitation of Criffell boulders along the S.E. border of the plain of Cumberland to about 400 feet above the sea-level is inconsistent with the idea of a boulder-charged ice-current 2,400 feet in thickness. His main argument against the theory of land-ice "charged throughout with rock-fragments of all sizes," is derived from the purity of the interiors of existing ice-sheets; and he quotes Prof. Wyville Thomson in support of his statements.

Observations on the unequal distribution of Drift on opposite sides of the Pennine chain, in the country about the source of the River Calder, with suggestions as to the causes which led to that result, together with some notices on the high-level drift in the upper part of the valley of the River Irwell, by John Aitken. The author, in calling attention to the unequal distribution of the drift on the opposite sides of the Pennine chain in this district, points out that on the western side of that range an extensive series of drift-deposits is found, spreading over the great plains of Lancashire and Cheshire down to the Irish Sea. It also occurs on the west flanks of the chain at elevations of from 1,100 to 1,200 feet, thus rising several hundred feet above the watersheds of some of the valleys penetrating that elevated region. On the eastern side, however, there is, with one or two slight exceptions, an entire absence of such accumulations, even in the most sheltered and favourable situations, for a distance of twelve or fifteen miles from the water-parting of the country. This absence of drift on the eastern side might, the author considers, be satisfactorily accounted for by supposing that the transverse valleys of the chain were, during the glacial epoch, completely blocked up with congealed snow or ice, by which means all communications between the opposite sides of the range would be entirely cut off. The southward flow of the ice, which was probably not so thick as to cover the higher portions of the chain, would, on encountering such an obstacle to its progress, be deflected westwards, and finally debouch into the plains of South Lancashire, and would there deposit on its retreat the débris it contained.—(To be continued.)

Geologists' Association, July 2.—Mr. Wm. Carruthers, F.R.S., president, in the chair.—On some of the causes which have contributed to shape the land on the North Wales border, by D. C. Davies. In a series of diagrams the author showed the probable results of an upheaving force acting upon different kinds of strata; and, in the second part of his paper, gave a detailed account of several instances, along the Welsh border, where important physical features now existing had been determined by faults and anticlines. These were shown in a second series of diagrams in which the actual relation of numerous valleys, gorges, &c., to faults, &c., was pointed out. The various agents of erosion such as sea-water, rain-water, and ice had modified, and in some cases altered, the features due to disturbance; but the author claimed that a proper regard should

be had to all the forces of nature, both internal and external to the surface in producing the contour as it now exists.—The Yorkshire Oolites, Part II., by W. H. Hudleston.

Entomological Society, July 5.—Sir Sidney Smith Saunders, C.M.G., president, in the chair.—Mr. Dunning remarked that the *Ornithoptera* bred by Mr. Sealy from larvae taken at Cochin, South India, and exhibited by him at a recent meeting had been identified as *O. minos*.—Mr. Bond exhibited two specimens of a *Curculio*, sent from Nova Fribourgo, Brazil, which were attached to the same twig and were both attacked by a fungus. Mr. Janson said that they belonged to the genus *Hylopis*, and were well known to be subject to such attacks.—The President exhibited a lock taken from a gate at Twickenham entirely filled with the cells of a species of *Osmia*, which Mr. Smith said was, most probably, *O. bicornis*, of which he had known several instances in locks. He also exhibited an example of the minute *Hylechthrus rubri*, one of the *Stylopidae*, parasitic upon *Prosopis rubicola*, recently obtained from briars imported from Epirus, and remarked upon a method of expanding the wings of *Stylopidae*. He also exhibited a series of *Hidictus nitidiusculus*, stylized, and recommended entomologists on the south coast to search in August for stylized *Hidicti*, especially among thistles. Finally, he remarked on the parasites of *Osmia* and *Anthidium*, and enumerated eleven insects attacking the same species of *Osmia* in its different stages—some devouring the egg and pollen-paste, some the larva, and others attacking the bee itself.—Mr. Champion exhibited a series of recently captured individuals of *Chrysomela coryalis*, from Snowdon, its only known British locality. Mr. M'Lachlan stated that he had recently seen this species in the Department of Saône-et-Loire, in France, in great numbers, each ear of wheat having several of the beetles upon it, and remarked on the singular nature of its sole habitat in Britain.—The Secretary exhibited nests of a trap-door spider, sent from Uitenhage, near Port Elizabeth, Cape Colony. The nests were not (as is usual) in the earth, but in cavities in the bark of trees; and the "trap-door" appeared to be formed of a portion of the bark, thus rendering it most difficult to detect the nests when in a closed condition.—Mr. Charles V. Riley, State Entomologist of Missouri, exhibited sundry insect pests that do so much damage in the State, including the Army-worm (*Leucania impuncta*), and the Rocky Mountain Locust (*Caloptenus spretus*), and entered at some length into the habits of the latter insect and the vast amount of destitution caused by it; stating that in a short period it devoured almost every living plant, leaving nothing but the leaves of the forest trees, and converting a fruitful country into an absolute desert. From a knowledge of the habits of the insect, and believing in its inability to exist in a moist climate, he had predicted that its ravages would not extend beyond a certain line, and he had seen these predictions fulfilled. Having noticed that hogs and poultry grew excessively fat from devouring locusts, and considering that the use of them as food for man would tend to relieve some of the distress occasioned in the devastated districts; he had caused a number of them to be prepared in various ways, and they were found to be well suited for food, especially in the form of soup.—Mr. Riley also stated that he was very desirous of taking a supply of cocoons of *Microgaster glomeratus* to America to lessen the ravages of the larvae of the genus *Pieris* on that continent, and would be greatly obliged to any entomologist who could assist him in obtaining them.—The following papers were communicated:—Descriptions of new Heteromeroous Coleoptera belonging to the family *Blapsidae*, by Prof. J. O. Westwood.—Description of a new species of Myriopod, from Mongolia, by Arthur G. Butler.—Descriptions of new Coleoptera from Australia, by Charles O. Waterhouse.

PARIS

Academy of Sciences, July 12.—M. Frémy in the chair.—M. Chevreul communicated the fourth extract from his third memoir "on the explanation of numerous phenomena which are a consequence of old age."—Are the disasters caused by the hurricane of 1860 near Réunion referable to the laws of Cyclones? by M. Faye.—M. J. Bertrand called the attention of the Academy to a passage in the second edition of P. Secchi's work on the sun, and made some critical remarks thereon.—Note by M. G. A. Hirn relative to the memoir of M. Kretz on elasticity in moving machines.—Theory of perfect numbers, a memoir by M. J. Carvallo.—Magneto-chemical phenomena produced in rarefied gases in Geissler tubes illuminated by means of induced currents, by M. J. Chautard. The author describes the effect of magnets in

modifying the spectra of certain elements and compounds. Determinations of the wave-lengths of these modified spectra have been made for chlorine, bromine, iodine; the chloride, bromide and fluoride of silicon, boric fluoride, hydrochloric acid, antimonic chloride, bismuthous chloride, mercuric chloride, and the two chlorides of tin. The light of sulphur and selenium is immediately extinguished on "making" the magnet. Oxygen does not undergo much change. Nitrogen is modified in the red and orange. The hydrogen tube showed the D line on "making" the magnet, the line instantly disappearing on breaking contact. The author explains this phenomenon by supposing that the gas is projected suddenly against the side of the tube on magnetisation and carries away sodium particles.—On the "square mirror," an instrument for tracing right angles on the earth, and for use in the rapid measurement of great distances, by M. Gaumet.—On fused boric acid and its tempering, by M. V. de Luyne. The hardness of this substance (between 4 and 5) is between fluor spar and apatite. The powdered glass combines energetically with water, the temperature of the mixture rising to 100°. The used acid poured on to a metallic surface gives rise to the formation of a vitreous plate, of which the lower surface is more expanded than the upper, producing in consequence a bending of the plate which is sometimes sufficient to rupture it. Poured into oil, the fused acid forms small tailed drops, which break under the same conditions as "Prince Rupert's drops." A plate of the boric acid glass, with parallel faces, acts on polarised light like "toughened" glass, but preserves its property under conditions which destroy the polarising power of glass. The fused acid, placed in water, undergoes hydration by laminae producing a true exfoliation.—On the laws of the exchanges of ammonia between the seas, the atmosphere, and continents, by M. T. Schloesing.—Description and analysis of a mass of meteoric ore which fell in Dickson County, Tennessee, by M. Lawrence Smith. Its composition is Fe, 91·15; Ni, 8·01; Co, 0·72; Cu, 0·06. Heated in vacuo, two volumes of gas were given off, composed of H, 71·04; Co, 15·03; Co₂, 13·03.—Planet 146 Lucine, discovered at the Observatory of Marseilles by M. Borrelly, June 8, 1875; ephemeris calculated by M. E. Stephan.—On the temporary magnetisation of steel, by M. Bouty.—Theory of storms; conclusions. A note by M. H. Peslin.—Estimation of carbon disulphide in the alkaline sulphocarbonates of commerce, by MM. Delachanal and Mermel.—On the preparation of tungsten and the composition of wolfram, by M. F. Jean.—On some new derivatives of anethol, by M. F. Landolph.—Researches on emetine, by M. A. Glenard.—Differential ophthalmoscopic signs of disturbance and contusion of the brain, by M. Bouchut.—Of the causes of the spontaneous coagulation of the blood on issuing from the organism, by M. F. Glenard.—On the hailstorm which burst over Geneva and the Rhône valley on the night of July 7-8, by M. Colladon.—On clouds of ice observed during an aerostatic elevation on July 4, by M. W. de Fonvielle.

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