

Other instances among insects were adduced to show the important influence of the surroundings of a species in producing functional changes in its economy, and it was sought to be established that defective nutrition has been a principal cause of cocoons being dispensed with by certain Bombycidae. From these preliminary considerations the author proceeds to consider the evolution of the various families of Lepidoptera. He believes that the butterflies have as a whole been developed from the Bombycidae, though that development has probably been accomplished through several roads. He claims the support of palaeontological evidence for his views. The earliest moths yet recorded are the Tineids, the lowest family of Lepidoptera; these may be regarded as constituting a persistent type like that of Terebratulas. The Sphingae are supposed to have descended from a Phryganea with Bombycid characters, and many ingenious suggestions and considerations are advanced in support of this view. A hypothetical genealogical tree is given at the close of the paper.—A monographic account of *Nisus* (*Accipiter*) *cooperi* and *N. gundlachi*, by Mr. R. Ridgway, gives the results of careful examination of many specimens. With regard to the former it is found impossible to establish the existence of two geographical races. The distinctness of the latter species is strongly maintained. Mr. Ridgway's account of the Buteonine sub-genus, *Craxirex*, which is peculiar to America, gives a synopsis of the species. The very variable *Buteo swainsoni* is particularly fully described.—A very interesting paper is contributed by Dr. Elliott Coues, devoted to a vindication of William Bartram as a scientific ornithologist. Dr. Coues seeks to prove that, according to the admitted rules of nomenclature and the rules of the British Association, Bartram has not received his due. He maintains that Bartram's Catalogue of United States Birds is not a mere valueless list, but all the more valuable in consequence of the terseness and simplicity of his descriptions, many of which are unmistakable.—One of the most important papers of the year is by Dr. Lautenbach, on the physiological action of hemlock and its alkaloid. His conclusions, from careful experiments, are as follows:—1. Conia, instead of being poisonous to plants, really acts as a preservative; the alcoholic extract of hemlock, however, acts poisonously on plants. 2. When locally applied, conia produces a progressive loss of functional power in every highly organised tissue with which it comes into contact. 3. In inducing complete repose of the muscular system, conia powerfully predisposes to sleep, but it is not a hypnotic in the sense that opium is. 4. The convulsions produced by a poisonous dose of hemlock are cerebral, and not spinal, as has heretofore been imagined. 5. Conia produces a double effect on the motor-nervous system, a paralysing effect on the periphery of the efferent or motor nerves, and a depression of the motor tracts of the spinal cord. 6. The increase in the number of heart-beats which occurs early in conia poisoning is due to paresis of the pneumogastrics. 7. The primary acceleration in the respiratory movements is also due to pneumogastric paresis. 8. The salivary secretion is the only secretion markedly increased by a poisonous dose of conia. 9. The voluntary muscles escape unscathed in conia-poisoning. 10. Contraction of the pupil only occurs when the drug is directly applied to the eyeball. 11. Conia causes a decided increase in temperature. 12. Conia is absorbed and is eliminated unchanged by the kidneys.

PARIS

Academy of Sciences, Jan. 31.—Vice-Admiral Paris in the chair.—The following papers were read:—Thermal researches on the formation of alcohols and on etherification, by M. Berthelot.—Account of experiments made to determine the work expended by Gramme's magneto-electric machines, used for producing light in the works of M.M. Sautter and Lemonnier, by M. Tresca. A direct-illumination photometer was used for comparing an electric lamp with a Carcel lamp, and when equality was had in the two contiguous zones, a dynamometer trace was taken, and the number of turns ascertained. The author gives data of machines, the light from which was equal to 1,830 and 300 Carcel burners respectively. The cost of fuel for the former was only about a hundredth of that of the oil and a fiftieth that of the coal gas.—M. Du Moncel presented the fourth volume of his "Exposé des Applications de l'Electricité" (3rd edition), relating to electric clockwork, electric registers, and applications of electricity to safety appliances in railway service.—Researches on magnetic rotatory polarisation (2nd part), by M. Becquerel. The rotation in diamagnetic bodies increases with the index of refraction. In solutions of a diamagnetic salt of varying concentration, the ratio of the rotation

to the weight of the anhydrous salt is a number nearly constant. With salts of iron the magnetic rotation increases much more quickly than the number of active molecules.—Caloric vibrations of a homogeneous solid of uniform temperature, by M. Lucas.—On the formation of hail (second note), by M. Planté. The electrodes of the secondary couples are introduced into salt water, the positive being covered with moistened blotting-paper. A multitude of ovoid globules are scattered out and up from this latter in all directions. M. Planté thinks the electricity in clouds may sometimes act thus, and the globules, rising to a region of lower temperature, become hailstones. Electricity may produce hail through mechanical, caloric, or magneto-dynamic effects.—Letter to the President of the Commission on Phylloxera, by M. Mouillefert.—On the boring operations in the tunnel of Saint Gotthard, by M. Colladon. Notwithstanding much greater hardness of rock, &c., than in the boring of Fréjus. M. Favre has, in the third year, realised an advance of 48½ per cent. above the maximum obtained in Fréjus during the thirteen years.—Discovery of the planet (159), by M. Paul Henry.—Note on left curves of the fourth order, by M. Serret.—On the principle of correspondence, and the means it affords of removing some difficulties in analytical solutions, by M. Saltel.—On topographic maps, by M. Hermite.—On the congelation of mercury by use of a mixture of snow and hydrochloric acid, by M. Witz. A mixture, in equal parts, of snow and hydrochloric acid having a temperature of -1°, will give a temperature of -37°·5 C.—On electrolytic aniline black, by M. Goppelsroeder.—On the ferment of urea, by M. Musculus. It has none of the properties of organic ferments, but is rather like soluble ferments, as diastase, saliva, and pancreatic juice.—On the elements of inverted sugar, and their presence in commercial sugar, by M. Laumené.—On digestion in insects; remarks *à propos* of a recent work of M. Jousset, by M. Plateau. M. Plateau claims priority of observation.—Note on the method to be employed for testing the conductivity of lightning conductors, by M. Michel.—Observations relative to the undulations and fractures of the Cretaceous system, *à propos* of the project of making a tunnel under the Channel, by M. Robert.—On spontaneous periodic movements in the stems of *Saxifraga sarmentosa*, *umbrosa*, *Geum*, *Acanthifolia*, and in *Parnassia palustris*; relations of this phenomenon with the disposition of the foliar cycle, by M. Heckel.

BOOKS RECEIVED

BRITISH.—Three Months in the Mediterranean: Walter Coote (Stanford).—Lardner's Handbook of Astronomy. 4th edition. Edited by E. Dunkin, F.R.A.S. (Lockwood).—British Manufacturing Industries. Edited by G. Phillips Bevan, F.G.S. 3 vols. (Stanford).—The Races of Mankind. Vol. III.: Dr. Robert Brown (Cassell).—Morecco and the Moors: Dr. Arthur Leard. (Sampson Low and Co.)—Memoir of Commodore Goodenough: C. R. Markham (G. Griffin and Co.)—Animal Parasites and Mesmates: P. J. Van Beneden (H. S. King and Co.)—First Book of Zoology: E. S. Morse, Ph.D. (H. S. King and Co.)—Livingstone's First and Second Expeditions to Africa. 2 vols. (John Murray).—Reboisement in France: J. Croumbe Brown, LL.D. (H. S. King and Co.)—Telegraphy: W. H. Preece, C.E., and J. Sivewright, M.A. (Longmans).—Tyrol and the Tyrolese: W. A. Baillic Grohman (Longmans).—Food: its Adulterations and the Methods for their Detection: Dr. A. Hill Hassall (Longmans).—Physical Geography: W. D. Cooley (Lutian and Co.)—Short History of Natural Science: A. B. Buckley (John Murray).

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