and thorough. In the college course, if anything besides English is required, and I think there should be, I would have the natural science as necessary a part of the education as language and mathematics. I would not have it possible for a student to graduate from the college without having studied, and thoroughly studied, mathematics as far as trigonometry, at least one foreign language, and at least one physical and one biological science. And I do not mean a few weeks of study in any of these branches, but exhaustive, careful, critical study. The methods of study in all these branches are diverse, and are absolutely essential for symmetrical mind-building,"

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 25.—"Further Note on the Transplantation and Growth of Mammalian Ova within a Uterine Foster-Mother." By Walter Heape, M.A., Trinity College, Cambridge.

In 1890 an experiment was recorded (*Roy. Soc. Proc.*, vol. xlviii.), designed to show that it is possible to make use of the uterus of one variety of rabbit as a medium for the growth and complete fœtal development of fertilised ova of another variety of rabbit. The experiment was further undertaken in order to determine what effect, if any, a uterine foster-mother would have upon her foster-children, and whether or not the presence, during development, of foreign ova in the uterus of a mother would affect offspring of that mother present in the uterus at the same time. In this experiment, two fertilised ova obtained from an Angora doe rabbit which had been inseminated thirty-two hours previously by an Angora buck, were inserted into the fallopian tube of a Belgian Hare doe, which had been inseminated three hours before by a buck of the same breed as herself; and in due course the Belgian Hare doe littered six young, four of which were Belgian Hares, while the other two were Angoras. This year experiments were made with Dutch and Belgian Hare rabbits, and the method adopted was the same as that described above, the result being that the Belgian Hare foster-mother gave birth to seven young, of which five were Belgian Hares and two were apparently Dutch. Both these Dutch young were, however, irregularly marked, and it appeared possible, after all, either (1) that the Belgian Hare foster-mother had influenced the Dutch fertilised ova, or (2) that these two young were really a cross between Dutch and Belgian Hare.

In order to test the first of these possibilities, the same Dutch buck was put to a tried, thoroughbred Dutch doe, and she produced a litter, every one of which was badly marked, thus showing that the bad marking of the foster-children can be justly attributed to their father's influence. The second possibility was more difficult to test. A cross between the Dutch buck and the Belgian Hare foster-mother was obviously possible, for when the foreign Dutch segmenting ova were introduced into the fallopian tube of the Belgian Hare foster-mother, they were still surrounded by spermatozoa from the Dutch buck, which were still alive, though failing in vigour. But the Belgian Hare doe had been inseminated by a Belgian Hare buck just before the operation, and the spermatozoa from this buck would arrive at the end of the fallopian tube before ovulation took place; it would be at least twenty-four hours younger than the foreign Dutch spermatozoa, and both more vigorous and in far greater numbers than the latter. The possibilities are distinctly in favour of the host of younger and more vigorous Belgian Hare spermatozoa beating the few older and less vigorous, foreign, Dutch spermatozoa in the struggle for the Belgian Hare ova; but, at the same time, it is possible that the latter won. The only way to test this at all seemed to be by crossing the same Dutch buck with Belgian Hare does, and comparing the offspring of such crosses with the young foster-children. This was done, and two Belgian Hare does each produced, in consequence, five young. Of these, three were Belgian hares splashed with white, one was black and white, three were fawn or fawn and white (the fawn being mixed with a delicate bluish dun shade), and three were thoroughbred Belgian Hares. The father's influence was seen in the introduction of white and in the fawn and dun colours. None of the young, however, at all closely resembled the Dutch breed.

With regard to the foster-children, one of them died at an early age, but the second lived, and is now more typically Dutch than it was when younger; it is coloured and shaped remarkably like the Dutch doe from which the foreign fertilised ova were obtained. The remarkable likeness is in itself very strong evidence of the origin of this young one, and when considered in conjunction with the results obtained by crossing the Dutch buck with Belgian Hare does, there can be little doubt it was derived from Dutch parents. This result, supported by the result obtained in 1890, is greatly in favour of the contention, that it is possible to make use of a uterine foster-mother, and to do so without thereby influencing any of the young which are nourished by her.

It is worthy of notice, if the above is true, that in case telegony be actually demonstrated, the characteristics of a primary husband transmitted to the offspring got by a secondary husband, can only be so transmitted through the ova of the mother.

"Mathematical Contributions to the Theory of Evolution. IV. On the probable Errors of Frequency Constants and on the Influence of Random Selection on Variation and Correlation." By Karl Pearson, F.R.S., and L. N. G. Filon, University College, London.

A brief indication of the nature of the contents of this paper is given on p. 210.

December 9.—"On the Calculation of the Coefficient of Mutual Induction of a Circle and a Coaxial Helix, and of the Electromagnetic Force between a Helical Current and a Uniform Coaxial Circular Cylindrical Current Sheet." By J. Viriamu Jones, F.R.S.

Zoological Society, December 14.—Lieut.-Colonel H. H. Godwin-Austen, F.R.S., Vice-President, in the chair.—Mr. G. A. Boulenger, F.R.S., offered some further remarks upon the Siluroid Fish, *Vandellia cirrhosa*.—A communication was read from Dr. E. A. Goeldi, "On *Lepidosiren paradoxa* from the Amazons." This memoir treated of the geographical distribution of the *Lepidosiren* on the Amazons, and of its external structure and dimensions, and gave an account of its habits in a natural and captive state.—Mr. J. Graham Kerr gave an account of his recent expedition, along with Mr. Budgett, to the Chaco of Paraguay in quest of *Lepidosiren*; and made remarks on its habits as there observed. Mr. Kerr also gave a general account of the early stages of its development, drawing special attention to the presence in the larva of external gills and a sucker similar to those of the Amphibia.—A communication was read from Dr. A. G. Butler, containing a list of thirty-three species of butterflies obtained by Mr. F. Gillett in Somaliland during the present year, and giving the dates of the capture of the specimens and their localities.—Mr. Oldfield Thomas read a paper entitled "On the Mammals obtained by Mr. A. Whyte in North Nyasaland, and presented to the British Museum by Sir H. H. Johnston, K.C.B.; being a fifth contribution to the Mammalogy of Nyasaland." This memoir contained notes on sixty-one species of Mammals, four of which were characterised as new, viz. *Macroscelides brachyrhynchus malosæ*, *Crocidura lixa*, *Myosorex soulla*, and *Graphiurus johnstoni*.—A communication was read from the Rev. O. Pickard Cambridge, F.R.S., describing a new genus and species of Acaridea (*Eatonia scopulifera*) from Algeria.—A communication by Mr. J. Stanley Gardiner, "On some collections of corals of the family *Pocillopori*dæ from the South-west Pacific Ocean," was read by the author. Twenty species of the genus *Pocillopora* and one of the genus *Seriatopora* were enumerated and remarked upon, five species of the former genus being described as new, viz. *Pocillopora septata*, *P. obtusata*, *P. coronata*, *P. rugosa*, and *P. glomerata*.—Mr. W. E. de Winton gave an account of a collection of Mammals from Morocco, made by Mr. E. Dodson on behalf of Mr. J. I. S. Whitaker. Twenty-one species were enumerated as represented in the collection, of which the following were described as new: *Crocidura whitakeri*, *Mus peregrinus*, and *Lepus atlanticus*.

DUBLIN.

Royal Dublin Society, November 17.—Dr. F. T. Trouton, F.R.S., in the chair.—Dr. G. Johnstone Stoney, F.R.S., presented a paper upon atmospheres upon planets and satellites (see p. 207).—Mr. W. E. Wilson, F.R.S., read a paper upon the apparent cometary nature of the spiral nebula in Canes Venatici. The paper was illustrated by a remarkably fine photograph of the nebula taken in February 1897, by the author.—Dr. F. T. Trouton read a paper upon the arrangement of the crystals of

certain substances on solidification.—Prof. A. C. Haddon presented a paper upon the Actiniaria of Torres Straits. This account of the Actiniaria is based mainly on the collections made by the author in 1888–9, supplemented by descriptions published by Mr. Saville-Kent in his works "The Great Barrier Reef of Australia" and "The Naturalist in Australia." In order to render the paper more complete, allusions are made in it to genera which are not recorded from Torres Straits. In a second paper, Prof. Haddon described a new species of Actiniaria from Oceania—*Phellia Sollasi*. This was collected by Prof. Sollas in the lagoon at Funafuti, Ellice Group, W. Pacific, in 1896.—The following objects were exhibited at this meeting: The Coccoliths of Dublin Bay, by Mr. H. H. Dixon, and Prof. J. Joly, F.R.S.—A collection of economic plant products from the Gold Coast, by Prof. T. Johnson.

ST. LOUIS.

Academy of Science, December 6.—Mr. Julius Hurter exhibited specimens of a considerable number of reptiles and batrachians, mostly of southern origin, which had been collected by him during the past season, and were additions to the known fauna of Missouri. Among the more interesting additions were the cotton-mouth moccasin, the banded water snake, Holbrook's water snake, the little brown snake, the Louisiana mud turtle, the chestnut-backed salamander (first detected west of the Mississippi River by Mr. Colton Russell), and the marbled salamander.—Mr. H. von Schrenk exhibited a series of specimens and drawings illustrating some of the injuries inflicted on the trees of St. Louis by the tornado of May 1896, showing not only the formation of double twig elongation and growth rings, but the exfoliation of the bark and the consequent drying out of 50 per cent. or more of the wood through the trunk and branches, in several species.

NEW SOUTH WALES.

Linnean Society, October 27.—Prof. J. T. Wilson, President, in the chair.—Descriptions of new species of Australian Coleoptera, Part 4, by Arthur M. Lea. Thirty-four species, principally belonging to the *Curculionidæ*, were described as new; with critical notes and remarks on synonymy.—On the lizards of the Chillagoe district, North Queensland, by Dr. R. Broom. Twenty-three species were collected during a six months' residence at Muldiva, seventy miles west of Herberton, a district in which during eight months of the year (April–December) as a rule there is practically no rain. A species of *Lygosoma* was described as new.—On a *Trachypterus* from New South Wales, by J. Douglas Ogilby. In this paper the author gave a detailed description of a young example washed ashore near Newcastle, and reviewed at length our present knowledge of the genus in the south-western Pacific.—Contributions to a more exact knowledge of the geographical distribution of Australian Batrachia, No. 5, by J. J. Fletcher. The present contribution is based upon the examination of collections from Tasmania and West Australia. In the British Museum Catalogue (second edition) seven (? eight) species are attributed to Tasmania, and fourteen to West Australia. Three additional species are now recorded for the former Colony, and six for the latter, including an undescribed species of *Crinia* belonging to the group having the abdominal surface non-granulate.—Mr. Froggatt exhibited a number of scale insects (*Eriococcus coriaceus*, Mask.), upon a twig of Eucalyptus, among which had been placed a great number of the eggs of the scale-eating moth *Thalpochares coccophaga*, Meyr. The eggs are pale pink, circular, and beautifully ribbed. The scales were infested with the larvæ of *Cryptolæmus montrouzieri*, Muls., a useful small black ladybird beetle. Both these enemies of *Eriococcus* are of great economic value, as the moth larvæ have now taken to eating the olive scale (*Lecanium oleæ*, Sign.), and the ladybird beetle is bred both in New Zealand and America. Also living specimens of our largest white ant, *Calotermes longiceps*, Froggatt, which were taken out of a log of fire-wood, and had already been in captivity for over two months.

DIARY OF SOCIETIES.

MONDAY, JANUARY 3.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—Standard Methods of Tanning Analysis as adopted by the International Association of Leather Trades Chemists, with Remarks thereon: Prof. H. R. Procter and Dr. J. G. Parker.—Extraction of Tanning Materials at various Temperatures: Dr. J. G. Parker.—Neatsfoot Oil: J. H. Coste and E. J. Parry.

VICTORIA INSTITUTE, at 4.30.—Ancient Civilizations: Rev. John Tuckwell.

TUESDAY, JANUARY 4.

ROYAL INSTITUTION, at 3.—The Principles of the Electric Telegraph: Prof. Oliver Lodge, F.R.S.

ROYAL VICTORIA HALL, at 8.30.—Coal: W. F. Rudler.

WEDNESDAY, JANUARY 5.

GEOLOGICAL SOCIETY, at 8.—On the Structure of the Davos Valley: A. Vaughan Jennings.—Sections along the Lancashire, Derbyshire, and East Coast Railway, between Lincoln and Chesterfield: C. Fox-Strangways.

THURSDAY, JANUARY 6.

ROYAL INSTITUTION, at 3.—The Principles of the Electric Telegraph: Prof. Oliver Lodge, F.R.S.

FRIDAY, JANUARY 7.

GEOLOGISTS' ASSOCIATION, at 8.—A Brief Account of the Excursions in the Urals, down the Volga, in the Caucasus, &c., made in connection with the Interntional Geological Congress held in Russia, August–September, 1897: L. L. Belinfante.

SATURDAY, JANUARY 8.

ROYAL INSTITUTION, at 3.—The Principles of the Electric Telegraph: Prof. Oliver Lodge, F.R.S.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—L'Electro-chimie: A. Minet (Paris, Gauthier-Villars).—Introduction to the Study of Organic Chemistry: J. Wade (Sonnenschein).—Natürliche Schöpfungs-Geschichte: Prof. E. Haeckel, 2 Vols., Neunte Umgearbeitete Auflage (Berlin, Reimer).—Notes on Carpentry and Joinery: T. J. Evans, Vol. 1 (Chapman).—What is Life?: F. Hovenden (Chapman).—The Collected Mathematical Papers of Arthur Cayley, Vol. xiii. (Cambridge University Press).—Physikalisch-Chemische Propaedentik: Prof. H. Griesbach, Zweite Hälfte, 2 Liefg (Leipzig, Engelmann).

PAMPHLETS.—Magnetic and Pendulum Observations: G. R. Putnam (Boston, Mass.).—Hand-Guide to the Botanic Gardens, Buitenzorg (Batavia, Kolff).

SERIALS.—Traité Encyclopédique de Photographie: Dr. C. Fabre, Cinqe Fasc. B. (Paris, Gauthier-Villars).—Journal of the Royal Microscopical Society, December (Williams).—Century Magazine, January (Macmillan).—Quarterly Journal of Microscopical Science, December (Churchill).—Natural Science, January (Dent).

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