

SOCIETIES AND ACADEMIES.

LONDON.

Zoological Society, June 18.—Mr. G. A. Boulenger, F.R.S., vice-president, in the chair.—The growth-forms and supposed species in corals: Dr. F. W. Jones. The author showed that the growth-form of the colony was the outcome of the conditions of the environment, and was not a specific character. The growth-form was largely the result of the method of division of the zooids of the colony, and different external conditions produced different methods of division, so that almost any coral could show almost any method of division.—The lizard of the Ionian Islands which had been named *Lacerta ionica* by Herr Philip Lehrs: G. A. Boulenger. The author stated his opinion that this lizard was not entitled to specific rank, and that it was merely a variety of *Lacerta taurica*, Pallas.—Neotropical Lycanidæ: H. H. Druce. A large number of new forms were described, and the synonymy of many others discussed.—Descriptions of *Veliifer hypselopterus* and of a new fish of the genus *Veliifer*: C. T. Regan.—The anatomy, classification, and systematic position of the teleostean fishes of the suborder Halotriognathi: C. T. Regan. The paper showed that the Lamprididæ, Veliiferidæ, Trachypteridæ, and Lophotidæ formed a natural group closely related to the Beryciformes, from which they differed especially in the structure of the mouth.—Monkeys of the genus *Cercopithecus*: R. I. Pocock. All the known forms of this genus may be arranged into groups typified by the following species:—*patas*, *aethiops*, *petaurista*, *cephus*, *nictitans*, *leucampyx*, *albicularis*, *mona*, *neglectus*, *phoesti*, and *diana*.—Some African species of *Felis*, based upon specimens exhibited in the society's gardens: R. I. Pocock. Special attention was directed to some interesting points connected with *F. nigripes*, *F. serval* and *F. aurata* (= *chrysothrix*). A specimen of the last-named species from Sierra Leone changed from red to dusky grey while living in the gardens, thus proving that the differences in colour between individuals of this species were not of specific or subspecific value.—The jelly-fish of the genus *Limnocnida* collected during the third Tanganyika expedition: R. T. Günther. The material was obtained on four distinct dates in September, November, and February, by Dr. W. A. Cunningham, and therefore during the season of the great rains. The greater number of specimens in all the collections showed a vigorous growth of young medusa-buds on the manubrium, and that therefore the theory that asexual reproduction occurred during the dry season only, which was propounded by Mr. Moore, must be abandoned. Dr. Cunningham's material threw new light upon the order and succession in which the tentacles developed, and had enabled the author to record all the stages of tentacle development as exhibited by individuals ranging from 2 mm. to 22 mm. Certain variations in the arrangement of radial canals and of sense-organs were discussed. So large a percentage as 24 per cent. were found to possess five or more radial canals, the greatest number being seven instead of the normal four. The Victoria Nyanza form of *Limnocnida* collected by Sir C. Eliot, which was also dealt with in the paper, was believed to be a variety, which differed from the Tanganyika form in that the tentacles were more deeply embedded in ridges of jelly of the exumbrella than in the Tanganyika form. All the individuals in a collection from the Victoria Nyanza were females. The result of a re-investigation of both *Limnocnida* and *Limnocodium* led the author to the conclusion that both genera were to be referred to the *Trachomedusæ*, in spite of the fact that no other known trachomedusan had gonads on the manubrium. Reasons for this view were given, as also for the association of both fresh-water medusæ with the *Olindiadæ*. It was considered exceedingly doubtful whether either *Limnocodium* or *Limnocnida* ever passed through a hydroid stage at all.

Geological Society, June 19.—Dr. Aubrey Strahan, F.R.S., vice-president, in the chair.—The Inferior Oolite and contiguous deposits of the Bath-Douling district: L. Richardson. In this paper a detailed description is given of the Inferior Oolite of the country between Douling and Bath. It is shown that there is within the area no Inferior Oolite deposit of earlier date than the Upper Trigonina Grit

—a deposit of *Garantianæ hemera*. In one appendix Mr. S. S. Buckman indicates the deposits in Dorset equivalent to those studied; in another the late Mr. J. F. Walker and Mr. Richardson deal with the Brachiopoda of the Fullers' Earth, naming seven new species; and in a third Mr. Richardson describes a new *Amberleya* and *Spirorbis*. The micro-fauna of the upper coral bed is dealt with by Mr. C. Upton, who obtained from material furnished him from Midford and Timsbury Slight most of the micro-brachiopoda such as were found by Charles Moore at Dundry Hill.—The Inferior Oolite and contiguous deposits of the district between the Rissingtons and Burford: L. Richardson. This paper is presented with the preceding, because there are several points of similarity between the two districts described. Both are near lines of country along which movements of upheaval were frequent during the time of formation of the Inferior Oolite rocks.—The flora of the Inferior Oolite of Brora (Sutherland): Miss M. C. Stopes. This paper is to place on record the discovery of a bed containing impressions of plants, which represent a flora bearing a strong likeness to that of the Inferior Oolite of the Yorkshire coast. Previously, but one species and a second doubtful one were known from these coal-bearing beds. The bed in which the plants were found was a thin shale-band cropping out below high-tide level on the coast, about 1½ miles south of Brora.—The constitution of the interior of the earth as revealed by earthquakes (second communication): some new light on the origin of the oceans: R. D. Oldham. The attempts which have been made to account for the oceans and continents are all subject to an uncertainty, in that we have had no means of knowing whether it is a mere irregularity of form that has to be accounted for or whether this irregularity is but the expression of a deep-seated difference in the constitution of the earth. The paper is an attempt to clear up this uncertainty by a comparison of the European records of the San Francisco and Colombian earthquakes of April 18 and January 31, 1906. The general conclusion is drawn that oceans and continents are not mere surface irregularities of the earth's form, but are accompanied by, and probably related to, differences in the constitution of the earth beneath them, which extend to a depth of about one-quarter of the radius. It is not possible to state exactly in what this difference consists, beyond that it causes the rate of propagation of the second-phase waves to be less, in comparison with that of the first-phase waves, under the oceans than under the continents.—The Swansea earthquake of June 27, 1906: Dr. C. Davison. With the exception of the Hereford earthquake of 1896, the Swansea earthquake was the strongest which has been felt in this country for more than twenty years. It disturbed an area of 66,700 square miles, reaching from Rochdale on the north to Penzance on the south, and from beyond Maidenhead on the east to Waterford on the west. The centre of the isoseismal 8 lies about three miles west of Swansea, the longer axis of the curve being directed E. 5° N. and W. 5° S. At Swansea, Neath, &c., the total number of chimneys thrown down or damaged must have amounted to several hundred. The shock consisted of two distinct parts, the first part being much weaker than the second, except at places within an oval area lying some miles to the east of the Swansea epicentre. The existence of a secondary focus beneath this area is also indicated by the relative positions of the isoseismal lines, the isoseismal 8 being much nearer the isoseismal 7 at the western than at the eastern end. Observations, fifty-three in number, were obtained from thirty-nine pits, distributed over an area forty-nine miles in length, from near Kidwelly to near Pontypool. The shock was, as usual, less strongly felt in pits than on the surface, and the sound was more uniform and monotonous underground. Both shock and sound were observed in pits over about the same area. The originating fault in the neighbourhood of Swansea must run from E. 5° N. to W. 5° S., heading to the south, and passing not far from the line joining Llanelly to Neath, which is five or six miles to the north of the great east-and-west fault under Swansea Bay.—The Ochil earthquakes of September, 1900, to April, 1907: Dr. C. Davison. During this interval a series of slight shocks was felt chiefly in the villages of Blairlogie, Menstrie, Alva, and Tillicoultry,

lying between the Ochil Hills and the river Forth. There were four shocks in 1900, one in 1903, ten in 1905, nineteen in 1906, and eight up to the end of April, 1907. The strongest shock of the series occurred on September 21, 1905; its intensity was 6, and it disturbed an area of about 1000 square miles. The originating fault must be directed from about E. 27° N. and W. 27° S., hading to the north, and passing not far from the villages mentioned above. It cannot therefore be identified with the great Ochil fault, which in the district referred to runs from about E. 13° N. to W. 13° S., and near Dollar hades to the south, although it is possible that some or many of the slighter shocks may have been due to slips along this fault.

Linnean Society, June 20.—Prof. W. A. Herdman, F.R.S., president, in the chair.—The distribution of conifers in China and neighbouring countries: the late Dr. M. T. **Masters**.—A group of papers on the collections of H.M.S. *Sealark*: J. Stanley **Gardiner**. A group of papers on collections obtained during the cruise of the yacht *Silver Belle*.—The pre-Glacial flora of Britain: Mr. and Mrs. **Clement Reid**.—Species and ovicells of Tubucellaria: **W. Waters**. The collections dealt with were from the Red Sea, Zanzibar, and the Atlantic.—Cephalopoda of the Sudan: Dr. W. E. **Hoyle**.—Triassic species of Zamites and Pterophyllum: E. A. N. **Arber**.—Plants collected on Mt. Ruwenzori by Dr. A. F. R. Wollaston (1906): E. G. **Baker**, S. L. **Moore**, and A. B. **Rendle**. The plants from the Ruwenzori range were collected from two camps, one at about 3500 feet above sea-level on the south-east slopes of the range between the mountains proper and Lake Ruisamba, the other at 6500 feet in the Mubuku Valley on the east side of the range. Expeditions were made to intermediate and higher altitudes, the highest camp being at about 12,500 feet, whence plants were collected up to the snow-level at about 14,500 feet on the east side. The time of year was January to July. Dr. Wollaston gives notes on the vegetation at different altitudes from 3000 feet to 15,000 feet, and has brought back some photographs showing the nature of the country and different aspects of the vegetation. The plants at the lower elevations include some common tropical weeds, with a fair percentage of more localised species and some novelties. Cultivation ceases above 7000 feet, and at from 7000 feet to 8000 feet is found the largest forest of the range; a large *Dombeya* is noticeable, and one of the finest trees is a *Podocarpus*. Above 8000 feet the forest thins out, and is gradually replaced by a belt of small tree-heaths and *Podocarpus*. The bamboo zone begins on the east side at about 8500 feet, and continues up to 10,000 feet. The big tree-heaths begin about 9500 feet, at which level a number of terrestrial orchids were found, with numerous ferns. From 10,000 feet to 11,000 feet moss is plentiful on the ground and trees, forming cushions 2 feet deep; here were found two tree *Lobelias*. In the next thousand feet *Helichrysums*, *Lobelias*, tree-heaths, and tree *Senecios* are the most conspicuous plants. The heaths cease about 12,500 feet, but the *Senecios* continue almost to 14,000 feet. Another *Lobelia* appears at about 12,500 feet, and is found on the steepest slopes almost to the snow-line. *Helichrysums*, sometimes forming bushes 4 feet or 5 feet high, grow luxuriantly. A small *Arabis* was found at 14,000 feet, and a rush, a grass (a new species of *Poa*), and mosses were found growing up to the level of permanent snow.—The anatomy of the *Julianiaceae*: Dr. F. E. **Fritsch**.—Certain critical freshwater algae: G. S. **West**.

Faraday Society, June 25.—Prof. S. P. U. Pickering, F.R.S., in the chair.—The thermochemistry of electrolytes in relation to the hydrate theory of ionisation: W. R. **Bousfield** and Dr. T. M. **Lowry**. The process of ionisation of a neutral salt in aqueous solution "is usually attended with development of heat" (Nernst, "Theoretical Chemistry," 1904, 659), e.g. $KCl \rightarrow K^+ + Cl^- + 250 \text{ cal.}$ (Arrhenius, *Zeit. phys. Chem.*, 1889, iv., 106). It is pointed out that the decomposition of potassium chloride into molecular potassium and molecular chlorine involves an absorption of 105,600 cal., and that a further absorption must accompany the decomposition of the molecules into

atoms. The electrification of the atoms is also probably an endothermic action, and the change represented by the above equation, so far from involving the liberation of 250 cal., must actually involve the absorption of more than 100,000 cal. The process of ionisation must therefore involve some powerful exothermic action not shown in the ordinary scheme, and it is suggested that this is supplied by the combination of the charged atoms or "ionic nuclei" with the solvent to form hydrated ions.—Influence of non-electrolytes and electrolytes on the solubility of gases in water. The question of hydrates in solution: Dr. J. C. **Philip**. The author supported the view according to which the diminished power of a solution to dissolve hydrogen and oxygen as compared with pure water is due mainly to the hydration of the solute and the consequent diminution of the "free" solvent.—Hydrates in solution: discussion of methods suggested for determining degree of hydration: Dr. G. **Senter**. It is pointed out that recent attempts to account for the properties of aqueous solution on the basis of association alone have not only proved inadequate to afford a quantitative representation of the facts, but in some respects do not appear to be even in qualitative agreement with experiment. The different methods of investigation indicate that the degree of hydration varies with the atomic weight; for example, in the case of the chlorides of the alkalis, the hydration decreases with increasing atomic weight of the alkali metals. From a quantitative point of view our knowledge of hydration is much less satisfactory, and the results so far obtained must be regarded as of a preliminary character.—The stability of hydrates as indicated by equilibrium curves: Dr. A. **Findlay**.

Chemical Society, July 4.—Sir Alexander Pedler, F.R.S., vice-president, in the chair.—*iso*Nitroso- and nitro-dimethyldihydroresorcin: F. **Maas**. The first of these substances is obtained by treating the potassium salt of dimethyldihydroresorcin with potassium nitrite in acid solution, and it is converted into the nitro-compound by treatment with nitrous gases in ether solution.—The structure of carbonium salts: F. **Baker**. *p*-Rosaniline and its monohydrochloride give absorption spectra conforming to the two types characteristic of carbonium salts such as the triphenyl- and trianisyl-carbinol sulphates, whence it is concluded that the magentas are carbonium salts.—Studies of dynamic isomerism, part vi., the influence of impurities on the mutarotation of nitrocamphor: T. M. **Lowry** and E. H. **Magson**. The view previously arrived at that the mutarotation of nitrocamphor in solvents is conditioned by the presence of alkaline impurities is confirmed.—The relation between absorption spectra and chemical constitution, part viii., the phenylhydrazones and osazones of α -diketones: E. C. C. **Baly**, W. B. **Tuck**, Miss G. **Marsden**, and Miss M. **Gazdar**. Examination of the absorption spectra shows that these substances, in neutral solution, possess the ketonic structure, whilst phenylhydrazones in alkaline solution tend to assume the enolic configuration.—Permanganic acid: M. M. P. **Muir**. A solution containing 17 per cent. of this acid can be obtained by adding the calculated quantity of dilute sulphuric acid to a solution of barium permanganate and concentrating the filtrate in a vacuum.—Methyl dicarboxy-aconitate: S. **Ruhemann**. Descriptions are given of additive and condensation products obtained by the inter-action of this ester with (a) phenylhydrazine and (b) aniline. The action of heat on *aa'*-hydroxycarboxylic acids, part iii., *aa'*-dihydroxysebacic acid and its diacetyl derivative: H. R. **Le Sueur**. Both these compounds are decomposed at 250° – 270° with the formation of carbon monoxide and the dialdehyde corresponding to suberic acid.—Dihydroxyadipic acids: H. R. **Le Sueur**. Two dihydroxyadipic acids are formed when the bromine atoms in *aa'*-dibromo-adipic acid are replaced by hydroxy-groups. These are probably stereoisomerides.—The relation between absorption spectra and optical rotatory power: A. W. **Stewart**. The absorption spectra of racemic acid in concentrated solution differ from those of the optically active tartaric acids, but on dilution approximate to them in character, indicating that the acid breaks down into its two optical antipodes.—Experiments on the synthesis of the terpenes, part xi., synthesis of 4: *isopropylidene-cyclo-*

hexanone and its derivatives: W. H. **Perkin, jun.**, and J. L. **Simonsen**.—Purification of acetic ester: J. K. H. **Inglis** and Miss L. E. **Knight**.—Solubility of lead sulphate in concentrated solutions of ammonium acetate: J. J. **Fox**.—Researches on morphine, part iii.: F. H. **Lees**. By the hydrolysis of chloromorphide a second isomeride of morphine, neoisomorphine, has been obtained which on methylation furnishes the substance already known as *pseudocodeine*.

Association of Economic Biologists, July 4.—Mr. A. E. Shipley, F.R.S., president, in the chair.—Some notes on ticks: Cecil **Warburton**. The author dealt with the classification and means of identification, and discussed the leading generic characters.—Results of experiments with the spruce-gall and larch-blight disease: E. R. **Burdon**. The results showed that a paraffin emulsion applied early in the year, before the buds open and whilst the insects are still hibernating, is most effective.—The Cecidomyiidae or gall midges: W. E. **Collinge**. The author gave an account of his work, and appealed to entomologists and others for assistance in working out the life-histories, &c., of this very difficult family of Diptera.—A disease of bees in the Isle of Wight: Prof. A. D. **Imms**.—The American gooseberry mildew and the proposed legislative measures: E. S. **Salmon**.—The bionomics of the calypterate Muscidae and their economic significance: C. G. **Hewitt**.—The next meeting will be held at Edinburgh about Easter, 1908.

GÖTTINGEN.

Royal Society of Sciences.—The *Nachrichten* (physico-mathematical section), part i. for 1907, contains the following memoirs communicated to the society:—

July 28, 1906.—Measurements of the vertical electric current in the atmosphere: J. H. **Gerdien**.

January 12.—A characteristic property of the *Klassenkörper*: Ph. **Furtwängler**.—A convergence theorem: E. **Landau**.—The most general conception of the plane continuous curve: A. **Schoenflies**.—The occurrence of genera and groups of Ammonites in the several zones of the Lower Chalk of Germany: A. **von Koenen**.

February 9.—The composition of quadratic forms: H. **Weber**.

February 23.—Researches from the Göttingen University chemical laboratory: O. **Wallach**. (1) Carbon acids of cyclic carbohydrates; (2) the behaviour of the nitrites of primary bases, and on the enlargement of the "ring" of carbocyclic systems.—(1) The Jacobian transformation of the quadratic forms of an infinite number of variables; (2) the transformation of assemblages of bilinear forms of an infinite number of variables: O. **Toeplitz**.

March 9.—Orthogonal systems of functions: F. **Riesz**.

PARIS.

Academy of Sciences, July 8.—M. A. Chauveau in the chair.—Endosmosis between two liquids of the same chemical composition at different temperatures: G. **Lippmann**. If two volumes of pure water, one hot, the other cold, be separated by a porous membrane, there is endosmosis from the latter to the former. This phenomenon is adapted to very delicate thermometry.—Thermodynamic endosmosis of gases: G. **Lippmann**. Between air at different temperatures there is endosmosis from cold to hot, more rapid than in the previous case of water.—The spontaneous combustion of balloons at ordinary atmospheric pressure: W. **de Fonville**. In the case of a recent explosion, the cause lay in a discharge of electricity between the earth and clouds. In previous instances the explosion was caused by an accumulation of positive electricity of the atmosphere in the metal of the valve.—The use of radiometry for the observation of low pressures in gases: application to researches on gaseous products emitted by radio-active bodies: Sir J. **Dewar**. Experiments show that by the use of a torsion balance or bifilar suspension radiometry can be used for quantitative researches at low pressures.—Polarisation by refraction, and the propagation of light in a non-homogeneous medium: Ch. **Fabry**. Light, passing through a medium the refractive index of which varies continuously, gives rise neither to any appreciable reflection nor in consequence

to any polarisation.—The optical analysis of pyroxyles: M. **de Chardonnet**.—The electrolytic oxidation of platinum: C. **Marie**.—The sulphides, selenides, and tellurides of thallium: H. **Pélabon**.—On the preparation and properties of the borides of iron, Fe₂Bo and FeBo₂: Binet **du Jassonneix**.—The direct oxidation of toluene by catalysis: Paul **Woog**. Oxides of iron, nickel, copper, and manganese can be used as catalytic agents.—A new method of preparation of amino-primary alcohols: H. **Gault**. The action of halogen derivatives of ketones on some aromatic amines: A. **Richard**.—Complete analysis of the fruit of *Lycopersicum esculentum*: J. M. **Aibahary**.—A proximate analysis of egg-yolk: N. A. **Barbieri**.—Photographic pelliplanimetry, a new method of rapidly measuring the surface of the living human body: B. **Roussy**.—The ferments in diseases of wine, especially *Coccus anomalous*: P. **Mazé**, and P. **Pacottet**.—The extension of the Trias into the south of Tunis: A. **Joly**.—The Empidæ of Baltic amber: Fernand **Meunier**. These may be considered as belonging to a fauna indigenous to Europe and North America during Eocene times.—The principal characteristics of the leaf of *Stauropteris oldhamia*: Prof. **Bertrand**.—The distribution of temperature in the atmosphere under the North Polar circle and at Trappes: Léon Teisserenc **de Bort**.

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