

gathered from the ground just after they have fallen and are almost invariably placed in the holes with their basal end outermost. The storing affords a useful supply of food during a period of scarcity, and, according to Dr. William E. Ritter, who has made a careful field study of the subject, two vital results have been that the California woodpecker has been able to extend the range of its favourable environment, compared with neighbouring species, and that it has been able to reduce its rate of mortality relative to neighbouring species as shown by its increased ratio of adult population to reproductive capacity.

#### Possible Origin of Woodpecker's Storing Habit

That the storing habit is not yet perfected is shown by several curious features to which Ritter directs attention. Such are the making of holes at seasons when there are no acorns to store, the making of hundreds of holes which are left unfilled though acorns and birds are abundant, the occasional storing of small pebbles instead of acorns, the neglecting of stored acorns until they are unfit for food.

Perhaps the English great spotted woodpecker gives a hint as to the origin of the storing habit. In *British Birds* (117, Oct., 1933), N. Tracy describes this woodpecker as cutting off fresh cones and fixing them in clefts so that they could be more easily split open, and Edmund Selous in his "Evolution of Habit in Birds" (1933) records careful observations of the storing of spruce cones in Scots pine trees by the Continental great spotted woodpecker in Sweden and Germany. There was no trace here of the deliberate making of storage holes, but the smoothness of the sides of the natural crack in the tree trunk suggested that the crevice had been used over and over again as a receptacle.

#### Hibernation and Heart-Beat

The cold weather of December must have driven the most dilatory of our hibernating mammals to their winter retreats, there to exist upon the lowest metabolism consistent with continued survival. In most of these small mammals the pulse-rate during normal activity is very high; in the dormouse, Dr. Frances Buchanan found it to reach 700 beats a minute, in the long-eared bat 600-900, in the pipistrelle varying from 100 to 800 and from 230 to 972 on different occasions, in a hedgehog 280-320 a minute. Constant features of the state of hibernation are loss of warmth and reduction of heart-beat, and under such conditions electrocardiograms of the four species mentioned recorded for the dormouse 12-30, long-eared bat 76-77, hedgehog 48, and a pipistrelle exposed to artificial cold and cold itself to the touch, though extremely active, had a pulse frequency of only 30 a minute.

A curious feature of deep hibernation, in some if not all species, appears to be a dissociation of auricle and ventricle. Thus when a dormouse was very torpid, showing no sign of respiratory movements for several consecutive minutes and having a pulse-frequency of 12-30 a minute, the records showed nothing but ventricle effects. But when auricular effects became more frequent, at about 40 a minute, well-marked auricular effects appear at quite irregular intervals. Dr. Buchanan concluded that when the dormouse is in its deepest sleep the ventricles only are beating.

*In sese vertitur annus.*

## Societies and Academies

### PARIS

Academy of Sciences, November 13 (*C.R.*, 197, 1073-1160). E. GOURSAT: A problem of the theory of congruences of straight lines. L. CAYEUX: The submarine alteration of the phosphatic nodules of the Albanian of the Paris basin. A. BIGOT and RAOUL FORTIN: The boring at Incarville, near Louviers (Eure). A summary of the geological results obtained by a trial boring for petroleum. E. J. GUMBEL: The limiting distribution of the smallest value amongst the greatest. PAUL DIENES: The deformation of spaces with general linear connexion. ARNAUD DENJOY: Integration along rectifiable cyclic continua. C. KURATOWSKI: The prolongation of homeomorphy. ANDRÉ CHARRUEAU: Remarks on certain movements of a viscous fluid mass, isotropic and heterogeneous. P. DUMANOIS: Concerning detonation in internal combustion motors. Reply to some criticisms by Dufraisse and Chaux. MLE. F. BLOCH, J. ELLSWORTH and S. P. LIAU: Photometric observations of the star *RS* Ophiuchi. Results of visual and photographic determinations are given. The oscillations found are characteristic of the light curves of novæ. CH. BERTAUD: The correlation between the velocity of ensemble of the *A* stars and their distance to the galactic plane, and on the rotation of the galaxy. FRANCIS PERRIN: The possibility of the materialisation by interaction of a photon and an electron. TH. V. IONESCU: The working of a Crookes radiometer in the high-frequency discharge. The Crookes radiometer is as sensitive to electric waves as to light waves. This has been applied to the study of the energy consumed in an ionised gas. JEAN GENARD: The magnetic extinction of the fluorescence of iodine vapour. Photometric measurements in magnetic fields varying from 0 to 42,600 gauss gave a curve in good agreement with the theoretical formula of Van Vleck. ALBERT TURPAIN: Remarks on the discovery of the molecular diffusion of light by pure liquids. Historical. Directing attention to the early work of A. Lallemand in this field. He established a reflection by the molecules of a pure liquid and predicted a part of the Raman effect. GEORGES ZIELINSKI: The polarisation of the fluorescence bands of mercury vapour. W. GENTNER: The absorption of the penetrating  $\gamma$ -rays. Criticism of recent work by C. Y. Chao. GEORGES I. COSTEANU: Batteries with liquid ammonia and with ammoniacal solutions. Studies of the effect produced by the gradual addition of water on the E.M.F. of batteries made up with dry liquid ammonia. The changes in E.M.F. are small. N. THON: The electrolysis of solutions of metallic salts with a cathode of rarefied gas. Discharge through a gaseous cathode does not lead to a deposit of metal except in the case of the three metals silver, platinum and gold. R. ETTENNE: The displacement of equilibrium. H. MURAOUR and G. AUNIS: Verification of the law of combustion of colloidal (explosive) powders. E. DARMOIS: The Lambert-Beer law and the nature of absorbing particles in solution. JEAN SAVARD: The ionisation potentials and energies of formation of non-polar molecules. ANTONIO DE PEREIRA FORJAZ: Modifications of chemical reactions under the influence of oscillating circuits. E. ELCHARDUS and P. LAFFITTE: The constitution of the magnesium-zinc-silicon alloys rich in magnesium. CHARLES DUFRAISSE and PAUL CHOVIN: Research on substances related to the

rubenes. MLE. DENISE SONTAG: Primary  $\beta$ -naphthyl ethyl alcohol and  $\beta$ -vinylnaphthalene. H. UNGEMACH: Some new minerals. E. CHAPUT: The anthracolithic in Central Anatolia. P. DELEAU: The presence of the lower Cretaceous at Djebel Safia, province of Constantine. MAURICE BLUMENTHAL: The tectonic relations between the betic, penibetic and subbetic zones of the south-west of Andalusia. R. DELABY, R. CHARONNAT and M. JANOT: New researches on the radioactivity of the waters of the Ballon d'Alsace massif. P. IDRAC: Records of long duration by photography of phosphorescent materials. To do away with the friction of the writing point in a recording instrument, the author suggests the use of a fragment of phosphorescent material, with a lens focusing the phosphorescent light on to photographic paper. JEAN CHEVRIER: Observations of the atmospheric electric field at the Observatory of Ksara (Liban) during the eclipse of the sun of August 21, 1933. GEORGES DUBOIS and MME. CAMILLE DUBOIS: The submerged forest of Léon since the middle Flandrian and the genesis of some peat bogs in this district. The results of pollen analysis have given a fairly complete history of these peat bogs, which are exposed at low tide, from the Neolithic to the present time. ANDRÉ DAUPHINÉ: Inter-cellular punctuations. J. CHAZE: A new example of exudation and of volatilisation of alkaloids in plants. In previous papers it has been shown that in tobacco plants under certain conditions the alkaloids can be exuded and volatilised into the air. Hemlock plants have now been examined and have been found to exhibit the same phenomena as regards the conine. DE CONDÉ and HEUDEBERT: Contribution to the study of the baking value of bread. M. RAUCOURT and B. TROUVELOT: Researches on the constituents of the leaves of *Solanum tuberosum* determining the feeding of the larvæ of *Leptinotarsa decemlineata*. The leaf principles attracting the beetle are localised almost exclusively in the green part. They are soluble in certain organic solvents, and are not volatile or destroyed by dry heat. RAOUL LECOQ: The rôle of the D vitamins in the utilisation of glyicides by the organism of the pigeon. The comparative influence of some hexoses and of some disaccharides (holosides) incorporated in diets containing 66 per cent of glycosides. THÉODORE POSTERNAK: The phosphorus of the fecula of potatoes. G. MOURIQUAND and M. BERNHEIM: Dietotoxics and protection of the liver by food equilibrium.

## CAPE TOWN

Royal Society of South Africa, Sept. 20. W. A. JOLLY: Retinal currents. M. R. DRENNAN: (1) Some artefacts in Bushman skulls suggesting trepanning. (2) A witch doctor's outfit from German South-West Africa. F. G. CAWSTON: Climatic changes and their effect on fresh-water molluscs. The number of pond-snails in the Union has been lessened by the recent drought in the mountains and by anti-malarial measures at the coast. The dearth of rushes and other large water-plants has discouraged the breeding of *Bulinus*, *Lymnæa Natalensis* and *Physopsis africana*. To-day one finds *Ancylidæ* and *Lymnæa truncatula*, small species which can readily resist desiccation and are dependent on light. Though allied *Lymnææ* may carry *Fasciola* infection, *Lymnæa truncatula* is the favourite host and is found in the Union at very high altitudes especially

in mountain marshes. Desiccation and frost will destroy many species of molluscs without destroying *Lymnæa truncatula*, which is therefore likely to become more prevalent. J. B. CUTHBERT: Further notes on the physiology of *Teloschistes Flavicans*.

## ROME

Royal National Academy of the Lincei, June 2. F. SEVERI: (1) The theory of correspondences to valency on an algebraic surface: the principle of correspondence (3). (2) Functional significance of the virtual group of the points united in the valency correspondences on a surface. U. CISOTTI: Further consideration of a translociratory current in presence of a circular obstacle furnished with an indefinite rectilinear appendix. A criticism by Murnaghan of the author's recent paper is refuted. A. BEMPORAD: Stellar currents about  $16^{\text{h}}$  R.A. +  $54^{\circ}$  Decl. The earlier notes on this subject recorded substantially concordant results concerning the distributions of the proper motions as regards order of magnitude and direction. The distribution of the moduli according to the curve of probabilities is now confirmed, but a law markedly different from that previously given for the directions is now deduced. P. RONDONI: Influence of thymus diet on neoplastic growth. The effects of the administration of relatively large amounts of thymus fail to indicate the presence in this organ of active anti-neoplastic principles. C. AGOSTINELLI: Differential relations for Riemann's homograph. L. FANTAPPIÈ: Solution with quadrature of the Cauchy-Kowalewsky problem for equations of parabolic type. S. GENNUSA: Integration by quadrature of the differential equation  $\frac{d^2z}{dx^2} + a\frac{dz}{dy} = f(x, y)$ . I. J. SCHWATT: The general term of a finite recurrent succession of the second order. B. SEGRE: The characteristic series of a surface on an algebraic variety of four dimensions. A. TONOLO: Formulæ representing the integrals of the Maxwell-Hertz equations for uniaxial crystalline media. L. S. DA RIOS: Further considerations on rotating vortex rings. G. KRALL: The motion of a planetary system of  $n+1$  rigid bodies. G. D. MATTIOLI: A 'wall' condition for the equation of the turbulence in tubes. According to the theory of turbulence recently developed, viscosity acts only in the very thin layer adherent to the walls. For cylindrical tubes of circular cross-section, an expression is now deduced for the interaction between this skin layer and the bulk of the flowing material. LUISA PELOSI: The fundamental formula of the kinematics of rigid systems. A new and simple demonstration, based substantially on the condition of integrability of a certain differential expression, is given for this principle. L. GIALANELLA: Elliptical elements of the orbit of the spectroscopic double  $\tau$  Persei. From a series of 21 observations made at the Lick Observatory between October 26, 1898, and October 21, 1907, the value  $P = 26.02$  is derived for the period of revolution. Corrected values for the elliptic elements of the orbit have thence been calculated. G. CONTINO: Observations on the latitude of Campidoglio by Talcott's method. The mean value  $\lambda = 41^{\circ} 53' 33.06''$  is found. NELLA MORTARA: A simple method for determining the coefficient of diffusion of radium emanation. A new method described leads to the value 0.11 for this coefficient, this being in good agreement with those

obtained in different ways by other experimenters. G. PICCARDI: The spectrum of red stars of types *M* and *N*. Behaviour qualitatively comparable with that exhibited by red stars is shown by  $TiO$  and  $C_2$  in a flame. P. PRATESI: Condensation products of isatin with pyrroles (pyrrole blue). The behaviour of various mono-, di-, tri-, and *N*-substituted pyrroles towards isatin is described. The bearing of the results on the constitution of pyrrole blue is to be discussed later. L. PATANÉ: The behaviour of *Littorina neritoides*, L. kept in subaerial surroundings and in other experimental conditions. L. CATTANEO: The choline of the human uterus during non-pregnancy, pregnancy and confinement (relations between the choline content of the human uterus and the uterine contraction). Results are given which indicate that the hypothesis that choline is regarded as the hormone of uterine peristalsis is not justified. V. ZAGAMI: Observations on the relation between nutrition and lactation.

### Forthcoming Events

Monday, January 1

ROYAL GEOGRAPHICAL SOCIETY, at 3.30.—Miss Cynthia Longfield: "Trail-riding in the Canadian Rockies" (Christmas Lecture for Young People).

Friday, January 5

ROYAL GEOGRAPHICAL SOCIETY, at 3.30.—E. E. Shipton: "The Mount Everest Expedition" (Christmas Lecture for Young People).

CONFERENCE OF EDUCATIONAL ASSOCIATIONS, January 1-8. To be held at University College, Gower Street, London, W.C.1.

Dr. G. Dyson: "Education for Life" (Presidential Address on Jan. 1).

Discussion on "The Failure of Modern Science Teaching to Develop an Adequate Cultural Background to Life" (Jan. 4).

G. W. Olive, J. W. Stork (and others): "Biology and the School Curriculum" (Jan. 1).

Dame Helen Gwynne Vaughan: "Experimental Work on Heredity" (Jan. 2).

BRITISH ECOLOGICAL SOCIETY, January 2-4.—Annual general meeting to be held in the Botany School, Cambridge.

SCIENCE MASTERS' ASSOCIATION, January 2-5.—Annual meeting to be held at the Imperial College of Science and Technology, South Kensington, London, S.W.7.

Discussion: "School Certificate Science".

GEOGRAPHICAL ASSOCIATION, January 3-6.—Annual conference to be held at the London School of Economics, Houghton Street, Aldwych, London, W.C.2.

Prof. P. M. Roxby: "China as an Entity—the Comparison with Europe" (Presidential address, Jan. 3).

Discussions on: "The Place and Problems of Local Geography" and "Suggestions for a First School Certificate Geography Syllabus".

MATHEMATICAL ASSOCIATION, January 4-5.—Annual meeting at the Institute of Education, Southampton Row, London, W.C.1.

Prof. G. N. Watson: "Scraps from Some Mathematical Notebooks" (Presidential address).

Discussions on: "Mathematics in Central Schools" and "Teaching of Differentials" (Jan. 5).

### Official Publications Received

#### GREAT BRITAIN AND IRELAND

The Pharmaceutical Society of Great Britain: Codex Revision Committee. Report of Dressings Sub-Committee: Summary of the Principal Standards for Surgical Dressings recommended by the Dressings Sub-Committee and accepted, provisionally, for inclusion in the British Pharmaceutical Codex, 1934. Pp. 13. (London: Pharmaceutical Press.) 1s. 6d.

National Laboratory of Psychological Research. Bulletin 6: Official Science and Psychological Research. Pp. 47+2 plates. (London: National Laboratory of Psychological Research.) 2s. net.

Ministry of Agriculture and Fisheries, Department of Agriculture for Scotland, and Ministry of Agriculture for Northern Ireland. Reports on the Work of Agricultural Research Institutes and on certain other Agricultural Investigations in the United Kingdom, 1931-1932. Pp. 395. (London: H.M. Stationery Office.) 6s. net.

Institute of Industrial Administration: Papers of 1932-1933 Session. Pp. 55. (London: Institute of Industrial Administration.) 5s.

Borough of Cheltenham Public Library, Art Gallery and Museum. Forty-ninth Annual Report of the Public Library Committee and the Thirty-fourth Annual Report of the Art Gallery and Museum Committee, 1st April 1932 to 31st March 1933. Pp. 24. (Cheltenham.)

Amgueddfa Genedlaethol Cymru: National Museum of Wales. Twenty-sixth Annual Report, 1932-33, presented by the Council to the Court of Governors on the 20th October 1933. Pp. 44+3 plates. (Cardiff.)

The Journal of the Board of Greenkeeping Research. Vol. 3, No. 9, Autumn. Pp. viii+57-112+vi+7 plates. (Bingley: St. Ives Research Station.) 2s. 6d.

#### OTHER COUNTRIES

Scientific Papers of the Institute of Physical and Chemical Research. No. 454: The Influence of a Magnetic Field on a Glow-Discharge. By Toshio Takamine, Taro Suga and Asao Yanagihara. Pp. 69-96. 35 sen. No. 455: Researches on the Cutting Action of Planing Tool by Mikrokinoematographic, Photoelectric and Piezo-electric Methods. By Makoto Okoshi and Shinji Fukui. Pp. 97-166. No. 456: On Dendrite Figures produced in Liquid Films, I. By Toshimasa Tsutsui. Pp. 167-187+21 plates. No. 457: Über die Benzinsynthese aus Kohlenoxyd und Wasserstoff unter gewöhnlichem Druck, 11: Versuche über den Co-Cu-Th- und Co-Cu-U-Katalysator. Von Kenji Fujimura und Shunzo Tsuneka. Pp. 189-197. No. 458: Über die Benzinsynthese aus Kohlenoxyd und Wasserstoff unter gewöhnlichem Druck, 12: Versuche über den Co-Cu-Th-U-Katalysator. Von Kenji Fujimura und Shunzo Tsuneka. Pp. 198-201. No. 459: On the Dispersion Theory in Metallic Conductors, 2. By Yoshio Fujioki. Pp. 202-215. No. 460: Studien über den Feinbau der Seide, 5: Quellungserscheinungen an Fibrinfäden. Von Kametaro Ohara. Pp. 216-232+plates 22-27. No. 461: Studies on the Thermo-Luminescence Spectra of Fluorites, Part 1: Thermo-Luminescence Spectra of Fluorites from Ojima. By Eiichi Iwase. Pp. 233-241+plates 28-30. No. 462: Über die Benzinsynthese aus Kohlenoxyd und Wasserstoff unter gewöhnlichem Druck, 13: Untersuchung über die Nickel-Katalysatoren (1). Von Kenji Fujimura und Shunzo Tsuneka. Pp. 242-247. No. 463: Über die Benzinsynthese aus Kohlenoxyd und Wasserstoff unter gewöhnlichem Druck, 14: Untersuchung über die Nickel-Katalysatoren (2). Von Kenji Fujimura und Shunzo Tsuneka. Pp. 248-253. No. 464: Über die Benzinsynthese aus Kohlenoxyd und Wasserstoff unter gewöhnlichem Druck, 15: Untersuchung über die Nickel-Katalysatoren (3). Von Kenji Fujimura und Shunzo Tsuneka. Pp. 254-258. No. 465: Über die Benzinsynthese aus Kohlenoxyd und Wasserstoff unter gewöhnlichem Druck, 16: Untersuchung über die Nickel-Katalysatoren (4). Von Kenji Fujimura und Shunzo Tsuneka. Pp. 259-263. No. 466: On a Simple Apparatus for the Determination of Melting Points, Boiling Points, Transition Points, Ignition Temperatures, etc., specially convenient for Use with a small Quantity of Sample. By Satosi Watanabe. Pp. 264-268. No. 467: On the Physical Properties of the Photoclastic Material "P-nelolite". By Masataka Nisida. Pp. 269-283. (Tokyo: Iwanami Shoten.)

Bernice P. Bishop Museum. Bulletin 101: Manual of Hawaiian Mosses. By Edwin B. Bartram. Pp. 275. Bulletin 102: New and Critical Plants from Raiatea. By John William Moore. Pp. 53. Bulletin 103: Tuamotuan Religion. By J. Frank Stimson. Pp. 154+3 plates. Bulletin 104: Archaeology of Oahu. By J. Gilbert McAllister. Pp. iii+201+12 plates. Bulletin 105: Geology of Tahiti, Moorea and Maiao. By Howel Williams. Pp. 89+8 plates. Bulletin 106: Report of the Director for 1932. By Herbert E. Gregory. Pp. 49. Bulletin 107: Pearl and Hermes Reef, Hawaii; Hydrographical and Biological Observations. By P. S. Galtsoff. Pp. 49+5 plates. Bulletin 108: Jungle Fowls from Pacific Islands. By Stanley C. Ball. Pp. 121+7 plates. Bulletin 109: Native Music of the Tuamotus. By E. G. Burrows. Pp. 107. Bulletin 110: Geology of Galapagos, Cocos and Easter Islands. By Lawrence John Chubb. With Petrology of Galapagos Islands, by Constance Richardson. Pp. 67+5 plates. Bulletin 111: The Cult of Kiho-Tumu. By J. Frank Stimson. Pp. 63. Bulletin 112: Revision of the Hawaiian Species of Peperomia. By Truman George Yuncker. Pp. 131. (Honolulu.)

India: Meteorological Department. Scientific Notes, Vol. 5, No. 54: A Note on Fog and Haze at Poona during the Cold Season. By Dr. L. A. Ramdas and S. Atmanathan. Pp. 89-96+6 plates. (Delhi: Manager of Publications.) 1.2 rupees; 2s.

#### CATALOGUES, ETC.

Rain Gauges and Recorders. (List 583.) Pp. 16. (London: C. F. Casella and Co., Ltd.)

"Caprokol" Brand of Hexylresorcinol. Pp. 4. Radiostol. Pp. 13. (London: The British Drug Houses, Ltd.)

Galvanometers: Photographic Recording Apparatus: Galvanometer Accessories. (Galvo 33.) Pp. 24. (Delft: P. J. Kipp en Zonen.) Calendar for 1934. (London: F. E. Becker and Co.)