

Societies and Academies.

SYDNEY.

Linnean Society of New South Wales, Aug. 29.—C. P. Alexander : The Tanyderidae (Diptera) of Australia. The family Tanyderidae is represented by ten recent and fossil genera ; of these, three genera with four species are here recorded from the Australian sub-region.—Rev. H. M. R. Rupp : Terrestrial orchids of Barrington Tops. During a visit paid in January last, abundant material of *Diuris venosa* was obtained. Southern forms discovered on the plateau were *Pterostylis falcata*, *P. decurva*, *Prasophyllum Suttonii*, and *Chiloglottis Gunnii*; while evidences of *Adenochilus Nortonii*, hitherto only recorded from the Blue Mountains, were found. Altogether, 23 species of terrestrial orchids were collected. Two species of *Prasophyllum* are described as new.—F. H. S. Roberts : A revision of the Australian Bombyliidae (Diptera). Part 2. This part includes the revision of the subfamily Bombylinae. Five genera are placed in this subfamily, namely, *Bombylius*, *Systoechus*, *Sisyromyia*, *Dischistus*, and *Anastoechus*. 36 species are described, 15 of which are regarded as new. The genus *Anastoechus* is recorded for the first time from Australia.—G. A. Waterhouse : Notes on Australian Lycenidae. Part 6. New subspecies of *Candalides heathi*, *Miletus apollo*, and *Pseudalmenus chlorinda* are described. *Miletus delicia* ab. *duaringae*, originally described from a single male, is the northern race of this species, while *Philiris* is a genus distinct from *Candalides*. The species *Lycæna? byzos* Boisd., described in 1832, is considered to be a *Miletus*, identical with the specimens of *M. hecalius* found near Sydney.

WASHINGTON, D.C.

National Academy of Sciences (*Proc.*, Vol. 14, No. 8, August).—Robert E. Burk : The thermal decomposition of ammonia upon mixed surfaces of tungsten and platinum. The velocity of decomposition is greater on a surface alloy than on an equal area of either tungsten or platinum, and the temperature coefficient is smaller. This points to separation of the atoms forming the bond as the mechanism.—Linus Pauling : The crystal structure of topaz. Using the co-ordination theory of ionic crystals, it is assumed that the fundamental polyhedra are an octahedron of anions (oxygen and fluorine) about each aluminium ion and a tetrahedron of oxygen ions about each silicon ion. Four layers of these polyhedra form an arrangement giving a space group of V_h^{16} , and the unit contains $4 \text{ Al}_2\text{SiO}_4\text{F}_2$.—Sam Lenher and Farrington Daniels : The intensive drying of liquids. Organic liquids were sealed up in glass and quartz tubes with phosphorus pentoxide. After about four years, certain of these, containing benzene and carbon tetrachloride, were opened and the boiling points determined. No abnormal rise of boiling points was observed.—Oliver R. Wulf : (1) A progression relation in the molecular spectrum of oxygen occurring in the liquid and in the gas at high pressure. Several bands just to the red of complete absorption (about 2400 Å.) appear to be due to the molecule O_4 .—(2) The heat of dissociation of oxygen as estimated from photochemical ozonisation.—G. L. Clark, A. J. King, and J. F. Hyde : The crystalline structures of the alkaline earth metals. Calcium, strontium, and barium of purity exceeding 99.9 per cent have been prepared for X-ray analysis, great precautions being taken against oxidation. Barium crystallises in the cubic system, the unit cell contains two atoms, and its constant is 5.04 Å.; the intensities of the lines indicate a body-centred cubic lattice. Strontium did not give sharp lines; possibly

there is a transition point at room temperature between two or more modifications.—C. J. Davisson and L. H. Germer : Reflection and refraction of electrons by a crystal of nickel. Further observations support the view that electron refraction in the optical sense is a property of the crystal, and that the indices are greater than unity. At bombarding potentials below 150 volts, however, the value of the refractive index seems to change with wave-length, and may be dependent on the order of the reflection.—Irving Langmuir : Oscillations in ionised gases. Oscillations of small amplitude (less than 0.2 volt), and of frequencies up to 1.2×10^9 , have been observed; an explanation is offered (*v. NATURE*, Oct. 20, p. 626).—Robert A. Millikan and G. Harvey Cameron : Evidence that the cosmic rays originate in interstellar space. Experiment shows (1) the abundance of positive and negative electrons in interstellar space; (2) that these electrons condense into atoms; (3) that these atoms aggregate under their gravitational forces into stars; (4) that occasionally a positive and negative electron in the interior of a star are transformed into an ether pulse. If this atom-building process is going on, it is reasonable to suppose that the supply of positive and negative electrons is continually being replenished by the condensation, by some unknown mechanism, of radiant heat.—Carl Barus : The displacement interferometry of barometric pressure.—Jared Kirtland Morse : The structure of acetylene. If the carbon atom be represented by a cube, the nucleus being at the centre and the L-electron positions at the corners, a model acetylene molecule can be built up, the constants of which agree with those determined from analysis of the infra-red band spectrum, as has previously been described for ethane and methane.—E. R. Hedrick : On derivatives of non-analytic functions.—G. Y. Rainich : Radiation and relativity (2).—Gordon T. Whyburn : Concerning plane closed point sets which are accessible from certain subsets of their complements.—Joseph Miller Thomas : Incomplete systems of partial differential equations.—Th. Dobzhansky : The effect of temperature on the viability of superfemales in *Drosophila melanogaster*. The viability of superfemales, which carry three X-chromosomes and two sets of autosomes, is greatest at about 20° C. Both high and low temperatures increase the breaking apart of the attached X-chromosomes.—A. V. Bock, P. S. Bauer, and J. H. Means : Preliminary note on the elastic hysteresis of the human aorta. The arch of the aorta is tied on to a water-mercury manometer, and after increasing the internal pressure monotonically to a maximum, the pressure is decreased by steps, the internal volume of the aorta being measured at each step. The loss of heat energy can be calculated, and also the efficiency. Assuming that the metabolic demands of the human system at 78 years are the same as before advanced changes occur in the arterial system, 45 per cent of the heart's energy output is lost as heat, compared with 25 per cent at 41 years, or the work of the heart must increase 20 per cent as a result of arteriosclerosis to maintain the same blood flow.

Official Publications Received.

BRITISH.

Professional Schools Post-Graduation Courses : Specialist Studies in the Universities and University Colleges of Great Britain and Ireland, Session 1928-9. Pp. 39. (London : Universities Bureau of the British Empire.)
Bulletin of the Raffles Museum, Singapore, Straits Settlements. No. 1, September. Pp. ii+44+2 plates. (Singapore.) 60 cents; 1s. 6d.
Records of the Geological Survey of India. Vol. 60, Part 4. Pp. 313-492+xxix+plates 26-39. 2.12 rupees; 5s. Vol. 61, Part 3. Pp. 207-325+plates 21-25. 2.12 rupees; 5s. (Calcutta : Government of India Central Publication Branch.)