

Research Items.

THE PSYCHOLOGY OF AMUSEMENTS.—In the *Nineteenth Century* (July 1926) M. Willson Disher discusses the 'Psychology of the Show.' He points out the antiquity of the show or circus, a form of entertainment referred to in Homer, and its almost universal appeal. He finds that the various incidents resolve themselves into means whereby the visitor can experience novel sensations, or normal sensations in an intensified form, and so obtain a heightened thrill. Normal behaviour is overturned, people delight in seeing men, beasts, and things put to any but their ordinary uses, and they prefer to be deceived. The means employed vary with the advance of knowledge, but the experiences aimed at remain the same. The power moving the roundabout may change, but the general appearance has changed but little. Men on holiday bent prefer to be able to return to the attitude of childhood, and this can best be secured by similarity of outward appearance. Hence attempts to 'show up' the tricks of the show have but little effect on the show. People are seeking, not an appeal to their reason, but an appeal to their primary emotions, and are not grateful to those who would deprive the stimulus of its power. Perhaps Prof. Karl Groos' famous theory of play may be suitably recalled in this connexion. After his theory of the play of children and animals, which suggests that, biologically, in play, instincts are exercised for later use, he urges that in adult play we seek (i.) 'completion of life,' *i.e.* to experience sensations and emotions which normally in our work receive little or no gratification; (ii.) freedom from the constraint of 'must.' Fear in a limited degree, which we invoke by our own will, is very different from the fear which we experience in defiance of our will. This the show can do for us: we need not go, we can depart when we like. There is, therefore, for a short space of time, granted to us the power to feel masters of ourselves.

CRANIOMETRY OF SINGAPORE COOLIES.—Dr. Gordon Harrower of Singapore has contributed to Vol. 54, Pt. 3, of the *Trans. Roy. Soc. Edinburgh* the results of an examination of the skulls of 54 male Tamils and 36 male Hokien obtained from unclaimed bodies of coolies. In cranial capacity the Hokien is on a par with the most intellectual races, and cannot be regarded as falling within the mesocephalic group in which Chinese skulls are generally classed. The Tamil, however, is on the border line of the meso- and microcephalic groups, approaching the modern negro. Yet the Hokien and Tamil skulls are approximately equal in length, the difference coming out in the breadth. In the different races compared, the Tamil is the second lowest, being only 0.9 mm. more than the Australian, while the maximum breadth of the Hokien is exceeded only by certain of the Burmese and the Ainu groups. The skull is markedly mesaticephalic. According to the view of Chinese ethnological history now generally held, the Hokien, who are natives of the Province of Fu-kien, are survivors of the aborigines who were driven into the highlands when the early invaders of northern China from eastern Turkestan had penetrated to the south of the Yangtze-kiang. The result of the present investigation strongly supports this view. The Hokien are a pure type, brachycephalic with high cranial capacity, narrow frontal region, well-marked prognathism, and distinctly sinotic megaseme orbits. The palate is primitive. In the Tamil skull the most noteworthy feature is the position of the foramen magnum, which is relatively far back. It appears to be a pure type characteristic of the Dravidian, and shows no element

incompatible with the current view of the ethnological history of southern India.

DECCAN VILLAGE LIFE IN THE EIGHTEENTH CENTURY.—Interesting side-lights are thrown on the customs of the Marâthâs by selections from the diary of the Râja of Satâra, Sivâji II. or Shâhu, who reigned 1708–1749, which are quoted by Mr. S. M. Edwardes in the *Indian Antiquary* for June. The position of *pâtel*, or headman of the village community, is shown to entail both responsibilities and privileges of no little importance. He took precedence in various functions, such as the presentation of the ritual cake at the *Holi*, the annual procession in honour of Gañesa and Gauri, at the annual *Poja* procession, when the *Poja*, a bull dedicated to the gods, was marked with a trident and discus and allowed to roam at large. He held a prior claim to the decoration of his house with festoons of flowers by the Mâng and with red-ochre by the Mahâr, and to the supply of water by the village Koñi or hereditary village servant, who was the recognised water-carrier. One of the processions in which the headman claimed precedence was the annual *Sirâñset* procession, *Sirâñset* being a legendary corn-chandler who became king for a short time, and an earthen image of whom was worshipped, carried in procession, and then thrown into a well or tank. An important rôle was filled by the headman in disputes about village boundaries. In a dispute of this nature in 1744, when other evidence failed to establish the facts, the *pâtel* was ordered to put a cowhide over his head and shoulders and, so adorned, to walk step by step over the real boundaries of the village. He was then kept under watch for fifteen nights. As nothing untoward happened to him he was declared to have indicated the boundary truthfully. The underlying idea was that the *pâtel*, having put the hide over his head and shoulders, became imbued with the divine influence of the sacred animal and must therefore speak the truth. In Mysore, in similar circumstances, an inferior village servant of the Holeya tribe had to carry on his head a ball of earth, scooped up in the village, with water in the middle, in which was the divine presence of the village goddess. If he went beyond the true boundary this ball of earth, it was believed, would fall to pieces, and he, having incurred the wrath of the goddess, would die in a fortnight and his house become a ruin.

A NEW ISOPOD FROM THE CHATHAM ISLANDS.—Prof. C. Chilton (*Records Canterbury Mus.*, New Zealand, vol. II, pp. 321–326, 1925) has found among the Isopoda collected at the Chatham Islands five small specimens from a fresh-water stream, for which he establishes a new genus *Paravireia* in the subfamily *Spharominæ*. The body is very convex and capable of rolling into a ball, but this genus differs from all other members of the subfamily in having five separate segments in the abdomen. A detailed description is given of a male specimen. The group (*Monolistrini*) to which this new genus belongs is probably an ancient one that has survived owing to the adoption of a fresh-water, and, in most cases, an underground, mode of life. The author directs attention to the interest attaching to the occurrence of this new genus in the Chatham Islands and the genus *Vireia* in underground waters in Europe—two very nearly related forms in localities so remote from each other.

VITALISM AND MECHANISM.—The editor of *Scientia* returns in the issues of his review for April and May

to the consideration of vitalism and mechanism, and seeks a solution of an intermediate character. In the June issue M. Leclerc du Sablon briefly examines the principal criteria which serve to distinguish living matter, and points out that in essence they are the transformations of matter and of energy which take place in the protoplasm of living beings. He believes that it is permissible to hope that the progress of chemical knowledge, which has already elucidated so many matters which appeared to our intelligence mysterious and inaccessible, may one day reveal to us the mechanism of life. He holds that it is a purely verbal solution to attribute the activity of living matter to a vital force. Every progressive step has permitted a deeper penetration into the knowledge of the phenomena which characterise life, and it is only by the slow and empirical method—as in the case of physics and chemistry—that our ideas of living matter can become more clear and more adequate. No other way can be adopted without going outside the prescribed limits of science. He concludes that the nature and origin of life may serve as a theme for the speculation of philosophers; they are not subjects of study for biologists.

THE CONTROL OF LOBSTER FISHERIES.—The interim report recently issued of the Interdepartmental Committee appointed by the Minister of Agriculture and Fisheries and the Secretary for Scotland to inquire into the crab and lobster fisheries of Great Britain (London: H.M. Stationery Office, 1926. 2s. 6d. net) gives the results of the Committee's inquiry into the lobster fishery only, the crab fishery being left until further evidence, which is to be obtained, has been considered. In accordance with the terms of reference, the Committee deals at some length with the question of further protection of the lobster of both sexes by an increase in the size below which the animal may not be taken, and of the berried female by forbidding its landing and exposure for sale during the whole or parts of the year, and the opinion is expressed that a real protection of the berried lobster would materially help to maintain an adequate lobster population. At the same time, it is held that the present position of the lobster fishery and such statistics as are available do not warrant immediate legislation in this direction. In a minority report Prof. A. Meek gives statistical evidence, accumulated since 1905 by the Northumberland Sea Fisheries Committee, which he regards as adequate grounds for the framing of an act to protect the berried lobster. An under-sized lobster is of little commercial value, and, so far as the writer's experience goes, there is but little contravention of the law forbidding its landing and sale; but fishermen strongly resent, as an interference with their calling, the imposition of a penalty for the landing and sale of a berried lobster. The Committee feels that the experiments which are being made in various countries in the artificial hatching of lobsters should be closely followed.

PARASITIC FUNGI IN BRITAIN.—The latest report on the occurrence of fungus, bacterial and allied diseases of crops in England and Wales, covers the three years 1922-1924 (G. H. Pethybridge, *Miscellaneous Publications* No. 52, Ministry of Agriculture and Fisheries). More diseases are listed than in the previous report, chiefly because additional host plants have now been admitted, these being mostly pasture and horticultural crops. Diseases which are new to the survey and in some cases new to Britain are indicated, and special reference is made to the downy mildew of the hop, *Pseudoperonospora Humuli* (Miy. and Tak.) Wilson, first noticed in Great Britain in 1920, which is now considered to be a probable native species

which, up to the present, has been overlooked. Attention is also directed to the discovery that apple and pear scab are able to overwinter on dead fallen leaves and to produce on them their ascigerous stages which serve as centres for early spring infection. The concluding index of parasitic diseases is intended to provide as clear an idea as possible of the number and nature of the parasites associated with the crops dealt with in this survey, as a contribution towards a more complete list of British parasitic fungi than at present exists.

PENETRATION OF LIGHT INTO THE SEA.—The second number of the *Journal du Conseil International pour l'Exploration de la Mer*, published in May at Copenhagen under the editorship of Dr. E. S. Russell, continues the high standard of the first number, which was reviewed in NATURE of May 22. In a paper by Dr. W. R. G. Atkins, researches are described dealing with the penetration of light into the sea and the increase in the coefficient of absorption on approaching land, owing to the presence of more particles in suspension. Since plant growth is dependent upon an adequate supply of light for the endothermic process of converting carbon dioxide into carbohydrates, the depth of the layer which is adequately illuminated is a major factor controlling the abundant flora of minute plants suspended in the water which the sea supports. As on land, the fauna are ultimately dependent upon the flora for their food supply, so a consideration of the conditions of plant growth in the sea is of fundamental importance for any inquiry concerning the fertility of particular areas of the ocean. The author also discusses the importance of the thermal stratification of the water, which restrains the mixing of bottom water, where the necessary phosphates and nitrates are regenerated from dead organisms, with the upper illuminated layers. An interesting point which has evolved is that a white disc let down into the sea is no longer visible from above after it reaches a depth at which the intensity of light is approximately one-third of that in air at the surface.

AGES OF RADIOACTIVE MINERALS FROM AUSTRALIA.—The *American Journal of Science* for July contains a very interesting record of the analyses of Australian radioactive minerals compiled by Prof. L. A. Cotton. Unfortunately the lead-ratios are not given, and the ages are calculated from the formula $8000 \cdot \text{Pb}/(\text{U} + 0.384 \cdot \text{Th})$ million years. The best modern data suggest that the factor 8000 should be about 6600. Making this correction, the pre-Cambrian mackintoshite and thorogummite from Wodgina are calculated to be about 1200 million years old. This result is probably a little high, for altered uranium minerals generally tend to lose more uranium than lead, proportionately. It agrees fairly well, nevertheless, with the ages of other minerals from the early Proterozoic era. The monazite from Normanville is also pre-Cambrian and gives a (corrected) age of 930 million years, a figure that agrees closely with the ages of permatitic minerals from Scandinavia, India, Ontario, and other localities. Results are given for other minerals, but as these are recognised to be altered, their evidence is not of immediate value for either age determinations or correlative purposes.

DUST IN MINES.—The Safety in Mines Research Board has issued its fourth annual report showing the researches in progress and the numerous subjects that are being dealt with, and including the report for 1925 of the Health Advisory Committee (London: H.M. Stationery Office, 1926. 1s. net). So far only

one research appears to have been completed, and a separate pamphlet, Paper No. 23 (Mines Department: Safety in Mines Research Board. Paper No. 23: A Method of Trapping the Dust produced by Pneumatic Rock Drills. By P. S. Hay. London: H.M. Stationery Office, 1926. 6d. net), has been issued descriptive of it. It consists of an appliance for trapping the dust produced in rock drilling. As is well known, the fine dust produced in drilling siliceous rocks is a serious menace to the health of the men engaged in the work, being the source of the dangerous disease known as miners' phthisis. The invention consists of a cap placed over the hole which is being drilled, the cap being connected by a suitable flexible pipe to a filter bag, whilst the necessary suction is produced by the exhaust air from the rock drill. Experiments tried with the appliance in actual underground mining operations have been highly satisfactory, and seem to have demonstrated that the apparatus is practical and convenient, and that by its use the air within the working in which the drilling is being done can be kept free from dangerous dust particles, so preventing any risk to the health of the men engaged in the work.

THE GROWTH OF SURFACE TENSION IN SOLUTIONS OF COMMON SALT.—The growth of the surface tension in newly formed surfaces of pure water has been investigated by Messrs. Hiss, Schmidt and Steyer, and Dr. E. Kleinmann in the *Annalen der Physik*, June 2, describes measurements, using the same method, on solutions of common salt. A tube with a fine and accurately measured opening at the top dips in the liquid, which can be raised and lowered on a slide. A stream of air blown horizontally across the opening causes the liquid to rise through the same, where it is blown away in spray. The air stream can be cut off electrically by means of a contact carried on a Helmholtz pendulum, which has a second movable contact producing an electric spark to illuminate the hole shortly after the air current has been shut off. The newly formed meniscus can be observed by means of a microscope, and its behaviour shows that the increase in surface tension follows an exponential law, the full value being reached in a small fraction of a second. The differences between the behaviour of water and salt solutions are studied, and some theoretical conclusions are drawn.

ALUMINIUM ANODE FILM DIELECTRIC.—It is known that various types of electrolytic cell possess unilateral conductivity, that is, they allow the electric current to pass through them much more readily when it flows in one direction than when it flows in the other. Such a device can be used to rectify alternating current into current pulsating in one direction. When we have, for example, one electrode of aluminium and one of some other conducting substance in a bichromate solution, then, when the aluminium electrode is at the higher potential, practically no current flows through the cell, provided that the potential difference is less than a certain critical value. When the potential difference is reversed a large current flows. Devices of this nature are largely used for 'lightning' arresters in electric traction. Mr. Subramanian has published in vol. 8B of the *Journal of the Indian Institute of Science* an interesting paper on the aluminium anode film dielectric. He finds that the leakage resistance of the film formed on the aluminium electrode is inversely proportional to the applied voltage for a given formation voltage and is directly proportional to the formation voltage. This resistance also is nearly independent of the frequency. The film when subjected to a voltage exceeding the

critical value collapses, the breakdown being accompanied by flashes of light and crackling sounds, the pitch of which appears to be an octave higher than the frequency of the supply voltage. The electrostatic capacity of the double film in ammonium borate increases slowly with the time.

THE SYNTHESIS OF NITROUS OXIDE.—The first direct synthesis of nitrous oxide has been carried out by a method due to D. L. Chapman, R. A. Goodman and R. T. Shepherd, which is described in the *Journal of the Chemical Society* for June 1926. The gas is obtained when nitrogen at low pressures is submitted to an electric discharge in a quartz tube, the walls of which have been impregnated with oxygen by means of the discharge. The gas is analysed by heating a platinum wire in it, when the volume increases in the ratio of 2 to 3. When the decomposition products are exploded with hydrogen, it is found that the proportion of nitrogen to oxygen is 2 to 1, leaving no doubt that the gas is nitrous oxide.

DETONATION TEMPERATURES IN CLOSED VESSEL EXPLOSIONS.—No. 1005 (E. 17) of the Reports and Memoranda of the Aeronautical Research Committee (Note on 'Detonation' Temperatures in Closed Vessel Explosions, by R. W. Fenning. I.C.E. 519. London: H.M. Stationery Office, 1926. 6d. net) supplements a former report on the temperature and pressure of the unburnt residue of the charge at the start of detonation in closed vessel explosions. The records of the experiments performed by R. W. Fenning make it quite clear that the chief factor in the production of explosions in mixtures of air with petrol, hexane, pentane or heptane is the temperature, the pressure having little or no effect.

THE PHOTOCHEMICAL DECOMPOSITION OF SILVER IODIDE.—The microbalance has been used by E. J. Hartung to study the photochemical decomposition of silver iodide. Thin layers of silver, chemically deposited on vitreous silica sheets, were iodinated and the films of pure iodide exposed to sunlight in oxygen, hydrogen, and nitrogen respectively at different pressures in the presence of silver, which was used as an iodine absorbent. The results of these experiments, and those on the rate of iodination of silver and previously insolated silver iodide, are published in the *Journal of the Chemical Society* for June 1926. They show that the decomposition into silver and iodine takes place in the absence of oxygen, the maximum percentage loss of iodine being, in hydrogen 91.6 per cent., in nitrogen 88.5 per cent., and in oxygen 94 per cent.

THE SLOW OXIDATION OF PHOSPHORUS TRIOXIDE.—The product of the luminescent oxidation of phosphorus trioxide has hitherto been assumed to consist of phosphorus pentoxide. A paper published in the *Proceedings of the Royal Society of Edinburgh*, Vol. 46, part 2, No. 21, describes the work of C. C. Miller, which proves that under certain conditions the tetroxide is produced. Phosphorus trioxide in the presence of water vapour of 0.1 mm. pressure from 98 per cent. sulphuric acid was submitted to the action of oxygen at a pressure of 600 mm. and at a temperature of 25°. The light snow-like solid was shaken into a weighed tube and analysed by oxidising the water solution with potassium bromate, treating with hydrochloric acid and excess of potassium iodide, the liberated iodine being titrated with sodium thiosulphate. The total phosphorus was obtained by precipitation as magnesium pyrophosphate after the solution had been boiled with strong nitric acid to remove halogens. The analytical results were confirmed by microscopic investigation of the resublimed crystals.