

### Research Items

**English Folk-Dances.**—Miss Maud Karpeles has published in *Folk-Lore*, vol. 43, No. 2, a study of the survival and revival of folk-dances, in which she reviews the principal types of folk-dance with special reference to the study of their meaning as a borderline province for the folk-dancer and the folk-lorist. The sword dance, which has survived in Yorkshire, Northumberland, and Durham, is danced by five men, or in Yorkshire by six or eight men, usually accompanied by additional characters, the 'fool', the 'king', 'queen', and 'Bessie'. The sword in Yorkshire has a wooden handle at one end but in Durham is a piece of flexible steel with a handle at each end. In the climax of the dance the swords are woven into a 'lock', 'nut', 'rose', or 'glass', and one character suffers a mimic decapitation. There are several features in the dance as it was sometimes performed which point to a play from which it has become detached. Fragments of the play have been noted and, like the mummer's play, it is evidently of a ritual character, a fertility rite of which an animal sacrifice once formed part. The other main type of spectacular dance is the morris, for the name of which the best derivation up to the present seems to be 'Moorish', as referring to the blackened faces of the dancers in earlier times, of which traces survive in a smudge of black worn by some dancers in recent times. The morris may be an offshoot of the sword dance. There is, however, no trace of the sacrificial victim, though there are signs of a sacrificial or sacramental rite which are not embodied in the dance itself. It may be a processional lustration dance in which the stationary dance at certain spots has been elaborated at the expense of the processional.

**Ritual Use of Fire in Queensland.**—Mr. Donald F. Thomson describes in *Man* for July some ritual uses of fire among the Koka Dai-yuri and other tribes of the lower Edward River, Gulf of Carpentaria, among whom social life differs little except in detail. As a centre of family life, fire establishes or affirms a bond of solidarity between individuals or within the group. Each family has its own fire, and family life centres around it. Of the two camps consisting of the single men and single women respectively, each has its own fire; and however intimate may be relations, no individual from outside the family joins the family fire; he has his own fire, though it may be only a few yards away. In the Ompela tribe, the simple act of sharing a fire in the presence of the camp constitutes the marriage ceremony. At the critical stages of life when an individual is cut off from participation in normal social activities, he or she camps at a fire apart from others. Fire is presented ceremonially to visitors. On approaching the camp they sit down outside until a 'big' man unarmed has sat down opposite them and then after a period has ordered a small piece of smouldering fire to be brought from the camp and presented to one of them. They then enter the camp. Fire is also used ceremonially in connexion with mourning and burial rites. After the body or bones of the deceased have accompanied the mourners for a period of two or three years, and the time has come to end the mourning, the body is laid in the dry bed of a river and a fire lighted at its head, while food and a small trough of water stand by. After a dance by the women and laments from the men, the mourning paint is washed off and the fire extinguished with the water from the trough, as all lament loudly.

**Inheritance of Alkaptonuria.**—So early as 1902, it was suggested that alkaptonuria is determined by

a recessive Mendelian factor. The condition is apparently due to the absence of an enzyme which catalyses the destruction of homogentisic acid in the human body, with the result that this substance is excreted in the urine. In an analysis of all the accumulated evidence, Messrs. Hogben, Worrall, and Zieve (*Proc. Roy. Soc. Edin.*, 52, Part III., No. 13) have summarised all the known pedigrees and confirm the above conclusions. The condition is very rare, being estimated to occur less frequently than 1 in 1,000,000 of the population. While it is recessive in a large majority of pedigrees, it occurs as a dominant in certain families, and particularly in one pedigree of four generations. One case of its probable origin by mutation is also recorded. The total number of recorded cases is now 151, of which 100 are males and 46 females. There is at present no satisfactory explanation of the excess of males, but the results are otherwise in accord with Mendelian expectation.

**Parasitism and Nutrition in Sheep.**—Field trials carried out in 1931 by Dr. I. Clunies Ross and N. P. Graham, of the Division of Animal Health of New South Wales, revealed the predominant influence of good nutrition over parasitism in sheep (*J. Council Sci. Ind. Res.*, vol. 5, 1932, p. 31). Lambs belonging to a lot known to be heavily infected with various internal parasites, the more important of which were the stomach worms, *Haemonchus contortus*, *Ostertagia circumcincta*, and intestinal worms belonging to the genera *Trichostrongylus* and *Nematodirus*, were divided into five lots and run on different qualities of pasture. All the sheep were weighed at monthly intervals, and faeces from five sheep in each group were cultured each month to determine the type and degree of parasitism. The trial ran from March 26 to Oct. 23-24, when the sheep were finally weighed and shorn. It was found that the increased risk of parasitism due to heavy stocking on improved pasture was more than offset by the improved condition of the sheep run on such pastures. The difference between the produce of un-top-dressed natural pasture and of improved pasture without rotation (at 2½ sheep an acre) amounted to 18 lb. 5 oz. of wool and 83 lb. 7 oz. of live weight per acre, and still further gains were recorded where a monthly rotation was in force. Medicinal treatment against internal parasites produced no demonstrable effects in treated sheep in comparison with untreated sheep under the same conditions on improved pasture. Indeed, at the end of the trial, practically all worm infestation appeared to have been thrown off by sheep on improved pastures, whether the animals had been treated or untreated.

**Mammal Coloration Simulating Environment.**—In 1929, L. R. Dice described two pocket mice and a wood rat from New Mexico, the colours of which strikingly matched those of their rather peculiar and distinctive surroundings. A further study of the distribution of these forms, carried out by Seth B. Benson and two colleagues in the Tularosa Basin and the neighbourhood, has discovered three more rodents which tend to match the colour of the lava fields on which they live and to which they appear to be restricted. These new subspecies, which have been named *Citellus grammurus tularosae*, *Perognathus intermedius rupestris*, and *Peromyscus nasutus griseus*, have not reached the degree of blackness of the lava-dwelling wood rat and pocket mouse, but appear to be intermediate stages between the ordinary colour and the black stage. They are described, with two plates, by Benson (*Univ. California Pub. Zool.*, vol. 38, 1932, p. 335).

**Irish Euphausians.**—Miss Winifred E. Frost in her work on the reproduction of *Nyctiphanes couchii* and *Meganyctiphanes norvegica* from off the south coast of Ireland (*Proc. Roy. Irish Acad.*, vol. 40, Sec. B, No. 14, 1931) investigates the breeding seasons of these euphausians and finds the larvæ of *Nyctiphanes* throughout the year with an April maximum. It probably has a spring and an autumn brood, whilst *Meganyctiphanes* apparently breeds in spring and summer with only one brood. As both these species, including the larvæ, form a large part of the food of herring, mackerel, and young hake, a detailed knowledge of their life histories is very important, and Miss Frost's observations give us some valuable information concerning the seasonal distribution of the larvæ. The area investigated lies off the south coast of Ireland and extends for about one hundred and fifty miles north and south, and for approximately two hundred miles from east to west, including both inshore and offshore waters. The main material consists of vertical plankton hauls taken with a Nansen net of two types, supplemented with occasional hauls with the Petersen trawl. It represents 31 cruises, spread over eleven years (1920–31). The distribution of the two species appears to be similar, although in the English Channel *Nyctiphanes* is usually found much nearer the coast than *Meganyctiphanes*. Both larvæ and adults occurred at one of the Irish stations with a depth of 150 metres. These two, both larvæ and adult, are the most frequent species in the plankton of the waters less than 100 fathoms deep off the south coast of Ireland, the distribution of the larvæ being 'patchy' without regard to depth or to a salinity range of 34.8–35.5 per mille. Only very general observations were made on vertical distribution, but the author found that the bulk of the calypotopis stages of *Nyctiphanes* are in the upper waters both day and night, whilst the older larvæ and adults were more abundant in the upper waters at night, which agrees with similar observations at Plymouth.

**Fossil Marsupial from Africa.**—Prof. E. Stromer, of Munich, has just described the first fragments of a fossil marsupial mammal from Africa (*Sitzungsber. Bayer. Akad. Wiss., math.-naturw. Abt.*, 1931 [1932], p. 177). They are portions of a lower jaw from a Middle Pliocene river-deposit south of Port Nolloth, Little Namaqualand, South Africa, and belong to an animal about as large as an ordinary rat. The dentition is sufficiently well preserved to show that the newly discovered species must have been closely related to the diprotodont marsupial *Cænolestes*, which now lives in South America, and is represented by several extinct allies in the Tertiary rocks of Patagonia. The African form is generically distinct, and is named *Palæothentoides* by Prof. Stromer, who remarks on the interesting geographical distribution of the cænolestid group of marsupials which is thus extended.

**Wood Anatomy in Mangrove Swamps.**—Alexis J. Panshin has studied the Philippine mangrove swamps from a new point of view (*Phil. J. Sci.*, vol. 48, No. 2, June 1932). The trees found in these forests belong to very different families, but are all growing in a remarkably uniform and very characteristic habitat. Panshin, therefore, studied the anatomy of these woods to see whether their common structural feature suggested a direct connexion between habitat and anatomy. All of the woods were typically diffuse-porous and the vessels had usually comparatively small diameter. Apart from these two features, great diversity of structure was represented amongst the large number of species examined, and the author concludes, in agreement with Solereder, that habitat

does not impress any definite type of anatomical structure upon species with a different evolutionary history.

**Hypal Fusions in Dermatophytes.**—Prof. A. H. R. Buller and his colleagues have devoted much attention to the study of hypal fusions in various fungi. They have now turned their attention to a practical application of this knowledge ("Hypal Fusions in Dermatophytes", by A. M. Davidson, Eleanor S. Dowding, and A. H. R. Buller, *Canadian Journal of Research*, vol. 6, No. 1, pp. 1–23, 1932). Studies on species of *Microsporon* and *Trichophyton*, which cause sores upon the skin and hair of human beings, have been made. It was found that hypal fusions formed between any two mycelia of the same species isolated from different patients, but did not form between the hyphae of two different species. A simple method of hanging-drop culture was used to compare the behaviour of an undetermined fungus with that of a stock culture. This method gave a trustworthy criterion for the identification of species, and may prove of great use in the treatment of human skin diseases.

**Earthquake Frequency at Kilauea.**—The *Volcano Letter* for Feb. 4, issued at the Hawaiian Volcano Observatory, contains a remarkable curve representing the seismicity of Kilauea during the past four years. In estimating seismicity, shocks of intensities 1, 2, and 3 of the Rossi-Forel scale are given the weights 1, 2, and 3, very feeble shocks the weight  $\frac{1}{2}$ , and tremors that scarcely show on the seismograph records the weight  $\frac{1}{4}$ . The number of tremors are occasionally very great, for example, 6531 and 10,080 during the weeks ending last Dec. 28 and Jan. 4, and, to keep the curve within reasonable limits, the logarithms of the weekly figures of seismicity are used. The outstanding features of the curve are the high peaks of suddenly increased activity that accompanied the four outbreaks of Halemaumau on Feb. 28 and July 25, 1929, Nov. 19, 1930, and Dec. 23, 1931, eruptions that were progressively more intense and lasting. The small oscillations tend to recur at intervals of from two to six weeks, with an average of 3.4 weeks.

**The Granular Theory of Matter.**—Volume 75 of *Memoirs and Proceedings of the Manchester Literary and Philosophical Society* contains the Dalton Lecture delivered before the Society by Sir J. J. Thomson on the occasion of his receipt of the Dalton Medal of the Society for his "eminent services to science", on March 17, 1931. The lecture was entitled "Atoms and Electrons", and in it Sir Joseph showed how the discovery that an electron moving with velocity  $u$  is always accompanied by waves of length equal to the quotient of Planck's constant  $h$  by the momentum  $mu$  of the electron, and of frequency proportional to the energy of the electron, had led him to the theory that matter was composed of granules of mass  $\mu$ , less than  $3 \times 10^{-27}$  gm., all moving with the speed of light, the force on any granule being always at right angles to its path and producing therefore no change in the energy of the granule. When lines of electric force connecting protons and electrons link these granules together, the combination constitutes matter, and the mass of the proton or electron is the sum of the masses of the granules gripped by its lines of force, and the energy the sum of their energies. Further, if each granule is exposed to a succession of impulses  $v_0$  per second, the time of the impulses for each granule being arbitrary, for a mass  $m$  having  $m/\mu$  granules the frequency  $\nu$  of the disturbances will approximate closely to  $v_0 m/\mu$  and the energy of the mass to  $\nu \mu c^2/v_0$ , which if we write  $h$  for  $uc^2/v_0$  gives Planck's law.

**Liquid Helium.**—Prof. J. C. McLennan and some collaborators have published in the June number of the *Philosophical Magazine* some interesting photographs of liquid helium. The liquid was very quiet, and had a meniscus with an almost negligible curvature at the edge and scattered very little light. Examined for Raman spectra, it was found to exhibit no isolated modified lines; the intensity of any possible Raman line was certainly fainter than the weakest Raman line observed in the spectrum of the light scattered from liquid oxygen or liquid nitrogen. The unmodified lines were, however, accompanied by very faint wings, probably to be attributed to rotational changes in unstable helium molecules in the liquid, of a structure recently investigated by Weizel, and formed from a pair of helium atoms each in the normal 1S state. This work was done with the low temperature form of the liquid, the form boiling above about 38 mm. pressure being continually full of bubbles which caused large spurious scattering.

**Excitation of the Nebular Spectrum.**—A short note by H. Nagaoka and T. Futagami (*Proc. Imp. Acad. Japan*, March) contains the announcement of the production in the laboratory of a fresh part of the nebular spectrum. An arc was run between carbon poles in nitrogen or oxygen which had been partly dissociated and ionised previously by causing it to pass through a hole in the carbon. The arc was spread out sideways by a magnetic field, and an auxiliary condensed discharge passed through it, between silver electrodes, at a distance of 15 cm. from the axis of the main poles. The luminosity of the auxiliary discharge extended somewhat towards the carbons, but the more remote parts were free from the bands of carbon monoxide and nitrogen, and showed only silver lines and lines of ionised oxygen and

nitrogen. It is stated that the latter included many found in nebulae and ascribed by Bowen to singly charged oxygen and nitrogen (O II and N II) and to doubly charged nitrogen (N III). The lines coming from doubly charged oxygen (O III) were not observed.

**Structure of Tetramminoplatinous Chloride.**—Werner's view that the 4-co-ordinated compounds of bivalent platinum possess a planar configuration, the four groups occupying the corners of a square with the platinum at the centre, has been several times contested. Pauling has, however, shown theoretically that the bivalent transitional elements nickel, palladium and platinum can form such compounds with a planar configuration, and, apart from available evidence of a purely chemical nature, his conclusions are supported by investigations on the nickel derivatives of benzylmethyl glyoxime and the X-ray analysis of  $K_2PtCl_4$  and  $K_2PtCl_6$ , in which the metal occurs in the anion. Cox (*J. Chem. Soc.*, June) has now shown by X-ray analysis that the same configuration also occurs in the cation,  $Pt(NH_3)_4$ , of the salt  $Pt(NH_3)_4Cl_2 \cdot H_2O$ , and it appears fairly certain that the bonds to any four identical groups co-ordinated to a platinum atom lie in a plane. The compound in question forms an ionic lattice with one molecule in the unit cell, and the symmetry requires that the ammonia groups are rotating about the covalent bond. The water molecules are loosely held and can be expelled without disrupting the crystal: the best position is probably with the oxygen atom at the centre of the cell. Each platinum atom is surrounded by four ammonia groups in a square and at a greater distance by eight equidistant chlorine ions. Each ammonia group is at the centre of four coplanar chlorine ions, while each chlorine ion is surrounded by eight ammonias.

### Astronomical Topics

**Comets.**—Dr. A. Dubiago gives a definitive orbit for Brooks's periodic comet at its last return, and a predicted one for this year, in *Astr. Nach.* 5874:

$T$	1925 Nov. 1-729463 U.T.	1932 Oct. 7-5519 U.T.
$\omega$	195° 39' 57-33"	195° 48' 18"
$\Omega$	177 25 11-60	177 27 11
$i$	5 33 11-07	5 32 52
$\phi$	29 8 36-20	29 4 7
$n$	513-27574"	511-654"
$\log a$	0-5597706	0-56075

An ephemeris from June 5 to Dec. 30 is given; it is very close to that of Mr. F. R. Cripps in the B.A.A. Handbook; Mr. Cripps applied perturbations by Jupiter and Saturn (Dubiago applied those of Jupiter only), and obtained  $T$  Oct. 7-623, differing from the other by less than two hours. The conditions this year are very favourable, the comet being in opposition at its perihelion.

The *Journal des Observateurs* for May contains a study by Dr. A. Schaumasse of the periodic comet Borrelly, which has been seen at each return since its discovery in 1905; he has applied perturbations by Venus, Earth, Mars, Jupiter, Saturn, and finds the elements;

$T$	1925 Oct. 7-53664 U.T.	1932 Aug. 27-79623 U.T.
$\omega$	352° 25' 34-11"	352° 33' 6-74"
$\Omega$	77 6 12-17	77 2 3-63
$i$	30 30 39-83	30 31 47-18
$\phi$	38 3 26-35	38 4 59-78
$n$	515-33164"	516-11281"
Period	6-885251 y.	6-874830 y.

$T$  in 1932 is 1-8 days later than the value used in

No. 3275, Vol. 130]

the ephemeris in the B.A.A. Handbook. The comet will be well placed as a morning object for northern observers in September and October; a misprint in the Handbook should be corrected. Read 352°, not 325°, for  $\omega$ .

**Slopes of the Lunar Mountains.**—Mr. T. L. MacDonald has been contributing a series of papers on lunar statistics to the *B.A.A. Journal*; the issue for May contains a study of the slopes of mountains, which is based on examination of the shadows at different altitudes of the sun. The mean value of the inclination is deduced as being slightly less than 30° for the larger craters, but attaining 36° for those with diameters less than 40 km. Mr. MacDonald states that 30° is the angle at which equilibrium of loose debris is possible. In view of the disturbing effect of the great range of temperature between day and night, the older formations would probably have had time to reach equilibrium; but it is suggested that the small formations may have been the latest, and that there has not yet been time to reach a state of equilibrium. Many of the objects in question are near the borders of the maria, which are likely to be areas of weakness where disturbances may have continued to a later period than in more stable regions.

Mr. MacDonald's work shows that observers need not consider that the moon's surface is so well known that nothing more remains to be done. Visual work can give more continuous records of the changing aspects of the shadows than can be done by photography, in view of the great number of plates that the latter would require.