of the technical chemist. For example, the part-time system whereby the summer vacation is spent in the industry is condemned; the value of industrial fellowships is regarded as diminishing as the liberty to publish is restricted. The report is eminently practical, and it will well repay serious consideration in this country.

SOCIETIES AND ACADEMIES.

MANCHESTER.

Literary and Philosophical Society, May 30.—Prof. W. W. Haldane Gee, vice-president, in the chair.—Dr. W. H. R. **Rivers**: Irrigation and the cultivation of taro. In the New Hebrides and New Caledonia irrigation is only used for the cultivation of *Colocasia antiquorum,* the taro of the Polynesians. This intimate connection between irrigation and taro, which is found in other parts of Oceania, suggests that if irrigation belongs to the megalithic culture (W. J. Perry, Manchester Memoirs, vol. lx., part i.), taro must have had a similar history. The distribution of the plant supports this suggestion, showing a close correspondence with that of the megalithic culture when its tropical and semi-tropical habits are taken into account. It occurs in Oceania, the Malay Archipelago, India and eastern Asia, Arabia, Egypt, East and West Africa, the Canary Islands, Algeria, southern Italy, Spain and Portugal, as well as tropical America. Since the original habitat of the plant is southern Asia, its use as a food was probably acquired by the megalithic people in India and taken by them both to the east and west. Although the general distribution of taro in southern Melanesia corresponds with that of the megalithic influence, a difficulty is raised by the island of Malekula, in the New Hebrides. So far as we know, irrigation does not occur in this island, although megalithic influence is present in a very definite form. To account for the absence of irrigation in this island it is shown that modes of disposal of the dead point to two megalithic intrusions into Oceania, and the high degree of development of irrigation in such outlying islands and districts as New Caledonia, Anaiteum, and north-western Santo in Melanesia, and the Marquesa and Paumotu Islands in Polynesia, suggests that this practice belonged to the earlier of the two movements. There is reason to believe that this movement had relatively little influence in Malekula.—Prof. G. Elliot **Smith**: The arrival of *Homo sapiens* in Europe. At a time when little was known of early man and his works beyond the stone implements which he fashioned, Sir John Lubbock (afterwards Lord Avebury) suggested the use of the terms Palæolithic and Neolithic to distinguish respectively between the earlier part of the Stone age, when crudely worked implements were made, and the later period, when more carefully finished workmanship was shown. In spite of the fact that subsequent investigation revealed a high degree of skill in the craftsmanship of the Upper Palæolithic period, which in many respects shows a very much closer affinity to the Neolithic than to the Lower Palæolithic period, Lubbock's terminology has become so firmly established that it has continued to determine the primary subdivision into epochs of the early history of man. Recent research has brought to light a vast amount of new information relating to the achievements of Upper Palæolithic man, and has conclusively shown that human culture and artistic expression had already attained the distinctive characters which mark them as the efforts of men like ourselves. This view has been amply confirmed by the general recognition of the fact that, after the disappearance of Neanderthal man at the end of the Mousterian period, the new race of men that supplanted them in Europe and introduced the Aurignacian culture conform in all essential respects to our own specific type, *Homo sapiens*. Thus the facts of physical structure, no less than the artistic abilities and the craftsmanship, of the men of the Upper Palæolithic proclaim their affinity with ourselves. The earlier types of mankind which invaded Europe and left their remains near Piltdown, Heidelberg, and in the various Mousterian stations belong to divergent species, and perhaps genera, which can be grouped together as belonging to a Palæanthropic age, which gave place (at the end of the Mousterian epoch in Europe) to a Neoanthropic age, when men of the modern type, with higher skill and definite powers of artistic expression, made their appearance and supplanted their predecessors. So long as primary importance continues to be assigned to the terms Palæolithic and Neolithic, the perspective of anthropology will be distorted. Though the facts enumerated in this communication are widely recognised, it is found that the writers who frankly admit them lapse from time to time into the mode of thought necessarily involved in the use of the terms Palæolithic and Neolithic. If modern ideas are to find their just and unbiassed expression some such new terminology as is suggested here becomes necessary.

PARIS.

Academy of Sciences, July 31.—M. Ed. Perrier in the chair.—At the preceding meeting of the Academy the president, in announcing the death of Sir William Ramsay, gave an account of his work in chemistry.—J. **Bergonié** and C. E. **Guillaume**: Surgical instruments adapted to the field of the electro-vibrator. Ordinary surgical instruments utilised in the field of the electro-vibrator are, like the projectile sought for, submitted to an intense oscillatory movement, a matter of difficulty for the surgeon. To reduce this vibration to negligible proportions, it is necessary that the instruments should be constructed of a metal non-magnetic and of high resistivity. The iron-nickel alloys, containing between 22 per cent. and 30 per cent. of nickel, fulfil these conditions, but offer difficulties in manufacture. Another group of alloys suitable for this purpose contains 90 per cent. nickel, the remaining 10 per cent. consisting of chromium, manganese, and a little copper. Such an alloy, under the name of baros, has been used for some years for weights of precision, and fulfils all the conditions of the present problem; it works like mild steel, is practically unoxidisable, and is free from action in the field of the electro-vibrator.—R. **Garnier**: Study of the general integral of equation (VI.) of M. Painlevé in the neighbourhood of its transcendental singularities.—H. **Arctowski**: The influence of Venus on the mean heliographic latitude of the sun-spots. The earliest communication on this subject was due to Warren de La Rue, Stewart, and Lœwy in 1867, and F. J. M. Stratton has recently taken up the same question. The author does not think the results of Stratton's calculations can be considered as conclusive, and has made a fresh series of calculations based on the Greenwich heliographic observations. It is difficult to decide from the curves whether the action of Venus is direct or the inverse.—A. **Colani**: The oxalates of uranyl and potassium.—C. **Zenghelis**: The composition and use of Greek fire.—F. **Diénert** and L. **Gizolme**: The influence of the algæ on submerged sand filters on the purification of water. The purifying power of these filters is a function of the development and vitality of the algæ, and can be

measured by the reduction of the alkalinity of the water.—J. **Amar**: The dynamographic path. The apparatus described permits of a graphical record being traced of the movement and forces exercised by the limbs in walking. It has been applied to the study of models of artificial limbs, and of pathological cases of injured or missing limbs.—C. **Galaine** and C. **Houlbert**: The removal of flies from houses. The visible part of the spectrum for flies appears to be comprised between the green and the orange. Making use of this fact, coloured glass, especially blue, is suggested for hospitals, and for protecting food in restaurants and shops, without restricting the free access of air.—E. **Fleurent**: A method of preserving bread destined especially for prisoners of war. The method suggested by the author in 1915 has been tried in practice, and its value has been confirmed.—J. **Roubinovitch**: Ocular compression in the examination of the oculo-cardiac reflex.

WASHINGTON, D.C.

National Academy of Sciences (Proceedings No. 7, vol. ii.).—L. B. **Loeb**: The mobilities of gas ions in high electric fields. The results, though at variance with those of most observers at low pressures for negative ions, are in good agreement with recent results of Wellisch, and likewise lead to the conclusion that the "cluster" theory is no longer tenable.—H. H. **Donaldson**: The relation of myelin to the loss of water in the mammalian nervous system with advancing age. There is no evidence that the cell bodies and their unsheathed axons suffer any significant loss of water; the progressive diminution in the water content of the brain and spinal cord is mainly due to the accumulation of myelin, the formation of which is a function of age, the most active production occurring during the first twentieth of the life span.—R. W. **Hegner** and C. P. **Russell**: Differential mitoses in the germ-cell cycle of *Dineutes nigrior*. The most conspicuous difference discovered between the origin of the oocyte in *Dineutes nigrior* and in Dytiscus is in the number of differential mitoses; in *Dineutes nigrior* there are only three, whereas in Dytiscus there are four.—E. S. **Larsen** and R. C. **Wells**: Some minerals from the fluorite-barite vein near Wagon Wheel Gap, Colorado. A description of specimens of the unusual mineral gearksutite, of a peculiar kaolinite, and of a new fluoride-sulphate, creedite.—P. D. **Lamson**: The processes taking place in the body by which the number of erythrocytes per unit volume of blood is increased in acute experimental polycythæmia. It is concluded that the liver acts as a reservoir for erythrocytes. The process by which the liver increases the number of the erythrocytes is thought to be a loss of plasma from the liver capillaries, together with a constriction of these vessels, driving the erythrocytes on into the blood stream.—I. S. **Kleiner** and S. J. **Meltzer**: The influence of morphin upon the elimination of intravenously injected dextrose in dogs. Morphin increases the elimination through the kidneys of intravenously injected dextrose and retards the return of the sugar content of the blood to its previous level.—C. P. **Olivier**: The work of the American Meteor Society in 1914 and 1915. From the 5543 observations of meteors, 139 radiants have been deduced with sufficient accuracy to calculate parabolic orbits for the meteor streams they represent.—A. J. **Dempster**: The light excitation by slow positive and neutral particles. Very slow positive rates are still able to excite light with a speed corresponding to fewer than 5 volts. The neutral rays can also excite light at very slow speeds; the excitation may occur directly because of the collision of a neutral particle with a neutral molecule of the gas.—C. D. **Perrine**: An apparent dependence of the apex and velocity of solar motion, as determined from radial velocities, upon proper motion. The position of the solar apex and of the solar velocity appear to vary with the proper motion of the stars used in the determination. Such variations point ultimately to some form of rotary or spiral motion among the stars.—C. **Barus**: Channelled grating spectra obtained in successive diffractions. A brief abstract of work presented by the author to the Carnegie Institution of Washington.—R. **Pearl**: The effect of parental alcoholism (and certain other drug intoxications) upon the progeny in the domestic fowl. Out of twelve different characters for which there are exact quantitative data, the offspring of treated parents taken as a group are superior to the offspring of untreated parents in eight characters. The results with poultry are in *apparent* contradiction to the results of Stockard and others with mammals, but the contradiction is probably only apparent.—G. H. **Parker**: The effectors of sea-anemones. It seems clear that among the muscles in sea-anemones there are not only independent effectors and tonus muscles associated with nerve-nets, but neuromuscular combinations that exhibit true reflex action.—G. H. **Parker**: Nervous transmission in sea-anemones. There is evidence not only for the assumption of independent receptors, but of relatively independent transmission tracts, a first step in the kind of differentiation so characteristic of the nervous organisation in the higher animals.—G. H. **Parker**: The responses of the tentacles of sea-anemones. The tentacles, in contradistinction to such appendages as those of the arthropods and vertebrates, contain within themselves a complete neuromuscular mechanism by which their responses can be carried out independently of the rest of the animal.—A. van **Maanen**: Preliminary evidence of internal motion in the spiral nebula Messier 101. The mean rotational motion is 0·022″ left-handed; the mean radial motion is 0·007″ outward. There is perhaps a small decrease of the rotational motion with increasing distance from the centre. The annual rotational component of 0·022″ at the mean distance from the centre of 5″ corresponds to a rotational period of 85,000 years.—Symposium on the exploration of the Pacific:—(*a*) W. M. **Davis**: The exploration of the Pacific; (*b*) J. F. **Hayford**: The importance of gravity observations at sea on the Pacific; (*c*) L. J. **Briggs**: A new method of measuring the acceleration of gravity at sea; (*d*) C. **Schuchert**: The problem of continental fracturing and diastrophism in Oceanica; (*e*) J. P. **Iddings**: The petrology of some South Pacific islands and its significance; (*f*) G. W. **Littlehales**: In relation to the extent of knowledge concerning the oceanography of the Pacific: (*g*) C. F. **Marvin**: Marine meteorology and the general circulation of the atmosphere; (*h*) W. H. **Dall**: The distribution of Pacific invertebrates; (*i*) W. G. **Farlow**: The marine algæ of the Pacific; (*j*) J. W. **Fewkes**: The Pacific as a field for ethnological and archæological investigation; (*k*) H. A. **Pilsbry**: Mid-Pacific land snail faunas; (*l*) D. H. **Campbell**: Some problems of the Pacific floras. The symposium contains a summary of some of the results obtained in past exploration of the Pacific and an outline of the importance to many sciences of further systematic and continuous exploration of the Pacific.

CAPE TOWN.

Royal Society of South Africa, June 21.—Dr. L. Péringuey, president, in the chair.—J. D. F. **Gilchrist**: Protective resemblance in post-larval stages of some South African fishes. In *Hemiramphus calabaricus*

the post-larval stages of the fish have the size and colour of fragments of weed, which often are found in the waters which these young fish frequent. When alarmed, the fish become rigid and float about in an apparently inanimate condition. When this occurs, it is difficult to distinguish them from the pieces of weed floating around. In klipfish (*Clinus* spp.) the young are born alive, and they are of a clear, glassy transparency difficult to detect in the water. The contour of the body is probably disguised by a number of minute dark dots. The colour pattern in other young fish is shown to be more marked and considerably different from that of the adult. Some details of this difference are enumerated in the cases of the leerfish and the stockfish and a species of dogfish. It is indicated how this colour pattern of the young fish may be a form of protective resemblance.—H. H. W. **Pearson**: Morphology of the female flower of Gnetum. Much work has been done in recent years on the morphology of the flower of the Gnetales, and very diverse views have been put forward. These are discussed, summarised, and compared in this paper, with special reference to recent investigations by the author and to the conclusions of MM. Lignier and Tison, both as published and as discussed in correspondence with the author. Investigations have tended of late to emphasise the Angiosperm characters of the Gnetales, and MM. Lignier and Tison even reach the conclusion that the innermost envelope of the female flower in Gnetum and Ephedra, and of both flowers in Welwitschia, is a plurilocular ovary containing a single naked ovule. They derive their evidence partly from the anatomical structure of the envelope, partly from its form, terminating as it does in "a long style and a stigma." The anatomical evidence they adduce is discussed in detail, and it is shown that the apparent traces of a vascular system do not necessarily prove the envelope to be an ovary, as well-developed vascular systems are present in the ovular integuments of Cycads and a number of the lower Angiosperms. Regarding the resemblance of the envelope to a carpel with style and stigma, it is pointed out that, external appearances to the contrary, there is no evidence that it is a reduced form of a functional stigma. Its present function is to facilitate the dispersal of pollen by attracting insects, and there is no sufficient reason for supposing that it has ever been concerned in the collection of pollen. The question of the cauline or foliar nature of the Gnetalean ovule arises in this connection; this is discussed in detail, and it is shown that recent investigations tend to confirm the opinion that it is cauline. Finally, the new knowledge furnished by MM. Lignier and Tison for Gnetum is summarised, and their comparisons of the Gnetalean and Angiosperm flowers are reduced to tabular form and correlated with those of other investigators, figures being given to render the comparison and correlation clear.—P. A. v. d. **Bijl**: Heart rot of *Ptaeroxylon utile* (sneezewood) caused by *Fomes rimosus*, Berk.

BOOKS RECEIVED.

The Bearings of Modern Psychology on Educational Theory and Practice. By C. M. Meredith. Pp. 140. (London: Constable and Co., Ltd.) 1*s*. 6*d*. net.

Color and its Applications. By M. Luckiesh. Pp. xii+357. (London: Constable and Co., Ltd.) 16*s*. net.

An Introduction to the Use of Generalized Co-ordinates in Mechanics and Physics. By Prof. Byerly. Pp. vii+118. (London: Ginn and Co.) 5*s*. 6*d*.

Organic Agricultural Chemistry. By Prof. J. S. Chamberlain. Pp. xvii+319. (New York: The Macmillan Company; London: Macmillan and Co., Ltd.) 7*s*. net.

Practical Mathematics for Technical Students. By T. S. Usherwood and C. J. A. Trimble. Part ii. Pp. x+565. (London: Macmillan and Co., Ltd.) 7*s*. 6*d*.

Historical Synopsis of the Royal Cornwall Polytechnic Society for the Years 1833–1913. By W. L. Fox. Pp. 80. (Falmouth: J. H. Lake and Co.)

Journal of the Institute of Metals. Vol. xv. No. 1. Pp. viii+392. (London: The Institute of Metals.) 21*s*. net.

The Investigation of Rivers. Final Report. Special. (London: Royal Geographical Society.) 3*s*. 6*d*. net.

Preservatives and other Chemicals in Foods: Their Use and Abuse. By Prof. O. Folin. Pp. 60. (Cambridge, Mass.: Harvard University Press; London: Oxford University Press.) 2*s*. 6*d*. net.

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