Research Items.

GYPSY MARRIAGE.—Mr. T. W. Thompson, in a continuation of his study of gypsy marriage in England, in pt. 4 of vol. 6, Ser. 3, of the *Journal of the Gypsy Lore Society*, deals principally with the question of permanence and divorce. A number of temporary unions are recorded. These lasted for varying periods from a few days or weeks to six months, a year, or even two years. In effect, these seem to have been trial marriages; though the Heron family seems to have been peculiar in this respect and deliberately to have taken their wives on trial, which as a premeditated act can be paralleled in a few cases only in other families. It is suggested, however, that this postponement of the marriage rite may have been a survival of the practice among German gypsies whereby marriages were not ratified by the Hauptmann until they had been in force for two years, during which period the bridegroom had to serve his father-in-law. There is no evidence that service in return for a bride ever existed in England. Marital fidelity after a settled marriage seems to have been more or less the rule, at any rate among the women. Some, however, had a regular succession of lovers or husbands. Among the men the patrilineal Herons claimed to have the right to occasional intimacy with gypsy women, though allowing their wives no liberties. Unfaithful wives were punished by stripping naked, when they were sometimes tied up and whipped or chased round a field; mutilation, such as nose slitting or cutting off an ear, was sometimes practised. Among English gypsies divorce was purely informal; but the Scottish gypsies parted with a good deal of ceremony. A century ago the woman received a token made of cast iron with a mark on it resembling the character T, and she was never permitted to marry again. If she did she was liable to the extreme penalty; she was tied to a stake with an iron chain and beaten to death.

QUATERNARY HUMAN SKELETONS FROM THE VALLÉE DU ROC, CHARENTE.—In the *Bull. et Mém. de la Soc. d'Anthropologie de Paris*, T. 8, Sér. 7, fasc. 1-3, Dr. Henri Martin describes three skeletons from a rock shelter in the Vallée du Roc. The remains were found buried under blocks of fallen stone, by the weight of which they had been much damaged. They belonged to three individuals, possibly the members of one family, a man of about fifty years of age, a woman of about forty, and a boy, probably of about eighteen, in view of the fact that the first wisdom tooth had not yet fully erupted. The remains had evidently been buried and the fall of rock was posthumous. The point of greatest interest in the skeletal remains lay in certain resemblances to Chancelade man as described by Testut. This was manifested in the cephalic index of the man, 72·8, as compared with Chancelade, 72·02, as well as in the scaphocephalic character of the skull of both male and female. Yet notwithstanding the keel-like ridge, both skulls were comparatively low. The supraciliary ridges were well marked. The cephalic index of the woman was 76. The skulls bear no resemblance to neolithic skulls, but are comparable rather with those of Brunn, Cro-magnon (female), and Laugerie Basse, but, as stated, particularly of Chancelade. The cranial capacity is approximately 1350 cm. (female) and 1525 cm. (male). The teeth are large and well formed, the third molar being smaller than the second, which is contrary to the state found in Neanderthal man. The wearing of the teeth shows a lateral bite. There are signs of caries in the man. The remains were found immediately above a Solutrean layer among signs of numerous hearths, and it is suggested that they belong to late Solutrean or the beginning of the Magdalenian period.

CAPROKOL.—We have received from the British Drug Houses, Ltd., London, N.1, a small booklet on Caprokol therapy. Caprokol (or hexyl resorcinol) is used both as a urinary antiseptic by internal administration and also as a general antiseptic by external application, including the cleaning of mucous surfaces. Its use as a general antiseptic has recently been referred to in our columns. Caprokol was introduced as a urinary antiseptic about three years ago, and considerable clinical evidence has now accumulated as to its value in various infections of the urinary tract. In doses of 1-2 gm. daily it clears up cystitis, pyelitis, or urethritis caused by staphylococci, streptococci, gonococci, or *B. coli*. In cases of infection with the latter organism it is advisable to give local treatment also in the early stages. To ensure complete and permanent sterility of the urine, prolonged treatment is sometimes necessary: an immediate effect, however, of the administration of the drug is the cessation of pain and relief from the frequency of micturition which so often accompanies urinary tract infections. The drug's antiseptic action is enhanced by its power of lowering the surface tension of the urine: fluids or alkalis which raise the surface tension should not be given at the same time as Caprokol. The evidence suggests that this compound has a definite use in practical therapeutics.

ATTITUDE OF EMPLOYEES TO INDUSTRIAL PSYCHOLOGY.—In the *Journal of the National Institute of Industrial Psychology* (vol. 4, No. 2) there is an interesting discussion on the attitude of employees to investigations of a psychological nature. It is obvious that no investigation can succeed without the co-operation and goodwill of the workers concerned, and it is equally obvious that workers are quite likely to view with suspicion strangers who come and observe them at work, who suggest alterations in long-established habits, and seem to take up a new attitude to problems. Mr. A. Stephenson points out that the present attitude of the workers towards investigations depends very largely on their attitude to the investigator and on local traditions and temperament, unless political convictions are so strong as to exclude all other considerations. In some industries where there is fear of dismissal it is sometimes very difficult to get rid of the impression that any worker who is being observed must necessarily be inefficient. Older workers are sometimes intolerant of innovations, and tend to consider that twenty years' experience must be worth more than any instruction. Where changes in the firm's policy are imminent and of a kind distrusted by the worker, then an investigator may be regarded as a spy: Mr. Stephenson said that such difficulties can usually be resolved by holding a conference and explaining clearly the objects of industrial psychology. On the whole though, workers prove to be interested in, or at least tolerant of, such investigations, and when one considers their novelty one is surprised at the willing help afforded in so many cases.

MARMOT PLAGUE IN UNITED STATES.—There has been a remarkable increase in recent years in the numbers and extent of the range of the eastern woodchuck (*Marmota monax*), a native of the States east of the Great Plains and north of northern Arkansas, Alabama, and North Carolina. Where these rodents confine their activities to their accustomed haunts on rocky hillsides, thickets, or forest land, no harm results, but their extension of range has led

them to transgress on cultivated land, and corn and forage crops, young fruit trees, and poultry have suffered. It is even recorded that disastrous flooding of crops and erosion of soil has followed upon their burrowing in levee and ditch banks. The U.S. Department of Agriculture (*Leaflet 21*) states that the surest practicable method of controlling the pest is gassing the woodchucks in their burrows, and recommends the use of carbon disulphide, calcium cyanide, or exhaust gases from a motor car. No individual effort, however, can afford any but a temporary success, and co-operation over a large area is essential for effective control. The leaflet states that the factors contributing to this recent general increase are not fully known, but curiously enough it says nothing about protecting and encouraging the wild creatures, birds and beasts, which are the natural controllers of such ground rodents.

THE INSECTS OF SAMOA.—Two further fascicles of "Insects of Samoa," a work in course of publication by the British Museum (Natural History), have recently come to hand. Part 4, Fasc. 2, deals with a number of families of Coleoptera, and Part 5, Fasc. 1, with aculeate Hymenoptera. The several accounts are written by specialists well known as authorities in the groups concerned, and should prove specially valuable in connexion with distribution, modification due to isolation and other problems of island life. Certain of the species described or listed are peculiar to the Samoan group: others, such as the beetles *Gnathocerus* and *Tribolium*, are cosmopolitan, while some other insects appear to be limited to certain of the Pacific Islands or extend into the continental tropics. The longicorn beetles are of exceptional interest, since each of the Samoan islands seems to possess endemic species, and four genera are unknown outside the archipelago.

SPERMATOGENESIS IN SPIDERS.—Dr. E. Warren contributes to the *Annals of the Natal Museum* (vol. 6, Part 1, March 1928) an important paper on the comparative histology of the testis of South African spiders, in which special attention has been directed to the nuclear divisions. The nuclei of the young genital cords of the embryo are capable of dividing by amitosis, and in the testis the germinal nuclei at the margin can divide without mitosis, and the spermatogonia can also divide amitotically to form primary spermatocytes, though in some spiders occasional mitoses were present. In some spiders the primary spermatocytes divide without mitosis to form secondary spermatocytes and spermatids, and chromatin structures indistinguishable from spermatozoa are formed in cells which have originated either without mitosis at all or without the full complement of mitotic divisions characteristic of typical spermatogenesis. In many species there are two kinds of sperms originating in different lobules of the testis. The presence of typical spermatogenesis in many spiders indicates that the various atypical methods which have been observed are to be regarded as simplifications of the typical process rather than as something fundamentally new or as a survival of primitive methods. The occurrence of amitosis is too general to be explained as an abnormality resulting from the temporary absence of the correct stimulus for the normal development of the spermatozoa. "The truly remarkable diversity which is seen in the chromatin behaviour of the genital cells of allied spiders is not in accord with the view that heredity depends on a system of material genes lodged in specific chromosomes and bodily passed on as a complete system from one generation to another." In most spiders the spermatozoa in the vesiculæ seminales become enclosed in capsules, and in some species the chromatin of the encapsuled spermatozoon may divide into pieces or may even be transformed into a resting nucleus.

A NEW FAMILY OF TURBELLARIÆ.—N. Nasonov describes in the *Bulletin de l'Académie des Sciences*, Leningrad (1927, No. 9-11, pp. 865-874), a new family Multipeniatidæ of the Turbellaria Allœcœla. The animals were discovered in the mouth of the River Maiche, which flows into Ussuri Bay, Sea of Japan. The representatives of the new family, two species of the same genus (*Multipeniata batalanscæ* and *M. kho*), differ greatly from members of other families of Allœcœla, especially in the remarkable structure of the male genital apparatus, since they possess several copulatory organs in different stages of development. A fully developed copulatory organ is a closed system isolated from testes and from glands; when it fulfils its function, it is replaced by the next one when this reaches its full development, and so on.

NON-MARINE MOLLUSCA OF BURU.—The non-marine molluscan fauna of the island of Buru has never been thoroughly investigated, and only scattered notes exist. Mr. Toxopeus has, however, visited a limited portion of the island for something less than a year, and the result of his collection of mollusca is now reported on by Dr. T. van Benthem Jutting (*Treubia*, vol. 7, suppl.). Omitting varieties and unidentified forms, the number of species amounts to 50, only 6 being described as new, while 18 are reported for the first time. There are two excellent plates and a number of rather rough, but effective, text illustrations, including distribution maps of the genera *Isidora*, *Physastra* and *Ameria*. A list of species formerly reported from the island but not found by Mr. Toxopeus is given, with references to the places of their description.

IRON ORES OF SOUTH AFRICA.—While on the staff of the Geological Survey of South Africa, Dr. P. A. Wagner contributed liberally to geological literature of the type that is of far more than local interest, and since his resignation he has prepared for publication still another memoir of outstanding importance, dealing on this occasion with "The Iron Deposits of the Union of South Africa" (*G. S. S. Africa, Mem. 26*, 1928). The types of ores considered include magmatic segregations; contact metasomatic deposits; lode and vein deposits; banded ironstones of the characteristic pre-Cambrian type; bedded ores of various ages; replacement and metamorphosed deposits, including those of the Lake Superior type; and laterites and other surface ironstones. Each chapter contains a wealth of observational data and critical comment—stratigraphical, petrological, chemical, and economic. South Africa possesses the most extensive titaniferous ores in the world, but apart from these her known reserves are exceeded only by those of India, the United States, Brazil, and France. As there are also associated resources on an ample scale of coking coal, limestone, dolomite, manganese, and fluor spar, the production of iron and steel should in the future prove to be a factor of prime importance in the economic development of the Union.

GEOLOGICAL HISTORY OF TASMANIA.—A stimulating account of this critical region of Gondwanaland, by A. N. Lewis, has recently appeared in the *Proc. Roy. Soc. Tasmania* for 1926 (pp. 1-24; 1927), with special reference to the relation of the existing topography to the Triassic dolerite intrusions and the major block-faulting. Mr. Lewis considers that after

the intrusions the old land surface was reduced to a peneplain, and that the present surface features have been moulded on variously uplifted blocks of country, the faulting and elevation responsible for these being of Tertiary age, probably late Miocene or early Pliocene, about which time there were at least two phases of volcanic activity. A discussion of the paper by P. B. Nye and others, with a reply from Mr. Lewis, appears in the same *Proceedings* for 1927 (pp. 67-77; 1928). Mr. Nye contends that the present physiography dates from the time of the dolerite intrusions, while Mr. Lewis retorts that if this had been so Tasmania would long ago have been reduced to a most mature peneplain. He thinks it inconceivable that 200 million years of denudation could still have left conspicuous dolerite-capped hills if the latter had been finally elevated at the time of intrusion. Apart from this controversy, the paper and discussion are valuable as a contribution to our growing knowledge of the great dolerite intrusions of the Mesozoic era.

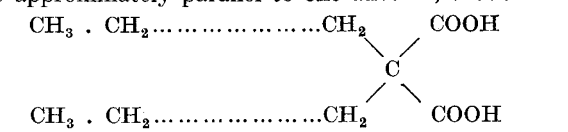
FIELD CURRENTS FROM POINTS.—A paper in the May number of the *Physical Review*, by Prof. Millikan and Messrs. Eyring and Mackeown, on the extraction of electrons from cold, negatively charged points by strong electric fields, is of particular interest in view of recent theoretical investigations of the problem on the basis of the new mechanics. The data which are presented show conclusively that a detectable current is first obtained for a definite strength of the field at the surface of the metal, irrespective of the applied potential and the disposition of the electrodes. The critical field is about the same for a tungsten point as for a tungsten wire, but it is greater for platinum than for tungsten. The importance of the field as variable rather than the potential was shown very clearly with a steel point and plane discharging system. The electric fields used are enormously high, thirty-five million volts per centimetre being attained in one instance.

INTERNATIONAL WEIGHTS AND MEASURES.—The *Proceedings of the International Bureau of Weights and Measures* for the year 1927 show that the question of the gas thermometer scale is to be considered, and that Prof. Keesom and Mr. Tuyn, of Leyden, have been asked to draw up a report on the subject. The various copies of the standard metre have been examined as to their expansion with increase of temperature, but there is a slight difference between the results obtained by the two methods used which has not yet been explained. The standards made at the same time have the same expansion, and the new quartz standards agree very closely with each other. The fine lines which mark the length of the standard are shown in the *Proceedings*, magnified 500 diameters, and it is noticeable how much finer the lines on the newer standards are than on the old. Several of the quartz standard kilograms having decreased in weight by 0·1 milligram in three years after being heated, observations have been made on a platinum kilogram submitted to a current of air at 100° C. for thirteen months, but no change in its weight could be detected. The proposal to make the British yard and the United States yard identical was withdrawn.

LONGITUDINAL STABILITY IN AEROPLANES.—An interesting new presentation of aeroplane stability analysis, in practical form, is contained in a publication of the Aeronautical Research Committee by S. B. Gates, on "A Survey of Longitudinal Stability below the Stall, with an Abstract for Designers' Use" (*R. and M.*, No. 1118. London: H.M. Stationery Office, 1928. 1*s.* 3*d.*). The paper develops in terms of new units, in which the resistance derivatives are expressed as non-dimensional quantities, a more compact analysis of longitudinal stability below stalling than has hitherto been attempted, and throws it into a form to bring it immediately within the scope of designers. The description is in terms of the two quantities, in practice at the disposal of the designer, position of centre of gravity and size of tail. With these co-ordinates the region of longitudinal stability is defined on a series of plane diagrams, and in typical cases curves have been filled in from which the damping and period of the phugoid motion may be estimated.

THE STRUCTURE OF A DETERMINANT.—In his lecture on the Rouse Ball Foundation at Cambridge in 1927, Major P. A. MacMahon gave an account of some recent developments in the theory and structure of determinants. A worker in this field is fortunate in having, in the four volumes of Muir's "History of the Theory of Determinants," a classified summary of the progress of the subject from 1693 until 1900. No important discovery has escaped the notice of Muir, who has spared no pains in mastering the great variety of notations employed at different times. During the last few years, two important advances have been made in the theory of the structure of a determinant. In the first place, various connexions have been established with symmetric functions appertaining to such algebras as that of hyper-determinants. Again, a certain algebraical expression, brought into prominence by Muir and named by him a 'permanent,' has been found to be a corner-stone in the algebraic theory. Both advances, which proceed hand-in-hand, are linked in a remarkable way with MacMahon's own work on the partitions of numbers. As yet the connexion with symmetric functions, arising from the new outlook, is but in its infancy. The study of the symmetric function of the umbral algebras, of which determinants are particular cases, is only just broached. Major MacMahon's very stimulating lecture is printed *in extenso* in *Jour. London Math. Soc.*, vol. 2.

THE STRUCTURE OF LONG CHAIN COMPOUNDS.—The *Proceedings of the Royal Society of Edinburgh*, vol. 48, Part I., contains an account of a further X-ray investigation by E. Henderson of a number of normal saturated dicarboxylic acids. Between the odd and even members of this series there is a definite alternation in physical properties, and this difference is also apparent in the crystal structures. The work has been extended to mono- and di-alkyl malonic acids with interesting results. The structure attributed to dioctadecyl malonic acid indicates that in acids of this type the two long hydrocarbon chains lie approximately parallel to one another, thus:



It has previously been observed that long chain compounds terminating in an incompletely saturated group form bimolecular layers in the crystal, the molecules of one layer being oppositely orientated to those in the other. Results now obtained with fatty acid amides confirm the view that the formation of these bimolecular layers is due to the presence of the incompletely saturated group in the molecule. In the malonic acids these bimolecular layers are not observed, and it appears, therefore, that the two carboxyl groups mutually satisfy their residual affinity.