

Research Items.

FIRE-MAKING IN THE MALAY PENINSULA.—The fire-piston for the production of fire is used in a limited area among the Shans and people of Pegu in Burma, among the Khas and Mois, in the Malay Peninsula, Western Sumatra, Java, Bali, Lombok, parts of Borneo, and in Mindanao and Luzon. Seven specimens of the implement deposited in the Perak Museum are described by Mr. Ivor H. N. Evans in the *Journal of the Federated Malay States Museum* (vol. ix. Part 4). They are made of buffalo-horn, wood, and tin. Mr. Evans finds that in two out of three attempts he can make fire by means of it. The important part is the binding of a rag near the distal end of the piston, which acts as a washer, and prevents the escape of air. This must be so adjusted that it allows the piston to pass smoothly down the cylinder when the piston-head is struck sharply with the palm of the hand, and it must not be so tight that there is difficulty in withdrawing the piston fairly quickly, nor so loose that air can escape from within.

RECORDS OF BRITISH COLEOPTERA.—In the *Entomologist's Monthly Magazine* for April Messrs. J. C. F. and H. F. Fryer record a species of weevil, *Sitones gemellatus* Gyll., from Sidmouth. Its occurrence in this country was scarcely to be expected. The only British species of *Sitones* with which it could be confused is *S. cambricus*, which lacks the mesosternal tubercle, and has the sides of the prothorax much more rounded. The same writers also record the very local beetle *Dibolia cynoglossi* from Chatteris, Cambs., where it occurs on *Galeopsis*. It is an extremely agile insect, and so quick in its movements that it is almost impossible to take it by ordinary sweeping. This may perhaps account for the absence of records in Britain, Cambridgeshire being apparently the first addition to its known distribution since Mr. Donisthorpe's discovery of it at Pevensy in 1902. Messrs. Fryer further record *Chrysomela marginata* at roots of *Reseda lutea* (?) in the Breck sand district, near Mildenhall. The record is not conclusive evidence as to the food-plant of this insect, but it is suggestive that the larval instars may be spent on that plant.

A TAXONOMIC STUDY IN THE CRUCIFERÆ.—Vol. 9, No. 3, of the *Annals of the Missouri Botanical Garden* is mainly occupied by a very full taxonomic study of the genus *Thelypodium* and its immediate allies (*Chlorocrambe*, *Caulanthus*, *Streptanthella*, *Warea*, and *Stanleyella*) by E. B. Payson, which has been carried out with the view of throwing light upon the phylogeny of the Cruciferae. The genus is characterised by the possession of a gynophore or stipe which raises the ovary and fruit above the torus; while sometimes nearly negligible, in the species *T. laciniatus* and *T. eucosum*, the stipe is usually more than two millimetres long. In view of the fact that a very characteristic stipe is frequently found in the *Capparidaceæ*, a close study of the species of *Thelypodium* would seem to be a necessary step toward the fuller examination of a favourite phylogenetic view which relates the ancestral form of the Cruciferae closely to the *Capparidaceæ*. It is further of interest to find that the characteristic septum traversing the pod in the Cruciferae shows a striking peculiarity in the genus *Thelypodium*, although no developmental series can be traced in this character and its interpretation is very difficult. Extending nearly or quite from end to end of the pod, through the middle of the septum, is a broad region composed of cells elongated parallel

to the marginal framework, and in this region the cell walls are more or less closely compacted. No species are now admitted to the genus *Thelypodium* that do not exhibit this type of septum.

A JOURNAL OF HELMINTHOLOGY.—The new *Journal of Helminthology*, edited by Prof. R. T. Leiper, is primarily intended as a medium for the prompt appearance of original communications by the staff of the Department of Helminthology at the London School of Tropical Medicine. Up to the present no British journal has dealt solely with this branch of parasitology, and Prof. Leiper is to be congratulated on this latest addition to scientific literature. The *Journal* is to be published bi-monthly, and the subscription is 25s. a volume. The first number (price 5s. net) contains five papers, three of which have a direct bearing on medical and veterinary science. Dr. A. J. Hesse contributes a paper on the free-living larval stages of *Bunostomum trigonocephalum*, a common intestinal nematode of the domestic sheep. Although this parasite is closely related to the hookworm, infection does not take place through the skin but by the mouth; moreover, the embryos at the infective stage exhibit negative thermotropism, whereas hookworm embryos are positively thermotropic. An epidemic of ascariasis on a skunk-farm has resulted in an inquiry, by Dr. T. Goodey and Mr. T. W. M. Cameron, into the morphology and life-history of *Ascaris columbiana*, a common parasite of the skunk. The results of their experiments indicate that the larvae of *A. columbiana*, in the course of their migrations in the body of the definitive host, pass through the lungs, as is the case with *Ascaris lumbricoides* and *A. megaloccephala*. Dr. M. Khalil re-describes a trematode (*Xenopharynx solus* Nicoll, 1912) from the gall-bladder of a "Hamadryad" (*Naja bungarus*); he also emends the genus *Xenopharynx*. Dr. G. M. Vevers contributes two papers. The first deals with the genus *Paragonimus*, which contains all the mammalian lung flukes of America and the Far East. He confirms Ward and Hirsch's view that the cuticular spines are the only trustworthy structures on which to distinguish the four species of the genus, and also suggests that more than one species occurs in man. His other paper contains a descriptive account of some new helminths from British Guiana.

LINKAGE IN SWEET PEA.—In a paper on linkage in the sweet pea (*Lathyrus odoratus*), Prof. R. C. Punnett (*Journ. Genetics*, vol. 13, No. 1) reviews the work begun by Bateson and Punnett nearly twenty years ago, much of which is now classical in the history of genetics. He considers the relation between the number of linkage groups and the haploid number (7) of chromosomes, and concludes that the two will eventually be found to correspond. The numerous pairs of characters such as purple-red corolla, long-round pollen, and erect-hooded standard are given new symbols according to the linkage group to which they belong, and provisional "chromosome maps" of five of the linkage groups are made, based on the percentages of crossing-over. The number of linkage groups at present appears to be eight, but there are several groups with as yet untested possibilities of low-grade linkage, and it is anticipated that the number of linkage groups will in this way be eventually reduced to seven, as the chromosome theory of heredity demands.

DESTRUCTIVE DISTILLATION OF BONES.—Mr. E. V. Aleksejevski, in the *Journal of the Russian Physical and Chemical Society*, 1921, vol. 53, describes a research he has carried out, at the request of the Russian Government, on the dry distillation of large quantities of bones which have accumulated in the towns of the Tersk district since 1914. He finds that the quality of the bone charcoal obtained is better if horizontal retorts are used, instead of vertical ones. The ammoniacal liquor produced by distillation from such retorts contains more than twice as much ammonia as was usually obtained by the old method. The bone charcoal left in the retorts has a medium carbon content, and possesses a high degree of efficiency as a decolourising agent, for which purpose it is used in the beet sugar industry. It may with advantage be used as a contact catalyst, as, for example, in the direct synthesis of phosgene from carbon monoxide and chlorine, or in any other reaction of gaseous combination. Its catalytic power is found in a number of cases to compare very favourably with that of cocoonut-shell charcoal, which is considered to be the most efficient carbon containing contact catalyst.

CORRELATION OF UPPER AIR VARIABLES.—Mr. P. C. Mahalanobis contributes two Memoirs to the Indian Meteorological Department (Volume xxiv. Part ii.) entitled "The Errors of Observation of Upper Air Relationships" and "The Seat of Activity in the Upper Air." He comes to the conclusion that Chapman's corrections to W. H. Dines's correlation coefficients are open to doubt. But he has fallen into error in stating that Douglas's coefficients are based on true heights. In a footnote in the Professional Notes of the Meteorological Office, No. 8, Douglas explains how he obtained his heights. He (Douglas), in the quotation given, merely meant that he did not use altimeter heights based on the erroneous supposition of a uniform temperature of 50° F. In the second Memoir Mr. Mahalanobis discusses the height at which the correlation coefficients between the five variables are numerically greatest and obtains a much lower value than 9 kilometres. However, he seems to have confused the T_m used by Dines, namely, the mean temperature between 1 and 9 kilometres, with the mean temperature between 0 to 9 kilometres, and this fully explains the discrepancies he finds. Leaving out the temperature of the first kilometre in forming the mean prevents the relationship between P_0 , P_9 , and T_m being a fixed one, whereas the relationships between the partial correlation coefficients given by Mr. Mahalanobis depend upon P_0 , P_z , T_z being connected by a definite equation. If these three quantities be rigidly connected, the connexion is equivalent to reducing the independent variables from five to four, and as a matter of course the partial correlation coefficients involving the three related quantities must be 1 or -1, and the second and third order partials must take the form found by Mr. Mahalanobis.

DEVELOPMENT CENTRES IN THE PHOTOGRAPHIC PLATE.—It is well established that photographic development starts at definite points or "reduction centres" in the individual grains of silver bromide. Silberstein favours the view that the corpuscular nature of light is the cause of this, while others regard these centres as pre-existing in the grains. The practical importance of the matter is that, if the latter is true, the emulsion maker may eventually be able to control the production and sensitiveness of these centres, and perhaps even to isolate them. Mr. Walter Clark, of the British Photographic Research

Association, gives some important results of his investigation of this question in the May number of the *Journal of the Royal Photographic Society*. He finds that a solution of sodium arsenite has no measurable reducing action on silver bromide produced by precipitation, and confirms the fact that a dilute solution of it applied to a plate renders the plate developable. This is evidence that there is in the plate something besides simple pure silver bromide, which is affected by sodium arsenite (as well as by light) to form development centres. By giving a plate a suitable exposure to light to render the centres developable and then treating the plate with chromic acid, the sensitiveness of the plate is reduced to a very low figure but always of the same order of magnitude if the action is thorough (the preliminary exposure is necessary). It appears probable that the chromic acid dissolves the "centres" produced by the exposure and that the low remaining sensitiveness is the sensitiveness of pure silver bromide.

MASS SPECTRA.—In a communication which appears in the May issue of the *Philosophical Magazine*, Dr. F. W. Aston gives an account of his work with the mass spectrograph to the end of 1922. The general technique has been in the main unchanged, but softer rays from the discharge tube are being used, and the photographic plates have had some of the emulsion dissolved from them to concentrate the sensitive grains more highly. Helium, nickel, lead, zinc, xenon, tin, iron, cadmium, thallium, selenium, tellurium, beryllium, aluminium, and antimony have been tested, and the constitution of nickel, tin, iron, selenium, aluminium, and antimony determined for the first time. Two new isotopes of xenon have also been discovered. Tin and probably iron show deviations from the whole number rule on the oxygen scale, and with hydrogen give three exceptions to that rule. A complete table of elements and isotopes determined by any of the positive ray methods up to the present time is given.

A FRENCH OIL-WELL.—In the *Comptes rendus* of the Paris Academy of Sciences of March 19, M. Ph. Glangeaud gives a note of the oil-well of Crouelle, near Clermont-Ferrand, Puy-de-Dôme, about which some paragraphs have recently appeared in the Press. The well-log is an interesting one, particularly from the geological point of view, and much information has been obtained regarding the Oligocene facies of the district between the Puy de Crouelle and the better-known Puy de la Poix. The beds traversed seem to belong to the Upper Sannoisien and Lower and Middle Stampien stages of the system, and, according to M. Glangeaud, recall in many respects similar Oligocene beds at Pechelbronn; further, the prevalence of abundant organic material and the conditions of sedimentation are cited as being distinctly favourable circumstances to the formation and accumulation of petroleum. The well was carried to a depth of about 856 metres, but operations were subsequently interrupted by casing breaking at 787 metres, which, with consequent water trouble, curtailed developments. Notwithstanding this, M. Glangeaud regards the results as being among the most important and encouraging yet achieved in this district, still an unknown factor as regards oil potentialities. Certainly the oil obtained from the well, both in quality and quantity, seems to augur well for future developments in the area, though on general geological grounds one can scarcely be optimistic as to the possibilities of a large field being discovered in this region of France.