

## Research Items.

**THE SAN BLAS INDIANS.**—Recent references to the San Blas Indians of Panama in connexion with the occurrence of "White Indians" in Darien, and their uprising against the control of the Panama Government a month or two ago, give a topical interest to an article on these tribes by Mr. A. F. Loomis in *Scribner's Magazine* for June. They now number about 30,000. Those who live on the coast are skilled sailors, their canoes, logs hollowed by elementary tools without keel or deck, going out to sea when the weather is too rough even for coasting-schooners. Little is known of them; no one not of their race is allowed to remain within their territory at night. The women wear gold nose-rings, but the most characteristic feature of their dress is an upper garment of appliqué work which is made of pieces of coloured material sewn on to a cloth foundation in most intricate and highly conventionalised patterns. Large flat discs of beaten gold are worn pendent from the ears. Armlets and anklets of beads are wrapped so tight as to stunt the extremities. The marriage ceremony consists in carrying the groom to the girl's house and placing him in her hammock, whence he flies for two nights in succession. On the third night he lifts her veil and sees her face for the first time. The next morning he leaves his father's house, and the eating of the meal the bride has prepared concludes the marriage rite. The son-in-law resides with the bride's father and virtually becomes his servant.

**EXCAVATIONS AT MARGIDUNUM.**—In describing pottery from a well of Claudian age at Margidunum (Notts) in the *Journal of the Society for the Promotion of Roman Studies*, vol. 13, pts. 1-2, Dr. Felix Oswald gives a brief account of the general results of his excavations, which have extended over several years. This camp formed a link in the chain of frontier posts established between Severn and Trent in A.D. 47. Previously it was unknown except by name. The site covers about 8 acres. The mud surface due to marshy ground was cleared away by the Romans and about six inches of river sand substituted. Drainage ditches flowing into the first of five outer ditches have furnished some of the earliest evidences of Claudian occupation in the pottery, which often shows La Tène features, Claudian sigillata ware, a coin of A.D. 41, and a tinned bow brooch almost identical with a tinned fibula from Ham Hill, Dorset, which has been dated A.D. 40-50. The persistence of La Tène features in the pottery suggests that local native industries were not suppressed but rather that there was an increased demand. Under Nero and Vespasian iron was smelted in rectangular pits with side gulleys exactly as in Africa to-day. The fort was twice destroyed by fire, possibly by Boudicca and by the Brigantes, and was abandoned before the end of the first century.

**A NEW BRITISH LAND PLANARIAN.**—Mr. E. Percival records (*Quart. Journ. Micr. Science*, March 1925) the finding of a new British land planarian—*Rhynchodemus britannicus*. He collected specimens in Yorkshire under large stones and logs which had lain undisturbed for a considerable time, always on moist clay or loam, and associated with earthworms and slugs, never with centipedes and carnivorous beetles. The planarian, which is extremely contractile, may attain a length of 90 mm., and is 1.5 mm. broad when in the extended condition. The anterior end tapers gently to a fine point, and just behind the tip is a single pair of minute eyes. The colour is variable—sulphur-yellow, salmon-pink, or dirty grey, and the ventral surface is paler, the mid-ventral

region being practically white. The mouth is mid-ventral and about the middle of the length of the worm, and the genital pore 5-8 mm. farther back. Mr. Percival gives a brief account of the anatomy, which is similar to that of other species of *Rhynchodemus*. The cocoons are 2 to 3 mm. in diameter. The planarian feeds on earthworms, sucking up the partly decomposed tissues of the worm and leaving only the cuticle, but how the worms were killed could not be ascertained. In one specimen many spores of a gregarine, probably *Monocystis*, were present in the endoderm cells, no doubt ingested while feeding on an earthworm. Two examples of this new species have also been collected at Stockport, and the author thinks that a specimen found at Plymouth probably also belonged to this species, in which case this new planarian would appear to be widely distributed in England.

**THE DEVELOPMENT OF EGG FRAGMENTS.**—Prof. C. V. Taylor and Prof. D. H. Tennent give a preliminary report (*Carnegie Institution of Washington*, Year Book 23) on the development of fragments of the egg of the sea urchin *Lytechinus (Toxopneustes) variegatus*, which they studied in the Tortugas Laboratory. The methods of micro-dissection were employed, *i.e.* the eggs were cut with very fine glass needles manipulated in a moist chamber on the stage of the microscope under fairly high magnification. A preliminary experiment was carried out to ascertain whether the operative technique would cause the parthenogenetic development of the egg; 50 eggs were pricked with the tip of the micro-needle but none developed. Eggs were transected in the vertical or the horizontal plane into two halves, one nucleated and the other not. When these halves, transferred to watch glasses, had rounded off, sperms were added, and by careful treatment many fragments both nucleated and non-nucleated were reared to the pluteus stage. 122 pairs of such fragments were studied. Cleavage followed insemination in 74 of the nucleated fragments and in 66 non-nucleated portions. The cleavage of both fragments is not, as stated by Delage, identical and as in the normal egg—one of the fragments follows the normal mode, but in the other the cleavage which should have given rise to the micromeres was an equal division of the cells of the vegetative half, and this division occurred shortly after the equal division of the four cells of the animal half of the fragment.

**BIRDS AND BUTTERFLIES OF EAST AFRICA.**—The *Journal of the East Africa and Uganda Natural History Society* takes a high place among publications devoted to the description and bionomics of local fauna. A recent issue (No. 21, March), under the editorship of Dr. V. G. L. van Someren, contains the opening parts of two excellent faunistic papers, dealing respectively with the birds and butterflies of Kenya and Uganda. The former of these papers, which is the work of the editor, gives a good account of the Guinea-fowls of the region, and is illustrated by a plate representing seven of the species, together with a diagram explaining the nomenclature of the external parts of a bird, and a chart showing the elevations from the lake level to the coast at Mombasa, with the various avifaunal areas. Careful descriptions are given of the adult and the successive immature stages of the plumage in each species, and valuable notes are appended on the distribution, courtship, nesting, and feeding habits of this characteristically African group of game-birds. The following paper, on the butterflies of the same region, is the joint work of Canon K. St. A. Rogers and Dr. van Someren. The

species dealt with are those of the genera *Danaiida* and *Amauris*. An admirable series of photographs accompanies the paper, in which are depicted numerous examples of the eggs, larvæ, and perfect insects of many of the forms described. As in all the work of Canon Rogers, great attention is paid to points of bionomic interest, and we may be permitted to trace in his careful notes on distribution, mode of flight, relative distastefulness, mimicry, etc., the influence of the Hope Department at Oxford, the studies pursued in which place owe so much to the activity and perseverance of Canon Rogers as a collector. It is to be hoped that these contributions to the natural history of East Africa, so well begun, may be pressed to an equally valuable conclusion.

**VIRUS DISEASES OF THE HOP.**—E. S. Salmon and W. M. Ware briefly describe two virus diseases of the hop, "nettle head" and mosaic, in the *Gardener's Chronicle* for May 9. In connexion with the interesting work they are doing at Wye in raising new strains of hop of commercial promise, the authors had occasion to send out a new seedling for trial in the hop-gardens. This seedling, while itself apparently resistant to mosaic, has thus come under suspicion as a carrier of mosaic to the susceptible varieties around it, thus recalling Bewley's experience with tomato plants and the similar suggestion made by Atanasoff (*Phytopathology*, March 1925) that the potato varieties Ashleaf and Koksiaan (equivalent to Jersey Non Such), themselves very resistant to stipple-streak, may transmit it to varieties, which are then swept away by its ravages. Only experiment can settle such questions, and as virus diseases are most certainly transmitted by grafting, Salmon and Ware describe successful methods for grafting hops.

**RHODODENDRONS FROM KWEICHOU, CHINA.**—Twelve more flowering plants are figured in the plates in Part III. of Volume 150 of *Curtis's Botanical Magazine*; they range from an old-established horticultural favourite like *Begonia manicata* Linn., introduced from Mexico before 1840, to a cultivated cypress drawn from the temple groves of Yunnan, China, *C. Duclouxiana* Hickel. A rhododendron from the Chinese province of Kweichou, *R. Lyi* Léveillé, provides the occasion for a very interesting discussion by the editor, Dr. Otto Stapf, of the limestone area in this province, studied first by the French missionaries and later also described by Sir Alexander Hosie in his book "On the Trail of Opium." Kweichou has the reputation of being one of the deforested provinces of China, but in this dry limestone plateau, with peaks climbing to more than 2000 m., with a temperate climate save in the deeply cut valleys where it is subtropical, rhododendrons are described as growing in profusion. The limestone is said to be triassic in character. It will be interesting to learn whether the rhododendrons gathered from this area prove tolerant of limestone soils in Great Britain.

**RATOON COTTON.**—Some observations upon the fibre obtained from ratooned cotton plants in Queensland were mentioned recently in these columns (*NATURE*, January 31, p. 171). James Templeton, botanist to the Ministry of Agriculture, Egypt, in Bulletin No. 55 of the Technical and Scientific Service of the Ministry, discusses the causes which have led to the disappearance of ratooned cotton from the Egyptian supply. Templeton points out that after its introduction in 1921, cotton was usually grown as a perennial crop, and that the change to cultivation as an annual may be traced to a practice prevailing upon the better lands when the cultivators were compelled by Mohammed Aly to grow the plant, although

then a relatively unprofitable crop. The perennial method of cultivation still persisted over large areas, until prohibited by the Government in 1912 as part of a campaign against insect pests thought to be harboured over winter by the standing crop. Templeton finds no evidence that the cultivation of the plant as a perennial was given up because ratooned cotton proved to be of inferior quality. As the result now of actual experiment he records with Sakellarides an increased yield of lint in the second year with quality probably not inferior. Furthermore, in the second year, the loss from boll-worm attack has not been so great as in the first year.

**EXTINCT ELEPHANTS IN ENGLAND.**—The elucidation of the inter-relationship of the many forms of Pleistocene elephants is a most difficult problem, especially when it is remembered how fragmentary the evidence is. A valuable paper has recently been published by Dr. Sandford in the *Quarterly Journal of the Geological Society*, vol. 81, No. 321, on "The Fossil Elephants of the Upper Thames Basin." This paper, together with one on "The River Gravels of the Oxford District" in the same journal for 1924, form an opening attack by Dr. Sandford on the general problem of the evolution of the elephants of the period. The author finds *E. antiquus* of an archaic type in the Handborough Terrace Level and in the Wolvercote Channel, a later level, specimens of a smaller form of the species which appear to be akin to the small form found at Barrington and in the Forest Bed. *Elephas primigenius* occurs in the Summertown-Radley Terrace and *E. antiquus* is again found in a level overlying this, which points to a warm phase following a colder one.

**TIDES AND CURRENTS IN NEW YORK HARBOUR.**—Under this title the U.S. Coast and Geodetic Survey has recently published a connected account by H. A. Marmor of the chief movements of the various tidal waters in the neighbourhood of New York. Observations at a large number of stations both on shore and off shore have been taken at various times, partly by the Survey itself and partly by the U.S. Engineer Office, and these afford material for a descriptive account which is exceptional in its completeness. An idea of this completeness may be gathered from the fact that the pamphlet contains 70 tables and 52 diagrams. Fort Hamilton, which occupies a central position in the region considered, is chosen as the standard station, and the characteristics of the tidal elevation at this place are summarised in 48 non-harmonic constants. Harmonic constants are given for the currents at Scotland Light Vessel, Ambrose Channel Light Vessel, and the Narrows, the results for each of the first two of these stations being based on hourly observations extending over 87 days. In several instances the elevation-gradients transverse to the current are connected with the currents and the earth's rotation in close agreement with dynamical theory. The currents in East River turn about half an hour after the waters at its two ends reach the same level, while the non-periodic flow from the Hudson River decreases in strength from the surface downwards. The monograph closes with a set of 13 maps, showing the states of the tide and current for each hour relative to the time of high water at Fort Hamilton. The pamphlet is well written and shows a regard for precision which is very welcome.

**MEASUREMENT OF ATMOSPHERIC HUMIDITY.**—Hygrometric tables have been prepared by the Meteorological Office, Air Ministry, for the computation of relative humidity, vapour pressure, and dew point from readings of dry and wet bulb thermometers



exposed in Stevenson screens (H.M.S.O., *rs. 6d. net*). The tables have been brought into use for obtaining data for publication from the commencement of the current year. Hitherto the tables in use in Great Britain were based on constants known as Glaisher's factors, said to be drawn up on an empirical formula. The new tables have been freshly computed on the basis of Regnault's formula and may be taken as practically identical with similar tables prepared by the Austrian Meteorological Service—with a light air blowing. They are not suitable for factories or store-rooms, unless precautions are taken to secure adequate motion of the air. The tables are, strictly, more scientific than those hitherto used in England and are in agreement with the best in use in other countries. Formulæ are given so that in countries where temperatures are common outside the scope of the tables, it is recommended to expand the table by computing other values. The preface by Dr. G. C. Simpson, the Director of the Meteorological Office, states that the results given by Glaisher's tables are in practical agreement with those obtained from the most recent tables based on Regnault's formula. Hygrometric tables based on Glaisher's factors were expanded and issued for private circulation by the Meteorological Office nearly half a century ago, and it is a satisfaction to know that the results used for so many years differ so slightly from the results which are the best obtainable to-day. The tables are very concise.

**VAPOUR PRESSURES OF FUEL MIXTURES**—Considerable attention has in recent years been devoted to the problems of vapour pressure of those liquids or liquid mixtures used as fuels in internal combustion engines. Such matters as loss incurred on handling or storing fuel, internal pressures developed in tanks or other containers used for transporting fuel, fire risk, and the facility with which fuel is vaporised in carburettors all depend on the vapour pressure of the liquid at or just above ordinary temperatures. Mr. J. Stanley Lewis discussed this subject recently at the Institution of Petroleum Technologists, and gave the results of several careful vapour-pressure determinations on binary and ternary mixtures. Starting with hexane and benzene, he showed that there is a rise in vapour pressure caused by traces of water, and that calcium chloride as a desiccant is inefficient. The author employed phosphorus pentoxide more satisfactorily in this connexion. He next gave results of vapour-pressure determinations on fractions of petrol and mixtures of the fractions, on mixtures of benzene with hexane and cyclohexane, and on motor benzol with No. 1 and No. 3 petrol. Other mixtures investigated include benzene and alcohol, ethyl alcohol and No. 1 petrol, ethyl alcohol and No. 2 petrol, and alcohol and water. An example of a ternary mixture is given by the fuel benzol and alcohol plus the small amount of water existent in commercial alcohol, while a petrol-alcohol-water mixture constitutes a similar case. Briefly stated, the addition of one component to a mixture of the other two raises the vapour pressure, and for a given concentration of a ternary mixture there will be a fourth (highest) maximum vapour pressure. In binary fuel mixtures, where the two components are completely immiscible, the vapour pressure of the mixture is the sum of their partial vapour pressures; where there is partial or complete miscibility the vapour pressures vary according to the degree of concentration of the components, and may lie between or be higher or lower than that of either component.

**FATIGUE STRENGTH OF STEELS**.—Messrs. Aitchison and Johnson presented the results of an investigation

on "The Effect of Grain upon the Fatigue Strength of Steels" at the May meeting of the Iron and Steel Institute. This work was carried out on behalf of the Engineering Research Board of the Department of Scientific and Industrial Research, which made a grant towards its cost. The test results have been obtained by examining a complete series of specimens, commencing with a large steel cast ingot, followed by specimens at different stages of forging, the final specimen representing a reduction in cross-sectional area of 96 per cent. of the original casting. In addition, tests were made upon commercial mild steels, high quality nickel chromium steel, Staffordshire wrought irons, and Armco iron. The report deals mainly with the mechanical properties, particularly the fatigue strength of steels when tested parallel to and at right angles to the direction of elongation during forging. The authors find that the direction of the grain has a marked influence upon the ductility recorded in the tensile test, and upon the toughness as measured by the impact test. The maximum stress of the material is not appreciably different in the two directions, nor is there such a large difference in the fatigue strength as had been anticipated. The authors always found that the values of this property were higher in specimens cut parallel to the direction of forging than in those cut at right angles. The maximum difference found is 16-17 per cent.

**LITHIUM SOLUTIONS IN LIQUID AMMONIA**.—C. A. Kraus and W. C. Johnson have recently measured the vapour pressures of solutions of lithium in liquid ammonia. The results, published in the March issue of the *Journal of the American Chemical Society*, afford no evidence of the existence of compounds of the alkali metals with ammonia of the nature of ammonium groups. The saturated solution contains 3.61 molecules of ammonia per atom of lithium.

**MAGNETIC PROPERTIES OF SILVER HALIDES**.—Recent work by A. Garrison, recorded in the March issue of the *Journal of the American Chemical Society*, shows that silver chloride is diamagnetic and becomes less so on illumination, whereas the bromide and iodide are slightly paramagnetic and become more so on exposure to light. These changes on illumination are instantaneous. It is pointed out that a change in the magnetic permeability would naturally accompany an increase in electrical polarity, an occurrence which is suggested by the fact that the absorption of light causes the halides to be more soluble in water and better conductors of electricity.

**SOAP SOLUTIONS**.—An interesting paper by J. W. McBain and G. M. Langdon on the equilibria underlying the soap-boiling processes appears in the *Journal of the Chemical Society* for April. The investigation consisted in the examination of the sodium palmitate—sodium chloride—water system, and phase rule diagrams are given for a series of temperatures. In any soap system the following phases can exist: lamellar crystals, crystalline curd fibres, anisotropic liquid "neat soap," anisotropic liquid "middle soap," and isotropic liquid. Soap-boiling operations depend on the equilibria between these phases. "Neat soap," "middle soap," and "isotropic solution" are three forms of soap solution proper; the first two are anisotropic (doubly refracting). Isotropic liquid solutions of sodium palmitate form a phase which includes wholly colloidal and wholly crystalloidal solutions within the temperature range investigated. Pure water and pure anhydrous liquid sodium palmitate are miscible in all proportions above 316°. The contents of the commercial soap pan behave approximately as a simple three component system, apart from crystallisation.