

Research Items.

WEST INDIAN STONE COLLARS.—An interesting suggestion relating to the origin of the 'stone-collars,' which are a problem in West Indian archæology, is made by Mr. A. D. Russell in *Man* for December. The collar stone is an object in shape much like a horse collar, but obviously too small for that purpose, and unsymmetrical in shape, being bent to one side at the narrower end. Various theories as to their origin have been put forward. Mr. T. A. Joyce has suggested that a wooden mechanism is indicated, two unequal ends of the fork of a tree being bent round and fastened together, the part of the tree cut off below the fork being represented by the protuberance called by some archæologists the 'shoulder.' It is here suggested that this wooden mechanism was a tree climber, which is symbolised by the stone collar. This might more accurately be termed a belt or cincture. The palm climber of West Africa and the West Indies, with which the collar is compared, is made in two pieces. Two lengths of supple wood are bent into a long oval hoop, the two ends on the right side being secured by a permanent fastening, those on the left being done up and undone as need requires. The identity of the palm climber in West Africa and the West Indies is scarcely to be explained as introduced by the slave trade, since the archaic stone collar proves its existence in the latter area before slaves were introduced.

MOHAMMEDAN CHILD-KILLING DEMONS.—In *Man* for November, Mr. W. Ivanow points out that Persia has preserved under a Mohammedan cloak many customs and beliefs descended from a remote antiquity. A great deal of this material is to be found in the literature and, especially, in manuscripts. In support of this, extracts are given from a rare medical treatise, written at Delhi in 1376, which reveals some peculiar beliefs relating to the supernatural malevolent beings causing death or harm to young children. The work is called "The Comfort of Man," the author being Abdu'l-Qawi ibn Shihâbi'd-din, surnamed Ziya. All evil beings are divided into five classes. The vampires attacking children belong to the fifth class of *divs* and *peris*. Of these there are two divisions, shapeshifters or were-hyenas (*Kaftâr*) and Ummu's-sibyan, called in Arabic "the mother of children," probably an ancient conception of the spirit causing the premature death of new-born babes: apparently Lilith, the Lamia, or the Strigil. According to Ziya she is the mother of devils and has seventy-five baby-divs at her breast. When a woman gives birth she may, if not watched, substitute a *div* for the human child. Burnt hair from the back of a black cat will drive her away. The *Kaftâr* or hyena, a rare animal in Persia, seems to imply a witch, but it has not much connexion with lycanthropic ideas. References to it are rare in Persian literature, and it is doubtful if the belief survives among the people to-day, unless it is under another name.

SPERMATOGENESIS IN THE MOUSE AND THE RABBIT.—K. Masui (*Jour. Coll. Agr.*, Imp. Univ. Tokyo, 8, No. 2, 1923, just received) undertook a reinvestigation of the spermatogenesis of the mouse and of the rabbit, chiefly with the purpose of studying the chromosomes. Measurements of the spermatogonial chromosomes show that these are in pairs and that there is a constant relation between their size and their form. Two special chromosomes are probably the sex chromosomes. The observed variation (44 to 54) in the number of chromosomes in the rabbit is attributed to the fragmentation of certain chromosomes caused by the fixation. The diploid number

in the mouse is 40. The conjugation of the chromosomes probably takes place by telosynapsis in the mouse and by parasynapsis in the rabbit. From the behaviour of the sex chromosomes it is suggested that dimorphism of the sperm results. The mitochondrial granules do not originate from the nucleus in the early stages of the spermatocyte, but exist in the cytoplasm from the beginning.

PHYLOGENY AND CLASSIFICATION.—In an extended discussion of phylogeny and the natural system, Dr. W. B. Crow (*Jour. of Genetics*, vol. 17, No. 2) reviews the various conceptions of phylogeny and their relation to classification. He covers a wide field of reference with relation to plants and animals, but occasionally betrays an inadequate first-hand acquaintance with the various interpretations placed upon the variations he is discussing. His paper serves, nevertheless, to focus attention afresh upon phylogenetic problems. He points out the inadequacy of causal morphology without an historical background to explain the problems of relationships, and shows, *e.g.*, that there are good reasons for concluding that such a simple colonial form as *Pleurococcus* has been derived by reduction from filamentous ancestors. He emphasises the principle of Cope, that in tracing the descent of genera, purely specific characters should not be taken into account, and similarly concludes that, in tracing the phylogeny of species, no account should be taken of the genealogy of individuals. This leads to a discussion of Mendelism from a phylogenetic point of view, and the recognition that the genealogy of gametes has its bearing on the phylogeny of characters.

TERTIARY SHELLS FROM JAPAN.—A number of fossil mollusca and brachiopoda from beds in the island of Sado, off the coast of Echigo, Japan, have been described by Prof. Matajiri Yokoyama (*Jour. Fac. Sci.*, Imp. Univ. Tokyo, Sect. 11, Geol., etc., vol. 1). These fossils come from the Sawané formation, and the author concludes that their geological horizon corresponds to the Musashino (Pliocene) of the neighbourhood of Tokyo. Following the few "general remarks" and table of distribution, the paper consists of descriptions of 149 species of mollusca and brachiopoda, including a goodly number believed to be new and figured on the six accompanying plates. There is also a good index.

MARINE SHELLS OF THE W. COAST OF N. AMERICA.—The first volume of what promises to be a most important manual on "The Marine Shells of the West Coast of North America" (*i.e.* Canada and the United States, but not Mexico), dated 1924, has only just reached us. It is published by the Stanford University and in somewhat Gilbertian manner forms No. 1, vol. 1, of the "Geological Sciences" series, and has been compiled by Mrs. Ida S. Oldroyd, the Curator of the Geological Museum. When completed the work will cover in extended form the same ground occupied by the 'Summary' by Dr. Dall, issued in 1921 (*U.S. Nat. Mus. Bulletin*, 112) with the addition of the Brachiopoda. The classification followed, though not so stated, is that of the same veteran conchologist, first proposed in 1895 (*Trans. Wagner Free Instit.*, vol. 3, No. 3). The major divisions above genera are not defined, but each genus is, while with each species is given the original reference and description, supplemented where necessary from other sources, followed by the citation of the type and type locality, with its 'distribution' (or 'range' as alternative term) and 'range in time.'

It is stated that some new species described by Dr. Bartsch are included, but apparently not in the present volume, which deals only with the Pelecypoda and Brachiopoda. To the 247 pages of text there are appended 57 plates of unequal merit that do not proportionately enhance the value of the volume, while the individual members of a genus, instead of being figured together, are peppered indiscriminately among the plates, sometimes widely apart. The task of bringing together this mass of material must have been enormous, and Mrs. Oldroyd will receive the cordial thanks of all fellow-workers, who will impatiently await the issue of the further volumes.

ISOSTASY IN SPAIN.—A recent report on the isostatic reduction of gravity stations in Spain (*Mem. del Inst. Geog. y Cadastral*, Madrid, vol. 15, 1926) is summarised and commented upon by W. Bowie in the *Am. Jour. Sci.* for October 1926. The computations were made by the U.S. Coast and Geodetic Survey. The method of least squares shows that the most probable depth of compensation is 96 km. as in the United States. The average anomalies are +0.011 with regard to sign and 0.032 without regard to sign, the corresponding United States figures being -0.006 and 0.021 respectively. It is noteworthy, in looking for an explanation of the residual anomalies, that the Spanish stations on pre-Cambrian formations give an average anomaly of +0.047, while those on Tertiary formations give -0.033. Anomalies have also been computed for depths of compensation ranging from 56.9 km. to 184.6 km. Very little difference was revealed by the results, except for the greater depths where the larger anomalies became exaggerated and nearly all became positive. The recent tendency towards adopting a smaller depth of compensation than those formerly advocated thus receives support.

ISOLATION OF ELEMENT 61.—Since the appearance of a preliminary note on the independent isolation by Rolla and Fernandes of element 61, mentioned in NATURE, December 4, 1926, p. 820, we have received a fuller account of their investigation in the September issue of the *Gazzetta Chimica Italiana*. The paper contains diagrams of spectra and a chart illustrating the long series of fractional crystallisations to which the didymium earth was submitted. Among the peculiarities displayed by the absorption spectra of the extreme fractions may be mentioned the strong absorption bands in the yellow, attributed up to now to neodymium, which by dilution of the solution are divided up into numerous lines having for the various fractions very diverse relative intensities. The peculiarities of these fractions are identical with those which are attributed to the presence of element 61.

PROPERTIES OF ACETONE.—Some accurate values for the vapour pressures and densities of acetone from about -80° to +60° appear in the *Journal of the American Chemical Society* for November. These are intended to replace the existing data, among which considerable discordance is noted. The determinations were carried out by Felsing and Durban in calibrated apparatus to which the acetone, purified and dried by distillation and by crystallisation as the acetone-sodium iodide addition compound, was transferred by direct vacuum distillation. The measurements were carried out in two types of cryostat, one containing liquid paraffin and kerosene for temperatures above 0°, and the other containing ethyl bromide for the lower temperatures. The solubility of carbon dioxide in acetone was also determined over the range -75° to +20°, and the latent heats of evaporation at different temperatures were calculated

from the vapour pressure data by means of the Clausius-Clapeyron equation.

LOW-TEMPERATURE CARBONISATION RETORT.—In pursuance of a policy of the Department of Scientific and Industrial Research adopted in 1924 (NATURE, September 20, 1924, p. 441), the Director of the Fuel Research Board has issued a report (H.M. Stationery Office, 9d. net) on a test on a 'Fusion' rotary retort for the carbonisation of fuels at low temperatures. The retort, installed at the works of Electro-Bleach and By-Products, Ltd., Cleford, consists of a horizontal externally heated rotary cylindrical retort, through which the material passes while stirred and kept from lodging on the walls by a special type of 'breaker.' The retort was rated to treat 5 tons per day, but in the test 3.4 tons of Welbeck Cannel was put through. 50 gallons of tar and oil was collected per ton, and it was shown that the recovery might have been increased to 54 gallons. 2740 cub. ft. of gas of calorific value 1070 B.T.U. per cub. ft. (gross) was obtained. No operating difficulties of any great consequence were noted. The test showed that a good yield of liquid products was obtained, but the solid product was in a finely divided form as a result of the action of the breaker and probably suitable for pulverised fuel firing. This may be satisfactory when dealing with a non-caking low-grade fuel, such as was used here. It restricts the scope of the process, which scarcely seems adapted to produce a smokeless domestic fuel.

THE SHOCK-WAVE FOLLOWING DETONATION OF HIGH EXPLOSIVES.—What is the nature of the 'shock-wave' sent out by the detonation of a high explosive? How far and at what speed does it travel? How is it that the flame from a high explosive may apparently penetrate a region occupied by an explosive gas mixture without igniting it? These are some of the problems raised by the use of high explosives in fiery mines, and they are problems which have not yet received authoritative answers. Indeed, it may be said that, until the recent work inaugurated by Prof. R. V. Wheeler, of the Safety in Mines Research Board, the functions of the shock-wave have not been so fully studied in England as they have been abroad, especially in France, where *l'onde du choc* has received both theoretical and practical investigation. The Mines Department has now issued a paper (No. 29) forming Part 2 of the research "On the Pressure-wave sent out by an Explosive," by W. Payman and W. C. F. Shepherd, assistants at the Mines Experimental Station. An apparatus has been constructed whereby the flame issuing from a high explosive has been directly photographed on a moving film, which at the same time registers the passage of the preceding shock-wave by *Schlieren* photography and also the movements of the products of combustion, since these were found to be opaque to the arc-light which gave the *Schlieren* effect with the pressure wave. It was thus possible to measure the speed of the shock-wave sent through the air by the explosion of a No. 6 Detonator, and its gradual slowing down as it travelled away from the experimental tube. The expanding products of combustion closely follow the shock-wave from the mouth of the tube, but soon begin to fall behind it. Behind the products of combustion the visible flame issues from the tube, and never gets in front of the products. This explains why a No. 6 Detonator will not ignite firedamp mixtures, since the inflammable gas would be shielded from the flame by an extinctive blanket of burnt products. The speed of the shock-wave as it starts through the open air was found to be roughly twice the velocity of sound.