

Research Items.

MUSIC OF THE SAN BLAS INDIANS.—Advantage was taken of the opportunity afforded by the presence of Tule Indians of Panama in Washington in 1924, to investigate their physical characters and certain aspects of their culture. It will be remembered that the chief point of interest about these Indians, who were brought to the States by Mr. R. O. Marsh, centred in the question whether there was among them a truly 'white' element, as Mr. Marsh claimed. Observations on their music were made by Frances Densmore, and these are now published as No. 11, Vol. 77 of the *Smithsonian Miscellaneous Publications*. The "official musicians," with the chief and the doctors, are the most important people in the villages. Of these the chief may act as a doctor, but not the musician. There are four musicians, two "Chief" and two "Assistant Musicians," in each village who know the songs and teach them for pay. Social gatherings, weddings, etc., are attended by one chief and one assistant musician, never more, for the entertainment of the people. In addition to the songs sung for entertainment there are songs with a definite purpose, such as the treatment of the sick, and songs sung as "charms" which are sold by the doctors. The principal instruments are the flute and the panpipes. The man from whom the songs in the present record were obtained was an amateur who had learnt his songs, some thirty in all, from the official musician. The first song he had learnt was that which brought success in catching a turtle. He also learnt the medicine man's songs, though not himself a medicine man. These include songs to make medicinal herbs effective, to cure headache and other ailments, and the songs that were sung after a man's death. The vocal and instrumental music of the Tule Indians is a form not hitherto recorded. It appears that though the substance of the words and the general character of a song is learnt, each performance is an improvisation. The tone is artificial and extremely difficult to acquire. It is very hard, with a pinched forced quality. The principal occasions for singing were the treatment of the sick, the scene after a burial, the maturity of a young girl and her wedding.

THE AUSTRALIANS AND SOUTH AMERICA.—In No. 18 of the *Compte rendu sommaire de la Société de Biogéographie*, Dr. Paul Rivet discusses the possible routes which might have been followed by the Australians in the migrations postulated to account for the Australian linguistic elements which he claims to have discovered in the language of the Ona of Tierra del Fuego. The sea route across the Pacific is out of the question in view of the scanty equipment of the Australian for navigation. No evidence can be brought forward to support the view that the Australians entered America from the north as did the immigrants from Asia. A third hypothesis was suggested by Mendez-Correa, namely, that they came by the south. The journey might have been performed by making use of the islands of Auckland, Campbell, Macquarie, Emerald, Wilkes Land, King Edward VII. Land, and Grahamland as stages. The powers of endurance of cold displayed by the Ona, which surpass those of the Eskimo, might be a result of a prolonged sojourn in these inhospitable regions. In present conditions, however, it is difficult to admit that the islands and shores of the Antarctic are habitable. It is, therefore, desirable to investigate whether there has been a change in climate in this area sufficiently recent for linguistic resemblances to survive, or

whether there has been a glacial extension sufficiently marked to shorten the crossing by sea and on which the people could have found game for their subsistence. In discussion it was suggested that the zoological evidence pointed in the direction of this hypothesis and possibly to an extension of Tasmania to the Antarctic, while the geographical and bathymetric distribution of echinoderms suggested a more temperate climate and warmer water at one time in the Antarctic area.

EARLY DEVELOPMENT OF HUMAN EMBRYO.—In the latest volume of "Contributions to Embryology" (Vol. 17, 1926, *Carnegie Institution Publication*, No. 362) Profs. G. W. Bartelmez and H. M. Evans have published a detailed account of the development of the human embryo during the period of somite formation, including embryos with two to sixteen pairs of somites. The material dealt with comprises twenty-five embryos belonging mostly to the collections of the Department of Embryology of the Carnegie Institution and the Department of Anatomy at the University of Chicago. The memoir, which is illustrated by a fine series of plates, deals with many points of interest. It is shown that the cranial flexure is present from the beginning of somite formation, and is due primarily to the more rapid growth of the dorsal as compared with the ventral lamina of the mid-brain folds. The asymmetry, which in the case of the neural folds is a striking feature of the external form, is quite as marked in other systems. It is interpreted as due to localised differences in the rate of growth on each side. Differentiations in the ectoderm foreshadow certain regions of the head, and definite parts of these contribute to the formation of certain of the cranial ganglia in the 16-somite stage. The closure of the neural folds begins at the level of the fourth pair of somites in the 6- to 7-somite stage, and the neural crest is proliferated at about the same time. The origin and early development of many other structures are described in detail, and their phylogenetic and physiological significance are pointed out. Owing to the comparatively large amount of material available, the time-sequence in which the various parts appear has been traced far more fully than in any previous accounts of early human development.

NEUROGLIA CELLS.—Those who are interested in the study of neuroglia will welcome the paper by Dr. C. Da Fano in the current (June) issue of the *Journal of the Royal Microscopical Society*, in which the recent methods for demonstrating the neuroglia cells are carefully described. These methods were devised by Cajal and Del Río-Hortega, but Dr. Da Fano has given due weight in his account to his personal experience gained chiefly through a short stay in Del Río-Hortega's laboratory in Madrid. It is impossible to give a summary of the methods; the paper, which is illustrated by eight figures, should be consulted for the details of the several processes.

SOUTH AFRICAN MOLLUSCA.—Two papers on mollusca from South Africa appear in the *Annals of the Natal Museum*, vol. 5. Mr. J. R. le B. Tomlin contributes a paper on marine forms, including the description of eleven supposed new species, and one new genus belonging to the Tectibranchiata. This last, *Alexandria natalensis*, n. gen. et sp., the author places in the Acteonidæ on account of the shell apex, the radula and operculum. The paper is illustrated by one of Miss G. M. Woodward's excellent plates. Mr. H. C. Burnup supplies Part 2 of his memoir

"On some South African Gulellæ, with Descriptions of Some New Species and Varieties." The genus Gulella was formerly reckoned as a section of the genus Ennea, under which name most of the numerous species were formerly described. The fascinating little group, which externally calls to mind the British 'chrysalis shells,' is remarkable for the armature of the mouth, which in some is so studded with teeth that the occupants must be seriously incommoded when issuing or retreating. Twelve species are dealt with in this instalment, of which four are described as new, and the whole illustrated by the author on a plate of 39 figures.

COPEPODS IN THE BAY OF BISCAY.—In his account of the Copepoda from the collections made by Dr. G. H. Fowler on board H.M.S. *Research* in the Bay of Biscay in 1900, Mr. G. P. Farran (*Journal of the Linnean Society (Zoology)*, vol. 36, April 1926) not only enumerates the various species but also gives most valuable data concerning their diurnal and nocturnal movements; thus treating the subject in a somewhat similar manner to that employed by Dr. Fowler himself for the Ostracoda in the same collections (1909). The samples were all taken in July, approximately in the centre of the Bay of Biscay, mainly along a diagonal line about 65 miles in length from the N.W. to the S.E. corner. The soundings taken lay between 1219 and 2341 fathoms, and the author divides his material into the epiplankton hauls made chiefly down to 100 fathoms with horizontal non-closing nets which lasted an hour or more, and the deep water hauls, almost all of which were made with closing nets hauled vertically. The former could not be treated quantitatively, but in the latter all the copepods were counted. The copepod population from the surface to 100 fathoms was found to be approximately doubled during the night by an upward migration consisting mainly of *Metridia lucens*, *Pleuromamma robusta* and *P. gracilis*, and from 50 fathoms downwards, *Undeuchaeta minor*, several other species joining in the migration. In the deep water hauls a number of little-known forms are noted whilst the new genus Bathydia and fourteen new species are described, three of which belong to Calocalanus and five to Scolecithrix. The view that *Aegisthus dubius* is the male of *A. mucronatus* has been rejected by Sars, but the present author seems to have good cause to regard the question as still an open one.

FISHERIES AROUND GREENLAND AND ICELAND.—The report of the North-western Area Committee (*Conseil Internat. Expl. Mer*) for the years 1924 and 1925 contains seven papers dealing with the hydrographical and biological researches undertaken in Greenland and Iceland waters. Hydrographical observations in the Faroe-Shetland Channel on May 3-14, 1924, showed that the water at the surface was composed of Atlantic water, while that at the bottom was bottom water from the Norwegian Sea. Between the two there was an intermediate layer formed by the mixing of Atlantic and bottom water with water introduced from the east Icelandic Arctic current. The biological part of the report deals with the five species of fish under the Committee's observation, namely, cod, halibut, herring, haddock, and plaice. It seems now beyond doubt that a particular stock or population of cod exists in Greenland which is indigenous to the waters of western Greenland. In Iceland, however, an almost unparalleled density of young cod is experienced off the north and east coasts, in spite of the fact that very few cod-eggs are spawned there. Thus, the stock is recruited by drift, and the quantity must depend on the success

of this drift. Faxø Bay, at the south-west part of Iceland, has proved to be a most important nursery-ground for the halibut, and there is little doubt that an enormous destruction of undersized halibut is caused by trawling operations in this area. The herring investigations are said to establish the fact that there are two distinct races of herrings in Icelandic waters, a spring herring and a summer herring, and that, as yet, no characters are known by which the Iceland spring herring can be distinguished from the Norwegian spring herring. Interesting figures from the estimations of age of haddock in Icelandic waters, in material collected over a number of years, show the way in which certain year-classes dominate. Thus, material of 1908-1909 showed an absolute dominance of the 1904 year-class, while that of 1924 indicated the predominance of the 1922 year-group. The study of the growth of haddock reveals the fact that growth is greatest off the south coast. Samples of plaice from Faxø Bay and Skjálfandi Bay in Iceland were examined as to their age composition, and important conclusions were drawn from the analyses of catches at intraterritorial and extraterritorial trawling stations.

A NOVEL CURRENT METER.—In No. 2 of the *Journal du Conseil International pour l'Exploration de la Mer*, Mr. J. N. Carruthers describes a current measuring instrument which, lowered from an anchored raft or vessel, records the direction and velocity of the current. It is an advance upon the customary form of meter in that it may be left working for several days, when the velocity and direction of the residual current or drift of the water, over and above the tidal oscillations, can be found. The instrument has been put to fairly extensive use and has already provided very interesting information. It will undoubtedly prove of considerable value for purposes of fishery research in relatively shallow areas such as the North Sea and eastern end of the English Channel, where the drift of water carrying the egg and larval stages of fish plays an important rôle.

PROPORTIONS OF KRYPTON AND OF XENON IN THE ATMOSPHERE.—The values obtained in 1898 by Ramsay and Travers, shortly after the discovery of the above gases, and those obtained by Ramsay in 1903, differ greatly from one another. In the *Comptes rendus Acad. Sci.*, Paris, July 19, Messrs. C. Moureu and A. Lepape describe measurements made by the spectrophotometric method previously used by them. The two gases were fractionated from commercial argon by means of coconut charcoal cooled to suitable temperatures. The volumes obtained per unit volume of air were, krypton 1.0×10^{-6} , xenon 9×10^{-8} .

SWEDISH RAINFALL.—The Swedish rainfall statistics for 1925 are already published in fairly considerable detail in Part 7 of *Arsbok* of the Swedish Meteorological and Hydrographical Institute. The greater part of a considerable volume is occupied with the data from 705 rainfall stations. In each case and for every month the figures given are the total, the heaviest fall in twenty-four hours, the number of days with precipitation of various stated amounts, and the days with hail and snow. The depth of the snow and its rainfall equivalent is added for certain stations. For the various departments of Sweden the duration of snow covering on the ground is given in another table. There are small scale rainfall maps for each month and a somewhat larger scale map for the year. The volume is very complete in the data it affords, but contains no discussion of the figures nor comparisons with the mean or any previous year.

CLIMATE OF NEW YORK STATE.—This subject is discussed by Mr. R. A. Mordoff in Bulletin 444 of the Cornell University Agricultural Experimental Station, Ithaca, New York. It is mentioned that the first organisation for local climatic observation in America was that inaugurated in 1825 by the New York Board of Regents. This was continued until 1863, when it was abandoned owing to the Civil War. In 1870 the National Weather Service was organised and five weather-observing stations were established in New York. Later, under the administration of the United States Weather Bureau, the number was increased to nine regular stations. It is said that New York State has a diversity of climate not usually encountered within an equally restricted area. Charts are given for each month showing the average temperature over the State. The temperature is greatly influenced by the proximity of the Lake Ontario and Lake Erie. Charts are also given showing the highest and the lowest temperatures recorded. During the summer months the maximum temperature often reaches 90° F. or above, and in winter temperatures of -40° F. are experienced in exposed localities. Frosts are dealt with and the periods when killing frosts occur. Precipitation over the State is shown by monthly rainfall maps; the heavy summer rains are largely due to thunderstorms. There is a good distribution of rainfall throughout the growing season. A serious drought affecting the State as a whole is of rare occurrence; the two most serious in recent years occurred in 1889 and 1908. Winds, sunshine, and humidity are discussed. Analysing past records, it is asserted that no change of climate can be traced.

THE INHIBITION OF THE GLOW OF PHOSPHORUS.—It is now fairly certain that the propagation of the glow that accompanies the slow oxidation of phosphorus is a process comparable with the passage of flame through a combustible gas mixture. It is therefore possible to determine the rate of propagation by measuring the blast of gas necessary to maintain the glow in a fixed position. H. J. Emeléus describes the application of this method to experiments on the inhibition of the glow of phosphorus by ethylene, in the *Journal of the Chemical Society* for June 1926. Measurements of the effect of temperature on the action of the inhibiting substance at constant volume and constant pressure are included, and the mechanism of inhibition is discussed.

THE ATOMIC WEIGHT OF SILICON.—The apparent variation of the atomic weight of boron with the source of supply, and the discrepancies between the published values of the atomic weight of silicon, have led P. L. Robinson and H. C. Smith to redetermine the atomic weight of silicon in materials from different sources. In order to make the comparison it was decided to determine the densities of silicon tetrachloride with great accuracy. The tetrachloride was prepared by chlorinating ferrosilicon manufactured from silicon from different sources, and was carefully purified by fractionation, shaking with mercury, sodium amalgam, and finally fractional distillation in a vacuum. A full description of the density determinations is contained in the *Journal of the Chemical Society* for June 1926, the measurements involving the use of glass floats, calibrated in a standard liquid (bromobenzene) with properties similar to those of the tetrachloride. It appears from the results that there is no variation in the atomic weight greater than 0.005 of a unit. (See letter by authors in the present issue of NATURE, p. 303.)

ELEMENT 61.—Moseley's work on X-ray spectra showed definitely that an element with an atomic number 61 should exist between neodymium and

samarium. Its isolation and X-ray analysis are the subjects of two papers by J. A. Harris and B. S. Hopkins, and by these two authors and L. F. Yntema, published in the *Journal of the American Chemical Society* for June 1926. When suitable rare earth minerals are fractionally crystallised using the double magnesium nitrates, element 61 concentrates between neodymium and samarium, but the ratio of the quantities of the new element and its neighbours is such that X-ray analysis fails to show its presence. Detection by absorption spectra, although more sensitive, fails on account of the width of the neodymium and samarium bands. If, however, the fractionation is carried out with the bromate series, element 61 concentrates with terbium and gadolinium, the former having one absorption band and the latter having none. By continued fractionation of this series the presence of a band was revealed which had always been regarded as due to neodymium. The crystallisation was continued until a fraction was obtained which contained sufficient of the new element for X-ray analysis. The *L*-series was investigated, and lines were obtained corresponding closely to the theoretical values for *L_a* and *L_β* of element 61. It is proposed to call the element illinium (II), in honour of the state of Illinois and of the University (*v. also* NATURE, June 5, p. 792).

COSMICAL CREATION OF MATTER.—The issue No. 15 of the *Sitzungsberichte Acad. Sci.*, Vienna, for 1926 contains a suggestion by Dr. A. Haas as to the possibility of the creation of matter at any point of the universe at which, at a given instant, radiation is excessively concentrated. If at such a point an incandescent gas is present having a mean molecular speed of the order of one-half or one-third of that of light, about a hundredth of the molecules will have speeds equal to that of light, and energies equal to that of a proton and an electron. The observations of the Compton effect show that it is possible that a light quantum impinging on such a fast-moving molecule may have its frequency increased, and a repetition of the impacts may so raise the frequency of the quantum that its energy becomes equal to that of a proton and electron, and it is transformed into these two constituents of matter.

A MUMETAL MAGNETIC SHIELD.—A paper by Prof. A. V. Hill, describing an effective magnetic shield for a moving needle galvanometer, is published in the July number of the *Journal of Scientific Instruments*. The shield is constructed of 'mumetal' strip, wound alternately with copper strip on a copper cylinder. At each end it is closed by two mumetal plates separated by a copper plate. Although only two pounds of actual magnetic material is used in the device, a screening ratio of 1000 to 1 is obtained, which is a great advance on the screens in ordinary use. It seems highly probable, therefore, that moving needle galvanometers, after being neglected for some thirty years, will again come into favour. The sensitivity of these instruments is far higher than that of moving coil instruments, and the coils used can have a much lower resistance as they are not limited by the resistance of the suspension. Their only drawback is their liability to magnetic disturbance, and this has proved most troublesome in the past. It can now be almost wholly prevented by this shield made of a nickel-iron alloy. The editor of the *Journal* makes the useful suggestion that a shield could be employed as the case of a chronometer watch, and doubtless other uses can be found for it. It seems certain that cobalt steel permanent magnets and the use of nickel-iron shields will raise the sensitivity and greatly widen the sphere of usefulness of moving needle instruments.