

Research Items.

JUVENILE DELINQUENCY.—In *Psyche* (vol. 2, No. 3) Dr. Cyril Burt discusses the causes and treatment of juvenile delinquency. In studying crime, he points out, we encounter at the outset the fact of multiple determination. Crime in any given person usually proves to be attributable, not to some one all-explaining cause such as "inborn criminality," but to a converging number of alternating factors. Usually some predominating factor can be singled out as chiefly responsible, which factor may be a legitimate label for classification, but in treatment it is never safe to deal with one factor only, however crucial it may be. In all cases it is necessary, for any scientific appreciation of the disturbance, to make a complete and comprehensive survey of the whole child and his surroundings; we must know the child's physical characteristics as well as its emotional and intellectual endowment. The author, while assigning a due position to mental defectiveness, does not support the view that all or most criminals are mentally defective. Various methods of diagnosis and of treatment are discussed. The article will be extremely valuable to all those who, whether from the point of view of theoretical psychology or of practical life, are interested in the individual and social consequences of delinquency.

CRANIOMETRY IN THE BRITISH ISLES.—Prof. F. G. Parsons has done good service to anthropometry by collecting in the February issue of *Man* all the available records of the cephalic index to be found in these islands. The record of 3000 criminals is of special interest, as they show the very high cephalic index of 785, and the size of their heads is very low. This suggests that our recent immigrants from Central Europe have contributed even more than their fair share of crime. It is also remarkable that the average index of a group of Cambridge students is 796 as compared with the Oxford average of 780; possibly some mistake has crept into the arithmetic, but the question deserves further investigation. Other interesting deductions from these figures are that the average head-shape of people in England differed very little between Saxon times and the eighteenth century, the trifling variations being probably due to immigration from the Continent; and that these records do not supply any reason to believe that the size of the modern Englishman's head is increasing with its increasing rotundity; in fact, both the Saxons and the Long Barrow folk, from the fusion of whom most of our blood is derived, seem to have had rather larger heads than the average modern Englishman, and there is no reason to believe that physically they were larger men. Unfortunately, these records, confined to the cephalic index, take no account of head height, which is a serious loss. Further, this collection, large as it is, is inconclusive when compared with a population of some forty millions. In the past, as, for instance, in India, the evidence from craniometry has led to unfounded theories because the number of the subjects was insignificant as compared with the total population. If it is to succeed in justifying its claims, provision must be made for a much larger number of measurements, and these must not be confined to the cephalic index.

SAFFLOWER-SEED OIL.—Bulletin 124 of the Agricultural Research Institute, Pusa, contains an account of safflower oil. Safflower (*Carthamus tinctorius*, L.) is widely cultivated in India, both as an oilseed and, to

a much smaller extent, for the reddish dye (carthamin) in the flowers. The crop is extensively grown in the driest areas of the Deccan for its oilseed. The oil is edible when clarified, and is used as an adulterant for butter. The sweet-oil of Bombay is made by mixing safflower, earth-nut, and *til* seeds and expressing the oil. After boiling, safflower oil forms a gelatinous mass, and it is a drying oil. This form is used as "rogghan," or Afridi wax, for the preparation of wax-cloth. The oil is also suitable for the manufacture of soap. It is suggested that safflower-seed oil could become a valuable commercial product on the home markets.

DATE CULTIVATION IN THE 'IRAQ.—Under the auspices of the Agricultural Directorate, Ministry of the Interior, Mesopotamia (Memoir 3, 1921), Mr. V. H. W. Dowson has published a very interesting and valuable report on date cultivation on the Shat el Arab, the river which conveys to the Persian Gulf the joined waters of the Euphrates and the Tigris. The Shat el Arab is the most important area of date cultivation in the world; both banks are lined with date-gardens for a distance of 108 miles, with an average width on either side of about a mile, representing about 138,000 acres. In the 'Iraq the date-palm flourishes wherever it is watered and cared for, from Ana on the Euphrates and Samara on the Tigris southwards; north of these towns the winters are too cold. Mr. Dowson describes in detail the methods of cultivation and marketing, and also enumerates the chief uses of the palm and its products—in the last instance he refers to an old Tamil song which enumerates eight hundred and one uses of the Palmyra palm, and remarks that the number of uses of the date-palm and its products is probably but little short of this number. Compared with many fruit-trees, the date-palm suffers but little from disease; its one important enemy is the larva of a Gelechiid moth, the adult of which is unknown. Preventive measures against the ravages of this pest, which causes the young green dates to turn brown and drop to the ground, have still to be devised. In a second part of the memoir the author gives a statistical summary of his investigation into the yield of the different varieties, and in a third part (in preparation) he will deal generally with the varieties of date-palms of the 'Iraq, which includes also the Bagdad area, the next largest date-cultivation centre in the country, comprising about twenty miles of date-gardens lining both banks of the Tigris. The memoir is illustrated with numerous photographic reproductions.

BRITISH MYCOLOGICAL SOCIETY.—In pt. 3 of vol. 7 of the Transactions of this society Mr. Petch, of Ceylon, continues his studies in entomogenous fungi, writing learnedly of the Nectriæ parasitic on scale insects. A number of new species are described, but it is very unfortunate that no cultural data are given. An interesting account of the recently founded Imperial Bureau of Mycology, with a suggestive *résumé* of its functions, is contributed by the director, Dr. E. J. Butler. The establishment of this bureau is somewhat of an epoch-making event in phytopathology, and all support possible should be rendered to it. Messrs. Brooks and Searle give an account of the fungi responsible for certain tomato diseases, emphasising what should be so obvious: the necessity of cultural data in specific determinations. There are also an interesting paper by Miss Mounce on homothallism and the production of fruit-bodies by

monosporous mycelia in the genus *Coprinus*, and a note by Mr. Collet describing viability in *Fumago vagans* after sixty-seven years' preservation as a herbarium specimen. The issue is well produced and illustrated by five plates, two of which are beautifully coloured.

SILICIFIED PLANT REMAINS.—The Middle or Lower Devonian flora discovered by Dr. Mackie at Rhynie, in Aberdeenshire, was generally reviewed by Prof. F. O. Bower in 1920 (*NATURE*, vol. 105, pp. 681 and 712). Dr. Kidston and Dr. W. H. Lang (*Trans. Roy. Soc. Edin.*, vol. 52, pt. 4, 1921) now describe the thallophytes occurring in the remarkable silicified peat-bed, and discuss the conditions of accumulation. The sequence is due to continued growth on a land-surface that was at times submerged in lake-waters impregnated with silica. A volcanic source is suggested for the silica, and it is pointed out that the growth of cyanophaceæ and bacteria in modern hot springs is known to promote a deposition of colloidal silica. We may note that Prof. W. N. Benson (*Proc. Linn. Soc., New South Wales*, vol. 45, p. 315, 1920) refers the silicification of remains of gymnosperms in Carboniferous beds on Mount Cobia, New South Wales, to contemporaneous hydrothermal solutions associated with the deposition of keratophytic tuffs. In view of climatic changes in the past, the possibility of the spread of siliceous waters derived from laterisation must not, of course, be overlooked.

AUSTRALIAN METEOROLOGY.—Meteorological statistics for the Australian Colony of Victoria have recently been published, based on all the available records obtained at 1046 official stations from January, 1856, to December, 1907. They have been prepared under the direction of Mr. Pietro Baracchi, Government Astronomer from 1895 to 1915. Observations were commenced at Melbourne in 1840 and continued until 1851, when, in consequence of Government changes, there seems to have been a break for about four years. From 1855 observations were made at Melbourne and at some twenty stations in different districts of the Colony. All observations were controlled by the authorities at Melbourne Observatory until 1907, when the meteorological duties were taken over by the Government of the Commonwealth of Australia under the control of the Commonwealth Meteorologist, Mr. H. A. Hunt. The observations included in the volume received are a summary of results to 1907, when the responsibility of Melbourne Observatory ceased. This volume of the early Australian weather observations is of great value as affording data for seasonal changes and possibly showing meteorological irregularities of interest in connection with more recent observations. A detailed history is given of the development of the system of observing and showing the requirements and value of meteorological observations, especially a thorough knowledge of rainfall distribution. Many details given in the introduction are of extreme value, and show most thorough supervision and great alertness as to the utility of special observations. At Melbourne observations are given for a period of fifty years. The mean and extreme values for the several elements and for the different regions of observation are of high scientific value.

STANDARD CELLS OF LOW VOLTAGE.—In the issue for November, 1921, of the Proceedings of the Physico-Mathematical Society of Japan Mr. J. Obata describes the investigation he has carried out on the possibility of constructing standard cells of low voltage for testing purposes. Nine types of cell have

been studied, in all of which cadmium or cadmium amalgam formed the negative, and cadmium or lead amalgam the positive pole. The electrolytes were solutions of lead or cadmium sulphate, chloride, bromide, or iodide, and the cells were given the H form. The two cells which proved most suitable for standards were the cadmium amalgam/cadmium iodide/lead iodide/lead amalgam cell with an electromotive force at 20° C. of 0.09838 volt and a temperature coefficient of 0.00024 volt per degree, and a cadmium amalgam (10 per cent.)/cadmium sulphate solution/cadmium amalgam (dilute) cell with an electromotive force of about 0.01 volt and a temperature coefficient of about 0.0004, according to the strength of the dilute amalgam.

MAGNESIUM IN ORGANIC CHEMISTRY.—Mr. H. Hepworth describes in the issue of the *Journal of the Society of Chemical Industry* for January 16 the recent applications of magnesium in organic chemistry. The "Grignard reaction," since its discovery in 1900, has found numerous applications in organic synthesis, and this paper is an interesting *résumé* of much recent work. The following examples will serve to illustrate the new lines of research made possible by the use of magnesium compounds. *Cyclopentamethylstannines*, in which the ring contains an atom of tin replacing carbon, have been obtained. Tin diaryl-compounds exhibit an intense colour. Lead tetra-alkyls, lead triaryls, apparently analogous to triphenylmethyl, and mixed tin and lead compounds have been prepared, and *l*-phenylchloroacetic acid is converted by magnesium phenyl bromide into *d*-diphenylsuccinic acid. The use of ether in preparing the Grignard reagent is not essential, but the early view that an additive compound was formed seems to have received confirmation by the isolation of a crystalline compound, $2(C_7H_7)_3PO \cdot CH_3MgI$, when tribenzyl phosphine oxide is used instead of ether, and of crystalline $(C_5H_{11})_2O \cdot MgCH_3I$ with amyl ether. Instead of the oxonium structure for such compounds, a formula in which magnesium is the central atom with co-ordination number 4 has been proposed, the ether being attacked by subsidiary valencies.

VIBRATIONS OF VEHICLES.—According to an article by M. A. Boyer-Guillon in the November issue of the *Bulletin of the Société d'encouragement pour l'Industrie nationale*, the Auclair and Boyer-Guillon accelerometer is to be used in the near future in a detailed study of the oscillations, shocks, or vibrations to which the rolling stock of the French railways is subjected. The Automobile Club of France and the Society of Architects propose also to use it in a study of the vibrations of buildings. The instrument has already led to the solution of problems connected with the failure of machines apparently well designed for the stresses they were expected to withstand. In most cases it has shown that the accelerations to which parts of the machines were subjected were far in excess of those contemplated. Used on autocars in Paris streets it gives the vertical accelerations on irregular wood and on good stone pavements as between 6 and 7 metres per sec. per sec. at a speed of 27 km. per hour. The instrument itself consists of a heavy mass held up by springs attached to the ends of rods which project radially from it. The springs are of graduated strengths, and each holds the rod to which it is attached against a stop with which it makes electrical contact until the down acceleration breaks the contact, and the break is registered on the revolving drum of a chronograph.