

Research Items

Milk-Drinking Habits of School Children

SPECIAL efforts have been made in Great Britain during the last few years to popularize milk consumption. The most important measure designed for this purpose was the so-called milk-in-schools scheme, by which milk is supplied free or at a reduced cost to children attending grant-aided schools. The object of this scheme was to encourage the milk-drinking habit in the younger generation, but little information exists regarding the habits of the children prior to its commencement. To remedy this defect, an inquiry was undertaken by the Hannah Dairy Research Institute, Kirkhill, Ayr, under the director, Dr. Norman Wright, the results of which have now been published by that Institute (Bulletin No. 7, 1936). The inquiry covered nearly 14,000 school children, about two thirds of whom were resident in Glasgow and one third in rural and urban districts of Ayrshire. The outstanding fact revealed by the inquiry is the small extent to which milk is normally drunk by children of school age. Of the 13,317 children investigated, more than one half did not drink milk at all and one third only took it once daily. Tea drinking, on the other hand, was almost universal, only five per cent of the children failed to take tea once, while fifty per cent took it three or more times in the day. Only twenty-five per cent of the children took porridge at breakfast. Of other drinks, coffee was rarely taken, and cocoa only by about seven per cent. Only seven per cent took water at dinner, but nearly half the children took it between meals or at supper.

Return of Swallows to their Nesting Sites

UP to the end of 1935, the number of swallows marked with numbered rings under the *British Birds* scheme was 34,243, the great majority being nestlings. The number recovered up to the middle of 1936 was 285, of which 24 were found abroad. A. W. Boyd and Dr. A. Landsborough Thomson (*British Birds*, 30, 278, Feb. 1937) have analysed the British returns, and find that adult swallows which have nested almost invariably return to the same place in subsequent summers, and often to the same nest. There is no record of an adult being recovered elsewhere in the breeding season, and there are records of pairs returning to a nest in more than one season. But young swallows very seldom return to the exact place where they were hatched, although many are found in the neighbourhood and within a few miles. A few were recovered so far away as 75-160 miles. A new feature which the analysis brings out is that soon after they are fledged, swallows tend to disperse from the nesting centre, previous to the setting in of true migration. This movement seems to take place in any direction, but since the observations are based upon the recovery of only 15 birds, confirmation is desirable.

Spawning of Black-headed Minnow

THE small North American cyprinoid, *Pimephales promelas*, known as the black-headed minnow, frequents areas where the bottom is covered with silt, and this leads to a peculiar spawning habit,

described by L. R. Richardson (*Canadian Field-Naturalist*, 51, 1, Jan. 1937). To avoid the smothering of the eggs in mud, they are adhesive and are attached to the under surface of some substantial object lying clear of the river bed. The site is selected by the male minnow, which thereafter shepherds a female to the place, after having cut her out from a group of various species. Invariably the male swims below the female during the shepherding operation, chivvying, pushing and even snapping at her if she shows any sign of an attempt to escape. On the arrival of the pair beneath the nesting site, the male by steady pushing causes the female to rotate with gradually increasing speed in an anti-clockwise direction. At the same time he presses her into a sideways position, in which her belly comes in close contact with the under surface of the log, to which during or after a few seconds of extreme commotion the eggs are attached and fertilized. The female is then driven away by the male, who repeats the performance with another and perhaps a third female. No special attention is given to creating a protective structure about the eggs, but the male guards the egg-mass assiduously from the attacks of other individuals who would devour them.

The Brown Bat in Western North America

IN Canada, the United States and Lower California, and Mexico, five races of *Eptesicus fuscus* are recognizable. These conform to Bergmann's law, showing a progressive decrease in size from north to south, the greatest difference being 19 per cent in total length and 8-9 per cent in skull length (William L. Engels, *Amer. Midland Naturalist*, 17, 653; 1936). From the author's descriptions, it would also appear that richer coloration is more frequent in the moist coastal regions and that the inland race (*E. f. pallidus*) is distinguished by a much larger number of pale individuals.

Reactions of Nauplii to Light

THE nauplii of *Balanus amphitrite* and *Tetraclita squamosa* show remarkable reactions to light. Shuzo Ishida (*Sci. Papers Inst. Phys. and Chem. Res., Tokyo*, 30, No. 659) describes how in the same culture some move to the side of the beaker that is illuminated, and others, fewer in number, move to the opposite side; he terms these movements skotophobic and photophobic. By using a beam of light passing through a slit, the concentration becomes more marked since the illuminated area is limited, and by altering the direction of the beam it can be shown that the phenomenon is independent of geotropism. If the light is directed horizontally and half the beaker is screened vertically, the two types show an interesting circulation in opposite directions in the darkened half of the beaker.

Physiological Effects of Polyploidy in Tomatoes

DR. A. C. FABERGÉ has made a statistical investigation of the effects of tetraploidy in the tomato in two recent papers (*J. Genetics*, 33, No. 3) in which the effects on growth and size and variability are carefully analysed. It is well known that auto-tetraploids

generally differ from their diploid parent in being larger and stouter in many of their parts and in having larger cells and nuclei, although the fruits appear to be always smaller. Dr. Fabergé finds, however, that tetraploid tomato plants contain no more substance and no more water than diploids, although $4n$ embryos are 30 per cent heavier than $2n$. This advantage is lost during germination. It is concluded that heterosis in the F_2 generation is due only to the greater initial weight, and is of the same magnitude in $2n$ and $4n$ plants. As regards variability, the results agree with those of Lindstrom in showing less variation in fruit-weight of $4n$ than of $2n$ plants. The same is true of the weight of whole plants, where the decreased variation is found to be due entirely to diminution in variability of the embryos. Possible causes of this surprising decrease in variation of tetraploids are discussed. In the fruits, the reduction of variability occurs not between different plants but between the fruits of the same plant. This appears to mean greater stability in the plants. It cannot be accounted for as a direct genetic effect of segregation, and the author suggests that doubling of the genes results in an increased probability of the action of quantitative factors, which is reflected in the greater physiological stability of the early meristems. In the terms of Timoféeff-Ressovsky, the penetrance and expressivity of quantitative genes may both be increased by an increase in their absolute number.

Vernalization of Garden Crops

THE process known as vernalization, in which the time of flowering can be controlled by treatment of the seed and seedling, seems to promise such beneficial results, that any practical contribution to the subject is of great interest. A short paper by Miss D. M. Turner and Mr. S. Burr (*Gard. Chron.*, Jan. 2, 1937) shows that tomato plants respond to vernalization. The most successful treatment seemed to be a chilling of the seed for twenty-four days previous to sowing, and the application of twelve days' continuous light to the young seedlings. Experimental results are on rather a small scale, but show that the yield of vernalized plants is both heavier and earlier than normal. *Calendulas* and peas apparently did not respond to the treatment.

Migmatites of Central Sweden

IN a recent memoir of the Sveriges Geologiska Undersökning (*Årsbok*, 30, No. 8, 88; 1936), Nils H. Magnusson describes his investigations of the veined gneisses of the iron-ore district of Kantorp in Södermanland. The ores belong to the leptite formation, which consists largely of volcanic rocks and sediments and their metamorphosed equivalents. Transformation of these rocks to veined gneisses was brought about, during regional subsidence, by emanations and solutions which arose from deeper levels where palaeogenetic processes were active. The change begins with the appearance of pegmatitic spots and strings, and these gradually increase in proportion until pegmatitic veins dominate the rocks. It is noted that slates everywhere appear to be most readily pegmatized. Comparative studies of nineteen chemical analyses indicate that granitic emanations 'soaked' through the leptite complex with its iron-ores and limestones. The emanations were followed up by intrusive pegmatites and these, in turn, by granites. The latter are regarded as concentrated segregation

products, the material of which came partly from below, and partly from the rocks now accessible at the surface. Reasons are given for rejecting the earlier view that the gneisses are products of magmatic differentiation during conditions of high tectonic pressure.

Earthquakes in New Zealand

DR. J. HENDERSON and Mr. R. C. Hayes have recently issued the report on New Zealand earthquakes for the year 1935 (Wellington, N.Z., : *Dom. Obs. Bull.*, No. 116), a report prefaced by some general considerations on the earthquakes of the islands. During the century 1835-1934, sixty-nine destructive earthquakes were felt, of which forty-nine were of intensity 8 (Rossi-Forel scale) or semi-destructive, fourteen of intensity 9 and six of intensity 10. The regions visited most frequently by such earthquakes were the eastern and southern parts of the North Island and the northern part of the South Island. In the fiord region of the latter, sealers are said to have felt violent earthquakes in 1792, 1810 and 1826-27. Thus, although some parts of New Zealand have experienced no severe shocks during the last century, it does not follow that their immunity will continue. The year 1935 was a comparatively quiet one; there were no destructive earthquakes, and only one of intensity 7, the total number reported as felt being 150.

A New Mass-Spectrograph

IN part 7 of vol. 145, Section 2A of the *Sitzungsberichte* of the mathematical sciences division of the Vienna Academy of Sciences, Dr. Josef Mattauch, of the Physical Institute of the University, gives an account of the behaviour of the mass-spectrograph constructed by the Institute with financial help from the Academy and the Rockefeller Foundation on the lines laid down by himself and Dr. Herzog in the *Zeitschrift für Physik* (89; 1934). It depends on the power of a radial electrical field of mean radius a to render parallel a beam of positive rays diverging from a point $a/\sqrt{2}$ from the entrance plane of the field, whatever their velocities. If the parallel beam then enters a magnetic field at right angles, each mass component of it when bent through a right angle is focused on a plane through the point of entrance at 45° to the line of entry, and the distance of a line from the point of entry is proportional to the square root of the mass of each constituent. This system of double focusing has been generally adopted recently and gives excellent results. Dr. Mattauch finds a new isotope of strontium ^{84}Sr , new bands due to the dissociation of hydrocarbons, separates ^{15}N and ^{18}O from CH_3 and OH_2 and can resolve triplets.

Excitation of Phosphors in a Neon Discharge Tube

IN connexion with a note appearing in these columns under the above heading (*NATURE*, 139, 160; 1937), we are informed by Mr. C. C. Paterson, director of the Research Laboratories of the General Electric Company, Ltd., that a neon discharge tube in which a zinc silicate phosphor is excited by the discharge was patented by the G.E.C., Ltd. and H. G. Jenkins in May 1935, the patent becoming available to the public in November 1936. Such discharge tubes are at present being used commercially, while mercury discharge tubes with phosphors have been on the market in England for at least three years.