

Research Items

Maternal Mortality and Malnutrition

THE causes of maternal mortality are many. Sepsis still occurs, though it is subdued, and is now low compared with "other causes", among which malnutrition appears to be important. This is the conclusion that emerges from recent investigations which are described in an article by Lady (Rhys) Williams in the October number of *Public Health*. The practical work described was begun in the Rhondda Valley, a distressed area, on January 1, 1934. In spite of increased ante-natal care and medical supervision, the puerperal death-rate there rose to 11.29 per 1,000 total births. In 1935, expectant and nursing mothers were provided with extra foodstuffs, tinned and bottled but protective, and one pint of milk a day, with the result that not a single mother, who had received the extra food, died. The feeding scheme was extended to include five adjoining towns of a similar type. Up to June 30, 1936, the puerperal rate had fallen to 5.46 in the Rhondda, and 3.75 in the new areas, as compared with the previous eight-year averages of 7.72 and 6.65, respectively; and the puerperal rate fell much more than the sepsis rate. Numerous graphs are reproduced which show a striking correspondence between the puerperal and the infantile death-rates when the latter relate to the preceding year. The divergence of the rates for the same year and their correspondence for successive years is explicable in terms of nutrition, and it is pointed out that these rates would have been affected simultaneously had climate or epidemics been the cause. Stronger evidence that malnutrition is an important cause of maternal and neo-natal mortality is afforded by the much higher average levels of the death-rate in distressed, as compared with prosperous, areas; and it is shown that the differences cannot be ascribed to climate or, to any extent, to bad housing (see also *NATURE*, 137, 529; 1936).

Tripolje Settlement in Kiev Province

SOVIET archaeologists of the Marr Academy of Material Culture, excavating near the village of Khalepye in the province of Kiev, it is reported by the Soviet Union Year Book Press Service, have brought to light a settlement belonging to the Tripolje culture. The settlement was circular in plan, enclosed by a single row of houses, with doors opening on the enclosed space, the whole resembling a fort, into which the domestic animals were driven at night for protection. The houses were built of clay, and were about twenty metres long. The baked clay of the floors, and remains of stoves, walls and fences were found in an excellent state of preservation. The stoves and walls in some of the houses had been coloured with red ochre. The chief occupations of the inhabitants of the settlement were agriculture and cattle-breeding; but there is evidence that hunting had been an auxiliary means of livelihood. Many stone grinders and agricultural implements made of horn were found inside the houses. One hundred earthenware utensils ranged in size from very small

receptacles of not more than two centimetres high to vessels seventy centimetres high. Thirty statuettes were found, some of which are unique. They give an idea of the dress of both men and women of the settlement. The women wore their hair loose, but tied in a knot at the ends, while an indispensable article of their attire was a girdle, the ends of which hung down at the side. The men are shown as wearing a garment draped across the shoulder. The excavations are to be continued next season.

Visual Acuity and Speed of Vision in Road Lighting

IN observing objects on artificially illuminated highways the first requirement is to perceive the presence of the object. This is rendered possible by the contrast between the object and the road surface. The nature of the contrast and the sensibility of the eye are the determining factors. When the object has been perceived, it is necessary to see its exact form and estimate its distance. This is governed by the visual acuity of the eye. It is customary to take the angle of vision at which two parallel lines are still just perceptible as separate entities. It is better to take the reciprocal of this angle (expressed in minutes), so that the larger number gives the greater visual acuity. Another method is to give the distance at which a circle with a diameter of 1 cm. and a square with a diagonal of 1 cm. can still just be differentiated. In addition to visual acuity, the speed of vision is also an important factor. In the *Philips Technical Review* (Eindhoven) of July, the relationship is investigated, by P. J. Bouma, between the visual acuity and the brightness levels of the object and the background. The difference also between the type of illumination and distance of observer from object is examined. Close investigation shows that all monochromatic colours, with the exception of blue and violet, give a greater visual acuity than white light. The low visual acuity for blue light is partly due to the fact that the eye is myopic for this short wave-length. With technical sources of light, the visual acuity is considerably greater with sodium and mercury light than with ordinary glow lamp and neon light. The author investigates the speed of vision for various types of light. For stationary objects, mercury and sodium lamps are better than glow lamps and neon light; but for moving objects sodium light is the best, then glow lamps and finally mercury light.

Sheep and Wool Production in North-Eastern Asia

THE total sheep population of China, Inner Mongolia and Manchukuo is round about 30,000,000, mostly run under nomadic conditions and carrying a low wool crop averaging only about 2.6 lb. a head. I. Clunies Ross points out (Pamphlet No. 65, Council for Sci. Ind. Research, Australia: Melbourne, 1936) that improved wool production by crossing between native and merino sheep is difficult because of climatic conditions and the effect particularly of the severe winter upon pastures, and would entail

housing and hand-feeding during six months of the year. In Japan, sheep-rearing is not likely to become a major industry, but the movement of the Japanese and Chinese markets from cotton and silk to woollen materials indicates a prospect of further demand for wool, and since both nations are developing their own woollen factories, the demand will be of direct benefit to the export from Australia of raw wool, from which the imported tops are manufactured.

Prosobranchs of the North Sea and Baltic

DR. W. E. ANKEL has contributed an excellent monograph on the gastropods ("Die Tierwelt der Nord- und Ostsee" (Lief. 29, Teil 9,b, "Prosobranchia", von W. E. Ankel. Pp. 240. Leipzig: Akademische Verlagsgesellschaft m.b.H., 1936). Although it deals only (except in a few cases) with the species occurring in the North Sea and Baltic, there are so many of these which are common on all the coasts of Britain that it is practically a text-book of the prosobranchs of our seas, and the general matter applies to all. The author has himself worked specially on the reproduction and reproductive organs of these molluscs, but the clear original drawings scattered about the work show that he is a true naturalist in every sense of the word. Many of these figures are of the live animals, showing them crawling, burrowing, feeding, and are of distinction and quality. Besides bringing together a large amount of work by other authors showing a thoroughly up-to-date knowledge of the subject, this monograph contains much original matter. It is refreshing to find here so much that is really new. The life histories of most of our common prosobranchs are now known, and we have a fair idea of their egg-laying habits and development, but these descriptions are scattered far and wide. This is the first time that an attempt has been made to bring them together, and we gradually come nearer to the ideal work in which the description of every species shall be accompanied by notes on its life-history, and not only adult characters shall be used in classification, but also those of the embryonic and larval forms.

Japanese Diatoms

DR. H. AIKAWA has contributed an extensive paper "On the Diatom Communities in the Waters Surrounding Japan" in vol. 8, No. 1 of the Records of Oceanographical Works in Japan compiled by the Committee of Pacific Oceanography of the National Research Council of Japan. All plankton samples collected by the research ships of the prefectural fisheries experimental stations along the coast of Japan are submitted to the Imperial Fisheries Experimental Station, Tokyo, and the author has studied these in detail both quantitatively and qualitatively. The number of individuals of different species is counted in a sample by Hensen's method, and the respective percentages of animal and plant plankton worked out. The work is mainly concerned, however, with diatoms, and diatom communities are described from the waters around the West Aleutian Islands; Okhotsk Sea, the Tôhoku region, Tokyo Bay, Sagami Bay, Suruga Bay, the southern Pacific coast, the tropical regions and in the Japan Sea with Wakasa Bay and Tyôsen Strait. Both cold and warm currents flow around Japan. Enormous mass-production is found in cold waters, the warm water regions being richer in species. Seasonal succession

is very noticeable in the neritic regions whilst the oceanic plankton is remarkably uniform. A list of forty of the principal diatom species shows many that are common in British waters.

Spiders of Lahore

A COMPREHENSIVE paper on the spiders of Lahore, by Mr. Sukh Dyal, has been issued (*Bull. Dept. Zoo., Punjab University*, 1, 119-252). This work forms the fourth of a series entitled "Fauna of Lahore", published by the Punjab University. Altogether, 121 species are enumerated and are comprised in 60 genera and 20 families; of these, 46 species were previously undescribed. The majority of the spiders of the district appear to be web-spinners of arboreal habits, and among them are instanced several remarkable examples of protective coloration. The paper is provided with keys to the families, genera and species dealt with, and the text is illustrated with a number of well-executed plates showing diagnostic structural characters. At the end of the text, a rather extensive glossary of the terms employed is given, together with a list of relevant papers and memoirs.

Origin of Rice

MUCH progress is now being made in connexion with the cytology and genetics of rice. The chromosome number is $2n = 24$ in all varieties of *Oryza sativa* examined, although haploids with 12 chromosomes frequently occur. Dr. H. K. Nandi has brought forward (*J. Genetics*, 33, No. 2) results of much interest to show that the genus *Oryza* is a secondary polyploid derived from a previous basic number of 5, and Mr. S. Ramanujam has found that the related *Zizania aquatica* has $2n = 30$ and is therefore probably a hexaploid based on 5. In the pollen mother cells of rice varieties Dr. Nandi finds two pairs of satellited chromosomes of unequal length attached to the nucleolus, and very clear secondary pairing of the chromosomes in the metaphase of both meiotic divisions. The maximum pairing gives three groups of two and two groups of three bivalents, thus indicating that 5 was the primary chromosome number in *Oryza*. Haploids also occasionally show two bivalents. It thus appears that the genus *Oryza* originated as an allotetraploid through hybridization between two different ancestral species having $2n = 10$ chromosomes. Due to meiotic irregularities in the hybrid, two chromosomes were probably duplicated, and subsequent chromosome doubling produced a stable type with $2n = 24$. The conclusion is reached that on the basis of present evidence it cannot be determined whether the cultivation of rice began in China, India or Africa.

Heat-Treatment for Wood-Decaying Fungi

A SHORT paper by Mr. H. B. S. Montgomery (*Trans. Brit. Mycol. Soc.*, 20, pts. 3 and 4, Nov. 1936) gives the results of some experiments upon the lethal temperatures for a number of common wood-decaying fungi. Four species of the genus *Lenzites*, *Merulius lacrymans* (dry-rot fungus), *Poria vaporaria*, *Pholiota adiposa*, *Polyporus hispidus*, *Schizophyllum commune*, *Fomes fraxineus* and *Lentinus lepideus* have been studied. Temperatures which destroy each species are set forth in tabular form, and *Lenzites lepideus*, the most resistant of the fungi tested, was killed by

treatment for 60 min. at 65° C. The experiments are on a laboratory scale, but they would provide a basis for the practical treatment of ornamental carving, or other small pieces of valuable timber when a rotting fungus appears.

A Fungal Parasite of Algae

A SHORT paper by Mr. D. J. Scourfield, in the *Essex Naturalist* (25, Pt. 3, April-Sept. 1936) describes a fungus parasitic upon the alga *Chlorogonium elongatum*. The host is only about a tenth of a millimetre in length, and the fungus is less than a thousandth of a millimetre in diameter. Ciliated zoospores are formed by the latter organism, and these organs come to rest upon the surface of a *Chlorogonium* individual, which is ultimately parasitized by the entrance of a hypha-like outgrowth from the fungus. *Phlyctidium chlorogonii* Serbinow is the name of the fungus; it belongs to the Chytridiales, and is now described as a British species for the first time.

The North Sea Basin

DR. DUDLEY STAMP has attempted the difficult task of tracing the physical development of the North Sea basin since Miocene times (*J. Con. Intern. pour l'exploration de la Mer*, 11, No. 2; 1936). Before that time, the problem is less involved and the history of the Germano-British sea can be traced from Carboniferous to Miocene times. The Alpine storms of Miocene times restricted this sea. In Lower Pliocene times the sea invaded the London Basin syncline and there was probably a strait to the west, either through the London basin or by a synclinal trough farther south. In later Pliocene times this connexion was severed. The shallow North Sea persisted until the period after the third British glaciation, but during the second glaciation it was narrowed by the Scandinavian ice to an ice-front lake overflowing to the English Channel. The present flow of the North Sea is essentially the submerged landscape of the period subsequent to the third glaciation, though the sediments have been partly resorted by current action. The land phase ended with the Pleistocene and beginning of the Holocene period. Then the connexion between the North Sea and the English Channel was made. In the Post-glacial period the Straits of Dover were open but shallow and narrow, and then set in a transgression of the North Sea waters, and with the opening of the Strait, tidal currents became marked and coast erosion and coastal accumulation begun. Dr. Stamp's reconstruction, which he admits is tentative, is illustrated by numerous maps.

Specific Heats of Metals

THE October issue of the *Canadian Journal of Research* contains two communications from Prof. H. L. Bronson and his colleagues of Dalhousie University describing their determinations of the specific heats of nearly pure specimens of silver, nickel, zinc, cadmium and lead between -80° C. and 120° C., and of silver and nickel between 100° C. and 500° C. For the lower temperatures, cylinders of between one and two kilograms, electrically heated in a heavy copper enclosure, were used; for the higher, cylinders of about 10 gm. heated in an electric furnace and dropped into a water calorimeter. The values found cannot be represented correctly to within about one

per cent by the Debye function of a temperature characteristic for each metal, but for the low temperatures require in addition a term proportional to a power of the absolute temperature, and for the higher a further term for temperatures above 250° C. in the case of nickel. The characteristic temperatures and powers of the absolute temperature are respectively for silver 220°, 1.16; nickel 372°, 5/3; zinc 235°, 3/2; cadmium 160°, 5/3; lead 88°, 1.38.

Helium produced in Artificial Transmutation

F. A. PANETH, E. GLÜCKAUF and H. LOLEIT (*Proc. Roy. Soc., A*, 157, 412) have for the first time detected a product of artificial transmutation by ordinary chemical methods. Boron, in the form of the volatile ester methyl borate, was exposed to slow neutron bombardment in a copper vessel. The helium was boiled out and purified by chemical methods and by cooled charcoal. The volume of the helium was measured in the capillary tube of a Pirani gauge. The presence of atmospheric helium was checked by a spectroscopic determination of neon in the helium. The amount of helium produced by the neutrons from 2 curies of radon during its decay is about 2.4×10^{-7} c.c. (see also *NATURE*, 136, 950; 1935).

The Identity of Comets 1818 i, 1873 vii, 1928 iii

IN *Astr. Nach.*, 261, 6245, there is a very interesting article by Dr. A. C. D. Crommelin which shows that Prof. Kobold and Miss Vinter Hansen were incorrect (*Astr. Nach.*, 260, 6226) in placing Comet 1928 iii among the non-periodic comets. Dr. Crommelin gives three independent lines of proof which establish the connexion. The first evidence is found in the fact that the elements derived from the apparitions of 1873 and 1928, when reduced to a common epoch, are practically identical, as shown by Dr. Crommelin's article in *Mon. Not. Roy. Astro. Soc.*, 89, 556 (April 1929). An interesting comparison is shown between the elements of Comet 1873 vii and 1928 iii, the differences in ω , Ω and i being -13.7', -26.2' and +6.8' respectively, and his computations on the perturbations of the four larger planets show that the changes are -9.5', -30.5' and +5.6', an agreement which certainly cannot be merely fortuitous. The second line of evidence is found in the fact that when Dr. Crommelin used an arc of nearly two months available observations in 1928, he found a period of 27.90058 years, and there was a close agreement between this and the period in 1928 derived from the perturbations between 1873 and 1928, which was 27.8969 years. The third evidence, which seems the most important, is found in the close agreement between the two periods in 1873 derived from the 1818-73 arc with perturbations and from the 1873-1928 arc with perturbations. It is true that Dr. Crommelin admitted a discordance of 13 days in his paper in *Monthly Notices*; but he has revised the work, using shorter time-intervals and including the inner planets. The result is almost perfect agreement, a difference of only 1.818 days existing. Prof. Kobold saw a proof of this article before publication and has admitted the validity of Dr. Crommelin's contention regarding the identity of the comets. His offer to include them under the title of "Crommelin's Comet" is a sign of his appreciation of the work of the director of the Comet Section of the British Astronomical Association.