

Research Items

Races and Languages in India. Sir Edward Gait's communication under this title to Section E (Geography) of the British Association at Leicester appears in full in the *Journal of the Royal Society of Arts*, 81, No. 4224, Oct. 20, 1933. Sir Edward states that the number of languages spoken in India is 223. [The figures of languages given in the actual census is 225 not 223.] The Indo-European languages (27) are spoken by 257 million persons, the Dravidian (14) by 72 million, Tibeto-Chinese (156) by 15 million and the Austro-Asiatic (19) by 5 million. There are a few unclassified languages of little numerical importance. The main Dravidian-speaking area lies south of a line Goa-Berar-Puri (Bay of Bengal). Tibeto-Chinese languages are current in Burma, the hill district of Assam and the sub-Himalayan tract from Assam to the borders of Kashmir. Throughout the rest of India, Aryan languages predominate. The Austro-Asiatic languages are scattered over a wide area and the numbers speaking them are small. They are a survival; but Dravidian Telugu, the Aryan languages of the Gangetic plain and the Tibeto-Burman languages of the Himalayan area all show signs of Austric influence. Their place in northern India was taken by Dravidian languages which in turn were displaced by Aryan languages. The physical type of the races who brought in the Aryan languages predominates in north-west India as far as Patiala. In the Himalayan area, and where the Tibeto-Chinese languages are spoken, the inhabitants are of the Mongoloid type. To the south of Rajputana and the Ganges valley, the people are commonly known as Dravidians, among whom two types are now generally recognised, the more primitive being proto-Australoid. Dr. Hutton in the recent Census of India suggests two waves of Dravidian migration, the later having an Armenoid admixture, and an incursion of Alpine peoples speaking an Aryan tongue. There is, however, little evidence of Mesopotamian or Caucasian affinities in Dravidian, and none that the Alpine invaders had adopted an Aryan form of speech before they came to India.

Stuttering. Dr. G. Seth (Edinburgh) read a paper before Section J (Psychology) of the British Association at the recent Leicester meeting on some clinical aspects of stuttering, and recorded observations based on the study of about a hundred cases. The percentage of stutters in five educational areas ranges from 0.72 to 1.30, with an average in the region of 0.95 per cent. This agrees with the general finding that about one per cent of the school population are stutters. The proportion of stuttering boys to stuttering girls is 6 to 1 in one area and 3 to 1 in another area. It is practically impossible to trace a connexion between the speech disorder and any immediate causative factor. It seems, therefore, that stuttering must be regarded as a developmental disorder most commonly of gradual onset, in which the predisposition, whether it be the result of inheritance or of fixation, becomes effective in most cases under the conditions and within the circumstances of development itself. The state of the mother before the birth of the child, difficult birth and difficulties in weaning, may all play a part in the causation of stuttering.

The Thymus in Filipinos. J. C. Nañagas (*Phil. J. Sci.*, 51; 1933) describes the relations and size of the thymus in 338 Filipinos ranging in age from birth to adolescence. At birth the Filipino infants possess a proportionately heavier thymus in relation to body-weight than is reported for American newborns, but in late childhood and in adolescence the Filipinos have a proportionately smaller thymus than the American group, and it is suggested that this is dependent on the existence of nutritional unbalance or dietary insufficiency. If to the degree of under-nourishment and the deficiency in vitamins A and B, which is claimed to exist in the majority of Filipino children, is added the aggravating condition of high incidence (97 per cent) of intestinal parasitism in the children, the seriousness of the nutritional condition which may hasten the premature involution of the thymus may be realised. The author points out the detrimental effect of this early involution on the vigour, the resistance to disease and the intelligence of the young population, and the importance of the problem if the race is to advance.

Prehistoric Shells in a Javanese Cave. In excavating Sampöeng Cave near Ponorogo, Java, several molluscs were found ("On Prehistoric Shells from Sampöeng Cave (Central Java)" by Tera van Bentham Jutting. *Treubia*, vol. 14. Livr. 1. 1932). These are partly land, fresh-water and brackish water, partly marine. The marine species, including *Haliotis*, *Nerita*, *Natica*, *Cypraea*, *Nassa*, *Marginella* and *Venus* evidently came from far away and were used as ornaments. The non-marine mollusca were almost certainly used as food. The present natives of Java eat many shellfish and the early cave dwellers apparently ate even more. Nearly all the shells have been broken as if to extract their contents. Most of the gastropods (*Hemiplacta*, *Amphidromus*, *Cyclophorus* and *Pila*) have the spine broken away, the *Melania* being whole and the animal probably extracted from the aperture in the same way as periwinkles are eaten. *Melania* also was sometimes pierced in the last whorl near the aperture or, more rarely, in the earlier whorls, and in this case they may have been used for ornaments. The bivalves, particularly the freshwater mussels, had been mostly broken at the siphonal end, the easiest part to break, pointing to the fact that they were crushed and eaten raw. The age of these deposits is estimated at about 1000 years B.C. and it is impossible that the Mollusca found are fossil; moreover the list includes only names represented in the actual Javanese fauna, and even in the much older Trinil beds in Central Java all non-marine Mollusca, except one, belong to recent species.

Mounting Microscope Sections on Mica. The current issue of Messrs. Watson's *Microscope Record* contains a note on the method of mounting microscope sections on mica sheets. The best quality of mica is essential. The mica is thinly smeared with glycerine and albumen, a film of distilled water is added and the sections placed on this in straight rows, close together, and the sheet placed on a hot plate to flatten the sections. The water is drained off and the mica sheets are put in a drying oven. The remaining treatment is identical with that used in staining sections on glass slides, including the

dehydration and clearing in xylol. If the sheets are to be stored, they are dipped in melted paraffin wax (45° C.), and stored until required. The sheets may be divided with scissors into rows of sections or single sections, which are treated with xylol to remove the wax, and mounted. If the sections on the mica are to be mounted immediately after dehydration and clearing in xylol, the sheet is placed in a dish containing thin Canada balsam, and cut, the sections or the rows of sections are mounted on glass slides in ordinary Canada balsam and covered.

Kiln-Seasoning of Timber. The Forest Products Research Laboratory at Princes Risborough has issued a second report on the principles of kiln-seasoning. The first report (*NATURE*, 122, 76, July 14, 1928) dealt with the types of kilns in commercial use. The present one is entitled "Practical Kiln-drying" by W. A. Stevens (For. Products Research—Special Report No. 3, May 1933. H.M. Stationery Office). In the past, the drying kiln, with its potentialities for the improvement or deterioration of large quantities of timber, has not always been regarded in the same way as a wood working machine of the same cost and importance: it has received neither the thought, care nor attendance that such a piece of plant merits. With the enormous and ever-increasing demand for wood material of all types at the present day, the prolongation of the life of the article into which it is converted is of primary importance. This is the aim of the seasoning kiln. The method in use for centuries was to leave the material, stacked or otherwise, to season in the open for varying periods. The few valuable timbers in use in different parts of the world for so many centuries were seasoned in this fashion and, in the minds of some, it is doubtful whether the kiln can better this natural seasoning of large-sized timbers of valuable species. But for practical purposes this is not the object aimed at. It is the smaller sized commercial material, so largely in demand, which is chiefly the subject of experiment and tests. Mr. Stevens deals with seasoning; the general principles and factors concerned in drying kilns and types of kilns; kiln design and kiln-drying routine; and test of kiln conditions with an appendix of drying schedules.

Geology of Sirohi State, Rajputana. Since 1924, A. L. Coulson has been intermittently engaged on the geological survey of Sirohi State, and his results, which are of considerable petrological interest, are now published, together with a coloured map (Part 1 of the *Mem. Geol. Sur. India*, 63, 166. Calcutta, 1933). The stratified rocks, apart from recent deposits, belong to the Archæan and Purana groups, and while the question of the correlation of the Arivalli and Delhi systems is important, the chief feature of the geology lies in the wealth of igneous rocks that are represented. Basic tuffs and lavas are interbedded with the earlier members of the Arivallis. Following the uplift, folding and denudation of these Archæan rocks, similar activity was renewed either during or shortly after the laying down of the sediments of the Delhi system. Granite and accompanying pegmatites and quartz reefs were next intruded into all the above rocks, this acidic phase being of gigantic magnitude. Another series of basic rocks followed, including basalts, dolerites, gabbros, pyroxenes and sodalite-syenites. A second intrusion of acidic material then occurred on an immense scale, introducing the Idar granite and its accompanying hypabyssal and volcanic representa-

tives. The igneous history concludes with the intrusion of dolerites into the older rhyolites and porphyries. The area has been quietly eroded from the time of intrusion of these post-Malani basic rocks down to the present day.

Radiography with γ -Rays. The August and September numbers of the *Journal of the Franklin Institute* contain articles by G. E. Doan on the use of γ -rays in the radiographic examination of thick metal objects. The work has been performed with the co-operation of the U.S. Navy Department, and indicates that γ -rays may usefully be employed to detect flaws in thick steel. Since the rays are more penetrating than X-rays, the contrast obtained with a flaw of given size is lower, but against this must be set the more favourable distribution of the scattered rays, which are thrown strongly forward in the case of γ -ray and cast shadows in the same direction as the primary beam. On the whole, it seems that γ -rays are useful only for the thicker sections. The times of exposure may be greatly reduced by using intensifying screens, and a number of objects may be arranged around the source and radiographed simultaneously. The cost of the exposure may then be made comparable with X-rays even for the thinner objects. The article incidentally contains interesting information about the present world supply of radioactive elements.

Spectra of Solid Metals. The *Physical Review* of October 1 contains an article by Osgood and a letter from O'Bryan and Skinner on the spectra obtained when solid metals are bombarded with electrons. The spectra are produced by processes in which electrons from the conduction group make transitions to replace electrons which have been ejected from atomic *K*- or *L*-levels. Since the conduction electrons occupy a wide band of energy levels, the resulting spectra consist of broad bands. The *K* band of beryllium, examined by O'Bryan and Skinner, gives close agreement with the elementary Sommerfeld theory of the conduction levels, a conclusion which had been disputed by earlier workers. The width of the bands observed for a number of the lighter elements is in general agreement with the Sommerfeld theory, but for carbon there is a marked disagreement and the bands are much narrower than is required by the theory. This work shows a new method of attack on the problem of the conduction electron, which seems very suitable for examining its energy distribution in detail.

Analysis of High Excitation Spectra. Miss Payne has recently published a very useful list of lines in the spectra of CII, NIII, OIV, together with an identification of the lines which occur in the Wolf Rayet stars (*Z. Astrophysik*, 7, 1, 1933). The Wolf Rayet spectra fall into two classes, those which show carbon and those which show no carbon. The spectroscopic data to which Miss Payne directs attention are derived chiefly from the work of Edlen, and form a notable addition to the material with which the astrophysicist has to work. Compilations of such data are always very welcome. At the moment, attention is being focused on high excitation spectra by recent identifications made at Harvard, including the identification recently noticed in *NATURE*, of the coronal lines which appeared in the spectrum of Nova Ophiuchi. These lines are assigned by the Harvard workers to the high excitation spectrum of oxygen, in which they are forbidden transitions.