

Research Items

Cultural Influence of Islam in India

THE Sir George Birdwood Memorial Lecture by Sir Abdul Qadir on "The Cultural Influences of Islam in India", delivered before the Royal Society of Arts (*J. Roy. Soc. Arts*, Jan. 10, 1936), while not professing to be more than a rapid survey, which might point a way to further research, touched upon a number of topics not without bearing upon the present situation. In certain respects, indeed, it might be held to afford hope of better relations between the Hindu and Moslem communities, when present acerbities cease to exhibit their more extreme manifestations under a new regime. One of the most striking facts to which he directed attention was the influence of the monotheism of Islam on the religion and thought of India. The Central Asiatic dynasties which established kingdoms in India had, he pointed out, come under the influence of Persia and her literature before they came to India. In the time of the Moghals the Persian language, as the language of the court and of literature, had come to be a subject of study by Moslem and non-Moslem alike. Hence the belief in one god, upon which no faith lays greater stress than Islam, began to be perceptible not only in the attitude of orthodox Hindus towards the idols of the temples, but also in such movements as the Arya Samaj, Brahmo-Samaj, and most conspicuously of all, in the Sikh religion founded by Guru Nanak, and the Bhakti movement, of which the best known exponent was Kabir. Sir Abdul also attaches much importance to the position of Urdu and its literature, regarding its development as due to the combined efforts of Hindu and Moslem, which by now has produced a varied and wide literature. The tendency shown in some quarters to regard that language as something imported from outside and foreign to the soil he attributed to a lack of knowledge of its true origin. In his view, the Moslem invasion created a new indigenous language, which was a mixture of Persian and Hindi, and this in course of time has become the most commonly used language in India.

Wintu Ethnography

In a study of the Wintu, one of the three Wintun-speaking peoples of the Sacramento Valley, California, by Cora Du Bois (*Univ. California Pub. Amer. Archaeol. and Ethnol.*, 36, 1), stress is laid on shamanism as the most important socio-religious aspect of their culture. The Wintu lived by hunting, which was pursued either communally or individually, and fishing. Procuring vegetable foods, principally acorns, buckeyes, and tubers, known generally as 'Indian potatoes', was the responsibility of the women. The attitude of the Wintu to their neighbours, on the whole, was one of fear. They believed that the Nomlaki (Wintun) stole souls by casting their shadows on persons; while their neighbours to the north and west were believed to have the power of transforming themselves into dogs and other animals. The relation of the individual with the natural phenomena of his area was exceedingly intimate. Of some thirty place names along the McCloud River in

the course of approximately two miles, many are found in the mythology or associated with mythological characters; at other times they are names of sacred places associated with supernatural potency. Shamanism was their chief preoccupation with the supernatural, yet it existed in a society so simple that there was never need for elaboration. The nearest approach to elaboration was the ceremony of shamanistic initiation, which was open to both men and women. An initiation dance was announced by a chief who owned an earth lodge at the behest of the shamans. This took place either in the spring or in late autumn, when all persons desirous of acquiring shamanistic powers presented themselves for initiation. Supernatural experience was attained through the dance, the spirit entering suitable candidates through the ears, after announcing his arrival by a whistling sound above the smoke-hole of the earth lodge.

Birds of Cape York Peninsula

As a result of three expeditions, occupying a total of three years, in Cape York Peninsula, North Queensland, Dr. Donald F. Thomson has compiled a comprehensive account of the birds of the area, and this has been published through a special Government fund ("Birds of Cape York Peninsula", Melbourne: Government Printer. London: Angus and Robertson Ltd. Pp. 82+15 plates. 1s. 6d. net). The area comprises mangrove zone, salt pans, scrub, savannah-forest and tropical rain-forest. Of the 183 species observed in the Peninsula, including waders and other migratory forms, 79 (43 per cent) are endemic Australian species, while a majority, no less than 104 (57 per cent), have a range extending to New Guinea or beyond. Some of these, to the number of 19, may be regarded as Papuan forms which have extended their range into the Peninsula in comparatively recent times. The general conclusions reached by the author are that the large number of genera and species common to Cape York Peninsula and New Guinea indicate a connexion between these areas in more recent geological times than has been generally supposed, and that the mountain range on the east coast of the Peninsula has been an effective barrier to distribution, since the Papuan elements have persisted in their purest and most concentrated form in a narrow zone on the north-east coast.

Development of the Vertebral Column

DR. HIMADRI KUMAR MOOKERJEE, in his presidential address to the Section of Zoology at the twenty-third Indian Science Congress held at Indore on January 2-8, discussed some results of his study of the development of the backbone among vertebrates. He disagrees with Gadow's classification of vertebral centra, since it fails to express the gradual evolution of vertebral structures; and himself describes, in what appears to be great detail for a general address, the formation of the centrum, of the lower and upper arches, of the ribs and rib-bearing processes, and of the articulating processes. An interesting suggestion is

made as to the origin of the four types of vertebral centra. In the development of any backbone, the vertebral portions of the perichordal tube soon become cartilaginous, whereas the intervertebral portions remain for a long time membranous, and through these intervertebral zones the migratory connective cells enter. At this stage the character of the centrum is determined, and the author considers that the procoelous, opisthocelous, amphicoelous, and heterocoelous conditions are produced by the various types of movement of the embryos at that particular time, since these movements determine the direction followed by the migratory cells which divide the perichordal tubes into vertebral segments.

Egg-like Synergids

In a communication received by NATURE, A. C. Joshi, of the Botanical Department, Benares Hindu University, reports two further examples of egg-like synergids. The synergids in the embryo-sac of the flowering plants have as a rule a very uniform structure. They possess a large vacuole in their chalazal half, and the nucleus embedded in cytoplasm is found at the micropylar end. Cases in which the position of the vacuole and the nucleus is reversed and the synergids look like the egg-cell are very rare. Two cases are cited by K. Schnarf in his recent book "Embryologie der Angiospermen", namely, *Aconitum Napellus* and *Delphinium elatum*, both belonging to the Ranunculaceae. Frisendahl has noted such synergids in *Myricaria germanica* (Tamaricaceae) and Puri has recorded certain cases of embryo-sacs in *Moringa oleifera* in which one or both of the synergids assume the form of the egg due to the migration of the nucleus towards the chalazal side. Joshi now records *Gisekia pharnaceoides*, Linn. (Molluginaceae) and *Tamarix dioica*, Roxb. (Tamaricaceae) with egg-like synergids. In *G. pharnaceoides*, up to about 20 per cent of the embryo-sacs have been seen to possess one or both the synergids of this form, and in a few cases synergids were seen with two vacuoles in place of the usual one, one below and the other situated above the nucleus. In *T. dioica* also the egg-like synergids are fairly frequent, and one or both the synergids of an embryo-sac may have this form just as in *Gisekia*.

Proteolytic Enzyme System of Fungi

MANY fungi are very active in the decomposition of proteins, and especially is this true of members of that group loosely described as moulds. Investigations of the proteolytic enzyme system of *Aspergillus parasiticus* show that at least four components are present, a proteinase and three peptidases. The latter resemble the peptidases of the mammalian digestive system, being respectively an aminopolypeptidase, a carboxypolypeptidase, and a dipeptidase (M. J. Johnson, *Z. physiol. Chem.*, 224, 163; 1934). The aminopolypeptidase has now been obtained in a purified condition by fractional precipitation with alcohol and adsorption on to aluminium and ferric hydroxides (M. J. Johnson and W. H. Peterson, *J. Biol. Chem.*, 112, 25; 1935). For its action, this enzyme requires a free amino group on the polypeptide as the point of attachment, the peptide group next adjacent to this free amino group then being hydrolysed. Methyl substitution of the free amino group entirely prevents enzyme action. Peptides consisting entirely of glycine, for example, triglycine, are unattacked, as also are dipeptides

unless decarboxylated to give the amines. The other peptidases could not be prepared in a purified condition. The system as a whole is capable of splitting peptides in which the free amino group has been substituted by methylation or chlorination, but not if benzoylated. The amounts of the individual peptidases vary greatly in different preparations as judged by the ratios of the rates of hydrolysis of specific substrates.

Siduoka Earthquake of July 11, 1935

THE Pacific coast of the Main Island of Japan is penetrated by two inlets, Sagami Bay and Suruga Bay, separated by the Idu peninsula. Siduoka lies on the west side of Suruga Bay, and it is worthy of notice that the great Kwanto earthquake of September 1, 1923, occurred in the district including Sagami Bay, a very destructive earthquake on November 26, 1930, in the northern part of the Idu peninsula, and, lastly, a less violent earthquake still further west on the coast of Suruga Bay on July 11, 1935, the epicentres of all three lying nearly on a straight line. The Siduoka earthquake has been described in six papers (*Bull. Earthquake Res. Inst.*, 13, 942-1018; 1935), with one exception written in Japanese, but with summaries in English. Nine persons were killed, while 814 houses were totally, and 3,077 partly, destroyed. The earthquake occurred at 5.25 p.m. (8.25 a.m., G.M.T.). From the seismograms obtained at ten stations, the epicentre was found to lie in lat. 34° 59' 4" N., long. 138° 26' 2" E., and the focus at a depth of about 9½ miles. The damage was confined to a small district including Siduoka and Simidu. After the earthquake, four series of precise levellings were carried out along two routes crossing the central area, but the changes of level were in every interval small. The most remarkable feature of the earthquake was the almost entire absence of after-shocks. During the first twelve hours after the earthquake, only one was felt in Siduoka. In the same interval after the Kwanto earthquake, 188 shocks were felt in Tokyo.

North Atlantic Weather

A STATISTICAL comparison of the severity of weather in the North Atlantic during the last five winters is made by Captain L. A. Brooke Smith in the *Marine Observer* of January 1936. Such a comparison is not easy to make owing to the number of observing ships at sea varying considerably, which vitiates the value of the number of gale reports received during any one month. In recent years, however, there has been a large number of 'selected' ships on the North Atlantic trade routes, and the noon position of every one has been recorded. It is, of course, possible, though not likely, that on some occasion the ships may have been so spaced that a gale passed unrecorded between any two. A table is given showing graphs of the gale records in western, central and eastern Atlantic respectively. The greatest gale frequency was in the central zone in 1934-35, but the greatest number of days during which weather of hurricane force was reported was in the central zone in 1932-33. In the western zone, March 1931 was a bad month, and in the eastern zone, January 1932 was equally stormy. In the central zone, December 1932 was almost equally bad. Thus it would appear that while conditions during the last five years have been variable, there is no indication of progressive change in any direction.

Thermal Effects of Magnetisation

A COMMUNICATION received by NATURE from Toshiko Okamura, of the Research Institute for Iron, Steel and Other Metals, Sendai, Japan, describes an extensive investigation on the thermal effects of magnetisation of ferromagnetics. Test specimens were built up of a large number of alternate bars of the ferromagnetic substance and of German silver, constituting a series of thermocouples. Changes of temperature of 10^{-6} °C. could be detected. From the experimental results for initial and cyclic magnetisation, it was possible to separate the reversible and irreversible heating effects. For initial magnetisation, the curves giving the irreversible heat evolution for iron, nickel and cobalt were similar in form to the magnetisation curves. For nickel, the reversible change, with an increasing field, was at first an absorption of heat increasing to a maximum, followed by a decrease to zero, and a subsequent evolution of heat. For iron the field for reversal was not reached, while for cobalt there was a continuous increase in the absorption with increasing field. For cyclic magnetisation, on decreasing the field from the maximum, the irreversible heat evolution increased slowly at first, rapidly on passing through the zero field region, and then slowly. The reversible heating curve for nickel showed two symmetrical minima and a central maximum; the curves for iron and cobalt only the central maximum. It is shown that the reversible heating effect is in satisfactory accordance with the thermodynamic equation relating $(\partial T/\partial H)_S$ with $(\partial I/\partial T)_H$, where T , H , S and I are temperature, field, entropy and intensity of magnetisation. An interpretation of the irreversible heating effect is given on the basis of the Honda-Okubo theory of ferromagnetism. Measurements have been made for iron, nickel, cobalt, K.S. magnet steel, iron-nickel alloy and single crystals of iron.

Photon Theory of Scattering

THE experiments of R. S. Shankland (*Phys. Rev.*, Jan. 1, 1936) on the scattering of γ -rays may have wide theoretical consequences. The 'modified scattering' of X-rays had been satisfactorily explained by A. H. Compton on the assumption of a collision between a light quantum and an electron, energy and momentum being conserved. Bothe and Geiger carried out an experiment with point-counters which appeared to show the simultaneous production of a scattered quantum and a recoil electron. The present experiment, similar in principle, was carried out on the scattering of γ -rays with modern counter technique, and no simultaneous electrons and quanta were observed. A beam of γ -rays was limited by lead blocks and fell on a scatterer of air, aluminium, beryllium, paper or paraffin. The recoil electrons were collected by a thin-walled Geiger-Müller counter, and the photons fell on a set of gold-walled counters which counted them with an efficiency of about one per cent. No significant difference in the number of coincidences between these counters was observed for the two cases in which they were placed so as to catch the electrons and photons respectively, or in positions into which coincident particles could not be directed according to the theory. At present, quantum mechanical theory appears to give the same prediction for X-rays as the simple photon view of Compton, it is possible that an extended quantum

theoretical calculation may give a less definite angular distribution for the γ -ray case than the photon theory. In any event, the experiment is of crucial importance.

Applications of the Thyatron

THE past few years have seen the extensive development and application of the thyatron, a hot-cathode grid-controlled rectifying valve manufactured by the British Thomson-Houston Co., Ltd. In a paper read before the Institution of Electrical Engineers on January 2, Mr. A. L. Whiteley described the fundamental principles of this form of the thermionic valve and outlined some of its applications. The thyatron was originally developed as a sensitive relay; but has now reached such a stage that it is able to control power of considerable magnitude, and in this form it has been put to several uses in industry. Owing to the absence of any mechanical moving parts, it is particularly adaptable to high-speed circuit interruption, where comparatively large powers can be handled with a rapidity and ease that is difficult to attain by ordinary methods of switch control. A condenser-resistor combination in the grid circuit of the thyatron provides a convenient means of measuring out small intervals of time, and this application is utilised in the control of spot-welding operations. Other applications dealt with in the paper include voltage regulation, theatre lighting control and the use of direct-current motors on an alternating current supply. The paper concludes with a summary of the disadvantages of the thyatron, although it is pointed out that some of the objections raised against the use of this device are not well founded.

Damping Influences in Torsional Oscillation

AN important contribution on this subject has been made in a paper to the Institution of Mechanical Engineers read on December 13 by Dr. J. F. Shannon, in which are described his investigations of multi-crank engines when in a state of torsional oscillation. In the design of marine engines and high-speed reciprocating engines, including automobile and aircraft types, it is necessary to take account of the torsional characteristics of the dynamical system. The main part of the research here described was made on a four-cylinder petrol engine, a Geiger torsigraph being used to examine conditions of resonance. Various sources of damping were investigated—hysteresis in the shaft material, and, under different conditions of lubrication, damping at piston, big-end and crankshaft bearings. Of these, the last were shown to be the principal media of the dissipation of vibration energy, and therefore an analysis was made to ascertain the amount of energy which could be disposed of by the oil film under conditions of journal vibration, and its expression in terms of journal displacement. The results are held to justify the experimental conclusions in that it is shown that practically all the vibration energy can be accounted for in this manner. From these data, an overall non-dimensional factor was derived which is practically constant for the range of frequencies investigated. Figures relating to tests of other engines being available, these were similarly reduced to the simple non-dimensional form, showing the factor not to be constant for different systems but to have a mean line, which is offered as a guide in design, closely corresponding with the elastic curve.