# Research Items

## Art in China and on the North-West Coast of America

ATTENTION was first directed to the resemblances between the style of Chinese decorative art of the Chou period (1122–256 B.C.) and that of ancient Central America by Prof. Perceval Yetts. Dr. Leonhard Adam, who also had already discerned similarities between the Chou and Huai styles and that of the marble vessels from the valley of the Rio Ulua (Honduras) of about the twelfth or thirteenth centuries A.D., now asks for the consideration of anthropologists of his theory that both the Chinese Chou style and the north-west American style in decorative art developed under identical rules (*Man*, 3; 1936). This comparison, it is thought, may lead to a solution of the problem of the Tao Tieh mask, which is obviously a key to an understanding of the typical Chou decoration. It is evident that the Tao Tieh mask does not always represent the same being, while the decorative elements surrounding it are not identical, but vary considerably. It is suggested that originally it was not a mask at all, but was the head of an animal; and the decorative details around it are not independent, but originally formed part of its structure. In the course of a long development, these details were separated from the body of the animal, and were distorted in the same way as occurred in north-west America, for example, in the Chilcat blankets, which show the final stage of degeneration. The fact that geometric forms are far fewer in north-west America than in Chou art confirms the view that the American art represents a more recent stage of development. The chronological gap of three thousand years between the two styles precludes the suggestion of a historical connexion between them, but the application of the principles, stylisation, symbolism, etc., to be deduced from studies of the art of the north-west to the art of the Chou dynasty provides an important and very elucidating auxiliary for a reasonable analysis of the Chou style, though it does not solve all problems.

## Begging as Woman's Function among Serbian Gypsies

THE latest of the "Contributions to the Study of the Serbian Gypsies" by Dr. Alexander Petrovič (*J. Gypsy Lore Soc.*, Ser. 3, 15, Pt. 1) deals with the begging activities of the women, which have a definite place in gypsy economy. There exists in Serbia a certain group, whose families would starve if their women did not go round to the villages to beg. They have no employment, except occasionally and unsatisfactorily as casual labourers. In them is firmly implanted the idea that so long as there is a woman in the house none will starve. Others have a certain craftsmanship, such as tinsmithery or fiddling, and may even own a house or cattle. The activity of the woman appears to create a special mentality in the man, who is always hungry and has an uncontrollable desire for everything he sees. When a gypsy woman goes begging, she invariably has with her her bag and her stick. To both a recognised ritual attaches. When a girl accompanies her mother to beg, an old bag is given her to carry; but as soon as she is betrothed, a new bag is prepared. It is made by an older woman, and she herself must not help. The sewing is begun before dawn, "when the day increases", but no sewing is done on a Saturday, which is 'the day of death', or on a Tuesday, which is a day of ill-omen. When the bag is finished, it is hung on a hook and must not be used until the girl is married. On the bridal night the bride puts in the bag a shirt and socks for her husband, as it must be full, and in Bosnia, where it is presented with the rest of the wedding gifts, it contains in addition bread, chicken, sugar and salt, and these form the first supper eaten by the bridal pair when they enter their tent. The stick, usually the hazel because of its fecundity, is presented to the bride by her mother-in-law, three days after her arrival. A fruitful source of the gypsy woman's income is by the extraction of the worms, which are thought to cause pains in ear, nose or eye, so much being paid for each worm which the gypsy pretends to extract by suction through a rush.

## Chemical Protection against Infantile Paralysis

INFANTILE paralysis is a virus disease the infection of which travels by the nasal passages to the central nervous system. Monkeys can be infected by instillation of an emulsion containing the virus into the nose, some seventy-five per cent of animals so treated developing the disease. According to Science Service of Washington, D.C., Drs. Sabin, Olitsky and Cox, of the Rockefeller Institute for Medical Research, find that if a four per cent solution of sodium alum or of tannic acid is dropped into the nose daily for a few days before instillation of the virus, only five per cent of the animals become infected. They therefore suggest that these agents might be similarly employed as preventives of human infection. The method is simple and harmless, the chemicals presumably acting as a shield against the disease by preventing the causative virus from entering the body and reaching the nerve cells in brain and spinal cord.

## Larval Euphausiids from the South-West Coast of Ireland

MISS WINIFRED FROST has continued her studies on larval euphausiids (*Nematoscelis megalops*, G. O. Sars, and *Stylocheiron longicorne*, G. O. Sars, taken off the south-west coast of Ireland. *Proc. Roy. Irish Acad.*, 42, *B*, No. 16, September 1935). These two species are both taken in the oceanic waters of considerable depths and the larvæ came from similar localities. The descriptions add to our previous knowledge of the development in the Euphausiidæ, for the larvæ of *Nematoscelis megalops* and *Stylocheiron longicorne* were not previously known, and it is shown that they respectively resemble closely those of other species belonging to the two genera. It is interesting that only certain furcilia stages are present, indicating that several stages are normally omitted, and in *Nematoscelis megalops* these do not correspond with those previously found in *N. microps* from the Mediterranean. Similarly, in *Stylocheiron longicorne* only a few furcilia stages are represented, these agreeing with *S. suhmii* and *S. abbreviatum* from the Mediterranean, except for the fact that one extra

stage was found in *S. suhmii*. It is emphasised that all euphausiid larvæ so far known from waters where oceanic conditions prevail (with temperature and salinity relatively high) have fewer furcilia stages than those from neritic waters (*Nyctiphanes*, *Meganyctiphanes* and *Thysanoessa*).

### Polyporaceous Fungi of Bengal

DR. S. R. BOSE, president of the Section of Botany at the Indian Science Congress held on January 2–8 at Indore, addressed his audience on "Bengal Polyporaceæ", a subject to which he has devoted twenty years of critical and productive research. Certain territorial limits are implied by the title; but the discourse also reviewed work prosecuted in many parts of the world. The sections on the origin of fungi, fossil records of Polyporaceæ, morphology and systematics, and physiology of polypores, would be directly useful to a teacher of mycology in any land, and form a concise digest of modern research findings. Species of Polyporaceæ found in Bengal show an affinity with the fungus flora of Malaya, and conditions for their development are determined largely by the monsoon climate of these lands. Methods of adaptation to the extremes of wet and dry weather are described, and the influences which control the discharge of spores are discussed. The cytology of reproduction has been investigated, and is quite similar to that established for other higher Basidiomycetes. Heterothallism has been demonstrated for fifteen species, eight of which are bisexual, and the others quadrisexual. The problem of sex in fungi receives critical review, and cultural characters of several species in monosporous culture are outlined. Chemical analyses of the organic matter and ash of polypores have been made, and the enzyme actions of some species have also received attention. *Fomes pectinatus* is used to cure weeping eczema, and *Polyporus anthelminticus* is, as its name implies, a control for worms. The language of the address was simple, even picturesque in the general parts, and the subject matter a striking portrayal of the useful results to be obtained from a limited field of research.

### Analysis of Cereal Products

THE assessing of the quality of a foodstuff is often a matter of great difficulty, if possible at all, without resort to the ultimate practical test of utilisation. No better example of the difficulties of evaluation of quality can be given than the case of flour and cereal products generally. Despite the efforts of many workers, the only certain test of quality in flour is still the baking test, though with a knowledge of composition and source something approaching a satisfactory prediction can be made. The American Association of Cereal Chemists has produced a revised book of standard methods for use in the analysis of cereal products (Cereal Laboratory Methods: with Reference Tables. Compiled by Committee on Methods of Analysis. Third Edition. Pp. viii+204. (Omaha, Neb.: American Association of Cereal Chemists, 1935.) 3.00 dollars). Many of the methods, of course, are well known and in common use; others of recent origin are not so familiar. Full descriptions of practical tests such as baking tests, the determination of shortening values of fats, wheat-meal fermentation time tests, etc., are given. No reference is made to the Chopin 'extensimeter' which has found wide use in France and certain other European countries for assessing the quality of flour by means of the physical characteristics of the dough. This publication covers the whole range of cereals, flours, and cereal products, shortening materials, baking powders and flour improvers, and should prove of value to many food chemists.

### Bog-flow in County Clare

A RECENT bog-flow in the Slieve Aughty Mountains in County Clare is described by Mr. G. F. Mitchell in a recent paper (*Sci. Proc. Roy. Dublin Soc.*, **21**, No. 27, November 1935). The burst occurred for a width of 50 yards over the edge of an escarpment at a height of 1,020 feet. Above the line of the burst, the hill slopes upwards at about 3°: below the line the gradient is much steeper. The bog moved forward and covered several acres, though its flow was checked by escarpments at lower levels. A more or less solid raft of crust about three feet in thickness was carried forward on a completely humified semi-fluid layer about two feet in thickness. Lower down, the movement of the more solid rafts of crust were checked, and the fluid underlayer flowed on into a small river channel. Mr. Mitchell suggests that a burst on such a terrain was inevitable sooner or later. What actually started it was probably an increase in weight of the peaty crust due to heavy rainfall, causing a pressure on the humified underlayer, which was thus pushed down the slope and moved under the influence of gravity. The flow was quiet and lasted for several days.

### Recent Earthquakes in California

MESSRS. P. BYERLY and J. T. Wilson have made two interesting studies of recent earthquakes in California (*Bull. Seis. Soc. America*, **25**, 223–246, 269–273 (1935)). In the first paper, they describe the Niles earthquake of May 16, 1933, and the two Parkfield earthquakes of June 7, 1934, all of destructive strength. The intensity of the former earthquake was greatest near Niles on the Hayward fault, but the inner isoseismals follow the Sunol fault. There was no surface faulting in connexion with this earthquake. The epicentre, as determined from seismograms at neighbouring observatories, lay in lat. 37° 38′ N., long. 121° 57′ W., and the focal depth cannot have exceeded 6 miles. The Parkfield earthquakes occurred at about 8.30 and 8.48 p.m. (Pacific standard time). The epicentre of the second earthquake was in lat. 35° 56′ N., long. 120° 29′ W., on the San Andreas fault, that of the earlier being about 2½ miles farther north. From the evidence of the seismograms, it seems that the thickness of the surface granite layer in this region is about 19 miles. In the second paper, they determine the epicentres of 70 earthquakes in northern California during the year April 1, 1933–March 31, 1934. The map shows that the epicentres were thickly clustered in the districts lying to the east of Monterey Bay and around Niles. The coastal region between Humboldt County and San Francisco was remarkably free from earthquakes, while the San Andreas fault—the great fracture with which the earthquake of 1906 was connected—was inactive northwards from Loma Prieta.

### Conditions in Cumulus Cloud

"SOME Observations on the Thermal Structure of Cumuliform Cloud", by Flight-Lieut. R. O. Veryard (*Scientific Notes*, **6**, No. 64, India Meteorological Department), is a paper describing meteorological

observations specially undertaken by pilots of aeroplanes of five squadrons of the R.A.F. in the neighbourhood of Peshawar, Kohat and Risalpur in the North-West Frontier Province of India. W. Kopp and others had observed a fall of temperature on entering cumulus clouds, the fall being greatest near the top. To account for the buoyancy of the cloud, which appears to require that the air within it shall have a lower density than has the surrounding air, Kopp suggested a high degree of supersaturation within the cloud, for the presence of a large amount of water-vapour would lower the density and might more than counteract the greater density arising from the relatively low temperature. These observations were made with the view of testing the validity of Kopp's observations and conclusions, and included readings of both the dry and wet bulb thermometers inside and outside cumulus clouds. Although it could not be claimed that the readings were accurate to within less than 1° F., on the whole they confirmed the lower temperature within the cloud. The internal temperature was the lower on no fewer than thirteen out of the fourteen occasions when the cloud was dissolving; out of twenty occasions of growing cloud, the internal temperature was lower on six and higher on ten occasions, and higher near the base while cooler or equal in temperature to the outside air at the top on three occasions, the remaining case showing no difference from the environment. The author of the paper evidently looked for evidence of supersaturation to be furnished by the wet bulb reading higher than the dry, but within the limits of accuracy of the readings such differences were not found; the wet bulb reading was sometimes entered as ½° higher than the dry; but even this was rare, the normal condition within the cloud being equality in the readings, implying a humidity of 100 per cent.

### Radiation from Aerials

PROGRESS is being rapidly made in the design of aerials for broadcasting and radio transmission. Many of the problems that have to be solved in practice possess considerable mathematical difficulty, and so the paper by E. B. Moullin on the radio resistance of aerials, read to the Institution of Electrical Engineers on January 8, will be welcomed by radio experts. The function of an aerial is to transmit or receive communication to or from a point at a considerable distance away. The author examines the action of the aerial from both points of view. In transmission he examines it to see whether its geometrical shape is such that it performs its functions with the least expenditure of power, and in reception he examines the aerial from a very distant point of view to see what field strength it produces at the point of reception. The broadcasting engineer has to build not only an aerial which produces the requisite direct-ray communication with the minimum expenditure of power, but also one which radiates little at high angles. The power radiated at high angles is not merely wasted but it is also definitely harmful. It is liable to be reflected by the ionosphere and so make the station audible at a radius far in excess of that occupied by the listeners it is meant to serve and who contribute to its cost. As the number of channels available for broadcasting is very limited, the possibility of having a large number of stations providing satisfactory services in different regions of the world depends on these stations having a limited range of action. The problem of designing an aerial affects both the initial cost of the station and the comfort of distant neighbours. It is proved that for a straight aerial of given length the necessary power is a minimum when it is vertical. It is also proved that the current distribution in the aerial is not the same in reception and transmission.

### Testing Electric Cables

TWO papers were read to the Institution of Electrical Engineers on January 15 discussing methods of testing the insulating wrappings of cables, and of eliminating defective or weak parts of the covering, which otherwise might develop into breakdowns in practice. The first paper, by Mr. A. N. Arnam and Dr. A. T. Starr, discusses the various types of breakdown which occur with high-voltage cables. There is first breakdown by disruption or puncture, which occurs immediately the voltage is greater than a certain definite value. This type rarely occurs in cables, and takes place generally with a large impulsive rush of current. The second type is due to thermal instability of the current. It occurs when the rate of increase with temperature produced by the losses at a part of the dielectric is greater than the heat conducted away, and so the temperature at this spot rises. In the third method, there is a breakdown due to a slowly progressive 'treeing' and 'coring' of the dielectric caused by ionisation by collision. This leads eventually to thermal instability at the thermal centre of the coring. The second paper discussed was by Mr. C. Kibblewhite, who suggested a method of routine high-voltage testing with direct current. He shows that this method locates weaknesses in the insulation of high-voltage cables which, unless eliminated, will develop into breakdowns in service. A series of tests carried out on a cable network operating at 11 kilovolts is described, and conclusions are drawn as to the best way of carrying out tests, and the extent to which this increases their factor of safety.

### A New Essential Amino Acid

ATTEMPTS have repeatedly been made to study the physiological significance of individual amino acids by feeding experiments in which a known mixture of amino acids has been supplied in place of proteins. Such attempts have failed, and the existence of a protein growth-promoting component other than the twenty known amino acids was proved. The addition of a crude concentrate of the mono-amino acids to such a synthetic diet provided for satisfactory growth. The inference was that the missing growth essential was of a simple nature. This missing component has now been isolated and found to be, in fact, two acids (M. Womack and W. C. Rose, *J. Biol. Chem.*, 112, 275 (1935); R. H. McCoy, C. E. Meyer and W. C. Rose, *ibid.*, 112, 283 (1935)). These have been separated by their solubility difference in aqueous butyl alcohol. The more soluble has been identified as isoleucine and the less soluble as one of the four optically active α-amino-β-hydroxy *n*-butyric acids. This acid has been isolated in a pure crystalline form, and several derivatives obtained. The importance of isoleucine had been recognised previously, but the amount present in the leucine of the amino acid mixture was insufficient for growth. Hydroxyaminobutyric acid has been described before as a hydrolytic product of proteins, but its essential character was not hitherto known. About 0·6 per cent of this acid is the minimum amount for satisfactory growth of rats with an otherwise adequate diet.