

Sinanthropus.

AT a joint meeting of the Sections of Geology and Anthropology of the British Association at Bristol, Prof. G. B. Barbour, of the Department of Geology, Yenching University, gave a very interesting lecture on "The Geological Background of Peking Man (*Sinanthropus*)." Chou-kou-tien, where *Sinanthropus* was discovered in an abandoned limestone quarry, overlooking the re-entrant margin of the Yellow River delta plain, lies 37 miles south-west of Peiping (Peking), on a branch of the Peking-Hankow railway. The fossiliferous deposit was first reported by J. Gunnar Andersson in 1921, and in the following year Otto Zdansky discovered mammalian material, reporting in 1926 that it contained hominid teeth. In 1928 B. Bohlin, C. C. Young, and W. C. Pei found an adult right ramus, with three molars *in situ*, together with part of another jaw and many skull fragments. In 1929 W. C. Pei, a young geologist on the staff of Yenching University, discovered first fragments of a skull, since reconstructed, and later an uncrushed adult skull. This latter discovery occurred at 4 P.M. on Dec. 2, the last day on which it was possible to work because of the increasingly wintry weather. The skull was embedded in a travertine matrix, and Prof. Barbour described the infinite care and skill with which Dr. Davidson Black removed the matrix, taking repeated casts and photographs, in an effort to ensure that the fullest records should be available for future workers.

The skull is that of a young adult, for the sutures are deep and unfused. The lower face is apparently missing, but the ear-hole and the back of the skull are present; the jaw sockets are massive, suggesting marked biting capacity. Dr. Davidson Black considers that the length of the skull approximates to that of *Pithecanthropus*, which it also resembles in its massive brow-ridges, but the distinct frontal swelling and the development of slight parietal bosses mark it off from the Java skull. A feature of importance in the site is that remains of at least ten individuals have been found, and, curiously enough, all skeletal parts so far recognised belong to the head.

In addition to the richness of the *Sinanthropus* finds, the quantity and variety of the vertebrate remains form a striking feature at Chou-kou-tien.

More than fifty types of mammals, besides frogs, snakes, turtles, and birds, have been recorded. In the three seasons, 1927 to 1929, about 8800 cubic metres

have been excavated, and 1475 boxes of fossil material have been removed. The most characteristic types are *Sinanthropus*, *Euryceros* (flat-antlered deer), *Rhinoceros*, cf. *sinensis*, and *Hyæna sinensis*. *Trogontherium* (big beaver) and *Bubalus* (primitive buffalo) also occur. The fauna has suggestions of a southern affinity and is distinctly older than the Loess fauna of Middle Pleistocene date, which includes *Rhinoceros tichorinus*, *Hyæna crocuta*, and *Cervus elephas* in place of those mentioned above. It can be closely dated as very early Pleistocene in view of the absence of truly archaic types and the presence of modern types, including *Equus*, but it is definitely older than the Middle Pleistocene. The fossil material is found *in situ* at various level deposits, and is of essentially the same age from top to bottom.

The finds were made in deposits of breccia, gravel, sand, and clay filling fissures and caves in Ordovician limestone. With the aid of a series of remarkably clear photographs, sections, and block diagrams, Prof. Barbour demonstrated the origin, by dissection, of the various clefts or caves, which at one time must have formed shelters for animals and are now filled with the brecciated clayish or sandy fossiliferous formations, comprising the typical Chou-kou-tien deposits. The interest of the lecture was greatly enhanced by the exhibition of casts of *Sinanthropus* and of a tooth. Prof. Barbour concluded by pointing out that all new data are issued from the laboratory of Cenozoic Research, under the combined control of the Geological Survey of China and the Peking Union Medical College. He paid a tribute to the way in which work has been continuously carried on in spite of the grave difficulties due to the prolonged political crisis in China. Reference was made to the important paper by P. Teilhard de Chardin and C. C. Young in *Bull. Geol. Soc. China* (vol. 8, No. 3, 1929), which not only gives a clear and detailed account of the geological history of the Chou-kou-tien formations, but also has a bibliography of all publications on the subject up to December 1929. Vol. 9, No. 1, 1930, gives further data.

It had originally been planned that Prof. Elliot Smith should open a discussion on the characters and affinities of Peking man, but he decided in early August to go to China to study *Sinanthropus* on the spot. His report, and a further one from Dr. Davidson Black, will be awaited with keen interest.

Staining Yeasts with Methylene Blue.

WORKERS who use the time-honoured method of staining yeasts with methylene blue are familiar with the untrustworthy results often obtained when an attempt is made to distinguish living from dead yeasts. It is now realised that apparently contradictory results may be due to differences in working conditions employed by various workers, and in this connexion a recent letter in NATURE (Brooks, 125, p. 599; April 19, 1930) may be cited, in which the importance of pH value, concentration and purity of the stain, and of the effects of light are indicated.

Fuchs also (*Woch. Brav.*, 46, p. 437; 1929: 47, pp. 171, 183; 1930) has pointed out that the concentration of methylene blue, which is usually 0.0001 per cent, may be increased to 0.001 per cent without any immediate marked change in the proportion of stained to unstained cells. After 15 minutes, however, this proportion may increase very rapidly. If this

result is correlated with the fact that granulated cells, which are usually considered dead, stain well, we have a certain amount of evidence that methylene blue is toxic to yeasts after a short period of contact.

Haehn and Glaubitz (*ibid.*, 315) actually showed, however, that preparations from which unstained yeasts were entirely absent grew in wort, and they therefore concluded that cells which take a weak stain are living, though impaired in vitality. The weak staining in the first instance may probably be attributed to adsorption by mucilage on the cell-walls. In both cases a 0.0001 per cent solution is favoured, and Fuchs adds this until the colour is blue-green and immediately counts the deeply stained dead cells. In the case of suspensions in wort the proportion of stain must be increased, as some is adsorbed by the wort-colloids.

Against this increase in stained cells on prolonged

contact must be set the decolorising effect of reductase, which persists when the cell is dead and is greatly increased at low pH values (for example, in wort). The influence of pH values has been accounted for by Fink and Weinfurter (*ibid.*, 47, pp. 89, 110, 124; 1930) by the fact that methylene blue is a base, the hydrochloride of which is soluble in neutral or in acid solutions. In alkaline solutions, however, the less soluble base is liberated and is available for adsorption. Thus, at pH 2.2 less than 1 per cent of the cells examined were properly stained, the remainder being pale-blue in colour, whilst at pH 4 a deeper shade of blue was obtained, increasing progressively in depth of colour until, at pH 8, all the cells were deep blue. The marked time-effect is illustrated by the increase in one case of from 5 per cent to 20 per cent of stained cells in 3 minutes (pH 2.6 to 6.8).

Yet another source of anomalous results was traced to the electrolyte-content of the medium in which the yeast is suspended. Thus, staining occurs more rapidly in distilled water than in tap-water, but a trace of electrolyte (for example, salt) added to the former

before the addition of the stain inhibits its action. It is not clear to what extent this is due to a corresponding change in pH value, since some substances, for example, dextrose and lævulose, have the effect of predisposing the yeast to staining. Maltose and glycerol are less effective in this respect, while mannitol is inactive. Electrolytes containing chlorides, iodides, thiocyanates, bromides, sulphates, nitrates, tartrates, citrates, and acetates act as inhibitors in decreasing order of efficiency, and it is suggested that their absence renders the yeast-walls more permeable to the stain.

Another important fact which emerges from these investigations is that one set of conditions cannot be formulated for all strains of yeast, so that there appears to be every reason why a study should be made of possible substitutes for methylene blue. In this connexion attention may be directed to the proposal of a 0.25 per cent solution of erythrosin by Devereux and Tanner (*Jour. Bact.*, 14, p. 217; 1927), and to the use by Tolstouhov of eosin-yellow for pH values above 3, and acid fuschin for pH 0.8-3.0.

International Eugenics Conference.

THE International Federation of Eugenic Organisations held a conference at the Larmer Tree Grounds, Tollard-Royal, Wiltshire, on Sept. 10-15. Eighteen countries maintain membership in the Federation, and many of them sent representatives. Among those present were Sir Bernard Mallet, of Great Britain; Dr. A. Ploetz and Prof. Rüdin, of Germany; Prof. Reichel, of Vienna; Dr. Heuyer, of Paris; Dr. Van Herverden, of Utrecht; Dr. J. A. Mjøen, of Oslo, and Dr. H. H. Laughlin, from the Eugenics Record Office, U.S.A. Mrs. C. B. S. Hodson acted as organiser and interpreter of the conference. One object of the conference was to co-ordinate research in different countries. Reports were received on eugenics and war, and on recent eugenic developments in various countries. Committees were formed or continued for the study of human heredity, race crossing, racial psychiatry, and the standardisation of anthropometrical measurements, physical and mental. Different conferences were held on the standardisation of human measurements, on race crossing, on racial psychiatry, and on human heredity. Miss Tildesley outlined proposals on behalf of English anthropologists for standardising measurements, and Miss B. Schieffelin discussed methods of measuring psychic differences.

In her report on the work of the American Eugenic Research Association on Mental Measurement, Miss Schieffelin pointed out that the search for any such thing as a measurement of hereditary mental endowment has proved a failure. A central clearing-house should be established so that all mental tests could be thoroughly classified and their value gauged. This clearing-house, which would of necessity be an expensive business, would be able to review the situation and plan future research. Workers would be able to apply to it for advice and should be able to obtain the existing position in relation to mental testing and its application to hereditary factors.

Prof. Rüdin outlined a scheme of research on racial psychiatry, and Prof. C. G. Seligman contributed some observations on Chinese and Japanese psychiatry. An afternoon was devoted to papers on human heredity.

A public meeting held in the Tythe Barn, Hinton St. Mary, at the invitation of Capt. Pitt-Rivers, on "The Urgency of Eugenic Reform", was attended by many local people. Sir Arthur Keith spoke on eugenics

from the evolutionary point of view; Prof. Ruggles Gates, on human heredity and segregation in racial crossing; Prof. Rüdin, on heredity of insanity; and Dr. C. J. Bond, on dangers of racial decay and the remedy.

Sir Arthur Keith, in his address, briefly traced the development of modern man from the time of *Pithecanthropus erectus* through the age of agriculture and showed how gradually the production of race was sacrificed for the accumulation of wealth. The new age, the eugenic age, is, it is hoped, to be one of constant race improvement. There are many difficulties in the way of execution of eugenics ideals, chief of which are human prejudice, emotion, and passion. The Church is falling into line, placing its blessing on attempts at racial improvement and paving the way for the more practical side which is the work of the eugenicist. The evolution of man is not, as some people imagine, at a standstill, for it is slowly but surely progressing, and must be directed by the knowledge of the eugenicist.

Dr. C. J. Bond emphasised the presence of a considerable element of mental and physical degeneracy in the general population. He pointed out that the remedy lay in first of all carrying out an exact ascertainment of the degree of mental and physical deterioration in the various social groups and then applying the principles of sterilisation and segregation. This would in course of time eliminate the defective and unstable members of society.

At another public meeting, cinema films showing various features of cell division and embryonic development were shown by Prof. Ruggles Gates, and Prof. Elton Mayo, of Harvard University, spoke on the physiology of efficiency.

Excursions were made to the surrounding country to view some of the numerous archaeological remains in this vicinity. Under the guidance of Mr. O. G. S. Crawford and Mr. St. George Gray, the ancient British village and Roman camp on Hod Hill, Ackling Dyke, Worbarrow, Stonehenge, Woodhenge, and other neolithic and later remains were visited. The numerous archaeological relics and models of excavations to be found in the Pitt-Rivers Museum at Farnham, Dorset, were also examined, as a preliminary to visiting some of the places from which they were excavated.