Early Man in China.

By Prof. G. ELLIOT SMITH, F.R.S.

THE reconnaissance inaugurated in 1921 by Dr. J. G. Andersson on behalf of the Geological Survey of China has brought to light evidence of exceptional interest and importance for students of archæology and human palæontology. In the province of Honan, Dr. Andersson discovered a rich industry, including painted pottery, the cultural link of which with ancient Sumer is widely admitted. It provides positive confirmation of the early diffusion of culture from Mesopotamia to the eastern limits of Asia during the third millennium B.C. In addition, he recovered a number of interesting human remains in association with the early industries in Honan and Kansu. His survey has also been responsible for the discovery of the fossil remains of the early Pleistocene genus of the human family which Prof. Davidson Black called *Sinanthropus*—roughly contemporaneous with *Pithecanthropus* and *Eoanthropus*.

(1) In *Palæontologia Sinica* (Series D, Vol. 6, Fasc. 1) Prof. Davidson Black has completed the statistical investigation of the Kansu and Honan skulls found with the painted pottery and has compared them with specimens from later Kansu prehistoric sites as well as with more recent crania from northern China and elsewhere. In this laborious work, he has followed the mathematical methods devised by Prof. Karl Pearson and his school. The interest and value of this elaborate monograph is not diminished by the fact that the results obtained fully confirm those announced in 1925 from simple observation, before Dr. Black had begun the statistical analysis of the material. He has now established the fact that the prehistoric population of eastern Asia in the third millennium B.C. was sufficiently akin to the modern inhabitants of northern China to justify the application to them of the term 'proto-Chinese'. He notes, further, that the earlier members of his series diverge much more widely from the modern type than do those of the later prehistoric phases of culture. In certain suggestive features the earliest types present some near resemblances to the Khams-Tibetan type described by Dr. Morant.

(2) Prof. Davidson Black is to be congratulated on the promptitude with which from time to time he has placed at the disposal of anthropologists the information relating to the various discoveries of fossil remains of *Sinanthropus*. The "Preliminary Note on Additional *Sinanthropus* Material" issued in the *Bulletin of the Geological Survey of China* (Vol. 8, No. 1, 1929) deals with the material found in the autumn of 1928 at Chou Kou Tien in the course of excavations carried out by Dr. Birger Bohlin, Dr. C. C. Yong, and Mr. W. C. Pei. Previous to this discovery, the new genus was known only from a few teeth, but in 1928 the excavators found, in the neighbourhood of the place where the tooth-type had been recovered in the previous year, the greater part of the right horizontal ramus of an adult lower jaw with three molar teeth *in situ*, and

the sockets of the premolar, canine, and distal half of the lateral incisor preserved. In addition, more than twenty teeth, both deciduous and permanent, representing many phases of wear and differences in age, were found, together with the front part of the lower jaw of a child. The fragments of jaws, adult and infantile, were embedded in blocks of travertine, and at the time the report was published the associated cranial fragments had been only incompletely freed from the stony matrix. The piece of the child's jaw was intimately associated in the block of travertine with a parietal bone of corresponding age. Although this part of the braincase had not been extracted from the matrix, sufficient of it was visible to enable Dr. Davidson Black to say that it was definitely human in type and represented part of a roomier braincase than that of *Pithecanthropus*.

The importance of this association of part of a human skull with a fragment of jaw of corresponding age is of special interest because the jaw presents simian peculiarities of conformation such as, in the case of the Piltdown jaw, aroused in the minds of many foreign palæontologists doubt as to the possibility of association with a human skull. The present report, providing more than forty photographs and skiagrams of the new specimens, and comparative data to permit an exact comparison with known specimens, makes it possible for anthropologists throughout the world to appreciate the exact nature of the material which has been found and to estimate its vast significance.

This discovery justified Prof. Davidson Black's bold action in creating a new genus on the evidence of a tooth. The far-reaching importance of the fossils found in 1928 is enhanced by the even more startling discovery made on Dec. 2, 1929, by Mr. W. C. Pei, of a complete braincase of an adult skull of *Sinanthropus*, which is uncrushed. This new specimen is unique: it is the only complete braincase of early Pleistocene man so far known. It brings home in a much more convincing way than the recovery of mere fragments, the reconstruction of which invariably excites suspicion in the minds of most people, the tremendous significance of the discoveries in China. For this braincase is more complete than the remains of either *Pithecanthropus* or *Eoanthropus*, and, contrary to the anticipations which were made last year (when a jaw was found presenting features hitherto unknown in any other human remains except *Eoanthropus*), displays a form more nearly akin to the Javanese than to the Piltdown fossil.

The photograph recently received in England, reproduced as Fig. 1, represents the skull in the state it reached the laboratory in Peking. The base is still embedded in plaster of Paris and the occipital bone is hidden almost as far as the lambda.

In the accompanying diagram (Fig. 2), made by Miss Eleanor Dale, the contour of the part of the skull of *Sinanthropus* displayed in the photograph

is shown by the line A. The dotted line is merely a tentative suggestion of the form of the skull with a drawing of the fragment of an adult jaw found in 1928. The contours of the cranial vaults of *Pithecanthropus* (B) and the type specimen of Neanderthal man (C), both presenting analogous forms, have been inserted for comparison, the inch-scale providing the criterion of exact size. Its resemblance to the Neanderthal skull is discounted by the significant difference in actual size.

With the photograph Prof. Davidson Black has sent the following information.

Within the main cave deposit at Chou Kou Tien, up to the present time, *Sinanthropus* remains have been recovered from five different sites, three of which, including the latest, have been discovered by Mr. Pei during the last season's work. Contrary to the reports which have been circulated, no skeletal parts other than the skull and numerous isolated teeth have been recovered during this year's excavations. Remains of at least ten individuals belonging to the genus have been found.

It should be noted that the different sites where

investigations of Père Teilhard de Chardin and Dr. C. C. Yong on the geology and palæontology. Though hundreds of cubic metres of material have

FIG. 1.—Brain-case of *Sinanthropus*.

been examined, no implements or artefacts of any nature have been found, nor has any trace of the use of fire been observed.

The greater part of the left side and the fore part of the base of this unique brain-case of *Sinanthropus* is still embedded in a block of very hard travertine. The vault of the skull from its massive brow ridges to the occiput, and the whole right side of the specimen was, however, encrusted with a relatively soft matrix, which was removed before the photograph was taken. It is apparent that the braincase has been almost completely preserved while most of the facial region seems to be lacking.

The skull of *Sinanthropus* is of approximately the same length as that of *Pithecanthropus* and, like the latter, is provided with massive brow ridges. However, *Sinanthropus* differs from the Java type in the following important features: Relatively well-developed frontal eminences, well-localised parietal eminences, and greater height of skull vault; all these characters pointing to a relatively greater brain capacity in *Sinanthropus*. The mastoid processes are small and rugged. The sockets in which the lower jaw articulated are well pre-

FIG. 2.—Contours of brain-case of (A) *Sinanthropus*, (B) *Pithecanthropus*, (C) Neanderthal man.

Sinanthropus has been discovered within the main Chou Kou Tien deposit are all clearly contemporaneous with one another, being Lower Quaternary (Plycene) in age. This statement is based on the

served on both sides, a circumstance which will be of great value when the task of reconstructing the lower jaw (shown in Fig. 2), recovered in 1928, is undertaken.