

Peking Man

REFERRING to the notes published in *The Times* on November 20 and 28, concerning the recent discovery of two skulls of *Sinanthropus*, I am writing to confirm the fact that the information contained in these notes is correct. (*The Times* has since published on December 8, an article announcing the discovery of still another skull. The information contained in this later article is now confirmed by letters of Dr. Young and Mr. Chia just received; but I am awaiting further information for details of this fifth skull.)

Since the untimely death, in 1934, of my friend Dr. Davidson Black, the honorary directorship of our Cenozoic laboratory and the investigations of anthropological materials obtained by the laboratory have been carried on by Prof. F. Weidenreich, whose replacement of Dr. Black was recommended by Sir G. Elliot Smith.

In 1935, Dr. W. H. Wong, director of the National Geological Survey of China, of which our laboratory is one department, sent me to Europe expressly to study the Quaternary geology, human palaeontology, and Palaeolithic industry in Europe, under the personal direction of Prof. H. Breuil. The work in excavation at Choukoutien is carried on by Mr. L. P. Chia, who was appointed by the director of the Geological Survey of China as field director, as successor in my former post. This young Chinese scientist, Mr. Chia, is carrying on his research with patient skill, as a result of which he was rewarded on October 22 by the discovery of a lower left jaw with five teeth well preserved.

On November 16, to the surprise of scientific circles, Mr. Chia discovered two more skulls of *Sinanthropus* in addition to the two skulls which I found on the same site years ago. This site is turning out to be really a treasure house for human science. It is much to be hoped that Prof. F. Weidenreich will be given the three year grant for which he has applied to the Rockefeller Foundation in order to carry on such vital scientific research.

Concerning these two latest skulls, a letter from Père Teilhard de Chardin says, "Two crushed, but largely preserved *Sinanthropus* skulls have been found, some three metres above the Lower Cave and only a short distance from the front of your own excavation, North Wall. The skulls, without any limb bones, were close to each other, and have no lower jaws. The bases of the skulls are missing, as usual. There are one adult male and one adult female. The male specimen will be soon reconstructed, and is more complete than the skull No. 1 all around the calvarium, with even a part of the molar bone preserved. It is difficult so far to appreciate how complete the female skull will turn out to be, but it has at least several parts well preserved: the mastoid area (perfect), a part of the upper maxillary (above the molars), etc. The characteristics are typical, as in skull No. 1, but accentuated. The skulls were found in a place practically barren of bones and implements in a matrix sandy and brecciated in places." A later letter from Mr. Chia adds that the skulls, although badly crushed, will be easily reconstructed, since the fragments were found close together and the breakages are very sharp.

I would like to express my sincere appreciation for the sympathetic co-operation of English scientists, and my gratitude to the Rockefeller Foundation, which has, since the beginning, granted us all the financial support necessary for carrying on our

research. In addition to the excellent leadership of Dr. W. H. Wong, director of the National Geological Survey, and Dr. C. C. Young, director of the Peking office of the Survey, we owe much to the co-operation of foreign scientists: Prof. Weidenreich, an excellent and experienced German anthropologist, by whose intensive studies our knowledge of early man in China is being extended and brought to the notice of scientific workers everywhere; and Père Teilhard, the well-known French geologist, whose wide experience has enabled us to carry on work in keeping with recent progress in geological science.

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Effects of Chemical Combination with Oxygen and Fluorine on the $K\alpha_{1,2}$ -Doublet of some of the Lighter Elements

It is well known that the $K\alpha_{1,2}$ -doublet from the elements 12 (Mg) to 17 (Cl) is influenced by chemical binding, apparent, for example, through its displacement towards shorter wave-lengths. Earlier measurements I have made¹ with the elements 12 (Mg), 13 (Al) and 14 (Si), which were carried out with special regard to the effects from oxygen and fluorine on the $K\alpha_{1,2}$ -doublet, have recently been extended by measurements with sodium. No conclusive evidence of any displacement in either direction could be found. These and previous results are summarized in the accompanying table; the measurements on the oxygen compounds of phosphorus, sulphur and chlorine were made by Lundquist².

Atomic number	Emitting atom	Maximum valency (p)	Displacement δV (volts)			
			oxygen binding		fluorine binding	
			obs.	calc.	obs.	calc.
10	Ne	0	—	0	—	0
11	Na	1	0.01	0.03	0.03	0.06
12	Mg	2	0.14	0.13	0.20	0.22
13	Al	3	0.31	0.30	0.52	0.50
14	Si	4	0.56	0.53	0.92	0.90
15	P	5	0.81	0.82		
16	S	6	1.18	1.19		
17	Cl	7	(1.62)	1.62		

Calling δV the displacement in volts towards shorter wave-lengths and p the maximum valency of the emitting atom, the following equations are found:

$$\text{Oxygen binding: } \delta V_O = 0.033 p^2$$

$$\text{Fluorine binding: } \delta V_F = 0.056 p^2; \delta V_F / \delta V_O = 1.68.$$

The values of δV calculated from the above equations are given in the fifth and seventh columns of the table, the observed values in the fourth and sixth columns. The discrepancies are well within the experimental errors. The value given for chlorine within brackets refers to the displacement chloride - perchlorate. Provided the equation holds good also for an extrapolation, one would infer from the result that the displacement chlorine - chloride must be very small indeed.

With elements belonging to the second horizontal line in the periodic system the disturbing atom, oxygen or fluorine, is seen to produce a displacement of the $K\alpha_{1,2}$ -line which appears to increase as the square of the maximum valency. Considering the highly complicated interaction between the ions or atoms entering into a chemical compound, the simple