THE NAN YE LI SANMENIAN FOSSILIFEROUS DEPOSIT*

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Nan Ye Li is a little village, lying about 80 kilometers West from Cheng Ting Fu, along the mountains, at some 370 meters above the level of tne great Hopei plain.

The site is quite monumental, being surrounded by the towering masses of the big classical Sinian and Cambro-Ordovician series of the Shansi border, dissected by deep cut valleys or rather cañons (fig. 1).

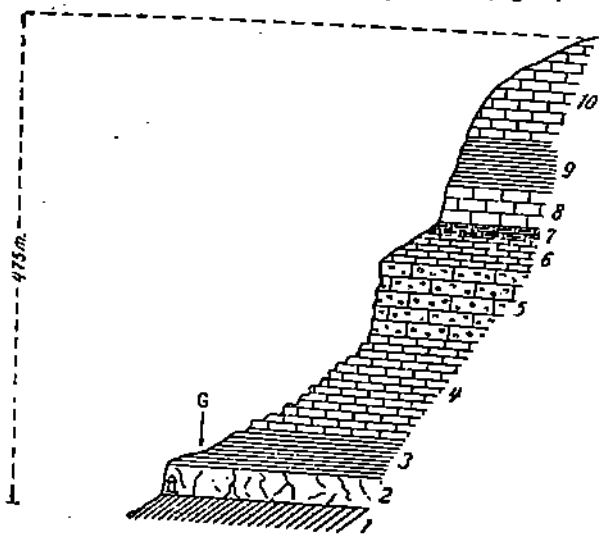

Fig. 1.—The geological section of the Nan Ye Li cliff. 1, Wut'ai formation; 2, Pre-Cambrian quartzite; 3, Cambrian fossiliferous (Trilobites) brown slates; 4, Slaty limestone; 5, Oolitic limestone; 6, Slaty limestone; 7, "Wurmkalk"; 8, Dolomitic limestone; 9, Slaty limestone; 10, *Actinoceras* limestone. G, Place of the Cenozoic fossiliferous formation.

Along the lower slopes made by the brown Cambrian shales, patches of late Cenozoic deposits are met with, from place to place, consisting of dark red

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waxy clay, overlaid by a hard cemented conglomerate, capped itself in some cases by typical loess. The red clay is generally barren from fossils. But, in one restricted place (not longer than some five meters), I succeeded in finding a small bone deposit, the stratigraphical conditions of which are indicated in the fig. 2. The Mammalian remains found in this pocket (which I have entirely

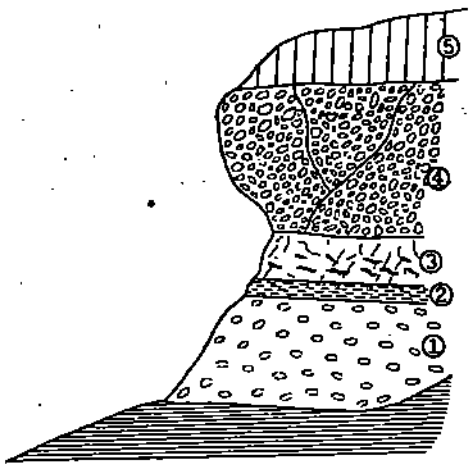

Fig. 2.—Section of the fossiliferous deposit of Nan Ye Li. 1, Red clay, with pebbles, angular stones, and a few fossils, lying over the Cambrian shales (1,50 met.); 2, Red calcareous clay (0,10 m.); 3, Red brown clay, fossiliferous (0,40 m.); 4, Hard cemented conglomerate (1,50 m.); 5, Loess (0,30-1 m.).

excavated) are very fragmentary. Nevertheless according to F. Teilhard, the following forms can be safely recognised:

1. *Rhinoceros* cf. *sinensis* Ow.—Lower jaw (with badly worn teeth), radius, astragalus. Although belonging to full grown specimens, those bones are exceptionally small (distal breadth of the radius, 63 mm.; proximal breadth of the astragalus, 62 mm.), probably due to an individual variety or geographical distribution.
2. *Equus* sp., a large form.—Upper teeth, phalanx, hoofs.
3. *Moschus* (or *Munjack?*).—Isolated upper and lower molar teeth
4. *Sus* sp.—Milk teeth.
5. *Cervus* cf. *rusa*.—Two sizes, one of those being rather small, One broken tine, teeth, several complete canon bones, broken limb bones. That the Nan Ye Li deers have to be referred to the *Rusa* rather than to the *Pseudaxis* (*Sika*) is indicated by the simple shape of the P_4.

6. *Gazella* sp.—Broken horn cores.
7. *Bison* (?) sp.—A broken P_3 and pieces of the feet: distal end of a metacarpe, astragalus, cubo-navicular bone. By the shape and the size, the form seems to be identical with the small Bison found in the Nihowan beds of the Sangkan Ho.
8. *Ovis* cf. *ammon*.—Teeth and broken canon bones.
9. *Nemorhaedus* (?) sp.—Teeth and entire canon bones (short and slender).
10. *Canis* sp. (size of *C. lupus*).-Jaws.
11. *Canis* sp. (size of a fox.)-One M_1.
12. *Ursus* sp.—Canines.
13. *Meles* sp.—Canines.
14. *Hyaena sinensis* Ow.—Lower jaw and several isolated teeth. Coprolithes.
15. *Machairodus* sp. A fine serrated upper canine, and, perhaps, an upper canine and a claw
16. *Hystrix* sp. One incisor.

On the whole, this fauna is typically a Lower Pleistocene or Uppermost Pliocene one, the "mountain facies" being indicated by the *Nemorhaedus*, the sheep, and perhaps the small size of the *Rhinoceros*.

The *Rhinoceros*, *Equus*, *Hyaena* and *Machairodus* seem to belong to the same species as those found both in Nihowan and Chou Kou Tien.

But, on the other hand, the small *Bison* and the *Rusa* deers represent probably such forms which have so far been met in the Nihowan beds *only*, and not in Chou Kou Tien.

The probable conclusion is therefore that the Nan Ye Li fauna, although found in conditions, and bearing a general facies, remembering closely the Chou Kou Tien (Lower Pleistocene) deposits, is more intimately connected geologically with the Nihowan beds (Uppermost Pliocene). Nevertheless, owing to the absence in it of any typical Pliocene form the Nan Ye Li deposit provides us with an exceptionally interesting link between the both formations.

Geological relations between the fossiliferous deposits and the conglomerate of Nan Ye Li.

Judging by the stratigraphical sequence exhibited by the fig. 2, it seems clear, at first glance, that the red fossiliferous clays are older than the cemented conglomerate which is met just at the normal position expected for the basal conglomerate of the loess. But, another hypothesis has to be considered, according which the clay would have been slowly deposited before the loess, in a shelter or cave existing under the cornice made by the conglomerate (which, in this case, would be of a pre-Sanmenian age). This latter hypothesis is supported by the nature of the clayish deposit, which looks as if deposited by a slow filtration of water, and by the consideration of the fossil bones which suggest the idea of the remains accumulated in some dwelling place of carnivorous animals.

Some observations concerning the recent caves existing near Nan Ye Li.

During the excavations made in Nan Ye Li, I took the opportunity to visit some caves carved in the high cliffs formed in the oolitic limestone.

In one of those caves (20 meters long, 10 meters high at the entrance and 7.50 meters broad in average) the floor was covered by an 1 meter thick sheet of travertin and stalagmite. I had many trenchees opon in this formation. But the deposits, consisting of a very soft and inconsistent stuff, proved to be entirely barren from fossils.

By this negative result, I was confirmed in the opinion I had got previously concerning the origin and the palaeontological value of such caves.

The Nan Ye Li caves lie under waterfalls formed by the little streams falling down from the high cliffs. The melting of snow and ice, as well as the "back-return" of the waterfall, excavates the caves. But, at the same time, the same factors of erosion destroy the ceiling of the cave already formed part of the cave, so that the cave is simultaneously advancing in the cliff by its bottom and shortened in its front. Traces of this retreat are found in the fact that, before reaching the threshold of the cave, it is necessary to progress along a narrow and steep gully, which, in more ancient times, was obviously the cave itself.

In such conditions of continuous rejuvenation, it is impossible that any animal or Man should have ever been dwelling in the Nan Ye Li's caves. And the case is probably the same for many other caves in China.