

47. *Mammalian Fossils Found in Limestone Caves in Korea.*

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Many remains of land Mammals of old Pleistocene epoch, as is widely known, were discovered at various places in Japan. The most important of these are *Elephas* and *Stegodon*. Others are *Bison*, *Sus*, *Cervus* and *Rhinoceros*.¹⁾ Some of these species are common to India and China. This gives support to the assumption that there was a land connection between Japan and the Continent of Eastern Asia in the Pleistocene epoch. It is not clear, however, what part of our Islands was connected with the Continent so as to make the migration possible. We always hoped that the existence of Mammalian remains might be reported from Korea. As far as my knowledge is concerned, no such report has ever appeared except the one written by me on *Rhinoceros* of the Tertiary Miocene (Vide Vol. II. No. 2 of this proceeding). Happily, however, I can now report on the discovery of land Mammalian remains of three individuals in the cavern of older Palæozoic limestone. They are *Cervus*, *Equus* and *Rhinoceros*. *Cervus* was discovered at Madenmen, Seisen-gun, in Heian-nando by some employees of the Mitsubishi Company, while they were excavating calamine contained in limestone. The other two were discovered in a limestone cave at Keisei near Keijo, by my friend Mr. N. Okada, a zoologist.

This specimen of *Cervus* is a portion of skull provided with the right halves of the palatine and maxillary bones and all the right upper premolar and molar teeth. These are two premolars and three molars, the measurement of which is as follows :—

	M ₁	M ₂	M ₃
Length (cm.)	24	30	32 (?)
Width (cm.)	19	22	22 (?)

Considering the shapes of the teeth this gigantic species has a close resemblance to a common red deer (*Cervus elaphus* Linn). But it differs from a existing Korean specimen of the same species in the extra-

1) After the appearance of my description of *Rhinoceros* in Vol. II. No. 2 of the Proc., jaw bones of the same provided with molars were collected from a district in northern Kyushu near the Inland Sea.

ordinary development of the accessory cone. I, however, hesitate to make any definite statement on the question, whether these specimens belong to the same species or not, because the individuals of *Cervus elaphus* often vary in the shapes of the teeth, and there are a number of established subspecific names for the species. It can be said at any rate, that my specimen belongs to *Cervus elaphus* or some species most closely related to it. *Cervus elaphus* was found as fossils in North America, Asia, North Africa and Europe since the Pleistocene, and is found very widely distributed even to-day.

The specimens of *Equus* are two isolated teeth—i.e., the upper left M_1 and M_2 . The measurement is as follows:—

	M_1	M_2
Length (cm.)	31	33
Width (cm.)	27	25
Height of crown (cm.)	95	105

These specimens are remarkable for their large size and extraordinary long crowns. But the plication of enamel closely resembles that of a recent horse (*Equus caballus* Linn). In Japan as well as in Korea no remains of the Equidae have been found before in the strata of the Pleistocene epoch, or in the remains of the stone age, though we had very doubtful reports regarding such cases in Japan. We, therefore, have but a very meagre knowledge about the ancestors of Japanese and Korean horses. The remarkable difference in the sizes of teeth, however, shows that my specimens may be different from Korean horses of to-day. But among *Equus caballus fossilis* of the Pleistocene we find specimens provided with teeth somewhat equal in size to my specimen. (References are to be made to Woldrich's work¹⁾ on Austrian horses, and other books). After a careful study a report will be made on the question, whether my specimens belong to *Equus caballus fossilis* or some other extinct allied species.

Specimens of *Rhinoceros* are an isolated upper molar tooth, and a lower jaw bone provided with a molar. Both are fragments, and it is rather difficult to determine the species, though without doubt they belong to the Rhinocerotidae.

Concerning to the age of Mammalian remains of the above-mentioned three species, it can reasonably be said that, extinct *Rhinoceros*, and *Equus* different from existing Korean horses, belong to the Pleistocene epoch, because they were found in the same place.

1) J.N. Woldrich, Beitrage zur Fauna der Breccien und anderer Diluvial-gebilde Oesterreichs (Jahrb. K. K. geol. Reichs., 22 Bd., 4 Heft, 1822).

Also *Cervus* specimen can be considered to belong to the same epoch, because the teeth are much varied from those of the living allied forms of Korea, and the specimen was excavated from a cavern of limestone as in the case of above-mentioned *Equus* and *Rhinoceros*. By the foregoing evidences I may say that, in the Pleistocene epoch Korea was inhabited by several species of land Mammals, which found shelter in caves as in the cases of Europe and other Continents. *Cervus* was found completely embedded in calamine deposit generated in limestone. The bone, therefore, was taken out by breaking up the ore. This fact may help us in the suggestion of the age in which zinc ore was generated.
