

Fig. 5. *Stegodon orientalis*. No. 18630. Palate of adult skull. One-half natural size.

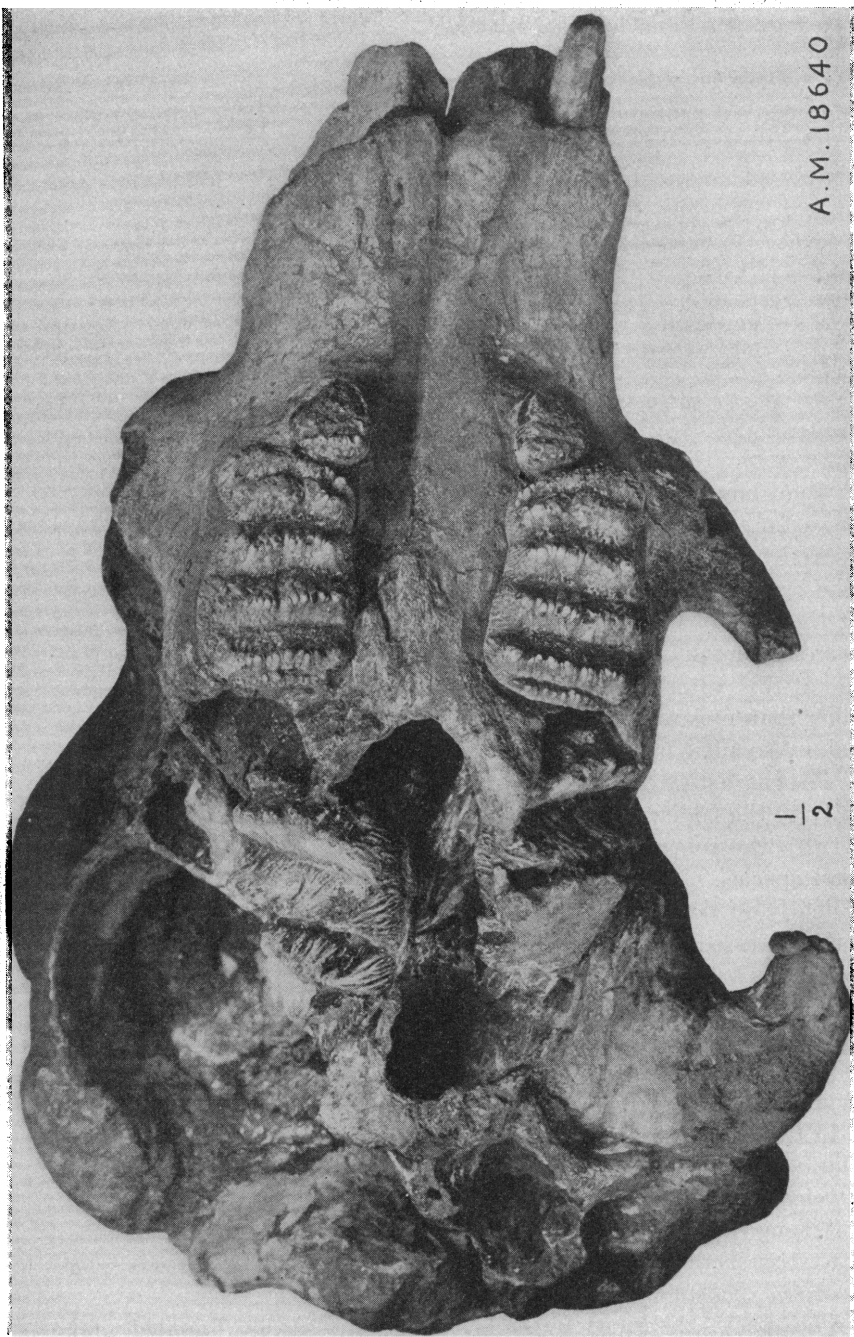


Fig. 6. *Stegodon orientalis*. No. 18640. Palatal view of young skull. One-half natural size.

species must be with *R. unicornis*. At all events, the Yen-ching-kao rhinoceros is a near relative of the typical modern Indian rhinoceros.

The type of *R. sinensis* consists of parts of upper and lower teeth, probably of different individuals. We designate the following as a neotype.

NEOTYPE.—A crushed skull, Amer. Mus. No. 18623.

CHARACTERS.—A large nasal horn. No clear indications of a second horn. Occiput apparently rather posterior in position. Teeth moderately hypsodont, slightly less so than in *R. indicus*. Premolars 130; length of molars, 160;  $p^1$  small, deciduous. Both external ribs prominent on  $p^{2-4}$ , posterior rib weak on  $m^1$ , wholly absent on  $m^{2-3}$ , the anterior rib prominent on all three molars. Crochet prominent on  $p^3-m^3$ , doubled on  $p^4-m^1$ ; crista rudimentary except on  $p^2$ , where it is prominent. No anterochet save as an obscure swelling. Postfossette on  $p^2-m^1$  only when considerably worn. The two inner cones of  $p^2$  strongly twinned, slight twinning on  $p^{2-4}$ .

The above characters are shown on the neotype and in Owen's type, so far as it goes. A number of incomplete skulls, palates and upper jaws and teeth show more or less variation in the external ribs, details of the crochet, crista and posterior fossette, but in all it may be said that the crochet is strong and more or less reduplicate, the crista and anterochet weak or absent, the postfossette moderately developed, the external ribs variable, the teeth subhypsodont, premolars considerably smaller than molars, but  $p^2$  unreduced and only  $p^1$  vestigial, molars subequal,  $m^3$  smallest of the three.

The characters of the teeth in the neotype are strongly suggestive of affinity to the Indian and Javan rhinoceroses, combining peculiarities of the two; the referred specimens bring it on the whole nearer to the Indian species. None of our specimens has the premaxilla preserved sufficiently to demonstrate the presence or absence of upper incisors; but the cheek teeth are nearer to the true rhinoceroses than to *Atelodus* and the proportions of the anterior end of the lower jaw agree best with *R. indicus*. The neotype skull is too badly crushed to be decisive as to the characters of the occiput, and no other specimens show this region. The position of the horn, on the nasals but not quite terminal, is like *R. indicus* and unlike *Atelodus*.

In the skeleton, including especially the length and proportions of the limb bones and feet, all the Yen-ching-kao rhinoceros material agrees fairly closely with *R. indicus*.

Among the numerous fossil species described we find certain Indian and western Eurasian forms that may be nearly related, especially *R. platyrhinus*, *palæindicus*, *sivalensis*.

The species described by Koken and Schlosser are founded upon tooth distinctions, of which the constancy is doubtful, to judge from our

collections. Both Schlosser and Matsumoto, in sorting out the material described and assigning it to various species and horizons, have attached great importance to the degree of fossilization and the quality of the matrix. Wide variation is shown in our collections in this respect, from almost unaltered and recent-appearing to thoroughly fossilized teeth and bones in hard clay matrix. But we cannot associate these differences at present with any faunal distinctions and it is probable that they are due chiefly or wholly to the accidents of location of the specimen, whether in the path of mineralizing waters or protected from their action. The present species can be satisfactorily placed as to its relationships, but not as to its nomenclature and synonymy.

**AFFINITIES.**—*R. sinensis* is clearly excluded from *Aceratherium*, *Teleoceras* or *Calodonta* and apparently from *Opsiceros*. Affinity with *Ceratotherium* is not especially indicated. All the positive evidence goes to show that it is a near relative of the true *Rhinoceros*, but specifically distinct from either the Indian or the Javan species, nearer perhaps to the former.

#### **Tapirus sinensis** Owen

Besides the teeth described by Owen, Koken figured a number of teeth and Schlosser records two from the Haberer collection. The latter were obtained at I-chang, a hundred miles down-river from Yen-ching-kao; Koken's material is said to be mostly from caves in Yun-nan or other southern provinces. They are all referred to the Pleistocene by Schlosser. It would appear that Owen's species is closely related to *T. indicus*, perhaps doubtfully distinct. Our tapir material consists of skulls, jaws, etc., of a very much larger species described below. It is not close to the modern Malayan tapir; whether the genus is distinct remains to be determined. *T. sinensis* is not represented in the Granger collection.

#### **Chalicotherium sinense** Owen

Owen's collection contained one upper molar. Koken described a supposed  $p_4$  ( $m_1$  according to Schlosser). Our collection contains a single lower molar, No. 18453, probably  $m_3$ . It affords no especial light upon the relations to the Indian *C. sivalense*.

#### **Hyæna sinensis** Owen

No. 18392, upper and lower jaws, is referred to this species; also Nos. 18395-7, isolated parts of jaws.

Owen distinguishes the species as larger and more robust than the modern *H. crocuta*, much larger than the Asiatic striped hyæna, and as allied to the African and not to the Asiatic species, "unlike the European cave hyæna."

## NEW GENERA AND SPECIES IN THE YEN-CHING-KAO COLLECTION

### Spalacidæ

#### *Rhizomys troglodytes*, new species

TYPE.—No. 18408, skull and jaws.

PARATYPES.—Nos. 18401–18417, a series of skulls and jaws, some with parts of skeleton associated.

DISTINCTIVE CHARACTERS.—(a) Size large, length of skull incisors to condyles = 77–85 mm.; (b) skull rather long and narrow, postorbital crests contracting sharply behind the orbits to a long and well-marked sagittal crest; (c) infra-orbital foramen sub-triangular, the maxillary crest in front of it and plate beneath extended upward on the side of the muzzle almost to its upper surface; (d) nasals long, narrow, wedge-shaped, tapering backwards almost to a point; (e) squamosals fail to reach the sagittal crest superiorly or the postorbital constriction anteriorly; (f) occiput strongly sloped forward; (g) posterior nares narrow and contracted transversely; (h) bulla somewhat flattened inferiorly, strongly convex anteriorly, culminating in a ridge directly behind the posterior lacerate foramen, slightly reflexed on the anterior inner border against the basisphenoid; (i) carotid foramen lying close behind the basisphenoid-basioccipital suture and the bulla extending a considerable distance in front of it; (j) bulla strongly reflexed posteriorly upon the surface of the paroccipital process; (k) inferior surface of auditory meatus strongly concave both ways, without any longitudinal ridge, and the opening large and flaring; (l) incisors strongly convex, the points of the upper pair directed somewhat backward, the anterior faces of the lower pair strongly flattened, of the upper pair, moderately so; (m) first upper molar somewhat, and first lower molar considerably reduced and  $m^1$  wearing to a lower grinding plane than the others; (n) third upper molar unreduced, approximately equal to  $m^2$  in size, the posterior portion of the third lower molar correspondingly enlarged and broadened.

Of the above characters, Nos. *c*, *d*, *e*, *f*, *g*, *h*, *i*, *k*, *l*, *m*, and *n* appear to be characteristic of *Rhizomys* proper as against *Nyctocleptes*. Nos. *a* and *j* resemble the latter, while *b* is peculiar. The affinities of the species are thus clearly shown to be with the much smaller *Rhizomys* of China, although in size and one or two characters associated with size it is suggestive of the large Malayan bamboo-rat, *Nyctocleptes sumatrensis*, etc., which it fully equals in size.

The above comparisons were made with modern skulls from South China collected by Mr. Andrews and a series of Malayan skulls in the National Museum loaned through the courtesy of Dr. Gerrit S. Miller and Mr. J. W. Gidley.

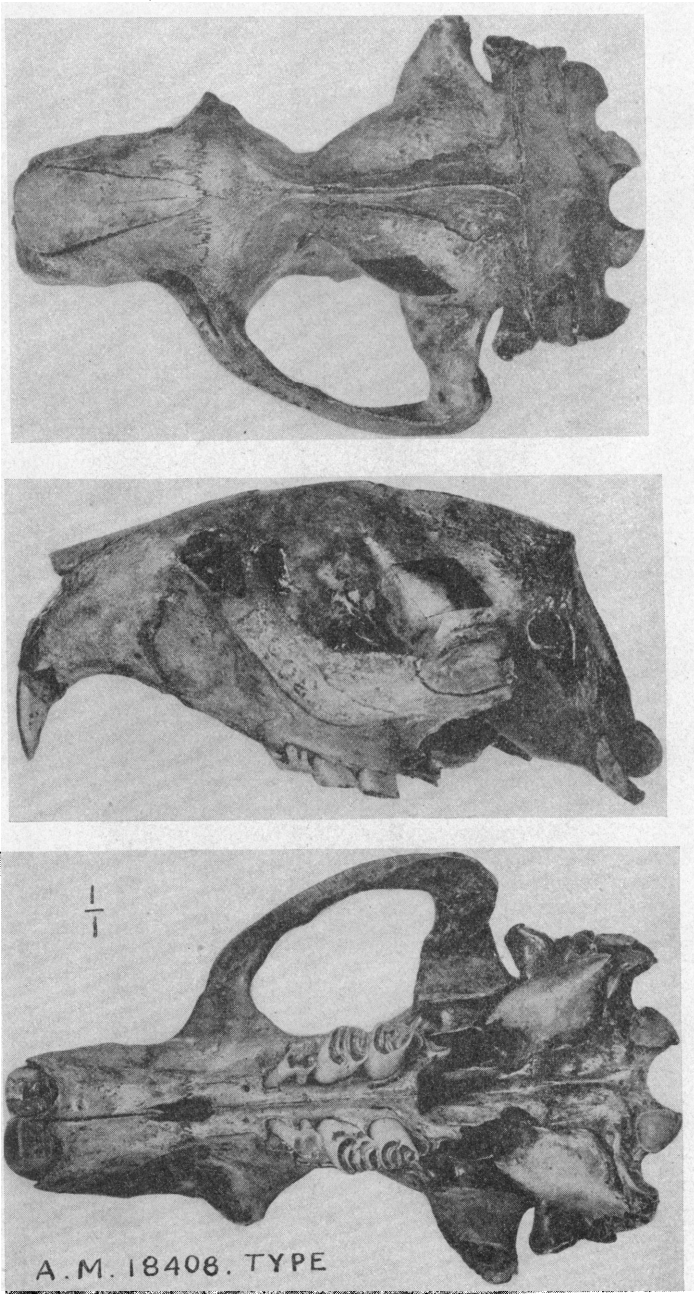


Fig. 7. *Rhizomys troglodytes*. Type skull, No. 18408. Natural size.

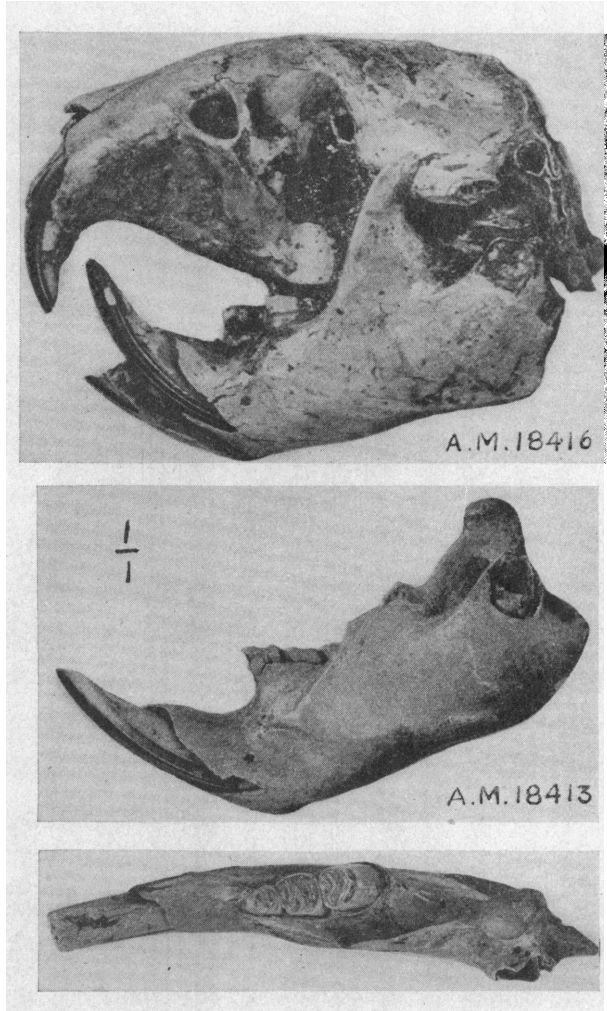


Fig. 8. *Rhizomys troglodytes*. Side view of skull and jaws, No. 18416. Outer and top views of lower jaw, No. 18413. Both natural size.