

Fig. 32 *Subhyracodon sagittatus* Russell, sp. nov., SMNH P833.1, paratype, immature skull; dorsal view,  $\times 0.75$ .

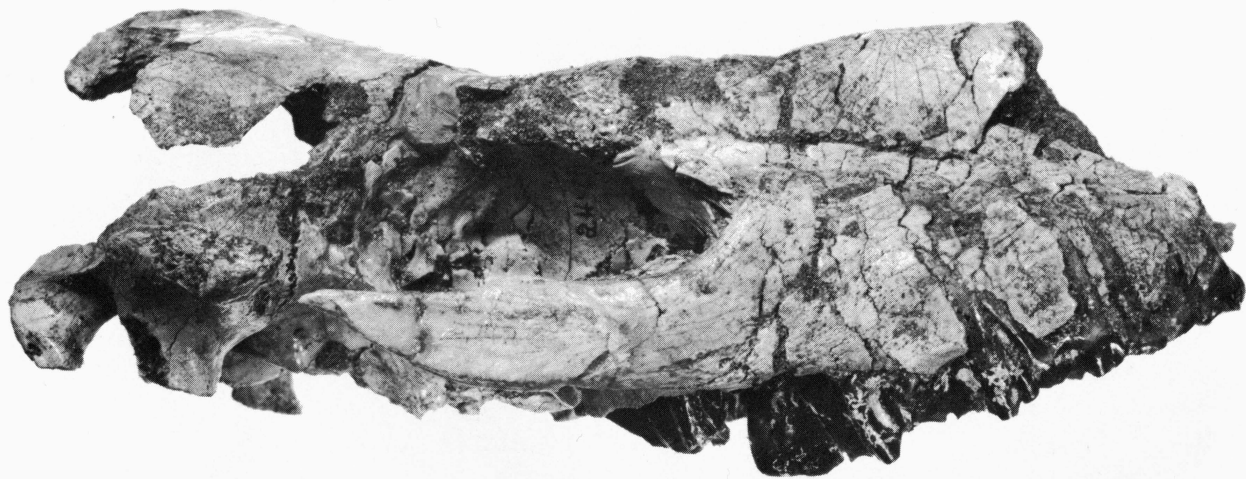


Fig. 33 *Subhyracodon sagittatus* Russell, sp. nov., SMNH P833.1, paratype, showing right P<sup>1</sup>, DP<sup>2</sup> to DP<sup>4</sup>, M<sup>1</sup>, M<sup>2</sup>; right lateral view,  $\times 0.75$ .

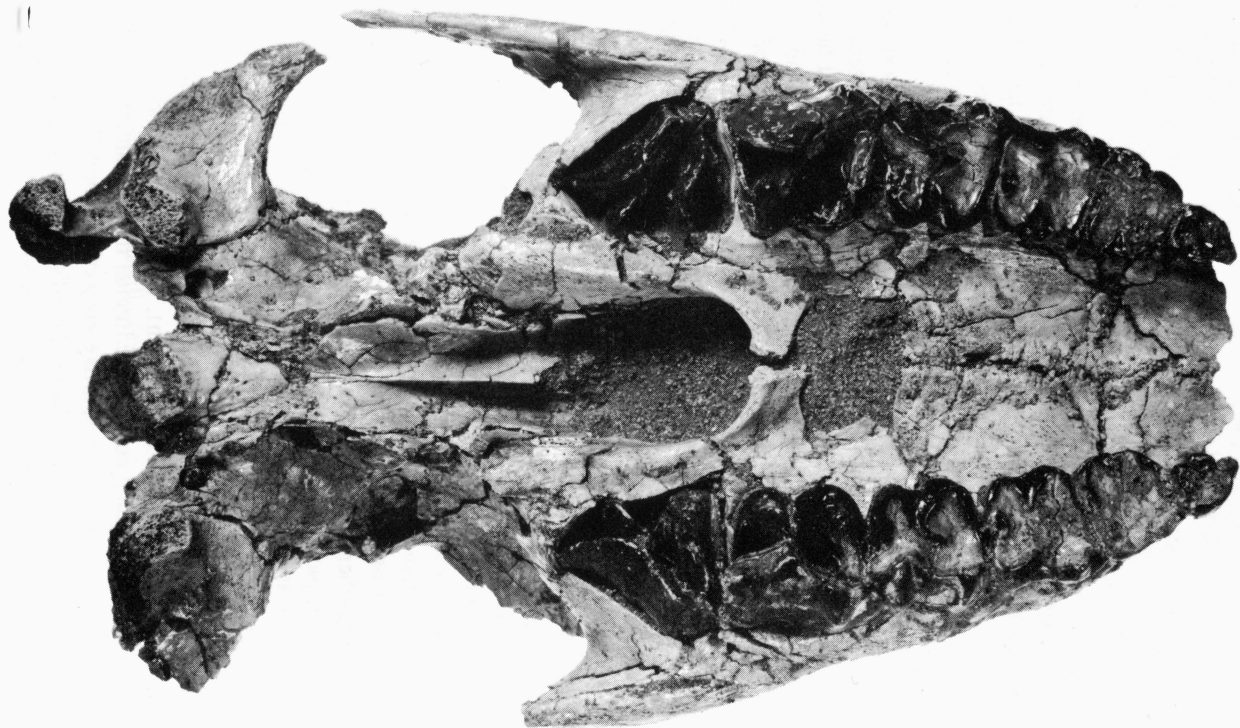


Fig. 34 *Subhyracodon sagittatus* Russell, sp. nov., SMNH P833.1, paratype, showing both P<sup>1</sup>, DP<sup>2</sup> to DP<sup>4</sup>, M<sup>1</sup>, M<sup>2</sup>; occlusal view,  $\times 0.75$ .

is much shorter and lower, failing to reach the crown margin but converging slightly on the protocone; the lingual cingulum is strongly developed and the lingual margin is oblique, curving posterobuccad from the protocone base. M<sup>1</sup> is well worn; there is a large, rounded antechrochet on the protoloph. M<sup>3</sup> has a very short ectoloph and a reduced metacone; the protoloph and metaloph are slightly divergent linguad.

The skull is proportionately broader than that of *S. occidentalis* as illustrated by Scott (1941:84, fig. 1a). The most conspicuous difference is in the *sagittal crest*, which is single, and distinct for most of the cranial length, although showing a trace of a double origin, which becomes obvious anteriorly, where the two components spread apart. In lateral view the dorsal outline of the skull rises somewhat anterior to the occiput, then slopes off as the sagittal crest diverges into the lambdoidal crest. The *frontals* form an almost flat platform between the orbits, with large but blunt postorbital processes. Like the frontals, the *nasals* are relatively broad. The free anteroventral margin, forming the dorsolateral rim of the naris, has a distinct notch on each side, as in *Hyracodon*.

The *premaxillae* are short, and the suture with the maxillae is almost vertical, meeting the narial margin just as it begins to curve dorsad; there is thus a wide separation from the nasals. The *maxillae* form the lower part of the lateral facial wall and have the infraorbital foramen above the contact of P<sup>3</sup> and P<sup>4</sup>. The suture with the nasals is almost horizontal, except for a dorsad angulation just in front of the lachrymals. The maxillary margin then turns ventrad along the front of the lachrymals and the jugals, and posterad beneath the jugals to the temporal opening. Ventrally the maxillae form the anterior portion of the palate to the juncture of M<sup>1</sup> and M<sup>2</sup>, then extend posterad along the alveolar rim in suture with the palatines to the temporal opening. The *jugals* meet the squamosals on the zygomatic arch by a very oblique suture, which does not quite reach the glenoid cavity. There is only a rudiment of a postorbital process on the dorsal rim of the jugals. The *squamosals*, as preserved, are much as described by Scott, except that they form all of the glenoid cavity. Within the temporal fossa there is a large foramen in front of the alisphenoid-squamosal suture, presumably housing the foramen opticum and the alisphenoid canal.

As noted, the basicranium is poorly preserved, and the sutures that define *vomer*, *palatines*, and *pterygoids* are obscure. The bifurcated posterior end of the vomer is separated from the presphenoid by a curved groove. The posterior opening of the alisphenoid canal is conspicuous on the side of the alisphenoids.

The paratype (SMNH P833.1) is about the same size as the holotype, but is obviously juvenile, not only on the basis of the dentition, but also because many of the sutures are not firmly closed. The first premolars are not as worn as is the tooth that follows, hence the identification as P<sup>1</sup> rather than DP<sup>1</sup>; they are similar to the P<sup>1</sup> of the holotype, with a main buccal cusp (worn), a metaloph-like crest extending from the main cusp, and an isolated cusp on the lingual margin, anterior to the crest; the anterior extremity of this tooth is a spurlike projection directed anterolinguad.

The next three teeth are obviously deciduous, as indicated by the extreme degree of wear and the very molariform crowns. DP<sup>2</sup> is somewhat narrower anteriorly than posteriorly. Little of the original crown structure remains, but the protoloph and metaloph were evidently well developed and distinct. DP<sup>3</sup> is not quite so badly worn, and retains remnants of the re-entrants between the lingual ends of protoloph and metaloph and between metacone and hypocone. DP<sup>4</sup> is worn, but has the molariform

pattern so well developed that an isolated example could be mistaken for M<sup>1</sup>. The ectoloph is sinuous, as in the molars, and the paracone is prominent. The protoloph is more worn than the metaloph, but still shows a rounded antecrochet. The metastylar extension of the ectoloph is more obvious than on DP<sup>3</sup>, and laps slightly on the protoloph of M<sup>1</sup>. If this were P<sup>4</sup>, the lap would be the other way around.

M<sup>1</sup> is typically rhinoceroid; the protoloph is less worn than the metaloph, and there is no antecrochet. M<sup>2</sup> is incompletely erupted, and in this position looks like M<sup>3</sup>, but the posterior extension of the ectoloph (metastyle) is long, and curves posterolingual, then posterad. The metaloph is short, and is directed posterolingual, with a slight angulation at the point of origin on the metacone.

The skull has most of the roof and face preserved, and the bones are still in place although badly shattered. The parietal area of the cranial roof is incomplete, but evidently bulged a little more prominently dorsad than it does in the holotype. The anterior end of the sagittal crest is indicated by the remnant of its base, but evidently it was distinct and somewhat elevated. The premaxillae are missing but clearly were separated from the nasals by a long portion of the nasal rim formed by the maxillae. The glenoid fossa is well preserved on the right side; it is shallow but with a prominent postglenoid process at the posterolingual corner of the fossa.

#### MEASUREMENTS (in millimetres)

	<i>Length</i>	<i>Width</i>
SMNH P1635.2		
Skull, from tip of nasals to lambdoidal crest	277.0	—
Skull, from widest point of zygomata (estimated)	—	137.5
Skull, facial portion of maxillae (estimated)	—	97.5
Left P <sup>1</sup> to M <sup>3</sup>	124.9	
Left P <sup>1</sup> to M <sup>1</sup>	82.8	
Left P <sup>1</sup>	13.0	
Left P <sup>2</sup>	16.1	19.4
Left P <sup>3</sup>	17.7	22.2
Left P <sup>4</sup>	19.2	23.7
Left M <sup>1</sup>	24.9	25.1
Left M <sup>2</sup>	26.9	27.7
Left M <sup>3</sup>	23.3	24.5
SMNH P833.1		
Skull, from widest point of zygomata (estimated)	—	135.4
Skull, facial portion of maxilla (estimated)	—	101.4
Left P <sup>1</sup> to M <sup>1</sup>	93.9	—
Left P <sup>1</sup>	13.7	—
Left DP <sup>2</sup>	16.6	18.3
Left DP <sup>3</sup>	20.3	20.5
Left DP <sup>4</sup>	21.8	22.6
Left M <sup>1</sup>	28.0	25.0
Left M <sup>2</sup>	29.6	±26.1

## REMARKS

This species, as known from the two skulls described above, presents a combination of features that make difficult a definite assignment to a known rhinocerotid genus. The reference to *Subhyracodon* is based on the low, almost flat, skull roof as seen in lateral profile, the low but distinct sagittal crest, the relatively long facial region, the exclusion of the premaxillae from contact with the nasals, and the molariform pattern of P<sup>2</sup> to P<sup>4</sup>. There are some resemblances to *Hydracodon*, such as the presence of three simple incisors, but the absence of a post-incisor diastema is a striking difference. The characters that are taken to justify the status of a distinct species of *Subhyracodon* have been mentioned; these include the absence of an incisor-premolar diastema and the free termination of the protoloph and metaloph in P<sup>2</sup> to P<sup>4</sup>. It is possible that we are dealing here with an unrecorded genus.

### *Caenopus* Cope, 1880

#### GENERIC CHARACTERS

Rhinocerotids of moderate size. Dentition  $\frac{2 \quad 1-0 \quad 4 \quad 3}{2-1 \quad 0 \quad 3 \quad 3}$ ; I<sup>2</sup> and I<sup>1</sup> not enlarged; P<sup>2</sup> and P<sup>4</sup> molariform, P<sup>3</sup> submolariform. Mandibular symphysis narrow. Manus tridactyl.

### *Caenopus?* spp.

#### REFERRED SPECIMENS

ROM 23190 (Fig. 35), portion of right mandibular ramus with P<sub>3</sub> to M<sub>3</sub> and posterior root of P<sub>2</sub>. ROM 23191 (Fig. 36), incomplete left mandibular ramus with P<sub>3</sub> to M<sub>3</sub>. ROM 23192 (Fig. 37), incomplete left mandibular ramus with P<sub>3</sub> to M<sub>3</sub>. ROM 23193 (Fig. 38), fragmentary right mandibular ramus with P<sub>3</sub> to M<sub>3</sub>. ROM 23194 (Fig. 39), portion of left mandibular ramus with roots of P<sub>2</sub> (?), entire DP<sub>3</sub> and DP<sub>4</sub>, worn M<sub>1</sub>, and unworn but broken M<sub>2</sub>. All from the Hunter Quarry.

#### DESCRIPTION

ROM 23190 is of about the same size as *Caenopus mitis* as recorded by Wood (1928). The root and alveoli of P<sub>2</sub> suggests a tooth much smaller than P<sub>3</sub>, and probably the first of the cheek series. This, and the narrow trigonid of P<sub>3</sub>, suggest that there was no P<sub>1</sub>. The P<sub>4</sub> is worn, but less so than the M<sub>1</sub>, which overhangs the posterior rim of P<sub>4</sub>.

On ROM 23191 the M<sub>3</sub> is fully formed but not yet fully erupted. It has an unworn trigonid distinctly higher than the talonid. M<sub>1</sub> is the only well-worn tooth. This specimen agrees in size and structure with ROM 23190. ROM 23192 has the P<sub>4</sub> worn but not quite fully erupted. In other respects the teeth resemble those of ROM 23190. ROM 23192 is a little smaller than 23190, but the teeth are almost identical in structure.



Fig. 35 *Caenopus?* sp., ROM 23190, portion of right mandibular ramus with P<sub>3</sub> to M<sub>3</sub>; occlusal view, × 1.



Fig. 36 *Caenopus?* sp., ROM 23191, incomplete left mandibular ramus with P<sub>3</sub> to M<sub>3</sub>; occlusal view, × 1.