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# Cranial anatomy of the prosauropod dinosaur *Sellosaurus gracilis* from the Middle Stubensandstein (Upper Triassic) of Nordwürttemberg, West Germany



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With 9 plates, 5 figures and 1 table

## Summary

The cranial anatomy of *Sellosaurus gracilis* v. Huene is described on the basis of several partial skulls from the Middle Stubensandstein (Middle Keuper, mid-Norian, late Triassic) of Nordwürttemberg, West Germany. Comparisons with two complete skulls of *Plateosaurus* from the overlying Knollenmergel (Middle Keuper) of Württemberg show that *Sellosaurus gracilis* should not be referred to *Plateosaurus*. The skull of *Sellosaurus* differs from that of *Plateosaurus* in having a small lateral sheet to the maxilla; a shallow anterior process to the jugal; a transversely narrow prefrontal that is widely separated from the adjacent end of the postorbital, so the frontal provides a significant contribution to the dorsal rim of the orbit; and in the form of the braincase. In both genera, the form of the lateral surface of the dentary is interpreted as evidence for the presence of cheeks functionally analogous to those of mammals. Comparisons with the skulls of other prosauropods show that *Sellosaurus* is a valid genus and it could have been a direct ancestor for *Plateosaurus*.

## Zusammenfassung

Anhand einzelner Schädelteile aus dem Mittleren Stubensandstein (Mittelkeuper, mittleres Nor, Obertrias) von Nordwürttemberg, Deutschland, wird die Morphologie des Schädels von *Sellosaurus gracilis* v. Huene beschrieben. Der Vergleich mit zwei vollständig erhaltenen Schädeln von *Plateosaurus* aus dem überlagernden Knollenmergel (Mittelkeuper) Württembergs zeigt, daß *Sellosaurus gracilis* nicht zu *Plateosaurus* gestellt werden kann. Der Schädel von *Sellosaurus* unterscheidet sich von jenem von *Plateosaurus* durch eine kurze, vom dorsalen Fortsatz des Maxillare ausgehende Knochenplatte, durch einen schmalen anterioren Fortsatz des Jugale, ein in transversaler Richtung schmales Praefrontale, welches vom dahinter folgenden Postorbitale so weit entfernt ist, daß nur das Frontale die Orbita dorsal umrandet, und im Bau des Gehirnschädels. Bei beiden Gattungen wird die Ausbildung der lateralen Oberfläche des Dentale als Hinweise für das Vorhandensein von Backen angesehen, die ähnlich wie jene der Säugetiere wirkten. Aufgrund des Vergleichs mit dem Schädel anderer Prosauropoden zeigt sich, daß *Sellosaurus* eine wohlbegründete Gattung ist. Er könnte der direkte Vorfahr von *Plateosaurus* sein.

## 1. Introduction

The holotype of the prosauropod dinosaur *Sellosaurus gracilis* v. HUENE 1908 is a partial skeleton from the Middle Stubensandstein (Middle Keuper, mid-Norian, Upper Triassic) of Heslach in Stuttgart. However, there is no cranial material and this is also true for the holotype of *Sellosaurus fraasi* v. HUENE 1908 from the Middle Stubensandstein of Pfaffenhofen in the region of Brackenheim, Stromberghöhe, northwest of Ludwigsburg, Nordwürttemberg. v. HUENE (1915) described a partial skeleton with a partial skull from the Middle Stubensandstein near Trossingen, Südwürttemberg. The teeth are very similar to those in an isolated maxilla from the Middle Stubensandstein of Heslach, originally described without a name by v. MEYER (1861), that became the holotype of *Thecodontosaurus hermannianus* v. HUENE 1908. Consequently, v. HUENE (1915) referred the Trossingen skeleton to *Sellosaurus hermannianus* (v. HUENE). After comparing the form of the tibiae, v. HUENE (1926) referred *Sellosaurus gracilis* to *Plateosaurus* v. MEYER 1837, the well known prosauropod genus from the overlying Knollenmergel (Middle Keuper) of Germany, as *Plateosaurus gracilis* (v. HUENE). v. HUENE (1932) described three additional partial skulls from Pfaffenhofen that, together with the specimens mentioned above, were referred to *Plateosaurus gracilis*. On the basis of an examination of the prosauropod material from the Stubensandstein, I conclude that it should all be referred to *Sellosaurus gracilis* v. HUENE (GALTON 1984a). This includes the postcranial material referred by v. HUENE (1908, 1915, 1932) to the poposaurid thecodont *Teratosaurus* v. MEYER 1861 (see GALTON 1985a) plus the small prosauropod *Efraasia* GALTON 1973a, the partial skull of which is described by GALTON & BAKKER (1985).

The purpose of this paper, the fourth in a series describing the dinosaurs of the Stubensandstein, is to describe the remaining cranial material of *Sellosaurus gracilis*, the postcranial material of which is redescribed elsewhere (GALTON 1985a, in prepn.), to compare it with the better preserved skulls of *Plateosaurus engelhardti* v. MEYER, and to establish the validity of the genus *Sellosaurus* v. HUENE. Institution names for cited specimens have been abbreviated as follows:

AMNH: American Museum of Natural History, New York;
BCM: Bristol City Museum, Bristol, England;
GPIT: Museum für Geologie und Paläontologie, Universität Tübingen;
MSF: Museum Saurierkommission Frick, Tonwerke Keller AG, Frick, Switzerland;
SMNS: Staatliches Museum für Naturkunde in Stuttgart;
YPM- Peabody Museum for Natural History, Yale University, New Haven, Connecticut, U.S.A.

## 2. Cranial Material

### Heslach in Stuttgart

SMNS 4388. — Isolated right maxilla (Pl. 2, Figs. 3—5; Pl. 7, Fig. 5), holotype of *Thecodontosaurus hermannianus* v. HUENE (1908: 216—217, Fig. 217, Pl. 104, Fig. 1), see also v. MEYER (1861: 292—293, Pl. 37, Figs. 28—31).

SMNS 52388. — Isolated left lacrimal (Pl. 7, Figs. 1—3), ?"post frontal" of v. HUENE (1901: 103; could not locate "lateral occipital" that also listed from Stubensandstein of Heslach).

### Pfaffenhofen in Stromberghöhe

SMNS 12216. — Anterior part of skull (Figs. 2A—D; Pl. 1, Fig. 2; Pl. 2, Figs. 1, 2; Pl. 3, Fig. 1; Pl. 6, Fig. 6; Pl. 7, Figs. 7, 8), described by v. HUENE (1932: 130—131, Pl. 15, Figs. 1, 2).

SMNS 12353a. — Partial disarticulated skull (Fig. 3G; Pl. 3, Figs. 2, 3; Pl. 6, Figs. 4, 5; Pl. 7,

Fig. 6), basis for rather hypothetical skull reconstruction by v. HUENE (1932, Pl. 23, Fig. 1) (see Fig. 3G).

SMNS 12667. — Partial skull including braincase, described by v. HUENE (1932: 73, Pl. 4, Figs. 1—4, basis for very hypothetical reconstruction of skull as Fig. 7, also 1956, Fig. 510), GALTON (1973a: 230—231, Figs. A—C) and GALTON & BAKKER (1985), holotype skeleton of *Palaeosaurus? diagnosticus* v. HUENE 1932, type species of *Efraasia* GALTON 1973a as *E. diagnostica* (v. HUENE).

SMNS 12684. — Disarticulated skull (Figs. 3A—F; Pl. 4, Pl. 5, Figs. 5—8; Pl. 6, Figs. 2, 3; Pl. 7, Fig. 4) described by v. HUENE (1932: 130—131, Pl. 16, Figs. 1—3 as SMNS 12669), dentary illustrated by GALTON (1985b, Figs. 3E, F).

SMNS 14880. — Poorly preserved disarticulated partial skull (Pl. 3, Figs. 4, 5; Pl. 6, Fig. 1).

SMNS 14881. — Isolated left quadrate described by v. HUENE (1932: 74; Pl. 6, Fig. 10), GALTON (1973a, Figs. 1D, E), and GALTON & BAKKER (1983, Pl. 1, Figs. 4, 5).

Trossingen

GPIT 18318a (field number used by v. HUENE 1915). — Partial skull (Fig. 1; Pl. 1, Fig. 1; Pl. 5, Figs. 1—4), described by v. HUENE (1915: 3—7, Figs. 1—3, Pl. 2, 1932: 130—131) who gave the horizon as Upper Stubensandstein but this specimen is included in the fauna of the Middle Stubensandstein by BRENNER (1973: 171).

## 3. Description

Only partial skulls of *Sellosaurus gracilis* are available and these are disarticulated to a varying degree from slightly (Pl. 1, Figs. 1, 2), to moderately (Pl. 4, Figs. 1, 2), to extremely so (Pl. 3, Figs. 2, 3). However, several complete skulls, both articulated (Fig. 4, Pl. 8; v. HUENE 1926, 1932, GALTON 1984a, in press) and disarticulated (Fig. 5; Pl. 9, Figs. 1—3, GALTON 1984a, in press), are known for *Plateosaurus engelhardti* from the overlying Knollenmergel. In the following description of *Sellosaurus* the figures of v. HUENE (1915, 1932) are reproduced (Figs. 1—3) with some reidentifications (indicated by ' ') given in the captions, and the bones are described by comparisons with those of two skulls of *Plateosaurus* (AMNH 6810, Fig. 5, Pl. 9, Figs. 1—3; SMNS 13200, Fig. 4; Pl. 8) described by GALTON (1984a).

Splanchnocranium

Premaxilla (Pm). — Two reasonably complete premaxillae are visible in lateral view (Figs. 1, 2A; Pl. 1, Figs. 1, 2 Pl. 5, Fig. 1) and one of these in dorsal view (Fig. 2C; Pl. 3, Fig. 1). The overall form is similar to those of *Plateosaurus* (Figs. 4A—C, 5A, B; Pl. 8, Figs. 1, 2).

Maxilla (Mx). — Half a maxilla is free of matrix (Pl. 2, Figs. 3—5; v. MEYER 1861, Pl. 37, Figs. 28—31) and three others, one incomplete posteriorly (Fig. 1; Pl. 1, Fig. 1; Pl. 5, Fig. 1) and the others more complete (Figs. 3A, B; Pl. 4, Figs. 1—3; Pl. 7, Fig. 4), are visible in lateral view. The upper part of the dorsal process is distorted (Fig. 3B; Pl. 4, Fig. 1; Pl. 7, Fig. 4) or covered by the nasal (Fig. 1; Pl. 1, Fig. 1) but the form is comparable to that of *Plateosaurus* (Figs. 4A, B, 5A, B). The sutural surface that was overlain by the nasal is visible (Pl. 4, Fig. 1; Pl. 7, Fig. 4). The medial sheet extends posteriorly about 6 to 8 tooth positions from the anterior end of the antorbital opening as in AMNH 6810 whereas in SMNS 13200 it is more extensive (12—14 positions; Figs. 4A, B, 5A, B; Pl. 8, Fig. 1). In *Sellosaurus* the lateral sheet extends only about 3 or 4 tooth positions before it merges with the body of the maxilla (Pl. 2, Figs. 4, 5; Pl. 4, Fig. 1; Pl. 7, Fig. 4) and beyond this the maxilla becomes only slightly deeper before tapering gradually to a point (Pl. 4, Figs. 1, 3). The depth of the maxilla ventral to the antorbital opening is about equal to that of the tooth

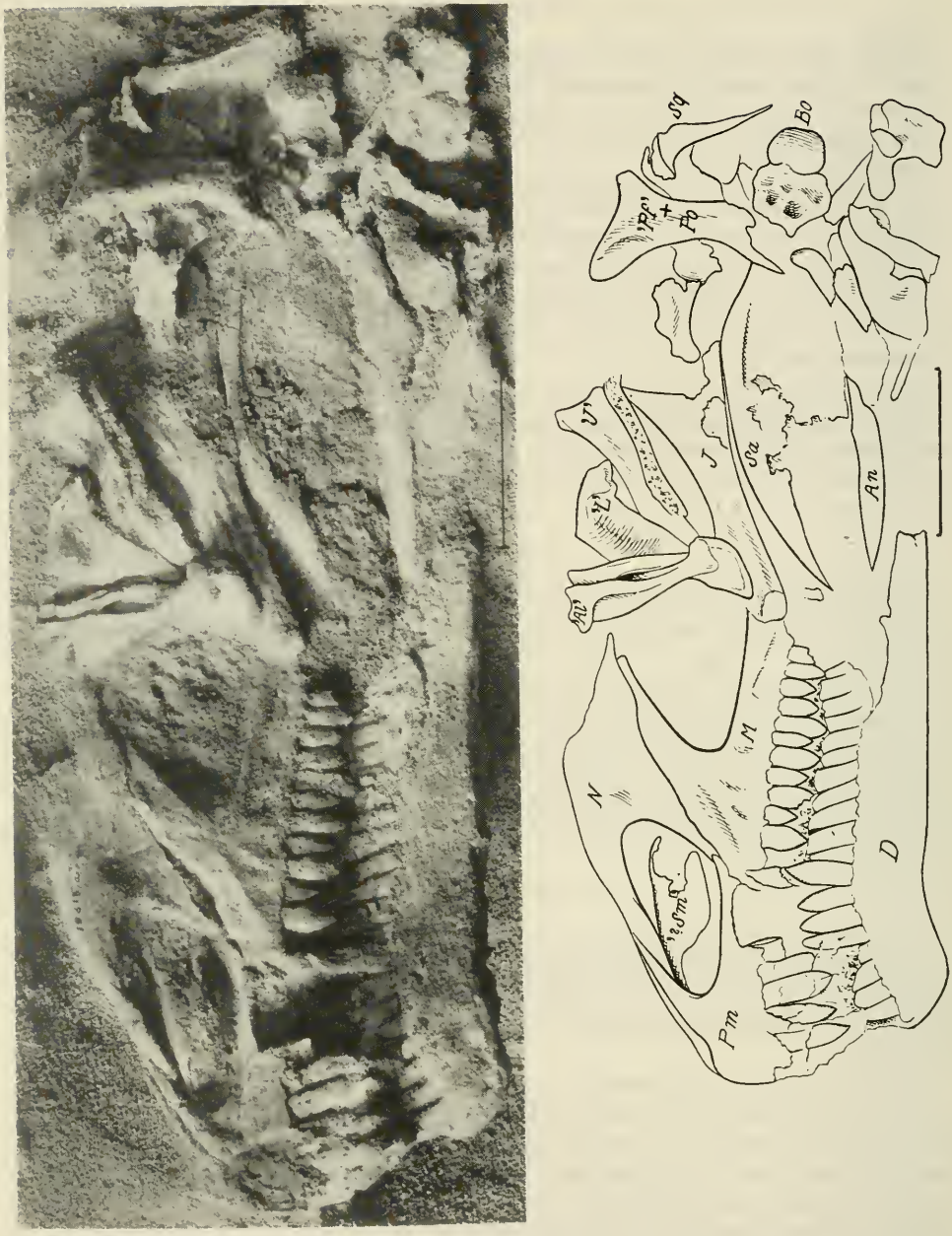



Fig. 1. *Sellosaurus gracilis*, referred specimen GPIT 18318a from the Middle Stubensandstein near Trossingen, Württemberg. Partial skull in left lateral view, photograph × 0.55 and explanatory outline drawing × 0.45 from v. HUENE (1915) with a few reidentifications indicated by ' '.
'Al' = left lacrimal; An = angular; Bo = basioccipital in ventral view; D = dentary; J = jugal; 'J' = left frontal in ventral view; 'L' = left prefrontal; M = maxilla; N = nasal; 'Pf' = dorsal part of postorbital; Pm = premaxilla; Po = postorbital; Sa = surangular; '?Sm' = vomer; Sq = squamosal. — Scale lines represent 5 cm.

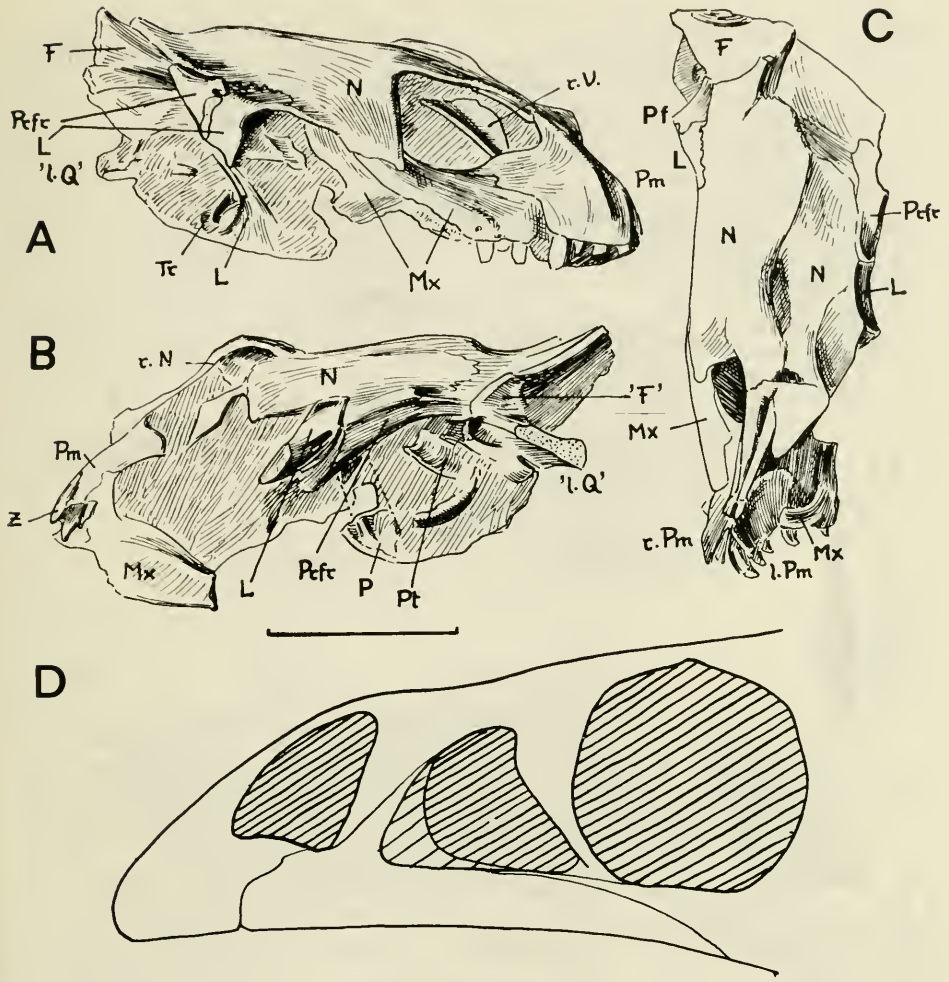
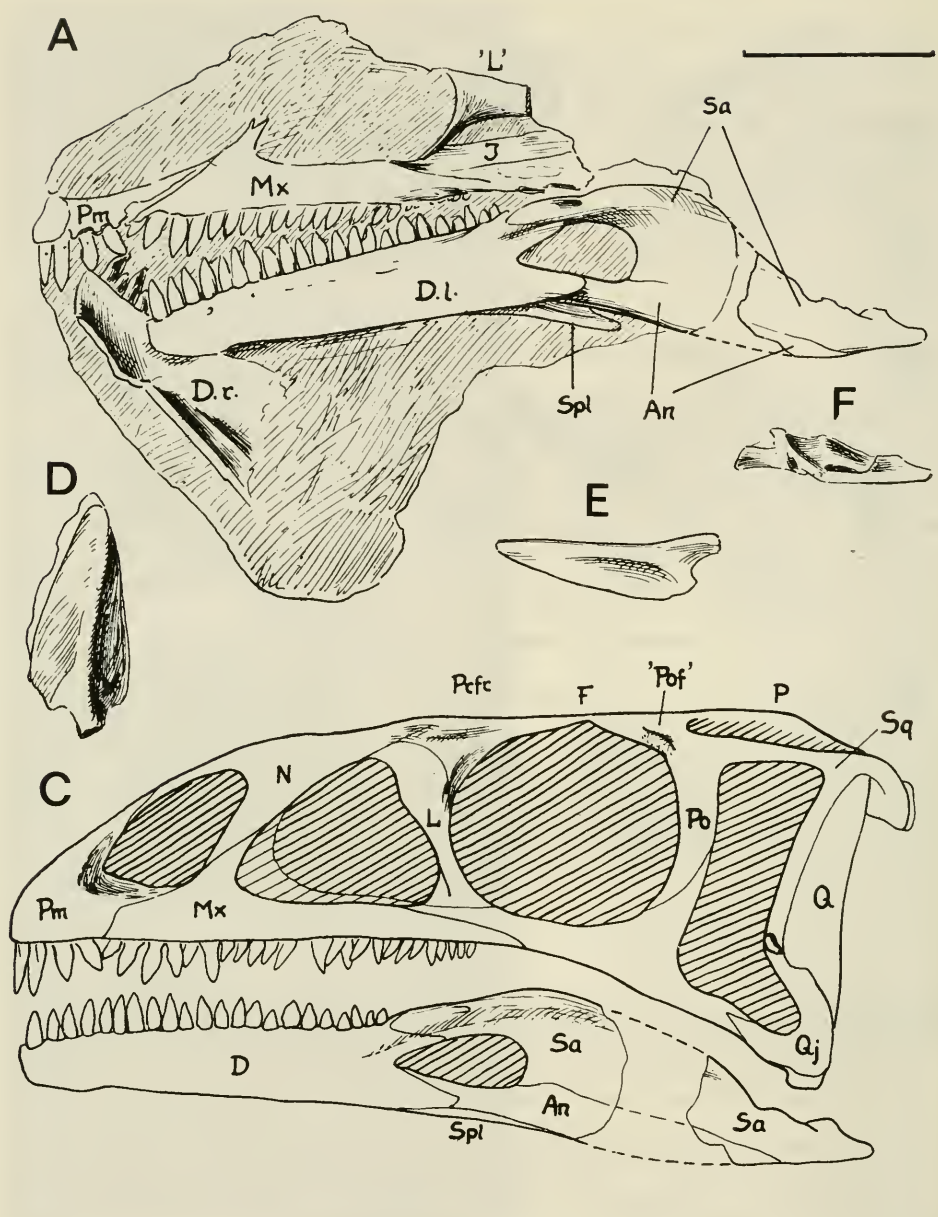



Fig. 2. *Sellosaurus gracilis*, referred specimen SMNS 12216 from the Middle Stubensandstein of Pfaffenhofen, Stromberghöhe, Württemberg. Anterior part of skull in A: right lateral; B: left lateral and C: dorsal views plus D: reconstruction in left lateral view. All from v. HUENE (1932) with a few additional labels plus reidentifications indicated by ' '. — × 0.5.
F = frontal, 'F' = ? part of pterygoid; L = lacrimal; l. = left; 'l. Q' = ? left frontal; Mx = maxilla; N = nasal; P = right palatine; Pf = prefrontal; Pm = premaxilla; Prfr = prefrontal; Pt = pterygoid; r. = right; Tr = ectopterygoid; V = vomer; Z = teeth. — Scale line represents 5 cm.

crowns. In *Plateosaurus* this depth ranges from 1.5 to 2 times crown heigth (Figs. 4A, B; Pl. 8, Fig. 1). In AMNH 6810 the depth of the lateral sheet reaches a minimum of about 2 mm 3 tooth positions from the anterior end of the antorbital opening but 9 positions more posteriorly it reaches a depth of 6 mm before the maxilla sharply tapers to a point (Figs. 5A, B; Pl. 9, Fig. 1). In dorsal view (Pl. 9, Fig. 2), the lateral sheet is visible almost to the end of the maxilla. The sutural area for the palatine forms a very prominent channel on the medial




surface (Pl. 2, Fig. 3) and it is roofed by a sharp edge against which the palatine probably also sutured as in *Plateosaurus* (Pl. 9, Figs. 1, 2).

Dentition. — The only complete dentition is on the left side of SMNS 12684 (Figs. 3A, C; Pl. 4, Figs. 2—4). There are 4 premaxillary teeth; v. Huene (1932) shows 5 premaxillary teeth in a reconstruction of SMNS 12353a (Fig. 3G) but the premaxilla is not on the block with this number (Pl. 3, Figs. 2, 3). The premaxillary count is 4 in SMNS 12216 (Fig. 2A) and 5 in GPIT 18318a (Fig. 1, first tooth now damaged, Pl. 1, Fig. 1). The maxillary and dentary counts (Fig. 3A; Pl. 4, Figs. 2—4) are 25 and 22. The range for the

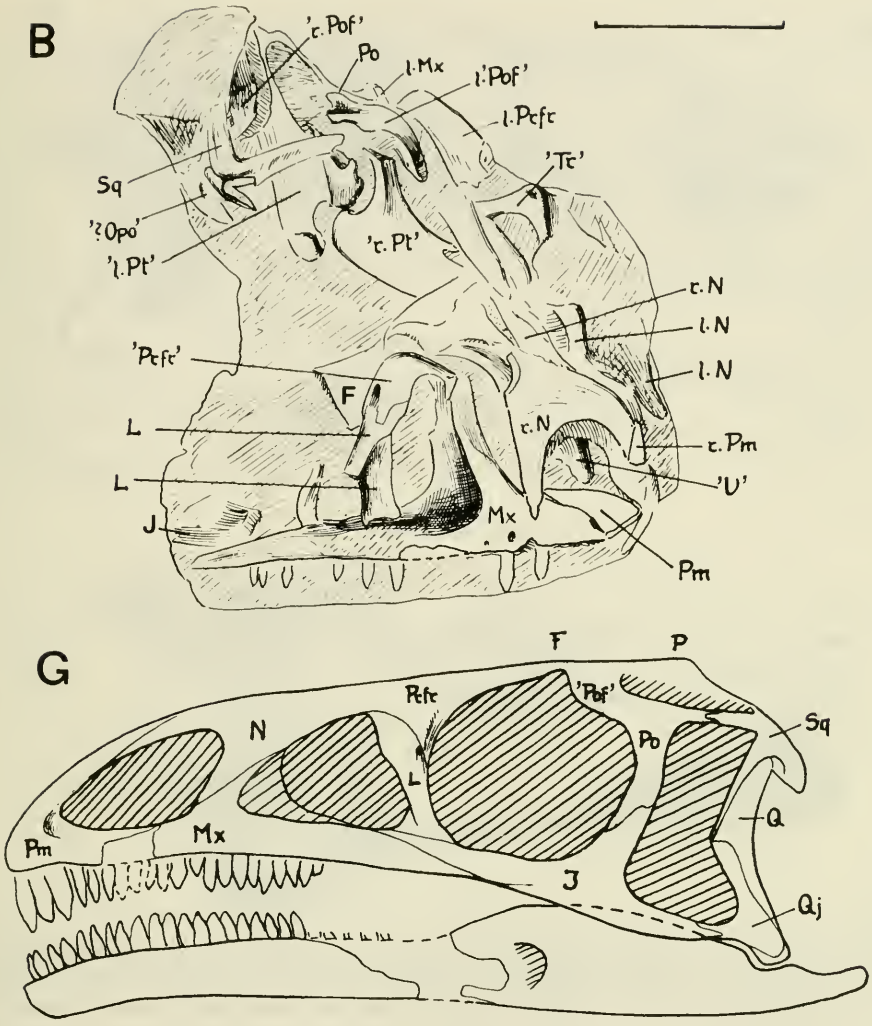



Fig. 3. *Sellosaurus gracilis*, referred specimens from the Middle Stubensandstein of Pfaffenhofen, Stromberghöhe, Württemberg. A—F: SMNS 12684, A—C: skull block in A: left lateral and B: right lateral views plus C: skull reconstruction in left lateral view; D, E: right quadrate in D: medial and E: posterior views; F: posterior part of left surangular and articular in dorsal view (cf. Fig. 3A); G: SMNS 12353a, reconstruction of skull in left lateral view. All from v. HUENE (1932) with a few additional labels plus reidentifications indicated by ' '. — × 0,5.
An = angular; D = dentary; F = frontal; J = jugal; L = lacrimal; 'L' = prefrontal; l = left; 'l. N' = part of dorsal process of left maxilla in medial view; 'l. Pof' = dorsal part of postorbital; 'l. Pt' = left quadrate; Mx = maxilla; N = nasal; '? Opo' = pterygoid flange of left pterygoid in lateral view; P = parietal; Pm = premaxilla; Po = postorbital; Prfr = prefrontal; 'Prfr' = lacrimal; Q = quadrate; Qj = quadratojugal; r. = right; 'r. pof.' = quadrate ramus of left pterygoid in lateral view; 'r. Pt' = left frontal in dorsal view; Sa = surangular; Spl = splenial; Sq = right squamosal in medial view; 'Tr' = left lacrimal in medial view; 'V' = anterior part of left maxilla in medial view. —
Scale line represents 5 cm.

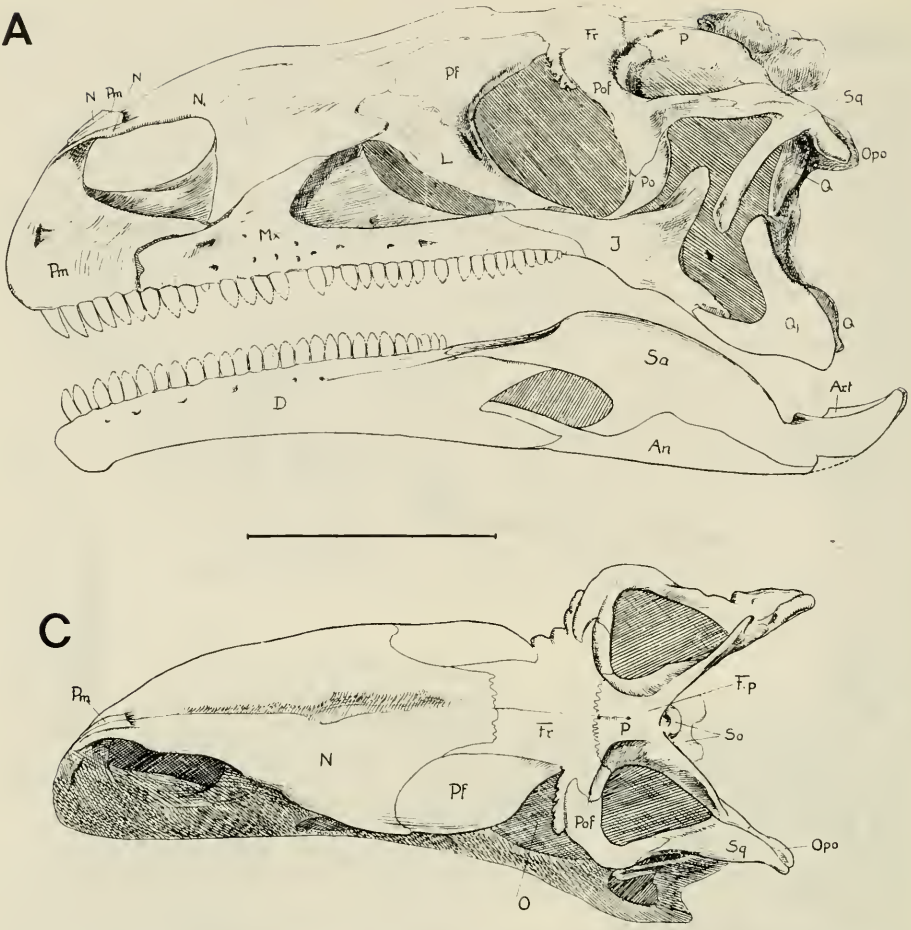
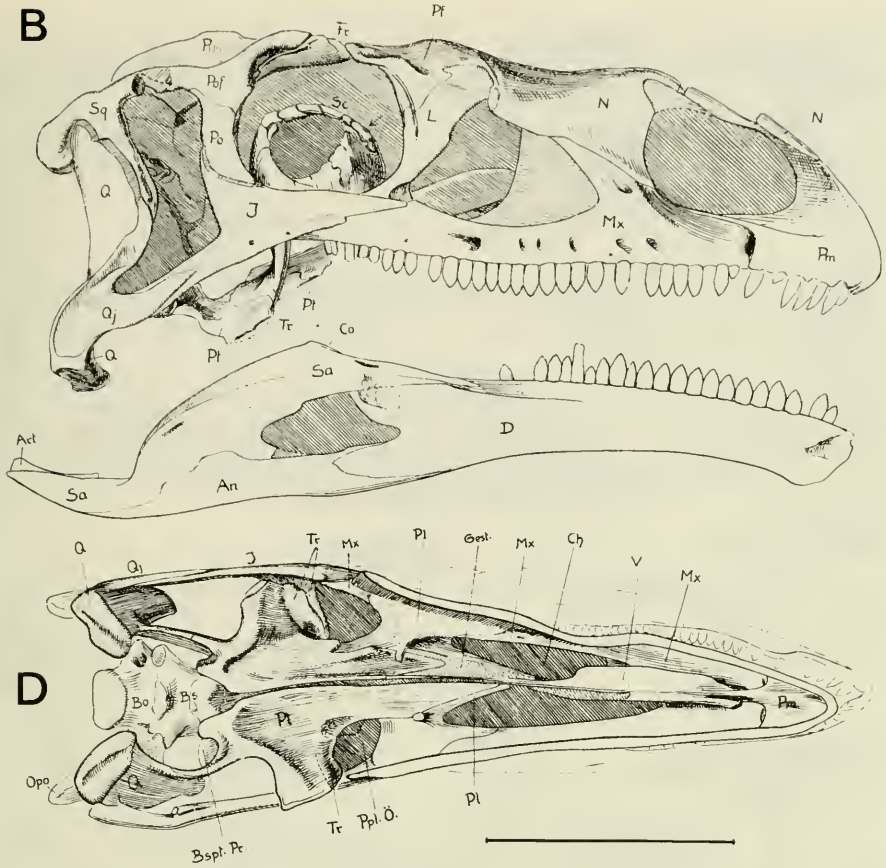



Fig. 4. *Plateosaurus engelhardti*, referred specimen SMNS 13200 from the Knollenmergel (Middle Keuper, Upper Triassic) of Trossingen, Württemberg. Skull (see Pl. 8) from v. Huene (1926) in A: left lateral; B: right lateral; C: dorsal and D: ventral views. — Approx. × ⅓.
An = angular; Art = articular; Bo = basioccipital; Bs = basisphenoid; Bspt. Pt. = basipterygoid process; Ch = choana or internal naris; Co = coronoid; D = dentary; F. p. = parietal foramen; Fr = frontal; Gest. = unprepared rock; J = jugal; L = lacrimal; Mx = maxilla; N = nasal; O = orbit; Opo = opisthotic; P = parietal; Pf = prefrontal; Pl = palatine; Po = postorbital; Pof = postfrontal (actually upper part of postorbital; Ppl. o = postpalatine opening; Pt = pterygoid; Q = quadrate; Qj = quadratojugal; Sa = surangular; Sc = sclerotic ring; So = supraoccipital; Sq = squamosal; Tr = ectopterygoid (transversum); V = vomer. — Scale line represents 10 cm.

premaxillary, maxillary and dentary tooth counts in *Plateosaurus* is 5—6, 24—30 and 21—25 (Galton in press), so, apart from the lower premaxillary count of 4 in some individuals, the count for *Sellosaurus* falls within this range.

The teeth of *Sellosaurus* (Pl. 4, Figs. 2—4; Pl. 5, Figs. 1, 2, 5—8; Pl. 7, Fig. 5) have transversely flattened crowns that are spatulate-shaped, being anteroposteriorly expanded




with the widest part of the crown apical to the crown-root junction. The large marginal denticles are apically inclined at an angle of about 45° to the anterior and posterior edges and the posterior edge of each tooth slightly overlaps the tooth behind it so the teeth are obliquely inclined in the jaw. In these respects, the teeth resemble those of the other anchisaurid prosauropods (GALTON 1984a, 1985b). In *Sellosaurus* the premaxillary (Fig. 1; Pl. 4, Fig. 3; Pl. 7, Fig. 7) and the anterior maxillary and dentary teeth (Pl. 4, Figs. 2—4) are taller with less expanded crowns that are more recurved with the apices slightly posteriorly directed and, in addition, the denticles extend further along the posterior than the anterior edge. In the dentary (Pl. 4, Figs. 2, 4), the asymmetrical shape of the crown continues until at least tooth 14 and on tooth 16 the denticles still extend further down on the posterior edge. In *Plateosaurus* (Pl. 9, Fig. 4), the denticles are symmetrical by at least tooth 13 (Pl. 9, Fig. 5) but the situation is not clear for the more anterior teeth. The tooth rows of SMNS 13200 (Pl. 1, Fig. 3; Pl. 8, Fig. 4) show graduations in tooth form similar to those of *Sellosaurus* (Pl. 4, Figs. 2—4) but, as with FSM 2 (Pl. 9, Fig. 4), the anterior teeth are less asymmetrical in shape and denticulation and all the teeth have proportionally broader crowns. The overall form of the teeth of *Sellosaurus* (Pl. 1, Figs. 1, 2; Pl. 2, Figs. 3, 5; Pl. 4, Figs. 2—5; Pl. 5, Figs. 1, 2, 5—8; Pl. 7, Figs. 5, 7) is more similar to that of *Thecodontosaurus* (Pl. 9, Figs. 6, 7; GALTON 1985b, Fig. 4F) than it is to that of *Plateosaurus* (Figs. 4A, B; Pl. 1, Fig. 3; Pl. 8, Figs. 1, 4; Pl. 9, Figs. 4, 5).

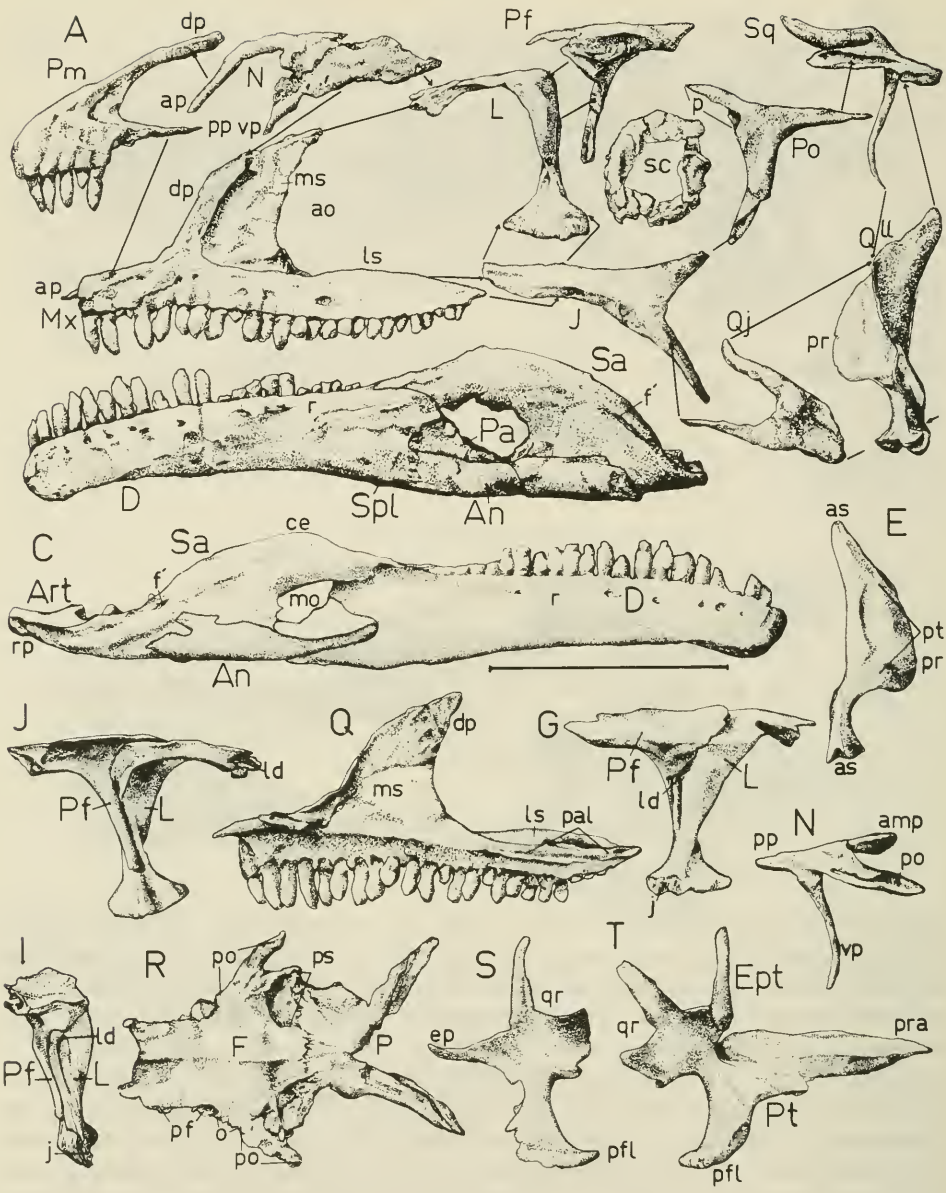
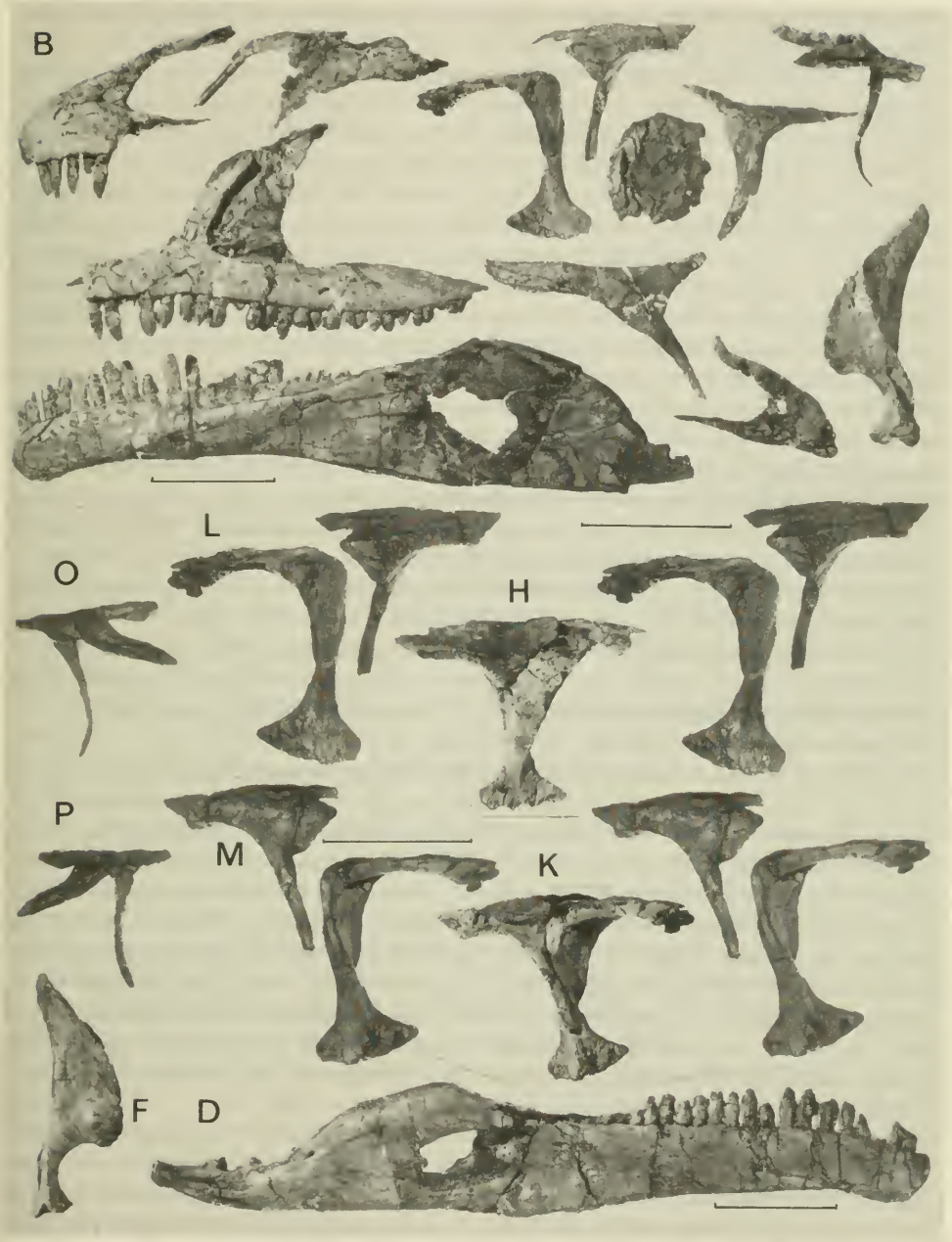



Fig. 5. *Plateosaurus engelhardti,* referred specimen AMNH 6810 from the Knollenmergel (Middle Keuper, Upper Triassic) of Trossingen, Württemberg. Isolated bones of skull from GALTON (1984a): A, B: outer bones of skull in left lateral view; C, D: right mandibular ramus in lateral view; E, F: left quadrate in medial view; G—I: right lacrimal and prefrontal articulated together in G, H: lateral and I: posterior views; J—M: left lacrimal and prefrontal; J, K: articulated together in medial view; L, M: disarticulated in L: lateral and M: medial views; N—P: right squamosal in N, O: lateral and P: medial views; Q: right maxilla in medial view (see Pl. 9, Fig. 1); R = frontals and parietals in dorsal view (see Pl. 9, Fig. 3); S, T: incomplete pterygoids in lateral view from S: left and T: right side. — H, K × ⅔, rest × ⅓.
For abbreviations see p. 20. — Scale lines represent 5 cm.




An analysis of the pattern of tooth replacement in *Plateosaurus* (AMNH 6810, Figs. 6A—D; Pl. 9, Fig. 1, see GALTON in press) clearly shows back to front waves of tooth replacement in alternating tooth positions and indications of the same pattern are apparent in *Sellosaurus* (Pl. 2, Figs. 3, 5; Pl. 4, Figs. 2—4; Pl. 5, Figs. 1, 2, 5, 8). The medial view of the maxilla (Pl. 2, Fig. 3) is similar to that of *Plateosaurus* (Pl. 9, Fig. 1; GALTON 1984a)

with small, triangular shaped interdental plates, the broad bases of which carry a horizontal groove that contained the dental lamina.

Nasal (N). — A reasonably complete nasal (Figs. 2A, C; Pl. 1, Fig. 2; Pl. 3, Fig. 1) plus two less complete ones (Figs. 1, 3B; Pl. 1, Fig. 1; Pl. 4, Fig. 1; Pl. 7, Fig. 4) are preserved; their form in lateral view is comparable to that of AMNH 6810 (Figs. 5A, B; GALTON 1984a) but not as deep as that of SMNS 13200 (Figs. 4A—C; Pl. 8, Fig. 1).

Lacrimal (L). — In addition to a well preserved but isolated lacrimal (Pl. 7, Figs. 1—3), several less complete examples are available (Figs. 1, 2A—C, 3B; Pl. 1, Figs. 1, 2; Pl. 3, Fig. 1; Pl. 4, Fig. 1; Pl. 5, Figs. 3, 4; Pl. 6, Fig. 5; Pl. 7, Figs. 4, 6, 8). Comparisons with the articulated (Figs. 4A, B, 5G—K; Pl. 8, Fig. 1) and disarticulated (Figs. 5A, B, L, M) lacrimal and prefrontal of *Plateosaurus* shows that, although the overall form is similar, the lacrimal of *Sellosaurus* differs in a few respects. The lateral sheet that roofs the posterodorsal part of the antorbital opening (Pl. 7, Figs. 1, 3, 4) is not as prominent as in *Plateosaurus* (Figs. 5G, I, L) and ventrally it has a concave outline as it approaches the body of the bone rather than showing a more gradual taper as in *Plateosaurus*. The bar separating the antorbital and orbital openings (Pl. 7, Figs. 1, 4) is more anteriorly inclined than it is in *Plateosaurus* (Figs. 5A, B, L, M). In medial view (Pl. 7, Fig. 2), the central region forms an obliquely inclined surface that faces dorsomedially and it was overlapped by the prefrontal. In *Plateosaurus* this region bears an acute edge formed by the junction of two surfaces, a transverse one that was overlapped by the prefrontal (Figs. 5G—I, L) and a vertical one that was not (Figs. 5J, K, M). In posterolateral view (Pl. 1, Fig. 1; Pl. 5, Figs. 3, 4), there is a prominent edge (also present in SMNS 52388) dorsal to the lacrimal duct and the prefrontal overlapped the more medial part of the bone to contact this edge. Consequently, the prefrontal probably bordered the medial part of the opening for the lacrimal duct whereas in *Plateosaurus* it did not (Fig. 5I).

Prefrontal (Pf). — Only partial prefrontals are represented (Fig. 1, 2A—C, 3A, B; Pl. 1, Figs. 1, 2; Pl. 3, Fig. 1; Pl. 4, Figs. 1, 2; Pl. 5, Fig. 4) that can be compared with the more complete examples from AMNH 5810 (Figs. 5A, B, G—M). In dorsal view (Figs. 2C, 3B; Pl. 3, Fig. 1; Pl. 5, Fig. 4) the prefrontal is slender whereas it is transversely expanded in *Plateosaurus* (Fig. 4C; Pl. 8, Fig. 2). The surface which forms the anterodorsal corner of the orbit is more acutely angled (Pl. 1, Fig. 1; Pl. 4, Fig. 2; Pl. 5, Fig. 4) than it is in *Plateosaurus* (Figs. 5G, H). In addition, it is less acutely tapered ventrally and proportionally more elongate (Pl. 1, Fig. 1; Pl. 2, Fig. 1; Pl. 5, Fig. 4; Pl. 7, Fig. 8) than it is in *Plateosaurus* (Fig. 5I). The prefrontal probably formed the medial margin of the opening to the lacrimal duct (see previous section) whereas in *Plateosaurus* it does not (Fig. 5I). The slender ventral process that was medial to the lacrimal (Figs. 5K, M) is preserved in a couple of cases ('L', Fig. 3A; Pl. 1, Fig. 2; Pl. 4, Fig. 2).

Frontal (F). — A bone of SMNS 12684 labelled palatine and identified as the right pterygoid (Fig. 3B) by v. HUENE (1932) is the left frontal in dorsal view (Pl. 4, Fig. 1; Pl. 6, Fig. 2). The most anterior part of the bone is overlapped by the left prefrontal, and the posterolateral part, the area of origin of the M. pseudotemporalis (Fig. 5R; Pl. 9, Fig. 3), is covered with matrix but it is visible in SMNS 12216 (Pl. 3, Fig. 1). Laterally the widely separated sutural areas for the prefrontal and postorbital are visible (Pl. 4, Fig. 1; Pl. 6, Fig. 2) and, in between, the frontal forms an extensive border to the dorsal rim of the orbit. The latter is also true for SMNS 12216 (Fig. 2C; Pl. 3, Fig. 1 — prefrontal overrode frontal during preservation so distance shortened), GPIT 18318a (Fig. 1; Pl. 1. Fig. 1; Pl. 5, Fig. 4) and SMNS 12667 (GALTON & BAKKER 1985) but only the ventral surface is exposed in the last two specimens. In *Plateosaurus* the sutural areas for the prefrontal and postorbital are

very close and the frontal only borders the orbit to a limited extent (Figs. 4C, 5R; Pl. 8, Fig. 2; Pl. 9, Fig. 3), and part of the posterolateral wing.

Postorbital (Po). — Although not separated by a suture, v. HUENE (1915, 1932) identified the more dorsomedial part of the postorbital as the postfrontal (Figs 1A, 3B, C, G). The incomplete postorbital of GPIT 18318a (Pl. 1, Fig. 1) was originally more complete dorsally (Fig. 1; v. HUENE 1915) and it has the best preserved ventral process. The dorsal part is visible in SMNS 12353a (Pl. 3, Fig. 2; Pl. 6, Fig. 4); the sutural relations with the frontal resemble those of *Plateosaurus* (Figs. 4C, 5R; Pl. 8, Fig. 2; Pl. 9, Fig. 3), viz. the sharp edge on the frontal is continued onto the postorbital as a more rounded ridge, posterior to which there is a recessed area on both bones from which the M. pseudotemporalis originated, and the anteromedial part of the process that overlaps the frontal is short. In SMNS 12684 (Pl. 4, Fig. 1; Pl. 6, Fig. 2) this part of the process is proportionally more elongate and is separated from the anterodorsal margin of the upper temporal opening by an elongate, slender strip that extends the ridge for the M. pseudotemporalis (Pl. 6, Fig. 2) almost to the dorsolateral edge of the postorbital. Consequently, the contribution of the postorbital to the recessed area for the M. pseudotemporalis is very small. Judging from the small part of the frontal preserved, an intermediate situation was present in SMNS 12216 (Pl. 3, Fig. 1).

Jugal (J.). — The jugal (Fig. 1; Pl. 1, Fig. 1) resembles the lateral sheet and body of the maxilla in being low compared to that of *Plateosaurus* (Figs. 4A, B, 5A, B; Pl. 8, Fig. 1). The only other jugals are the poorly preserved anterior ends of SMNS 12684 (Figs. 3A, B; Pl. 4, Figs. 1—3) and the posterior part of the left one of SMNS 12353a in medial view (Pl. 3, Fig. 3; Pl. 6, Figs. 4, 5).

Quadratojugal (Qj). — v. HUENE (1932) noted that a very complete quadratojugal is preserved in SMNS 12353a (Fig. 3G) but the element so identified is probably the posterior part of the right jugal in medial view (Pl. 3, Fig. 3; Pl. 6, Fig. 5) or it was on another block that has been lost. Consequently, the quadratojugal is unknown.

Squamosal (Sq). — Comparisons with isolated squamosals of *Plateosaurus* (Figs. 5A, B, N—P; GALTON 1984a) show that the squamosal of SMNS 12684 (Fig. 3B; Pl. 4, Fig. 1; Pl. 6, Fig. 3) is the left in medial view. The base of the anteromedial process (for the parietal), about half of the posterior process (for the paroccipital process), about half of the anterior process (for the postorbital) and most of the ventral process (against anterior edge of quadrate) are preserved. The slender ventral process and part of the main body of the squamosal are visible in lateral view in GPIT 18318a (Fig. 1; Pl. 1, Fig. 1), and a partial squamosal is preserved in SMNS 12667 (GALTON & BAKKER 1985).

Quadrate (Q). — Except for the ventral articular end, most of the disarticulated right quadrate of SMNS 12684 is preserved (Figs. 3D, E) and the sutural area of the pterygoid flange for the pterygoid is visible (Fig. 3D). The other quadrate is partly exposed in medial view and is complete ventrally ('l. Pt', Fig. 3B; Pl. 4, Fig. 1; Pl. 6, Fig. 3). Views of the partly exposed quadrate of SMNS 12667 and the isolated, incomplete and dorsoventrally crushed quadrate of SMNS 12668 are given by GALTON & BAKKER (1985). These quadrates are similar to the quadrates of *Plateosaurus* (Figs. 5A, B, E, F).

Pterygoid (Pt). — The bones identified by v. HUENE (1932) as the pterygoid ('r. pt.', 'l. pt.', Fig. 3B; Pl. 4, Fig. 1; Pl. 6, Figs. 2, 3) are the left frontal in dorsal view and the left quadrate in medial view. The pterygoid is a complexly shaped bone in *Plateosaurus* (Figs. 4B, D, 5S, T; Pl. 8, Fig. 3). Parts of it are preserved in SMNS 12661 (Fig. 2B; Pl. 2, Figs. 1, 2; Pl. 7, Fig. 8) and SMNS 12353a (Pl. 3, Fig. 2) but each is too incomplete to identify the parts or determine the side it came from. The quadrate ramus and the pterygoid flange of

the left pterygoid are partly exposed in lateral view in SMNS 12684 ('r. Pof', '? Opo', Fig. 3B; Pl. 4, Fig. 1; Pl. 6, Fig. 3); they are similar to those of *Plateosaurus* (Figs. 5S, T).

Ectopterygoid (Ect.). — Bones identified by v. HUENE (1932) as the ectopterygoid are either very poorly exposed (Tr, Fig. 2A; Pl. 1, Fig. 2) or incorrectly identified ('Tr', Fig. 3B; Pl. 4, Fig. 1). The form of this element in ventral view in SMNS 12353a (Pl. 3, Fig. 3) is similar to that of *Plateosaurus* (GALTON 1984a).

Palatine (Pal). — The right palatine of SMNS 12661 is represented by the base, which sutured against the posterior part of the maxilla, and by part of the anterodorsally and vertically expanded pterygoid ramus (Fig. 2B; Pl. 2, Fig. 1; Pl. 6, Fig. 6). The same regions of the right palatine of SMNS 12353a (Pl. 3, Fig. 2; Pl. 6, Fig. 5) and of the left palatine of SMNS 14480 (Pl. 3, Fig. 4; Pl. 6, Fig. 1) are also visible in medial view. The anteroventral edge of the base of the pterygoid ramus is thickened medially in *Sellosaurus* but not in *Plateosaurus* (GALTON 1984a).

Vomer (V). — The poorly preserved bone visible in the nasal opening ('Sm' Fig. 1; V, Fig. 2A; Pl. 1, Figs. 1, 2) may be part of a dorsally displaced vomer. However, a comparably placed element in SMNS 12684 ('V' Fig. 3B; Pl. 4, Fig. 1) is the medial surface of the anterior end of the left maxilla (cf. Fig. 3A; Pl. 4, Fig. 2).

## Chondrocranium

The poorly preserved basioccipital and the adjacent part of the basisphenoid are exposed in ventral view in GPIT 18318a (Fig. 1; Pl. 1, Fig. 1). The bone identified by v. HUENE (1932) as ?opisthotic ('? Opo' Fig. 3B; Pl. 4, Fig. 1) is the pterygoid flange of the left quadrate in lateral view. However, a nearly complete but slightly disarticulated braincase of a juvenile individual (SMNS 12667) of *Sellosaurus* is described by GALTON & BAKKER (1985).

## Lower Jaw

The best preserved mandibular ramus is that of SMNS 12684 (Fig. 3A) and, because the posterior part is separate, there is uncertainty concerning the original length of the jaw (Figs. 3A, C). The posterior part of the other mandibular ramus is disarticulated and very poorly preserved (Fig. 1; Pl. 1, Fig. 2).

Dentary (D). — The well preserved dentary of SMNS 12684 is visible in lateral view (Fig. 3A; Pl. 4, Figs. 2, 4), as is the less well preserved one of GPIT 18318a (Fig. 1; Pl. 1, Fig. 1). Both resemble those of *Plateosaurus* (Figs. 4A, B, 5A—D; Pl. 8, Fig. 1; GALTON 1984, in press). The thick posterodorsal part is overlapped by the surangular, and the anterolateral edge of the coronoid emminence is continued onto the dentary as a diagonally inclined ridge that merges into the body of the bone at about mid-height ventral to tooth 10 or so (Pl. 4, Figs. 2, 4). The more posterior ten teeth were inset and, as is also the case in all ornithischian dinosaurs except fabrosaurids (GALTON 1973b), this ridge was probably for the attachment of cheeks that were functionally analogous to those of mammals, i.e. they retained the food in the mouth after it was chewed. PAUL (1984) points out that additional evidence for the presence of cheeks is provided when there are only a few large nerve foramina on the lateral surface of the jaws rather than a series of more numerous small foramina. There are four small foramina ventral to tooth positions 1—2, 3—4, 5—6 and 7, two larger foramina ventral to tooth positions 9 and 11—12, and an even larger one ventral to tooth positions 14—15 (Pl. 4, Figs. 2, 4 cf. Figs. 5A—D). Consequently, the attachment area for cheeks probably extended along the dentary as far as tooth position 9 as in *Plateosaurus* (cf. Figs. 5A—D; GALTON in press; PAUL 1984 shows corner of mouth level

with tooth positions 12—13). The medial view of the anterior part of the left dentary (Pl. 4, Fig. 2) shows the Meckelian canal and a small rugose symphysis for the other dentary.

Surangular (Sa). — A fairly complete surangular (Fig. 3A; Pl. 4, Fig. 2) and less complete ones (Fig. 1; Pl. 1, Fig. 1; Pl. 3, Figs. 2, 3) are similar to those of *Plateosaurus* Figs. 4A, B, 5A—D; Pl. 8, Fig. 1). The anterodorsal part overlapped the dentary and the dorsal surface formed a broad, dorsolaterally facing surface for the insertion of jaw closing muscles (M. adductor mandibular externus, pars medialis and profundus; M. pseudotemporalis) as in *Plateosaurus* (GALTON in press).

Angular (An). — A fairly complete angular (Fig. 3A; Pl. 4, Fig. 2) and a very incomplete one (Fig. 1; Pl. 1, Fig. 1) are similar to those of *Plateosaurus* (Figs. 4A, B, 5A—D; Pl. 8, Fig. 1). This bone overlaps the ventral part of the angular and is overlapped by the posteroventral part of the dentary (Pl. 4, Fig. 2).

Splenial (Spl). — Only a small part of the splenial is visible in lateral view (Fig. 3A; Pl. 4, Fig. 2).

Articular (Art). — The medially incomplete posterior part of the articular was figured by v. HUENE (1932) in dorsal view (Fig. 3F) and the same view of a more complete example (Pl. 3, Fig. 3) is similar to those of *Plateosaurus* (GALTON 1984a, in press).

Accessory elements

Sclerotic ring (sc). — Five articulated plates representing about a quarter of a sclerotic ring are preserved and a negative plate plus two overlapping plates at either end are recognizable (Pl. 1, Fig. 2). The complete ring was probably comparable to that of *Plateosaurus* with a total of 18 plates that includes two positive and two negative plates so a Type A arrangement is present as in other dinosaurs (GALTON 1984a).

## 4. Comparisons

*Plateosaurus* v. MEYER 1837. — Several differences between the form of the cranial bones of *Sellosaurus* and *Plateosaurus* are mentioned in the description given above and most of these are summarized in Table 1 (characters 1—8) along with those of the braincase (characters 9—11, see GALTON & BAKKER 1985). From this table, it is readily apparent that *Sellosaurus gracilis* v. HUENE 1908 was incorrectly referred to *Plateosaurus* v. MEYER 1837 as *P. gracilis* (v. HUENE) by v. HUENE (1926, 1932) and subsequent workers including myself (GALTON & CLUVER 1976). For each of the character states listed, *Plateosaurus* exhibits the more derived condition so, although both are valid genera, there is no cranial character that debars *Sellosaurus* from the Stubensandstein from being the ancester of *Plateosaurus* from the overlying Knollenmergel.

Comparisons with the other prosauropod genera erected prior to 1908 is necessary to establish the validity of *Sellosaurus*.

*Thecodontosaurus* RILEY & STUTCHBURY 1836. — This genus is based on disarticulated bones from the Rhaetic (Upper Triassic) near Bristol, England. The holotype dentary with the remains of 21 teeth (BCM 1, RILEY & STUTCHBURY 1840, Pl. 29, Fig. 4) was destroyed during World War II. The teeth of the better preserved neotype dentary (BCM 2, Pl. 9, Figs. 6, 7; HUXLEY 1870, Pl. 3, Figs. 1, 2; GALTON 1984b, Fig. 4F) are almost identical to those of SMNS 12684 (Pl. 4, Fig. 4; Pl. 5, Fig. 8) and referred braincases are similar (see GALTON & BAKKER 1985). However, the skull of a partial skeleton from South Wales that KERMACK (1984) refers to *Thecodontosaurus* differs from those of *Sellosaurus* in several respects. The maxilla is reconstructed with a large lateral sheet, the lacrimal has practically

| Characters | *Sellosaurus* | *Plateosaurus* |
|---|---|---|
| 1. Asymmetry of teeth of anterior part of tooth row | more marked | less marked |
| 2. Proportions of tooth crowns | slender | broader |
| 3. Lateral sheet of maxilla | small, gets progressively lower, ends by tooth positions 3 or 4 | large, maximum height level with base of lacrimal, extends to end of bone |
| 4. Depth of anterior process of jugal | shallow | deep |
| 5. Transverse width of prefrontal | narrow | wide |
| 6. Contribution of frontal to dorsal orbital rim (distance between ends of prefrontal and postorbital) | large | very small |
| 7. Opening of lacrimal duct bordered medially by prefrontal | yes | no |
| 8. Size of lateral sheet of lacrimal | medium | large |
| 9. Projection of line through middle of parasphenoid goes | through middle of occipital condyle | well below occipital condyle |
| 10. Space between basipterygoid processes in ventral view is | V-shaped with no transverse sheet | roughly W-shaped with a large transverse sheet. |
| 11. Supraoccipital in anterior or posterior view is | low and wide | tall and narrow |

Tab. 1. Contrasting cranial characters of *Sellosaurus* and *Plateosaurus*

no lateral sheet, the posterior process of the postorbital is very short, and the jaw articulation is in line with the tooth rows rather than being ventrally offset.

*Massospondylus* Owen 1854. — Skulls have been described from the early Jurassic (Olsen & Galton 1977, 1984) of South Africa (Clarens Formation, Cooper 1981) and Arizona, U.S.A. (Kayenta Formation, Attridge et al. 1985) and these differ from *Sellosaurus* in several respects. The anterior process of the maxilla is more vertical than it is in *Plateosaurus*, the medial sheet is very small, the large lateral sheet extends to the end of the bone, the anterior process of the jugal is deep, and the lateral sheet of the lacrimal is small.

*Euskelosaurus* Huxley 1866. — No skulls of this genus are known from the lower Elliot Formation (Upper Carnian or lower Norian, Olsen & Galton 1984) of South Africa but, judging from the postcranial anatomy (van Heerden 1979), *Sellosaurus* Huene 1908 is not a junior synonym of *Euskelosaurus* Huxley 1866.

*Anchisaurus* Marsh 1885. — An almost complete skull (YPM 1883, Galton 1976) is known from the Portland Formation (early Jurassic, Olsen & Galton 1977) of Connecticut, U.S.A.; it differs from those of *Sellosaurus* in several respects. The prefrontal is transversely very narrow, the lacrimal has practically no lateral sheet, the postorbital and parietal process of the squamosal are very short, and the jaw articulation is in line with the tooth rows rather than being ventrally offset.

*Ammosaurus* Marsh 1889. — The cranial anatomy is very poorly known (see Galton 1976) in this genus from the Portland Formation (early Jurassic) of Connecticut, U.S.A., but the bones of the pelvic girdle show several differences from those of *Sellosaurus* (see v. Huene 1908, 1932, Galton 1973a, 1976) so *Sellosaurus* Huene 1908 is not a junior synonym of *Ammosaurus* Marsh 1889.

It is concluded that *Sellosaurus* v. HUENE is a valid genus and comparisons with the skulls of anchisaurid prosauropod genera described since then show that they differ from *Sellosaurus* in several respects as follows:

*Lufengosaurus* YOUNG 1941. — The holotype skeleton from the Lower Lufeng Series (early Jurassic, OLSEN & GALTON 1984) of Yunnan, China includes a crushed skull (see YOUNG 1941). The maxilla has a deep lateral sheet, the anterior end of the jugal is deep, and there is practically no lateral sheet to the lacrimal.

*Yunnanosaurus* YOUNG 1942. — The teeth of *Yunnanosaurus* (Lower Lufeng Series, early Jurassic, of Yunnan, China) are unique for a prosauropod in being sub-cylindrical, sauropod-like, almost completely lacking marginal denticles, and with prominent wear facets, both food-to-tooth and tooth-to-tooth (see GALTON 1985b) and, because of this, I exclude this genus from the Anchisauridae and place it in its own family, the Yunnanosauridae YOUNG 1941.

*Azandohsaurus* DUTUIT 1972. — Based on a partial dentary with teeth plus an isolated tooth (DUTUIT 1972, Figs. a, b; not fabrosaurid tooth, Fig. c) from the Argana Formation (mid-Carnian, late Triassic, GALTON 1984b) of the Argana Valley, Atlas Mountains, Morocco. The anterior teeth are less asymmetrical, the crowns are proportionally more elongate and the central vertical ridge is more prominent (see GALTON 1984b, Figs. 3N, M, 4A, B) than in *Sellosaurus* (Pl. 4, Fig. 4; Pl. 5, Fig. 8).

*Coloradia* BONAPARTE 1978. — Based on a complete skull from the Los Colorados Formation (Norian, late Triassic, OLSEN & GALTON 1984) of northern Argentina. The lateral sheet of the maxilla is deep as is the anterior process of the jugal, the posterior process of the postorbital and the anterior process of the squamosal are short (BONAPARTE 1978), and the form of the braincase is rather different from that of *Sellosaurus* (see GALTON & BAKKER 1985).

*Mussaurus* BONAPARTE & VINCE 1979. — Based on several complete but extremely small skeletons (estimated total length about 20 cm) with skulls from the El Tranquilo Formation (Norian) of southern Argentina. However, this genus and the family Mussauridae BONAPARTE & VINCE 1979 are based on extremely young individuals. J. BONAPARTE (Personal communication) has collected juvenile intermediate sized specimens that link it with adults that were described as *Plateosaurus* by CASAMIQUELA (1980). From the illustrations of the fragmentary cranial material given by CASAMIQUELA (1980), this prosauropod is referable to neither *Plateosaurus* nor *Sellosaurus*.

On the basis of the cranial anatomy, it is concluded that *Sellosaurus* is a valid genus that to date has only been found in the Stubensandstein of Württemberg, West Germany. A fuller discussion of the affinities of *Sellosaurus*, with a reconstruction of the skull and a description of the postcranial material from the Middle Stubensandstein, will be given elsewhere (GALTON in prepn.).

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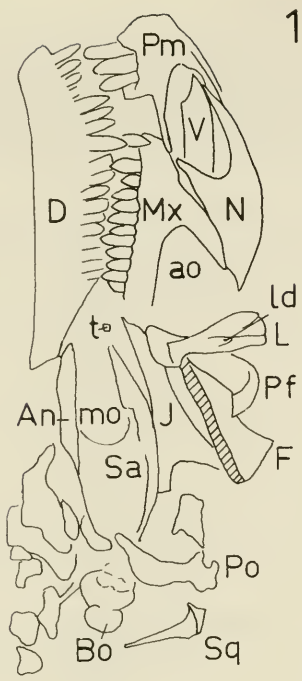
## Abbreviations used in illustrations

The abbreviations for Figures 1—4 are given in the captions. In Figure 5 and in the explanatory drawings to the plates, the first letter of the abbreviation is only capitalized for a bone and the same uncapitalized abbreviation is for a sutural surface against which that bone fitted; the abbreviations for all other structures are also uncapitalized.

| | |
|---|---|
| amp | anteromedial process |
| An | angular |
| ao | antorbital opening |
| ap | anterior process |
| Art | Articular |
| as | articular surface |
| Bo | basioccipital |
| ce | coronoid emminence |
| D | dentary |
| dp | dorsal process |
| ds | dentary symphysis |
| Ect | ectopterygoid |
| en | external naris |
| ep | epipterygoid process |
| Ept | epipterygoid |
| F, f | frontal |
| f' | foramen |
| in | internal nares of anterior palatal opening |
| J, j | jugal |
| L, l | lacrimal |
| l. | left |
| ld | opening of lacrimal duct |
| lj | lower jaw |
| ll | lateral lamella |
| ls | lateral sheet |
| Lsp | laterosphenoid |
| lto | lower temporal opening |
| mc | Meckelian canal |
| mo | mandibular opening |
| ms | medial sheet |
| mx | maxilla |
| N, n | nasal |
| o | orbital margin |
| P, p | parietal |
| Pa | prearticular |
| Pal, pal | palatine |
| pap | paroccipital process |
| Pf, pf | prefrontal |
| pfl | pterygoid flange |
| Pm, pm | premaxilla |
| Po, po | postorbital |
| pp | posterior process |
| pr | pterygoid ramus |
| pra | palatal ramus |
| ps | M. pseudotemporalis |
| Pt, pt | pterygoid |
| Q | quadrate |
| Qj | quadratojugal |
| qr | quadrate ramus |
| r | ridge for cheeks |
| r. | right |
| rp | retroarticular process |
| s | special foramen |
| Sa | surangular |
| sc | sclerotic plates |
| So | supraoccipital |
| Spl | splenial |
| Sq | squamosal |
| uto | upper temporal opening |
| V, v | vomer |
| vp | ventral process |

# Plates



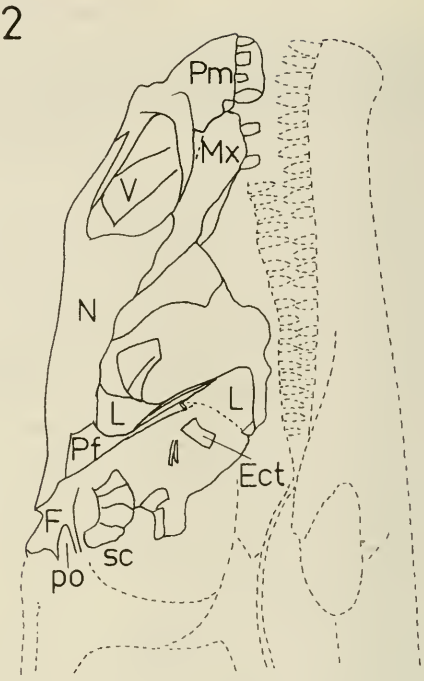




Plate 1

*Sellosaurus gracilis,* referred specimens from the Middle Stubenstandstein of Württemberg.

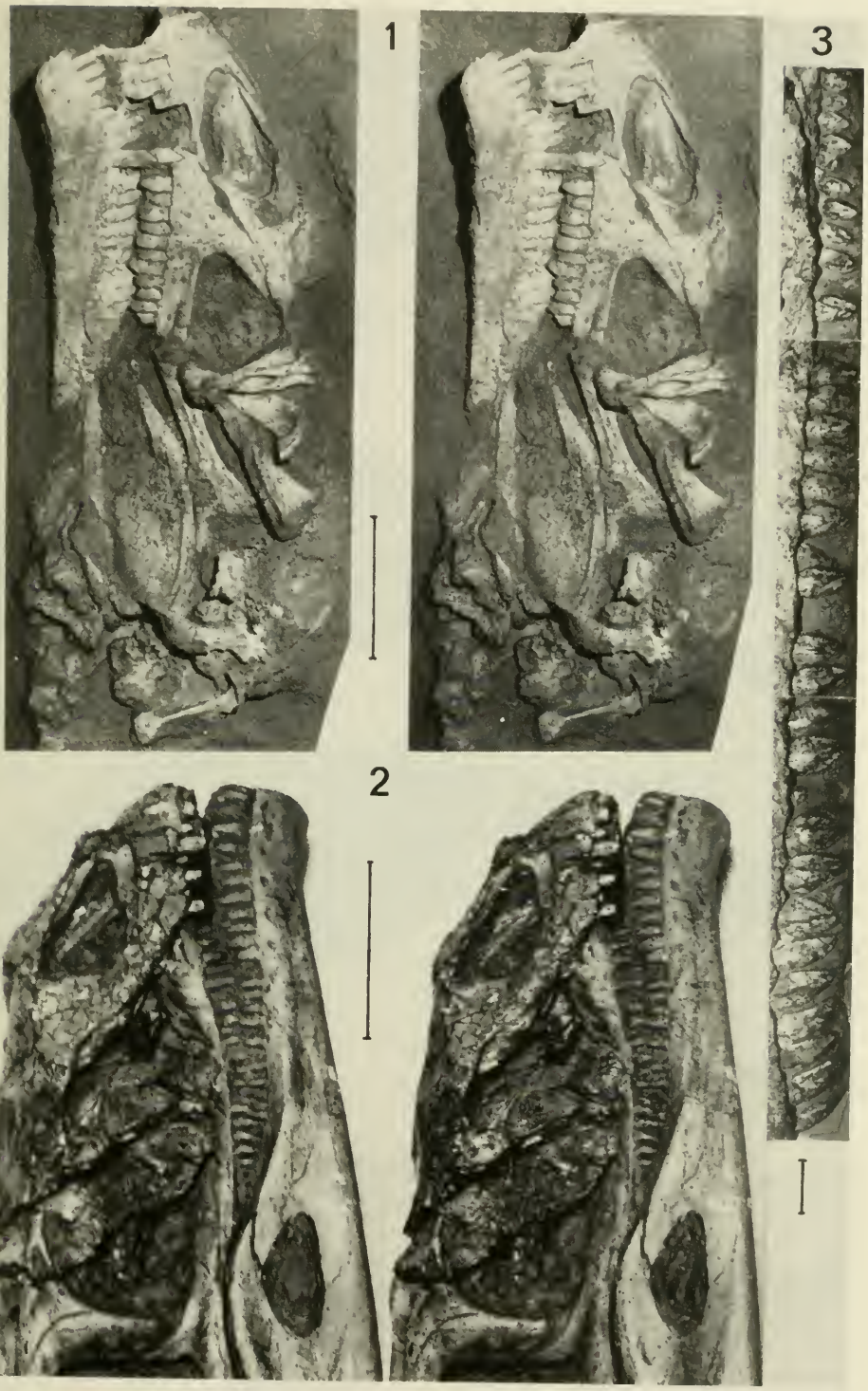
Fig. 1. Partial skull GPIT 18318a from near Trossingen, left lateral view (Fig. 1). — × 0.4.

Fig. 2. Anterior part of skull SMNS 12216 from Pfaffenhofen, Stromberghöhe, right lateral view (Fig. 2A). — × 0.5.

*Plateosaurus engelhardti,* referred specimen from Knollenmergel near Trossingen.

Fig. 3. Left upper tooth row in lateral view of SMNS 13200. — × 0.75.

For abbreviations see p. 20.
Scale lines represent 5 cm (1,2) and 1 cm (3).



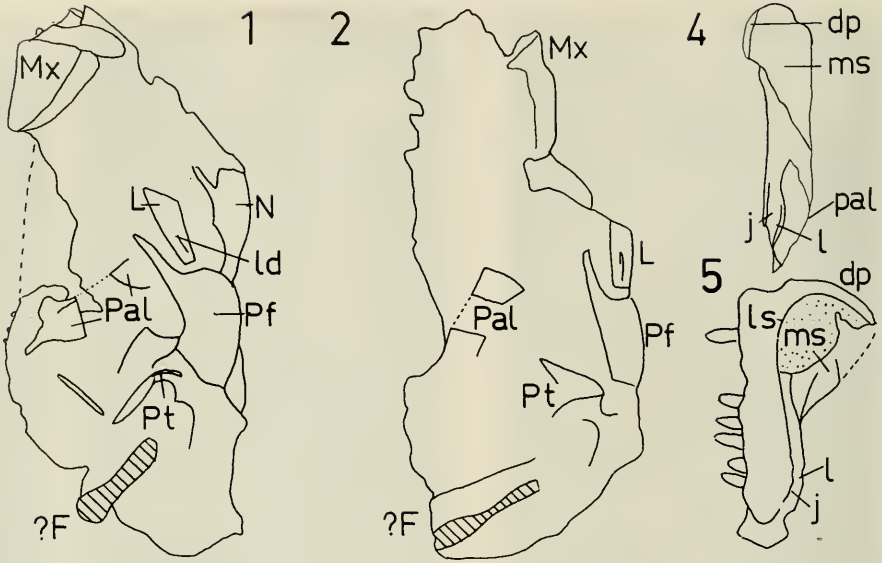


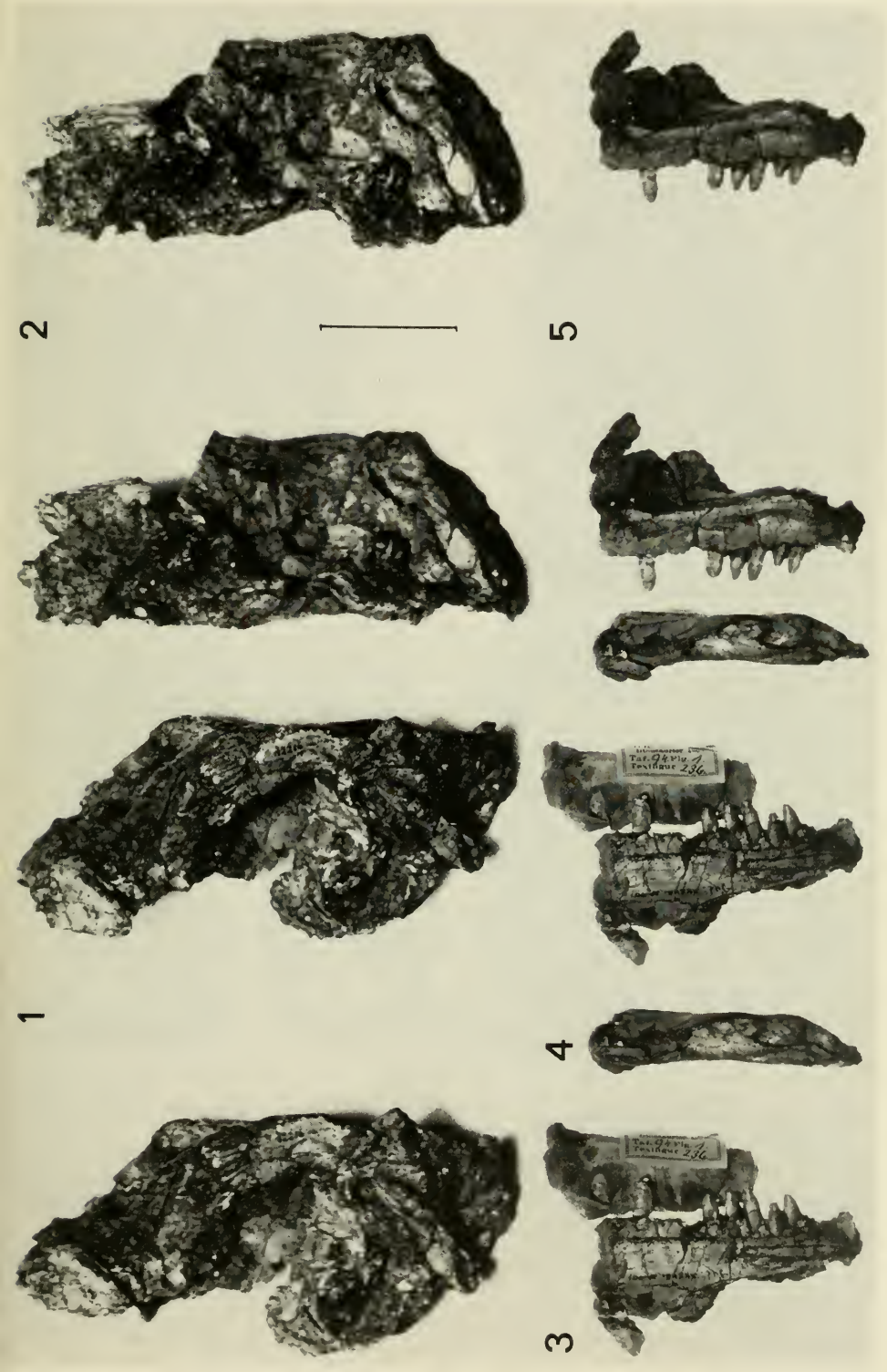

Plate 2

*Sellosaurus gracilis,* referred specimens from the Middle Stubensandstein of Württemberg.

Figs. 1, 2. Anterior part of skull SMNS 12216 from Pfaffenhofen in 1: left lateral and 2: ventral views. — × 0.5.

Figs. 3—5. Left maxilla, SMNS 4388, holotype of *Thecodontosaurus* ? *hermannianus* v. HUENE from Heslach in Stuttgart. 3: medial (v. MEYER 1861, Pl. 37, Fig. 28); 4: dorsal (v. MEYER 1861, Pl. 37, Fig. 30) and 5: lateral views (v. MEYER 1861, Pl. 37, Figs. 29, 31). — × ⅔.

For abbreviations see p. 20.
Scale line represents 4 cm (1, 2) or 3 cm (3—5).



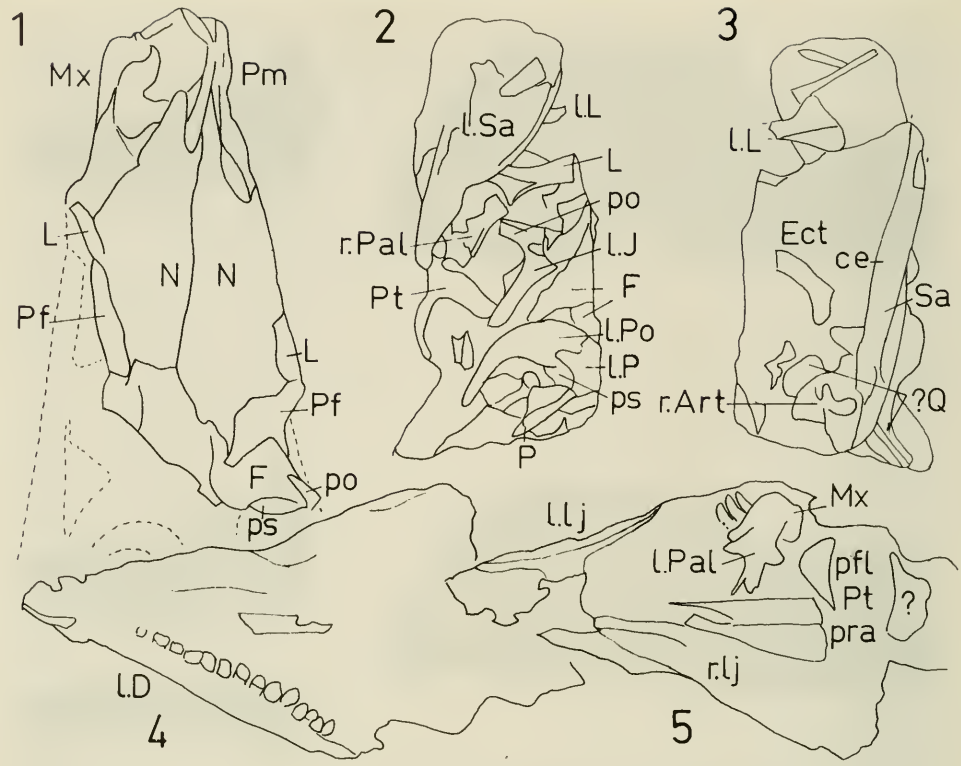



Plate 3

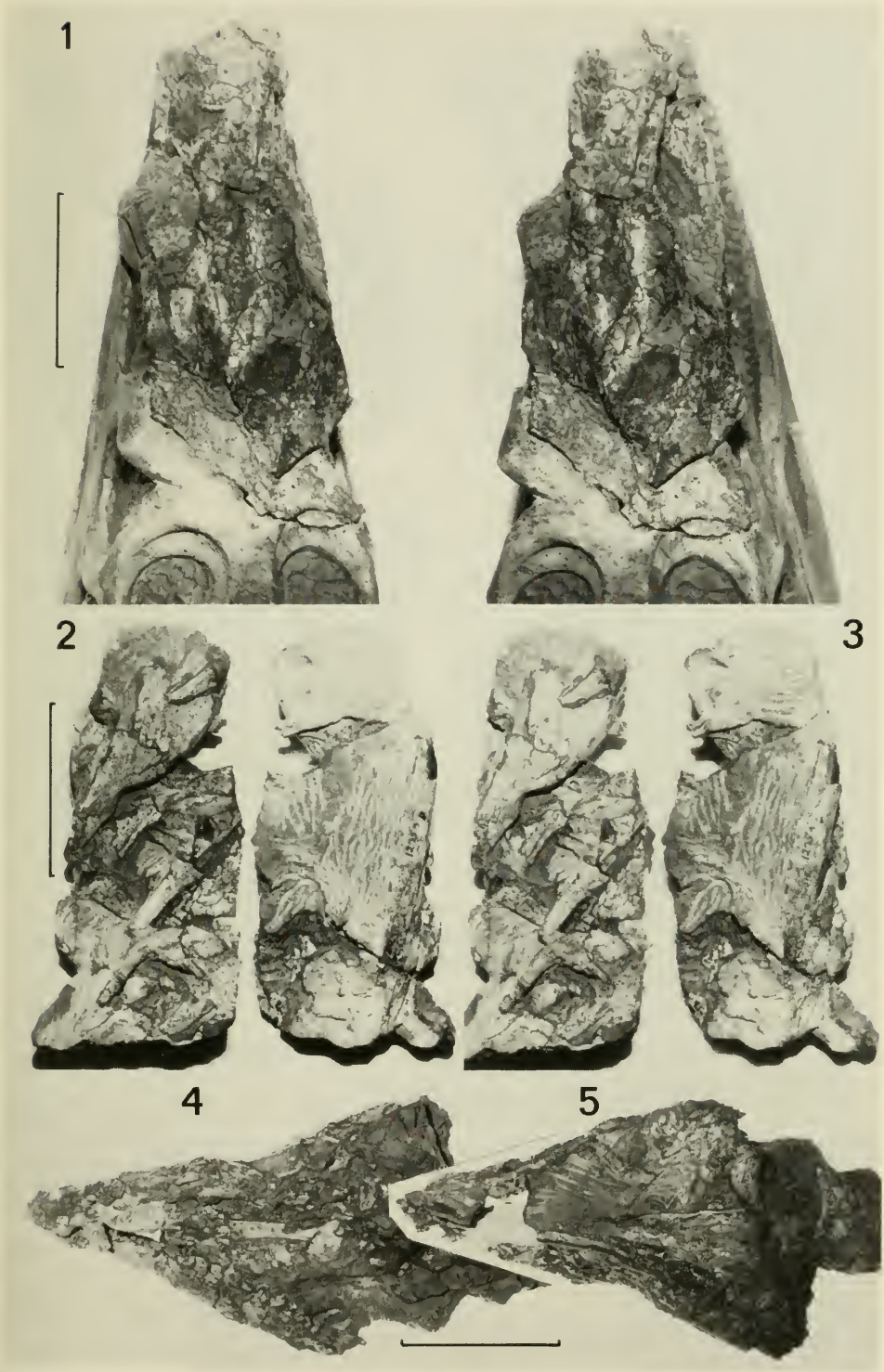
*Sellosaurus gracilis,* referred specimens from the Middle Stubensandstein of Pfaffenhofen, Stromberghöhe, Nordwürttemberg.

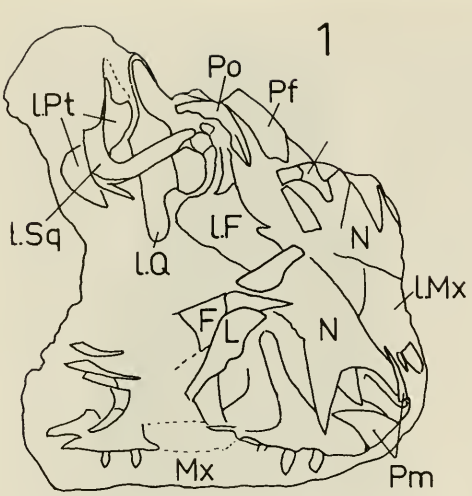
Fig. 1. Anterior part of skull SMNS 12216 in dorsal view (Fig. 2C). — × 0.5.

Figs. 2, 3. Partial skull SMNS 12353a, block with disarticulated bones in 2: upper and 3: lower view. — × 0.5.

Figs. 4, 5. Partial skull SMNS 14880, block with disarticulated bones in 3: lower and 4: upper views. — × 0.46.

For abbreviations see p. 20.
Scale lines represent 5 cm.





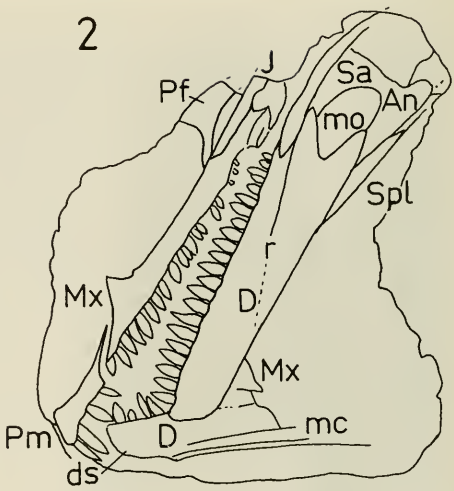



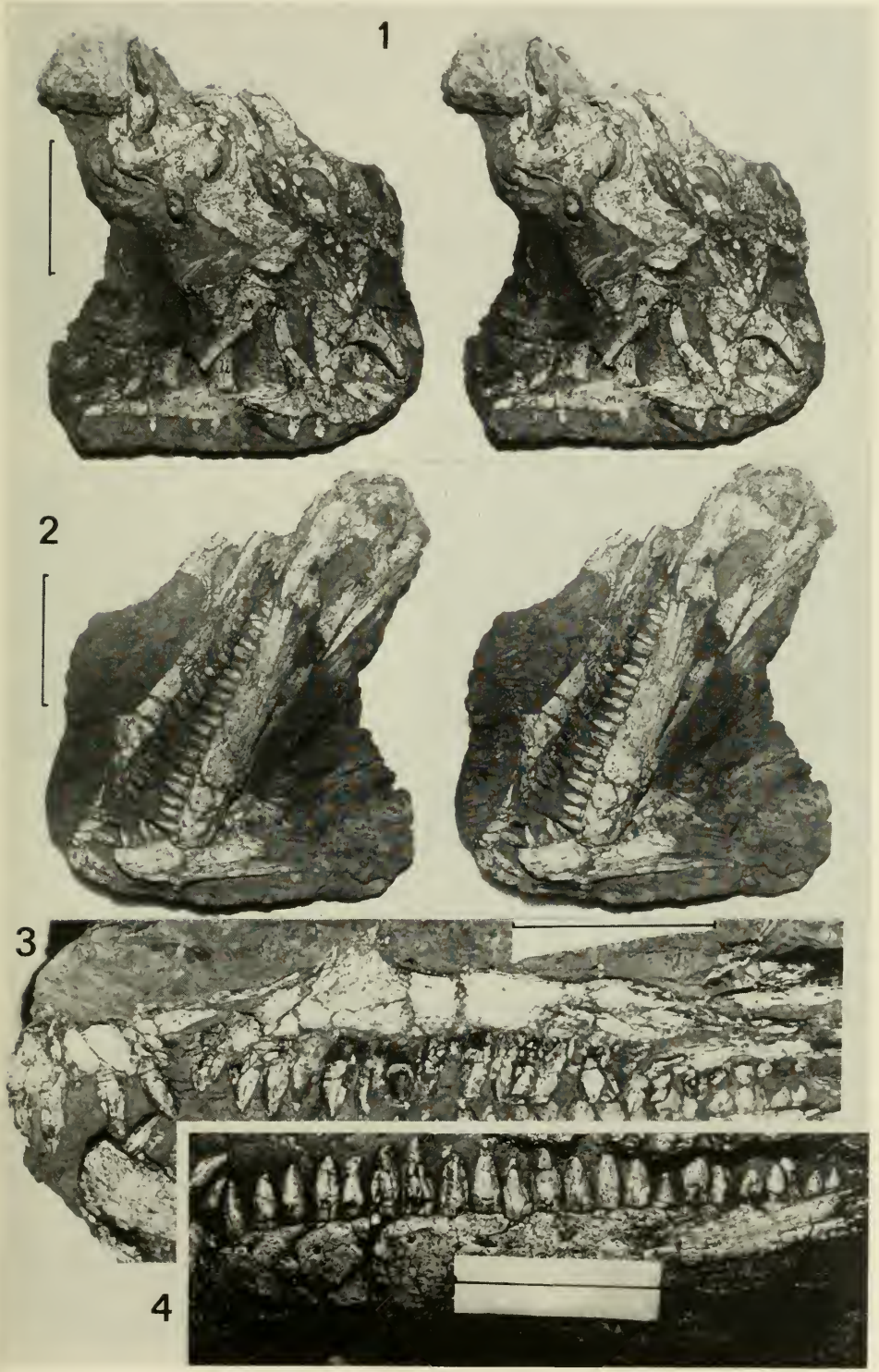

Plate 4

*Sellosaurus gracilis*, referred specimen SMNS 12684 from the Middle Stubensandstein of Pfaffenhofen, Stromberghöhe, Württemberg.

Figs. 1, 2. Skull block (Figs. 3A, B) with lateral view of 1: right maxilla (plus other bones) and 2: left maxilla (plus other bones). — × 0.38.

Figs. 3, 4. Tooth rows in left lateral view of 3: premaxilla and maxilla and 4: dentary. — × 1.

For abbreviations see p. 20.
Scale lines represent 5 cm (1, 2) and 3 cm (3, 4).



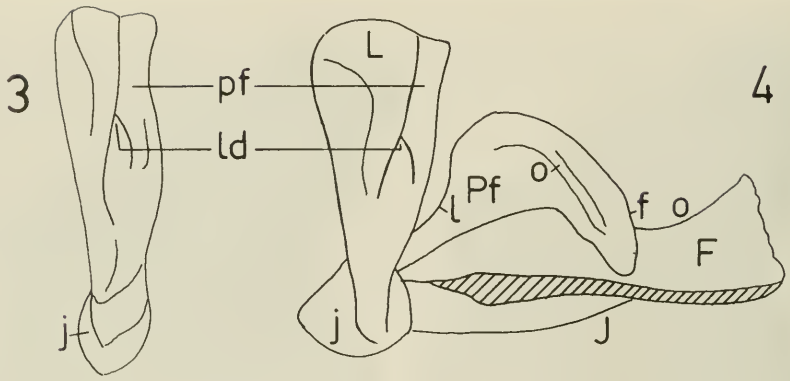



Plate 5

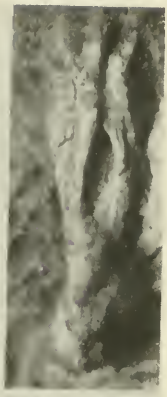
*Sellosaurus gracilis,* referred specimens from the Middle Stubensandstein of Württemberg.

Figs. 1—4. Details of left side of skull of GPIT 18318a (see Fig. 1; Pl. 1, Fig. 1) from near Trossingen. 1: tooth rows of premaxilla, maxilla and dentary. — × 1; 2: teeth of maxilla and dentary. — × 2; 3: lacrimal (in posterior view). — × 1; 4: lacrimal (posterolateral view), prefrontal (posterior view) and incomplete frontal (ventral view). — × 1.

Figs. 5—8. Details of teeth of SMNS 12684 (see Pl. 4, Fig. 2) from Pfaffenhofen, Strombergh öhe. 5: teeth 7 to 3 of left maxilla in lateral view; 6, 7: tooth 1 of right dentary in 6: medial and 7: anteromedial views; 8: teeth 1 to 8 of left dentary in lateral view. — × 3.

For abbreviations see p. 20.
Scale lines represent 1 cm (1—4) and 1 mm (5—8).


1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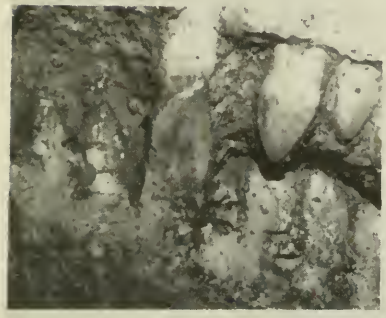


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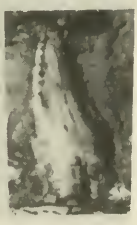
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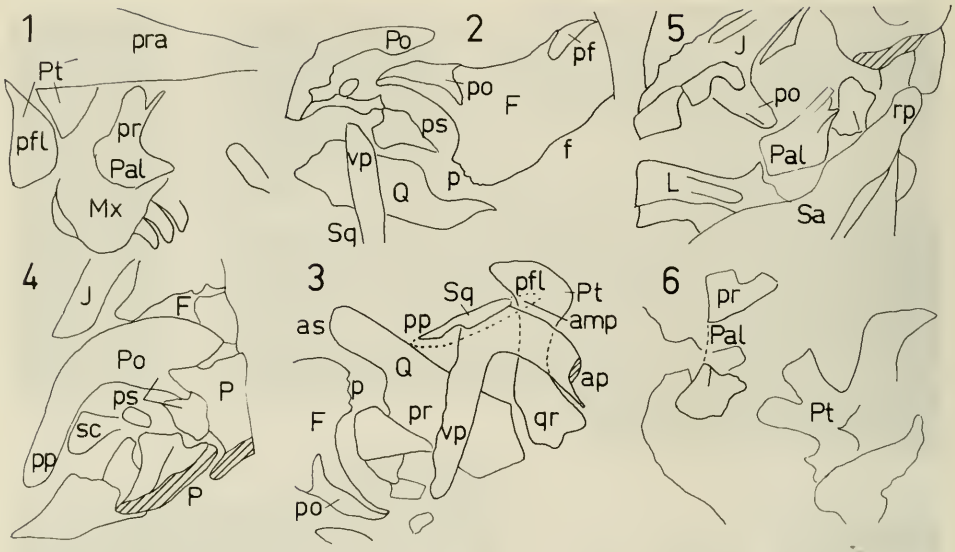



Plate 6

*Sellosaurus gracilis,* details of skulls of referred specimens from the Middle Stubensandstein of Pfaffenhofen, Württemberg.

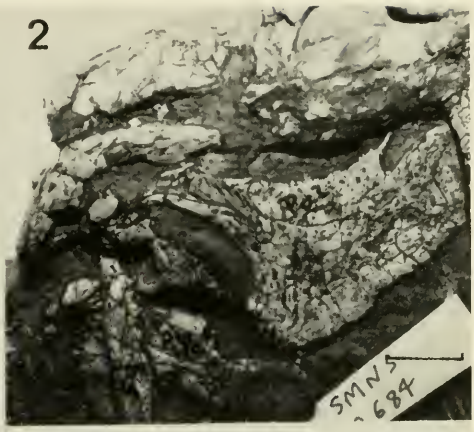
Fig. 1. Partial skull SMNS 14880 in "upper view" to show posterior part of left maxilla in medial view with palatine plus parts of pterygoid. — × 0.7.

Figs. 2, 3. Right side of skull block SMNS 12684 (Pl. 4, Fig. 1) to show 2: left frontal in dorsal view and adjacent bones and 3: left squamosal and quadrate in medial view. — × 1.

Figs. 4, 5. Upper side of skull block SMNS 12353a (Pl. 3, Fig. 2) to show 4: left postorbital and adjacent parts of frontal and parietal and 5: right palatine in medial view. — × 1.

Fig. 6. Left side of skull SMNS 12216 (Pl. 2, Fig. 1) to show base of right palatine in medial view. — × 1.

For abbreviations see p. 20.
Scale lines represent 1 cm.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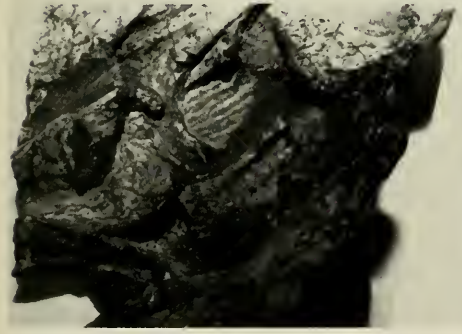


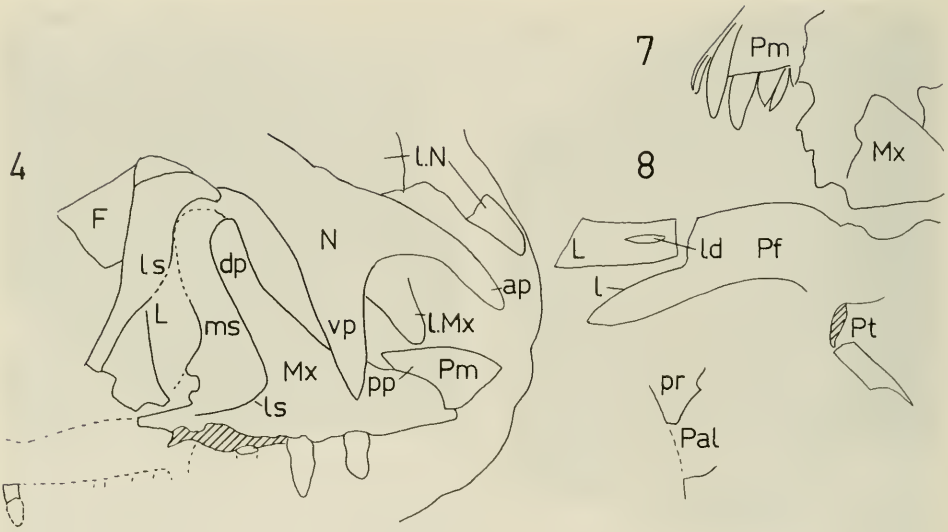



Plate 7

*Sellosaurus gracilis,* referred specimens from the Middle Stubensandstein of Württemberg.

Figs. 1—3. Left lacrimal SMNS 52388 from Heslach in Stuttgart in 1: lateral; 2: medial and 3: ventral views. — × 0.5.

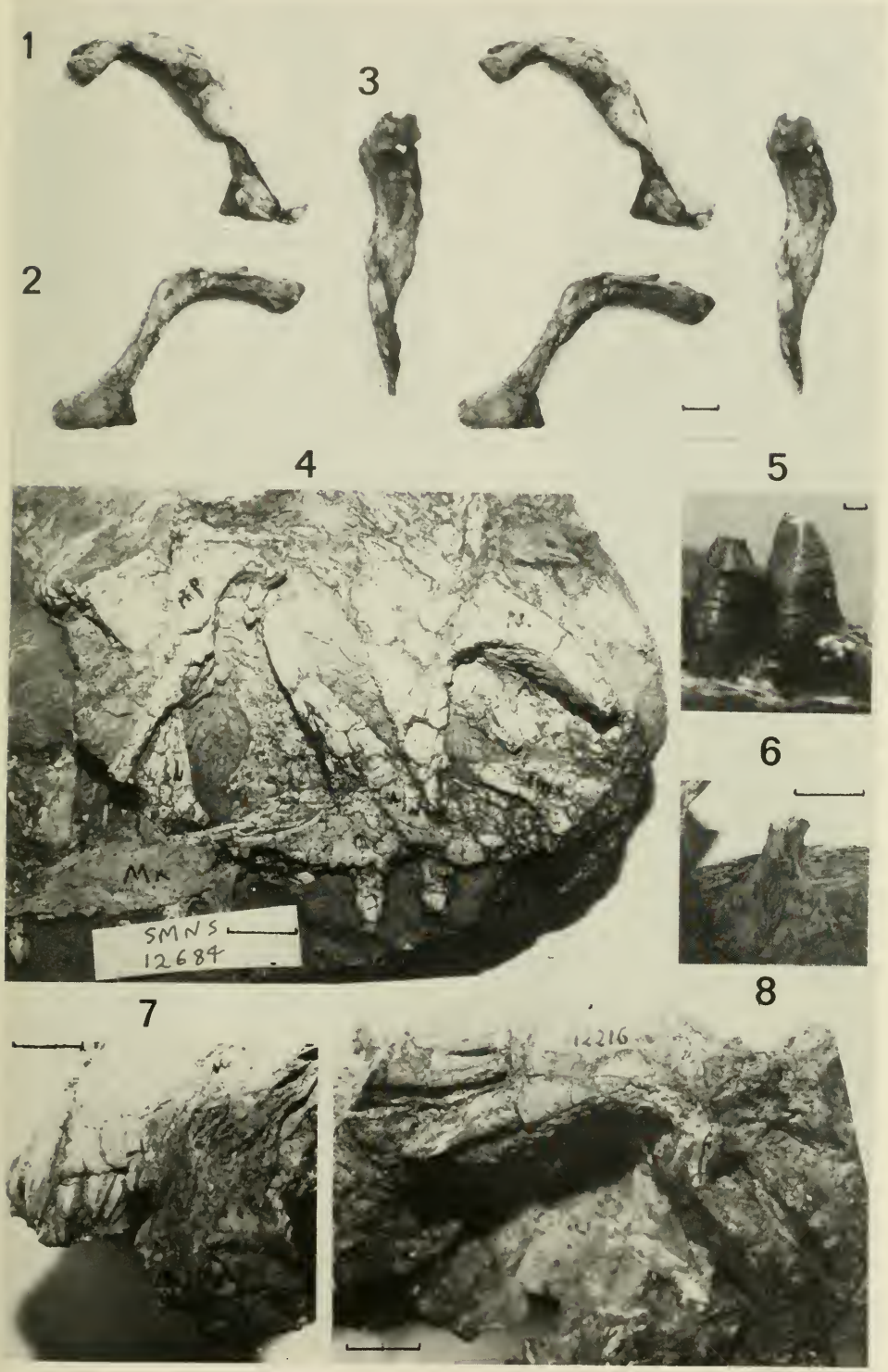
Fig. 4. Detail of right premaxilla and maxilla and adjacent bones in lateral view of SMNS 12684 (Pl. 4, Fig. 1) from Pfaffenhofen, Stromberghöhe. — × 1.

Fig. 5. Medial view of posterior left maxillary teeth of SMNS 4388 (Pl. 2, Fig. 3; v. Huene 1908, fig. 236) from Heslach in Stuttgart. — × 3.

Fig. 6. Ventral end of right lacrimal in lateral view, SMNS 12353a from Pfaffenhofen. — × 1.

Figs. 7, 8. Details of left side of skull SMNS 12216 from Pfaffenhofen. 7: premaxilla in lateral view and 8: lacrimal and prefrontal in ventrolateral view (plus right palatine and pterygoid).

For abbreviations see p. 20.
Scale lines represent 1 cm.



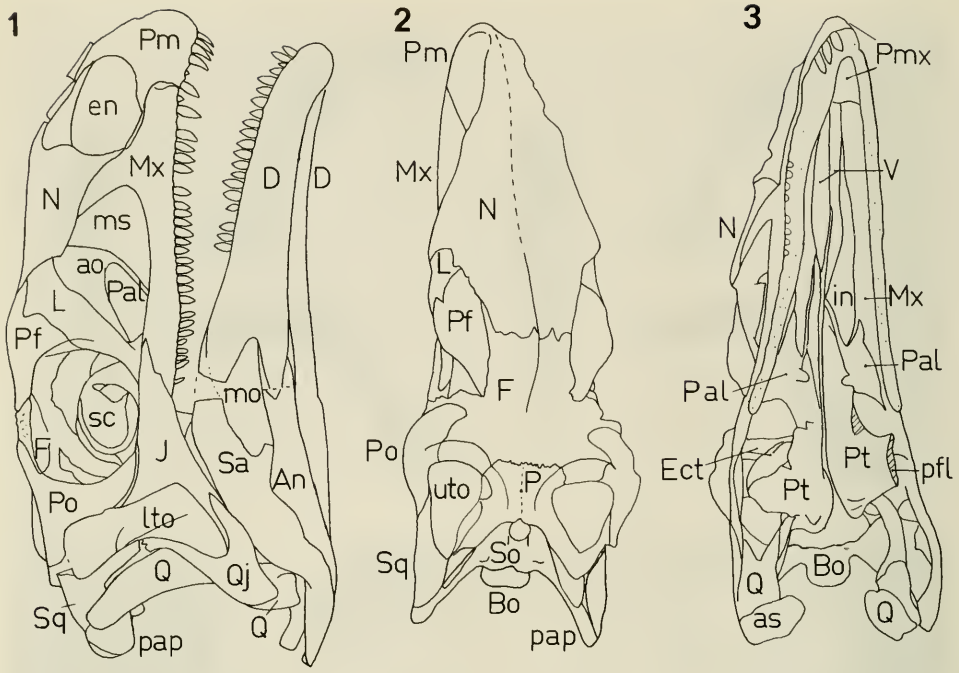



Plate 8

*Plateosaurus engelhardti*, referred specimen SMNS 13200 from the Knollenmergel (Middle Keuper, Upper Triassic) near Trossingen, Württemberg.

Figs. 1—3. Skull in 1: right lateral; 2: dorsal and 3: ventral views (see Figs. 4B—D). — × 0.4.

Fig. 4. Lateral view of teeth of right dentary. — × 0.75.

For abbreviations see p. 20.
Scale lines represent 5 cm (1—3) and 1 cm (4).

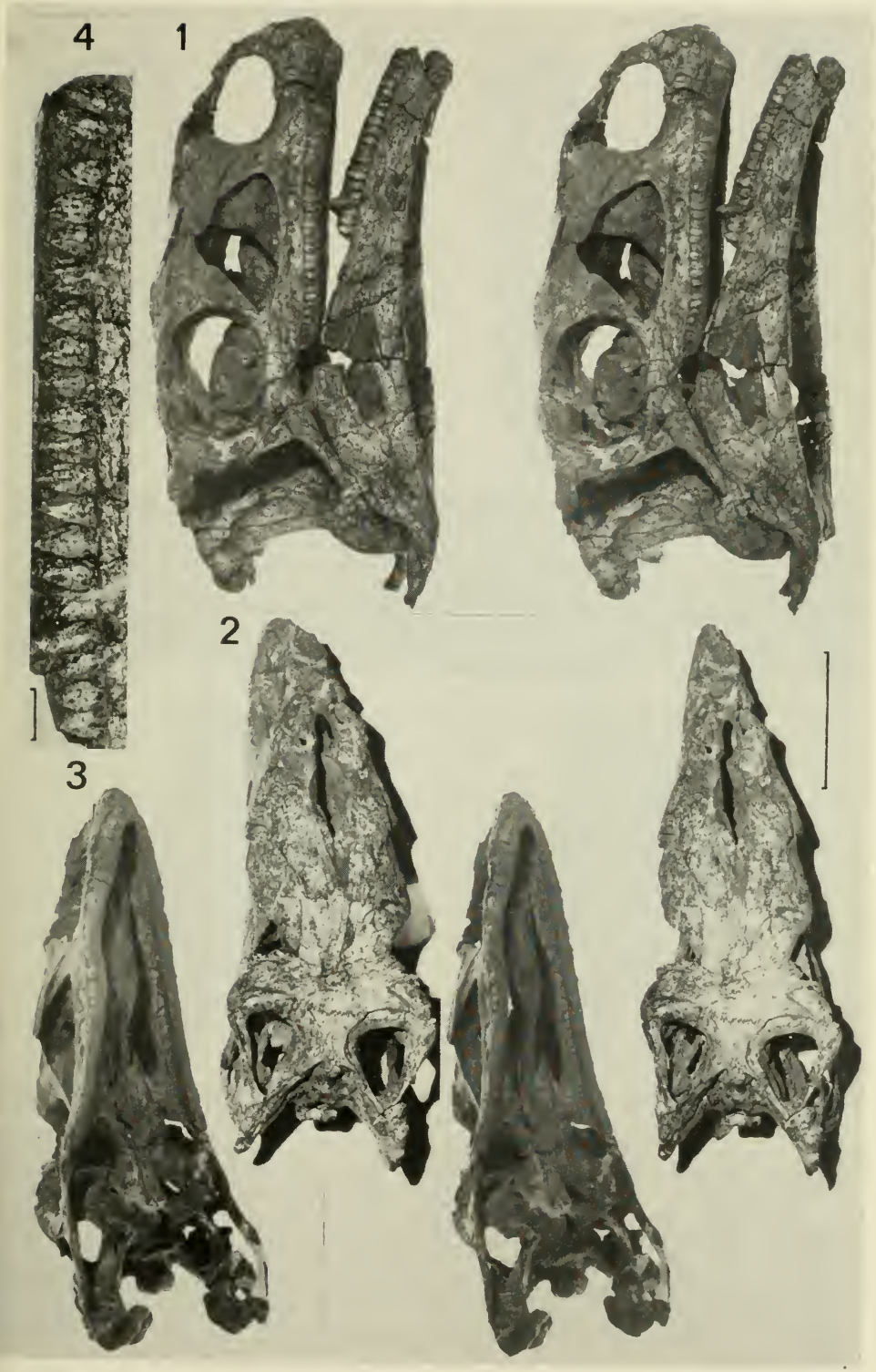


Plate 9

*Plateosaurus engelhardti*, referred specimens from the Knollenmergel (Upper Triassic) of Trossingen, Württemberg (1—3) and Frick, Switzerland (4, 5).

Figs. 1—3. Disarticulated skull AMNH 6810 (see GALTON 1984a, in press). 1, 2: right maxilla in 1: medial and 2: dorsal views. — × 0.4; 3: frontals and parietal in dorsal view (Fig. 5R). — × 0.5.

Figs. 4, 5. Left dentary MSF2 in lateral view to show 4: tooth row × ⅔ and 5: teeth 13 and 14. — × 2.

*Thecodontosaurus antiquus* MORRIS 1843, neotype BCM 2 from the Rhaetic (Upper Triassic) of Durdham Down near Bristol, England.

Figs. 6, 7. Left dentary in 6: lateral view (see HUXLEY 1870, Pl. 3, Fig. 1) × 1.3 and 7: teeth 8 and 9 (see GALTON 1984b, Fig. 4F). × 4.

Scale lines represent 5 cm (1—3), 1 cm (4, 6) and 1 mm (5, 7).