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SOME ALBIAN DESMOCERATID AND LYTO- CERATID AMMONOIDEA FROM ANGOLA

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Professor A. K. Miller of the State University of Iowa passed on to the writer for study a collection of Cretaceous Ammonoidea from Angola that had been sent to him by Eng^o Henrique Vieira, Chief of the Repartição Central dos Serviços de Geologia e Minas in Luanda, together with Cretaceous and Tertiary nautiloids from the same colony. I am greatly indebted to Professor Miller for this courtesy and to Eng^o Vieira for permission to study the collection and to publish the results.

The photographs accompanying this brief report were taken by Mr. Robert Adlington and the suture line drawings were made by Miss Helen Babbitt. I deeply appreciate the skill and devotion they applied to their respective tasks.

In addition to the desmoceratids and lytoceratids explicitly dealt with in this report, the collection includes a small fragment, and an imprint of such a fragment, of *Hysterocheras semilève* Haas (1942), both from Benguela.

All the specimens have been returned to the Repartição Central dos Serviços de Geologia e Minas in Luanda, Angola. Plaster casts of the holotype of *Puzosia lytoceratoides* and of the other figured specimens have been retained at the American Museum of Natural History.

DESCRIPTIONS OF FORMS

DESMOCERATIDAE ZITTEL

Most of the representatives of this family in the collection under study belong to the genus *Desmoceras*, *sensu stricto*. In addition, the genus *Puzosia* is represented by an attractive new species and by a few poor specimens of a previously described one.

DESMOCERAS ZITTEL, EMEND. DE GROSSOUVRE

In 1942 (p. 164) I followed de Grossouvre's and Spath's example in restricting the above generic name to the group of *D. latidorsatum* (Michelin) and rejecting Jacob's generic name *Latidorsella* for this group. However, Breistroffer (1947, p. 59), although recognizing the group as the typical one of *Desmoceras* Zittel, *sensu lato*, rejects the latter name as a junior homonym of *Desmocerus* Dejean, a coleopterid genus, and uses, therefore, *Latidorsella* for the forms concerned. Breistroffer's procedure is, however, not justified by the Rules, as interpreted in the Recommendations following Article 36 which explicitly state that generic names differing from older ones only in termination (example: *Picus-Pica*), "when once introduced, are not to be rejected on this account." Accordingly, Zittel's name *Desmoceras* is here maintained for the present genus, and the name Desmoceratidae for the family to which this genus belongs.

Hitherto only two poor fragments from Angola have been referred to this genus by Spath (1922, p. 152), but in the present collection it is represented by altogether 14 more or less complete individuals, mostly referable to a form closely related to, and considered a "variety" of, the type species *D. latidorsatum* (Michelin). It has been previously recorded from Europe, Angola, and India. A single specimen must be assigned to another species, also already known from Europe.

***Desmoceras latidorsatum* (Michelin), var. *inflata* Breistroffer**

Figures 1, 3-10

Desmoceras latidorsatum Mich. f.; PARONA AND BONARELLI, 1896, p. 79, *pro parte*, pl. 10, fig. 8.

Desmoceras latidorsatum Michelin; var. a, KOSSMAT, 1898, p. 107, pl. 19, fig. 2.

Latidorsella latidorsata Michelin sp.; JACOB, 1907, p. 35, *pro parte* (var. a only), pl. 4, fig. 13 only.

Desmoceras latidorsatum (Michelin); SPATH, 1923, p. 39, *cum synonym.*, *pro parte* (var. a only), text figs. 9a, b only.

Desmoceras cf. *latidorsatum* Michelin sp.; SPATH, 1925a, p. 152.

Latidorsella latidorsata Mich., var. *inflata* BREISTROFFER, 1933, p. 7.

L. latidorsata Michel. 1838, sp. var. *inflata* Breistr. 1933; BREISTROFFER, 1947, p. 60.

The anterior portions of the specimens measured belong to the body chamber, but none is complete to the apertural margin. In specimen no. 11 the last septum is situated at a diameter of 35.5 mm.

DIMENSIONS

SPECIMEN	D	H	H'	W	U
Egito 4	24.0 mm.	57 ¹ / ₂	?	ca. 58	20 ¹ / ₂
Salinas 1	26.4	48 ¹ / ₂	ca. 32	57	22 ¹ / ₂
Catumbela 34	35.9	49 ¹ / ₂	28	63	18 ¹ / ₂
Egito 6	37.3	50 ¹ / ₂	33 ¹ / ₂	60	23
Egito 23	37.8	47	34 ¹ / ₂	61	ca. 23
11	38.3	52	ca. 40 ¹ / ₂	59	21 ¹ / ₂
Egito 2	39.2	48 ¹ / ₂	ca. 38	60 ¹ / ₂	22 ¹ / ₂
Catumbela 32	40.0	51	31	63 ¹ / ₂	22 ¹ / ₂
Catumbela 8	42.0	ca. 52 ¹ / ₂	29	56 ¹ / ₂	ca. 19 ¹ / ₂
Catumbela 29	42.1	50	32 ¹ / ₂	63 ¹ / ₂	ca. 18 ¹ / ₂
Catumbela 30	44.7	49	31 ¹ / ₂	58	21 ¹ / ₂
12	45.0	ca. 50	36	61 ¹ / ₂	18
10	ca. 50.0	ca. 47 ¹	?	65 ¹ / ₂ ¹	22 ¹ / ₂ ¹

¹ Measured at D, 47.3 mm.

DESCRIPTION: Shell rather stout, with crescent-shaped whorl profile, well-rounded umbilical shoulder and high, almost perpendicular umbilical wall (Catumbela 34, fig. 7).

The outer whorls can be recognized to be constricted at irregular intervals varying from about 35 to about 90 arc degrees. They are distinct on casts and are sometimes recognizable on the test as well. They form a forward convex sinus on the inner half of the flanks, a forward concave one on their outer half, and a strongly forward convex tongue on the venter (No. 12, figs. 8, 9). Blunt growth folds, about 10 of which can be counted to 1 cm. and which are separated by somewhat narrower furrows, run parallel to these constrictions (Salinas 1 and Nos. 10 and 12; figs. 3, 10).

Suture lines are recognizable only here and there, best in Catumbela 32 at a diameter of about 25 mm. (fig. 1). The siphonal lobe is not so wide and divided into two hardly divergent fine points which are separated by a high and slender median knob. The external saddle also is high and slender and ends in two branches, the inner one of which is inclined dorsad. The first lateral lobe is shallower than the siphonal one, rather wide, and symmetrically trifid. The first lateral saddle is lower than the external one and ends in two leaves which are about equally high and wide. The second lateral lobe might best be characterized as a reduced repetition of the first. The bifid second lateral saddle is lower than the first but not so much narrower. The

first auxiliary lobe points ventrad and is trifid, with a long and slender middle point; it is situated just outside the umbilical shoulder. The following auxiliary elements are not accessible to observation.



FIG. 1. Right external suture line of *Desmoceras latidorsatum* (Michelin), var. *inflata* Breistroffer. Catumbela 32. D , diameter of disk.

REMARKS: Agreement with Jacob's (1907) specimen, on which Breistroffer (1933) established this variety, and with Parona and Bonarelli's (1896), which Breistroffer later (1947) included in it, is so perfect that the identification of this form from Angola is beyond doubt. On the strength of Spath's (1925a, p. 152) statement that his specimen from the canyon east of Old Lobito "has the depressed, broad-ventered aspect of the typical specimen of *D. latidorsatum* figured by these authors" (i.e., Parona and Bonarelli's fig. 8), the only fragments from Angola hitherto referred to *Desmoceras*, *sensu stricto*, can be assumed also to belong to this variety.

The only other Angolan specimen referable to this genus is compared below (p. 6) with the present form. There the reasons are given for my following Breistroffer but not Spath in keeping it separated from *D. obesum* Reynès (here renamed *D. reynesianum*), to which that specimen is referred.

MATERIAL STUDIED: One specimen from Salinas, four from Egitto, five from Catumbela, and three without indication of locality; altogether 13 specimens.

***Desmoceras reynesianum*, new name**

Figures 2, 11–13

Ammonites obesum REYNÈS, 1876, p. 4 (*fide* Spath, 1925b).

Not *Ammonites obesum* STOLICZKA, 1865, p. 55, pl. 32, fig. 1.

? *Desmoceras obesum* (Reynès); SPATH, 1925a, p. 181, *pro parte*.

Ammonites obesus, Reynès; SPATH, 1925b, p. 101, *pro parte*, pl. 4, fig. 2.

Latidorsella latidorsata Mich. sp., var. *obesa* [Reynès sp. in Spath]; BREISTROFFER, 1933, p. 194.

Latidorsella obesa "Reyn." ex Spath 1925 sp.; BREISTROFFER, 1947, p. 60.

SPECIMEN	DIMENSIONS				
	D	H	H'	W	U
Catumbela 33	39.3 mm.	47 $\frac{1}{2}$	25	74	ca. 15 $\frac{1}{2}$

From one-third to one-half of the outer whorl seems to belong to the body chamber which is, however, not completely preserved.

DESCRIPTION: This specimen is characterized by its decidedly stout shape, low and broadly crescent-shaped whorl profile, rapid increase of its outer whorl in width, and narrow umbilicus. Otherwise it agrees with the preceding form, but no constrictions or growth folds can be observed.



FIG. 2. Right external suture line of *Desmoceras reynesianum* Haas. Catumbela 33. D, diameter of disk.

Suture lines are well visible at a diameter of about 22 mm. (fig. 2). The siphonal lobe is quite wide but not so deep; its two terminal points are almost parallel, and the median knob between them is high and slender. The external saddle is comparatively stout; its two terminal leaves are nearly equal in height. The rather wide first lateral lobe is a little deeper than the siphonal one and is trifid, with a three-pronged middle point. The first lateral saddle is symmetrically bifid and slightly exceeds the external one in height. The second lateral lobe is wide, shallower than the siphonal one, and trifid. Beyond it there follow the second lateral saddle, which is only a little lower than the first, the slender and trifid first auxiliary lobe, which just rides on the



FIGS. 3-10. *Desmoceras latidorsatum* (Michelin), var. *inflata* Breistroffer.
3, 4. Salinas 1. 5-7. Catumbela 34. 8, 9. No. 12. 10. No. 10.

FIGS. 11-13. *Desmoceras reynesianum* Haas. Catumbela 33.

All figures $\times 1$.

umbilical shoulder and points decidedly ventrad, the comparatively low and bifid first auxiliary saddle, and near the umbilical seam two more, short auxiliary lobes and two more auxiliary saddles.

REMARKS: The new trivial name here proposed for this species must replace Reynès' "*obesus*," revived by Spath and Breistroffer (*loc. cit.*, in *synon.*), for when Reynès created his *Ammonites obesus*, Stoliczka's quite different species, to whom its author had given the same name, already existed. Thus Reynès name is under the Rules a still-born homonym and not available despite the fact, emphasized by Spath (1925b, p. 102), that it "ne sera pas confondu avec l'espèce albienne de Reynès."

In reviving Reynès species, Spath (*ibid.*) included in it Kossmat's (1895, p. 172) "variety a" of *D. latidorsatum* (Michelin) and the stout form from Escragnoles, illustrated in Parona and Bonarelli (1897, pl. 10, fig. 8). For both those forms Breistroffer (1933, p. 193) proposed his var. *inflata* (see above). He considered it distinct from Reynès' species which he had previously (1933, p. 194) treated as another variety of *D. latidorsatum* but to which he later (1947, p. 60) granted species rank. Comparison of Spath's (1925b) figures with Parona and Bonarelli's (1897, pl. 10, fig. 8) and Jacob's (1907, pl. 14, fig. 13) seems to justify Breistroffer's opinion. Furthermore, the measurements of the present specimen compared with those of the preceding form prove that within the Angolan material under study *D. reynesianum* is considerably stouter than *D. latidorsatum*, var. *inflata*, which it otherwise closely resembles.¹ The rapid increase of the outer whorl in width, lending a decidedly flaring aspect to the ventral view (fig. 11), may well be considered another characteristic of the present species.

MATERIAL STUDIED: A single specimen (No. 33) from Catumbela.

PUZOSIA BAYLE

For the circumscription to be given to this genus and for its type species, reference is made to Haas (1942, p. 148). Both groups there distinguished within this genus are represented in the collection under study: the group of *P. mayoriana* (d'Orbigny)

¹ The same marked difference in width prevails also between the two shells of *D. obesus* figured by Spath (lectotype: W, 76; paratype: W, 78 1/2) and the specimens on which Breistroffer based his var. *inflata* of *D. latidorsatum* (Jacob's fig. 13b: W, 62; Parona and Bonarelli's fig. 8b: W, 58 1/2).

by the following new species, and that of *P. planulata* (Sowerby) by some fragments referable to *P. venzoi* Breistroffer (= *P. spathi* Haas, *non* Breistroffer), a species previously known from Angola.

***Puzosia lytoceratoides*, new species**

Figures 14-17

DIMENSIONS

SPECIMEN	D	H	H'	W	U
Egito 1	ca. 50 mm.	34 ¹	28 ¹	35 ¹ / ₂ ¹	52 ¹ / ₂ ¹
Egito 2 (holotype)	64.1	36 ¹ / ₂	27 ¹ / ₂	33 ¹ / ₂	42 ¹ / ₂

Comparison of the above measurements seems to indicate that involution increases with growth.

The paratype is septate throughout. In the holotype the last septum can be located approximately at the middle of the outer whorl; it can, thus, not be far from complete.

DESCRIPTION: Shell discoidal, evolute. Whorl profile sub-circular, with slightly flattened flanks, rounded umbilical shoulder, and high umbilical wall which slopes at an angle of about 60 degrees.

Six irregularly spaced constrictions of the cast, and varices of the shell, respectively, are recognizable on the outer whorl of the holotype. Their course is somewhat prorsiradiate and gently sigmoidal on the flanks, with a forward convex sinus on the inner half and a forward concave one on the outer half. On the venter they form an obtuse, forward convex tongue. The same course is shown by fine ribs, about 70 of which can be counted on the anterior half of the outer volution of the holotype. On the whole, they are uniform in strength, but those riding on the varices are markedly reënforced, especially so in the inner third of the sides, and here and there thin, thread-like costae are intercalated between those of normal strength. These ribs are separated by intercostals of about the same width. In the anteriormost quarter whorl bifurcation occurs not so rarely at about the inner third of the sides.

As the holotype has most of the test preserved, the suture lines can be studied only in the paratype, best at a diameter of about 45 mm. (fig. 14). The siphonal lobe is comparatively wide and shallow. Its two branches are two-pronged and diverge markedly. The median knob between them is high and slender.

¹ Measured at D, 31.9 mm.

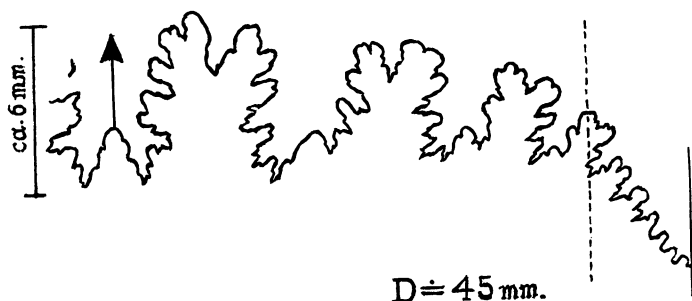


FIG. 14. Right external suture line, coarsened by weathering, of *Puzosia lytoceratoides* Haas. Paratype, Egito 1. D, diameter of disk.

The external saddle is quite broad and symmetrically bifid, as is the almost equally high first lateral one. In the second, which is only slightly lower, the outer branch is markedly wider and higher than the inner. The first lateral lobe, which about equals the siphonal one in depth, is trifid, the second bifid. Most characteristic of this suture is the "suspensive lobe" which slopes much more steeply than in other species of this genus, of which it is a distinctive character. Whereas the line connecting the tops of the three main saddles runs in an approximately radial direction, that connecting the following sutural elements slopes so steeply as to reach the umbilical seam even considerably behind the point where a radius drawn from the top of the external saddle of the preceding suture line hits that seam. This "suspensive lobe" comprises altogether seven auxiliary saddles, with six auxiliary lobes between them and one more beyond the last of the saddles.

REMARKS: This form is closely related to *Puzosia mayoriana* (d'Orbigny, 1841, p. 267, pl. 79; Spath, 1923, p. 42, *cum synonym.*, text fig. 10, pl. 1, figs. 9, 10), but it differs from it so markedly by its much wider umbilicus¹ and by its subcircular whorl profile that it cannot be considered conspecific. Also its costation is considerably denser and finer than that of d'Orbigny's species. The high degree of evolution and the almost cylindrical whorl profile account for the lytoceratoid aspect of this species which has suggested its trivial name. However, the trifidity of its first lateral lobe and especially its characteristic suspensive lobe leave no doubt as to its generic affinities.

¹ In the holotype of *P. mayoriana*, as figured by d'Orbigny, U amounts to 34, as compared to 42 1/2 in our holotype.



FIGS. 15-17. *Puzosia lytoceratoides* Haas. Holotype, from Egito. $\times 1$.

FIGS. 18-20. *Gaudryceras aenigma* Haas. Hypotype, from Egito. Figure 19 unwhitened, to show suture lines of mature stage. $\times 1$.

From all the other species of this genus previously recorded from Angola (see Haas, 1942, pp. 148-164, figs. 20-22, pls. 37-42) *P. lytoceratoides* is readily distinguished not only by its wide umbilicus, but also by its costation, which is absent in all of the former.

MATERIAL STUDIED: Two specimens from Egitto.

***Puzosia venzoi* Breistroffer**

Puzosia Stoliczkai Kossmat var. *spathi* nov. var.; VENZO, 1936, p. 69, pl. 6, fig. 1, pl. 11, fig. 2.

Puzosia spathi Venzo; HAAS, 1942, p. 158, text figs. 21h, 22, pl. 39, figs. 3-5, pl. 40, fig. 1, pl. 41, figs. 14, 15, pl. 42, fig. 1.

Not *Puzosia spathi* BREISTROFFER, 1936, p. 65.

Puzosia Venzoi Breistr. n.n.; BREISTROFFER, 1947, p. 62.

Three rather poor fragments, the largest of which corresponds to a diameter of about 80 mm., can readily be referred to this species, previously described and figured under the preoccupied name *P. spathi*, from Angola. One is remarkable for showing at a diameter of about 55 mm. four constrictions within not quite a quarter of a whorl.

No suture lines are present in any of these fragments.

MATERIAL STUDIED: Two fragments from Benguela, and one without indication of locality; altogether three fragments.

LYTOCERATIDAE NEUMAYR

In the collection under study this family is represented by the only two genera hitherto known from the Albian of Angola, namely, *Gaudryceras* and *Tetragonites*, and by the forms of these genera that have been previously (Haas, 1942) recorded from that region and horizon.

***Gaudryceras aenigma* Haas**

Figures 18-20

Gaudryceras aenigma HAAS, 1942, p. 167, text fig. 24, pl. 44, fig. 2.

DIMENSIONS

SPECIMEN	D	H	H'	W	U
Egitto (hypotype)	72.6 mm.	44	35½	37	32

DESCRIPTION: Although the individual here described lacks the test and shows therefore only here and there faint indications

of the characteristic costation of the holotype, it otherwise agrees so well with the latter that their conspecificity cannot seriously be doubted. The differences in measurements, as seen from the respective tables of dimensions, are quite considerable but are still believed to come within the range of individual variation.

Although larger than the holotype by one-fourth, the hypotype is still chambered throughout (fig. 18); thus the maximum size reached by this species cannot even be estimated.

In frontal view (fig. 18) the venter of the penultimate whorl can clearly be seen to be fastigate; this at a diameter of 28 mm. at which the median ridge is just about to disappear in the holotype (Haas, 1942, p. 168, text figs. 24b, c). This observation refutes a suspicion given to the writer orally by Professor Breistroffer that the unorthodox profile of the earlier whorls of this species, as described in 1942, might be due to crushing.

Up to a diameter of 48 mm. the suture lines of the hypotype agree well with those of the holotype, as described and depicted in 1942 (pp. 168, 169; pl. 44, figs. 2a, b). From that stage on, however, their pattern somewhat changes inasmuch as the lobes narrow down to thin strips, bounded on either side by straight, though discontinuous, perpendicular lines formed by the margins of the adjacent saddles (fig. 19).

MATERIAL STUDIED: A single specimen from Egito.

***Tetragonites jurinianus* (Pictet), subspecies *angolana* Haas**

Figures 21-25

Tetragonites jurinianus (Pictet), var. *angolana* HAAS, 1942, p. 170, text fig. 25, pl. 44, fig. 3, pl. 45, fig. 1.

DIMENSIONS

SPECIMEN	D	H	H'	W	U
Egito 5	31.1 mm.	47	$34\frac{1}{2}$	ca. $43\frac{1}{2}$	$28\frac{1}{2}$
Egito 3	52.2	56	$42\frac{1}{2}$	49	19
Catumbela 28	62.1	$52\frac{1}{2}$	36	55	21
Catumbela 27	79.5	ca. $53\frac{1}{2}$	?	ca. $51\frac{1}{2}$	21
Cubal 25	155.0	ca. 55	?	ca. 46	ca. 18
Dombo Grande 37	190.0	ca. $54\frac{1}{2}$	ca. $40\frac{1}{2}$	ca. 51	ca. 17

The above table shows that in this species involution, in general, increases with growth.

The smallest specimen present (Egito 5) is obviously a juvenile, for it shows the last septum at a diameter as small as 22 mm. The medium-sized specimens (Egito 3 and Catumbela 28 and 27) are septate throughout, as is the holotype (see synonymy), whereas the last septum can be located at a diameter of somewhat less than 10 cm. in the largest individual but one (Cubal 25) and, with a fair degree of probability, at a diameter of about 13 cm. in the largest specimen present (Dombo Grande 37). Should this estimate be correct, then about three-eighths of the last volution of this shell would belong to the body chamber, and its full size might be somewhere between 20 and 25 cm., that is considerably more than the 15 cm. assumed in 1942 (p. 170).

DESCRIPTION: Whereas a single individual attaining a diameter of about 10 1/2 cm. served as hypodigm for the establishment of this subspecies, the present collection includes six, varying in diameter from about 3 to about 19 cm.; the largest attains almost twice the size of the holotype.

The following observations can be added to the first description of this subspecies: The smallest specimen (figs. 24, 25), with its pronouncedly trapezoidal, almost rectangular, whorl profile, fully confirms the description of the whorl profile at the posterior end of the holotype as made in 1942, and thus the reference of this form to the genus *Tetragonites*. In all the larger individuals of the series under examination, however, the whorl profile has already become rounded at the anterior end, as in the holotype, and at both ends in the two largest specimens. Whereas the holotype shows just one constriction at a diameter of about 6 cm., two, a little more than a quarter whorl apart, can be recognized in Catumbela 28, three on the posterior quarter whorl of Cubal 25, and five, at intervals of from about 30 to about 55 arc degrees, in the largest specimen (fig. 22). All these constrictions are almost straight and markedly prorsiradial on the flanks, form a very shallow, forward convex sinus on the latero-ventral shoulders, and cross the venter, as a rule, in a shallowly forward concave line. Faint growth folds, about six of which can be counted to 1 cm., run in a radial direction up the steep, almost perpendicular umbilical wall of the largest specimen (Dombo Grande 37); here they show a gently forward concave course. They can still be seen to cross the umbilical shoulder where they turn decidedly forward, but they vanish on the flanks. As far as observable, their course is parallel to that of the last constriction.

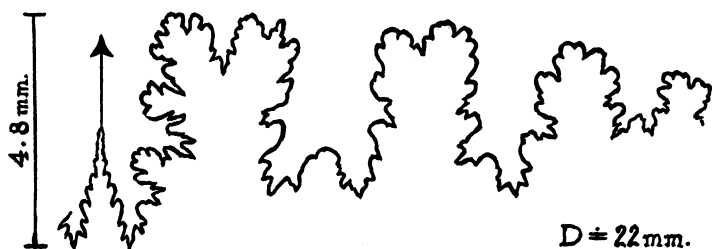
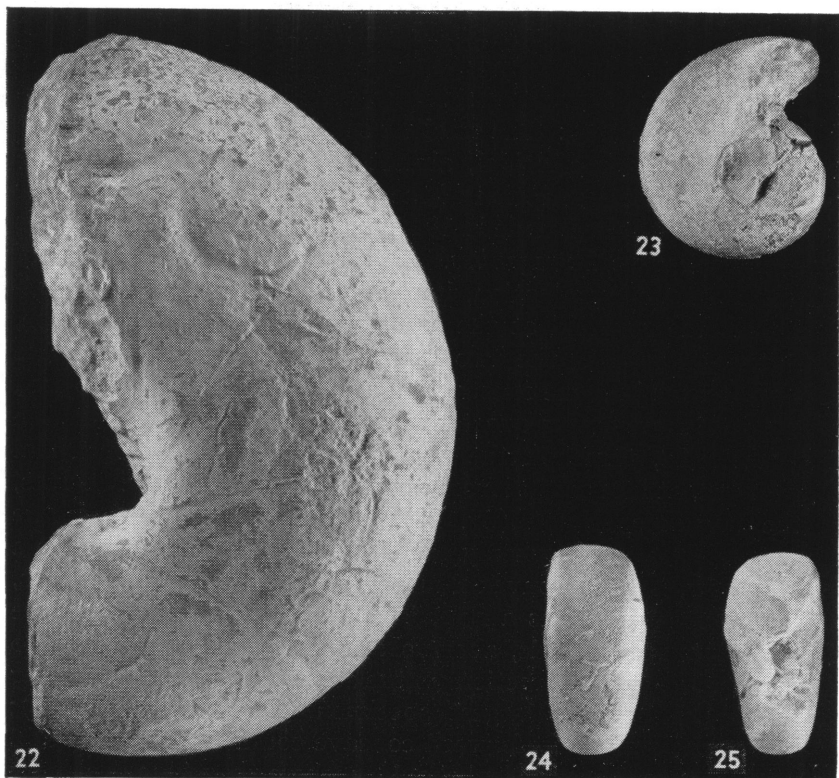


FIG. 21. Right external suture line, coarsened in part, of *Tetragonites jurinianus* (Pictet), subspecies *angolana* Haas. Egito 5. D , diameter of disk.

Good suture lines could be made visible in the smallest specimen (Egito 5) only at diameters of from 20 to 22 mm.; the last is depicted in figure 21. It agrees with the one described and



FIGS. 22-25. *Tetragonites jurinianus* (Pictet), subspecies *angolana* Haas. 22. Dombo Grande 37. $\times 1/2$. 23-25. Egito 5. $\times 1$.

figured in 1942 (p. 171, pl. 44, fig. 3), except for the following differences: the first lateral lobe is considerably shallower than the siphonal one; the second lateral saddle is just as high as the first, and the first auxiliary saddle is almost as high as the lateral saddles. Thus a line connecting the tops of the saddles runs in a radial direction, whereas it slopes somewhat towards the center in my 1942 drawing. Finally, the three-pronged middle point of the second lateral lobe, though clearly pointing dorsad, is here so much longer and stronger than its outer point that this lobe must be called trifold rather than bifid. These differences may well be due to ontogenetic changes, the suture line here described corresponding to a diameter less than half of that at which the suture line of the holotype was drawn.

MATERIAL STUDIED: Two specimens from Egito, two from Catumbela, and one each from Cubal and Dombo Grande; altogether six specimens.

CONCLUSIONS

Faunistically, the present study yields the following results:

1. The Desmoceratidae are well represented in the Albian of Angola not only by the genus *Puzosia*, of which close to 200 specimens have been recorded in previous literature, but also by the genus *Desmoceras*, to which 14 individuals are here referred, in addition to the two fragments recorded by Spath (1923).¹

2. An interesting new species of *Puzosia* is described and illustrated. Of all the species occurring in Angola, it is closest to *P. mayoriana*.

3. Many more Lytoceratidae than have hitherto been known from the Albian of Angola are contained in the collection here studied. A second, markedly larger specimen has joined the holotype of *Gaudryceras aenigma*, and *Tetragonites jurinianus angolanus* is now represented by a whole series of altogether seven individuals ranging in size from about 3 cm. to 19 cm.

Paleoecologically, this last fact would seem to indicate that lytoceratids were not accidentally washed into an infraneritic assemblage (Haas, 1942, p. 213), but rather contributed to a moderate extent to a fauna living somewhere near the boundary of the neritic and bathyal zones of the Albian sea.

¹ In addition to *Puzosia* and *Desmoceras*, the desmoceratid genera *Beudanticeras* (one specimen) and *Aconeceras* (two specimens) are also represented at Hanha, near Lobito.

Stratigraphically, the Albian age of the Ammonoidea here described is beyond any doubt, but they give no clue as to their more precise dating within the Albian.

All ammonites here dealt with, except one, come from the same region around Lobito, in the province of Benguela (from about latitude 12° to latitude 13° S.) which has yielded the hitherto known Albian ammonites from Angola. The only exception is the smallest specimen but one of *Desmoceras latidorsatum*, var. *inflata*, which is from Salinas, about 230 kilometers south-south-west of Lobito. An ammonoid fauna from Salinas has been described by Douvillé (1931) who dated its various forms from Barremian to Turonian, but Spath (1931, p. 316) considers this fauna as essentially Cenomanian. Since, however, the specimen under discussion is undoubtedly conspecific with the specimens from Egito and Catumbela, whose Albian age need not be questioned, the Albian fauna may be assumed to be present beneath the Cenomanian one at Salinas. This assumption is further supported by the presence there of a form identified by Douvillé (1931, p. 40, pl. 2, fig. 6) as *Desmoceras toucasi* Jacob, but tentatively referred by the writer (1942, pp. 158, 163) to "*Puzosia spathi* Venzo" (= *P. venzoi* Breistroffer, 1947), a species not so rare in the Lobito area. Should this assumption prove correct, the Albian would extend in Angola to the south as far as Salinas.

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