

On the supposed aptian occurrence of the ammonite genus *Neodeshayesites* in Colombia and Venezuela; with an appendix on *Neodeshayesites Karsteni* (Marcou).



FERNANDO ETAYO SERNA¹

RESUMEN

El género norandino de amonitas *Neodeshayesites*, ha sido encontrado asociado con otros géneros de amonitas, que forma parte de una fauna del Albiano inferior o Albiano medio basal. El registro de este género en capas supuestamente de edad aptiana se basa en datos sin apoyo estratigráfico o en el listado conjunto de faunas procedentes de diferentes localidades.

ABSTRACT

Where associated with other ammonites *Neodeshayesites*, a group of Northern South American species, forms part of a Lower Albian or basal Middle Albian fauna. The supposed record of the genus from Aptian strata is based on inconclusive stratigraphical data or falacious listing of faunas from different localities.

CONSIDERATIONS ON THE SO-CALLED APTIAN OCCURRENCE OF NEODESHAYESITES

In 1954, E. Rod and W. Maync published a "Revision of the Lower Cretaceous Stratigraphy of Venezuela"; in part I of this paper (p. 207-208) Rod stressed that he himself had "... isolated a specimen looking like a *Douvilleiceras* out of a *Deshayesites* pavement of a big concretion. ... the *Douvilleiceras* indicates Lower Albian age and the *Deshayesites* Upper Aptian. The fact is that they were found in the same concretion closely together. There is no mixing of faunas by the collector. A mixed fauna in a thin layer

could also be explained as a condensed deposit. However, all the other criteria for a condensed deposit are missing.."

At time of publication of Rod and Maync's paper, no precise knowledge existed on the stratigraphic position of the group of species described by Riedel (1938, p. 37-40), under *Deshayesites*. When proposing the genus *Neodeshayesites* for the same group of species, Casey chose "*Deshayesites stutzeri* Riedel" as type species (1964, p. 289, footnote), and apparently relying on the fact that the Old World genus *Deshayesites* occurs in Aptian beds, assigned *Neodeshayesites* to the Upper Aptian.

From the perusal of Rod and Maync's paper, it is clear that in part II (op. cit., p. 266-267), Maync combined in one list fossils coming from different localities; this may

1. Universidad Nacional de Colombia
Instituto de Ciencias Naturales - Museo de Historia Natural
Apartado Aéreo 7495 Bogotá, D. E.

have lead authors to believe that in "... Quebrada Santa Rosita, ... *Neodeshayesites* was found side by side not only with Aptian genera such as *Chelonicer*, *Colombicer* and *Dufrenoyia*, but also with *Douvilleicer* and *Knemicer*, generally considered to indicate a position in the Lower or Middle Albian". Casey (1964, p. 295, footnote). The above artificial association of *Neodeshayesites*, or the Aptian age for the genus have been relied upon by Etayo Serna (1964, p. 67; 1968a, p. 27; 1976, p. 234), Renz (1977, p. 47), Casey (1978, p. 585).

As it will be demonstrated in this paper, the so-called "co-occurrence" of *Neodeshayesites* with Aptian ammonites in the stratigraphic sequence of the Mid-Cretaceous of the Northern Andes rests upon faulty bases.

THE CO-OCCURRENCE OF NEODESHAYESITES WITH OTHER AMMONITES (Fig. 1)

1) In Colombia the genus has been collected at several localities, the classical one being the neighborhood of Apulo (Rafael Reyes, see-fig. 1). Here these ammonites

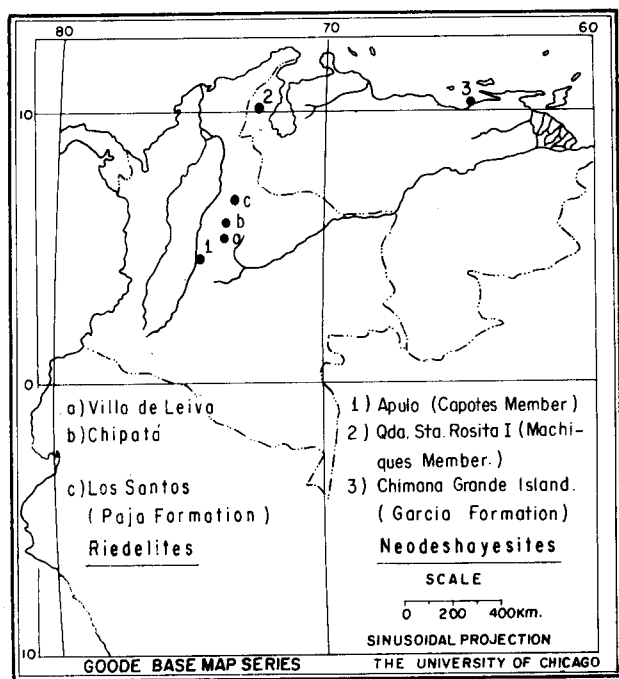


FIGURE 1.— Index map showing the location of the principal *Riedelites* and *Neodeshayesites* occurrences in Colombia and Venezuela discussed in this paper.

have been found above beds with *Douvilleicer*, or side by side in the same beds or concretions with *Douvilleicer*, *Lyellicer*, and *Dipolocer*. (See also Etayo Serna, 1979, p. 10).

2) In Venezuela at the Sta. Rosita I locality: "In a small, commonly dry quebrada in the left bank of Quebrada Santa Rosita, 1-4 meters above the top of the Lower Apón, about 1,500 meters upstream from Rancho Santa Rosita". (Rod and Maync, 1954, p. 208).

At my request, Dr. R. Imlay send me to examine fourteen specimens from the "Sta Rosita I, USGS 23836" sample, the same sample discussed by Maync (1954, p. 267-8). The conclusions of the writer in relation to Imlay's determination cited by Maync (1954, p. 267), are as follows:

Imlay's determinations	Etayo-Serna's determinations
Deshayesites columbianus	Neodeshayesites columbianus (see E.S., 1979, p. 62)
Pascoeites ? or Brancoceras	Rinconiceras ? E. S.
Douvilleicer aff. D. monile (Sow)	Douvilleicer cf. D. abozagloi (see E. S., 1979, p. 56)
Knemicer	Platiknemicer sp.
Deshayesites rotundus Riedel	Not seen.
Deshayesites stutzeri Riedel	Not seen.
Deshayesites stutzeri var. contracta Riedel	Not seen.

This assemblage is the same as that of *Platiknemicer colombiana*-*Rinconiceras rinconi*-*Lyellicer pseudolyelli*-forme Assemblage Zone of Etayo-Serna, of Upper Lower Albian to basal Middle Albian (Etayo-Serna, 1979, p. 14). This is also consistent with the Tethyan record and range of *Platiknemicer*, Casey (1961, p. 356), and Breistroffer (1952, p. 2634).

I think, one must conclude from the available evidence, that *Neodeshayesites* is a true early Albian ammonite genus.

BIOSTRATIGRAPHIC CONCLUSIONS

1) Age of the Machiques Member of Western Venezuela. Renz (1959, p. 7) proposed the formal term Machiques Member for the Middle Apón Member of Rod (Rod and Maync, 1954, p. 205). In the second edition of the stra-

tigraphic Lexicon of Venezuela (1978, p. 403) the Machiques Member is considered a valid term and is dated Aptian. As shown in the present paper, when discussing the fauna of the Middle Apón Formation, at reference locality on Quebrada Santa Rosita, the age of the Machiques Member should be considered early Albian.

II) Age of the García Formation of Northeastern Venezuela. Guillaume (Guillaume et al., 1972, p. 1628) introduced the term García Formation to describe the interval of shales which overlies the Barranquin Formation. He attributed (op. cit., p. 1648-1650) to the García Formation a fauna collected at Chimana Grande Island, consisting of the following species:

"*Deshayesites*" cf. *columbianum* Riedel

"*Deshayesites*" *stutzeri* Riedel

"*Deshayesites*" cf. *inconstans* Riedel

"*Deshayesites*" sp. ind.

"*Ammonitoceras*" sp.

"*Oxytropidoceras*" sp.

This fauna was referred to the lower part of the *Chelonicerases martini* Zone of the Upper Aptian, probably on the assumption that the "*Deshayesites*" spp. (:*Neodeshayesites* spp.) represented primitive species of *Dufrenoyia* (op. cit., p. 1650). However, with the exception of the record of *Ammonitoceras*, the rest of the fossils identified by C.W. Wright indicate an Albian age. It is my opinion, that the reference of this fauna from Chimana Grande Island to the Upper Aptian may only reflect lack of precise stratigraphical information.

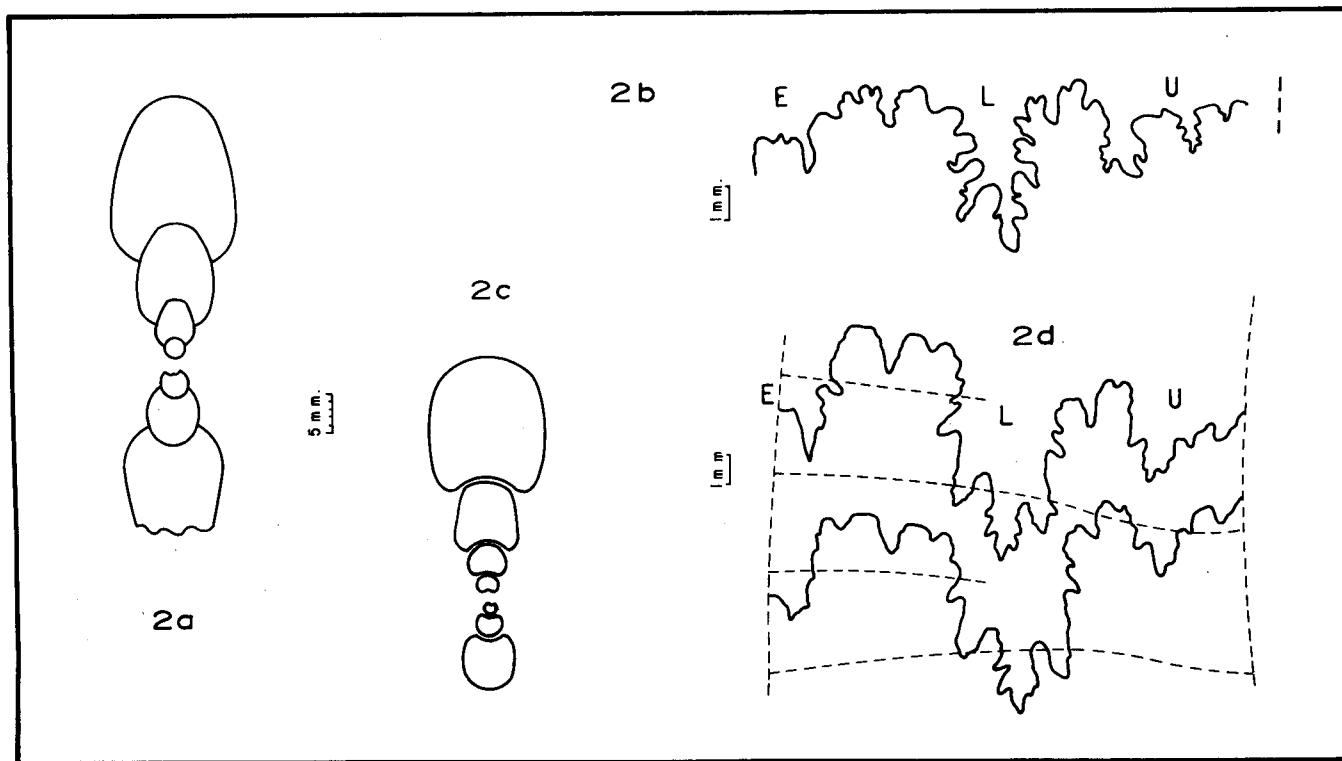


FIGURE 2.— 2a. Cross section of *N. karsteni* (M.) drawn directly from acetate peel of polished surface of sectioned Hypotype C-501-44, at H 22 mm.

2c. Cross section of *R. luisdurani* n. sp., drawn directly from acetate peel of polished surface of sectioned Paratype ICNMHN 1005, at H 19.2 mm.

2b. External suture line of *N. karsteni* (M). Hypotype C-501-27 at H 12 mm.

2d. External suture line of *R. luisdurani* n. sp., Paratype ICNMHN 1004, at H 13 mm.

SYSTEMATIC APPRENDIX

Genus *Neodeshayesites* Casey, 1964

Neodeshayesites Casey, 1964, p. 289, footnote

Type species. *Deshayesites stutzeri* Riedel, original designa-

Neodeshayesites karsteni (Marcou)

Figs. 2a, 2b; 3A, 3B

1858 *Ammonites Acostae*, Karsten, p. 111, pl. 5, fig. 1.

1875 *Ammonites Karsteni*, Marcou, p. 165

(Synonymy in Etayo Serna, 1979, p. 64).

Lectotype — (Here selected). The specimen in the Karsten Collection, Museum für Naturkunde, Humboldt Universität, Paläontologisches Museum, Berlin G.D.R., here illustrated in figure 3A

Hypotype. ICNMHN-C-501-43

Description. Shells with progressively widening, shallow umbilicus. Whorl-section with angular venter that becomes rounded late in ontogeny. Costation of thick ribs, round-topped, about forty-three ribs on venter at 80 mm diameter, moderately flattened especially on outer half of flank and on venter, separated by shallow interspaces, about as wide as the ribs on test, but much wider on the internal mold. Primaries commence at umbilical suture, describe an adoral concavity on the gentle umbilical slope, and as they pass over the inner two thirds of the flank they are gently convex adorally, but trend rectiradiate on the external third. Secondaries confined to outer half of flank with tendency to alternate regularly with primaries. At large diameters (about 100 mm), all ribs broaden into wide, flattened bands, separated by very narrow interspaces. (cf. Hypotype C-501-43, fig. 3B).

Comments. A full description of the ontogenetic development of this species and remarks on Karsten's composite illustration of the species was given by Etayo Serna (1979, p. 6).

Horizon. Lower Albian.

Genus *Riedelites* Etayo Serna, 1979

Riedelites Etayo Serna, 1979, p. 85.

Type-species. *Riedelites esthersernae* Etayo Serna, original designation.

Riedelites luisdurani n. sp.

Figs. 2c, 2d, 4

1928 *Colombiceras karsteni* Marcou, Basse p. 136, pl. 8, fig. 5.

?1931 *Colombiceras karsteni*, Marcou sp., Spath p. 654, ex examples in the British Museum (Natural History) under Nos. C 4284a, b.

1949 *Ammonites karsteni* (Marcou): *Ammonites acostae* Karsten, Humphrey p. 151, ex Basse (1928, p. 136, pl. 8, fig. 5) supra cit.

1954 *Colombiceras alexandrinus* (d'Orbigny), Bürgl p. 16, ex examples in INGEOMINAS Nos. HB-511/4,5,16.

1955 *Colombiceras karsteni* Marcou in Basse (1928, p. 136-137, pl. viii, fig. 5), Cantu Chapa, p. 55.

1965 *Colombiceras karsteni* (Marcou), Casey, p. 419, 420.

1968 *Colombiceras alexandrinum* sensu Bürgl (non d'Orb), Etayo Serna, p. 28, fig. 3.

1979 *Colombiceras karsteni* (Marcou) sensu Basse (1928), Etayo Serna, p. 71.

Holotype. INGEOMINAS HB-245-80

Paratypes. ICNMHN. 1002, 1003, 1004, 1005.

Description. Shells with progressively loosely coiling and wide, deep umbilicus. Inner whorls rounded depressed, outer whorls rounded suboval (Fig. 2c). Costation of strong ribs, close up on the juvenile, distantly spaced with growth, about 35 ribs on venter at 50 mm diameter; 55 at 70 mm. Primaries commence at umbilical margin in high relief, secondaries about center of flank in a subdued manner; secondaries generally alternate. The ribs are sharp and flanging on inner half of flank, round to flat-topped with steep sides on outer half of flank; interspaces about as wide as, or wider than, ribs. At umbilical third, primaries form an adoral concavity; at about mid flank, describe a gentle adoral bow, and on outer third, trend rectiradiate and pass over venter in straight line; thus the general appearance of ribs is as if they were rursiradiate.

There is a great deal of material at all stages of growth to enable the ontogeny to be followed.

Comments. *Neodeshayesites karsteni* Marcou, with which some authors identified the present species, may be distinguished by its ribbing that changes from distantly spaced in the juvenile to close in the adult; the opposite is true for *R. luisdurani* n. sp.

Horizon. Upper Aptian. This species has been found with species of the *Dufrenoyia sanctorum*, *Stoyanowiceras treffryanus* Assemblage Zone.

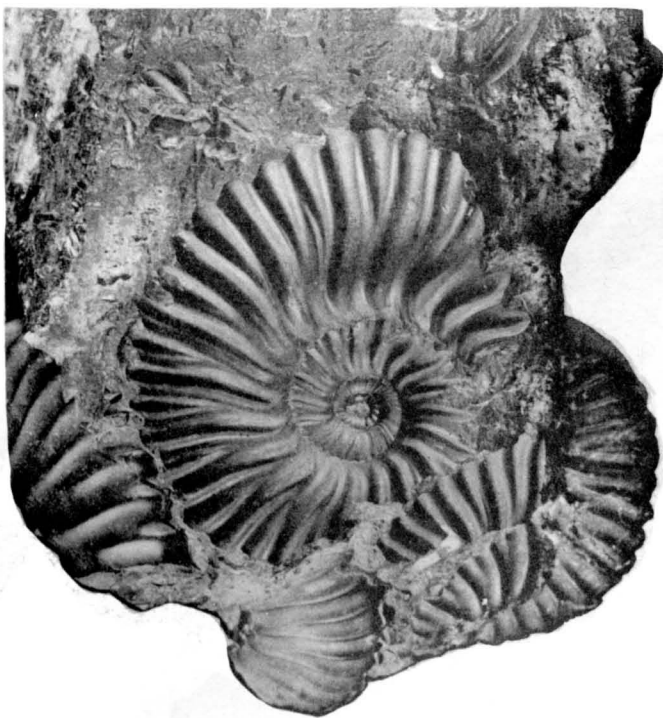


FIG. 3A

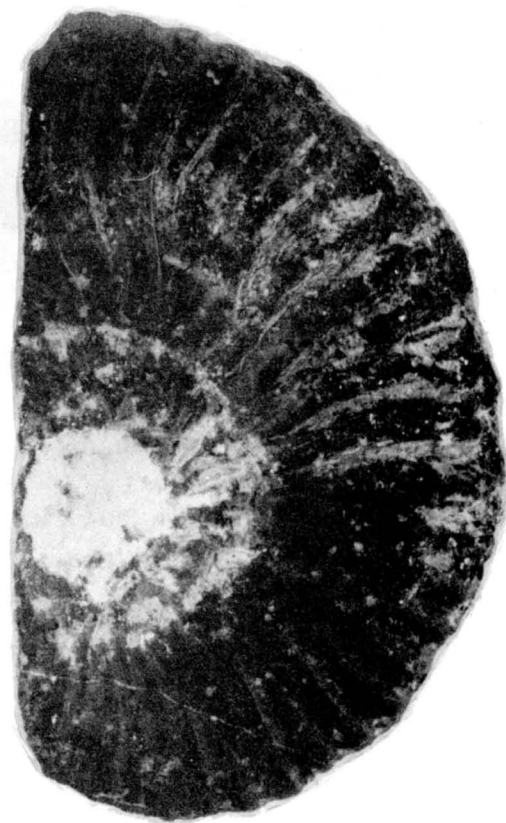


FIG. 3B

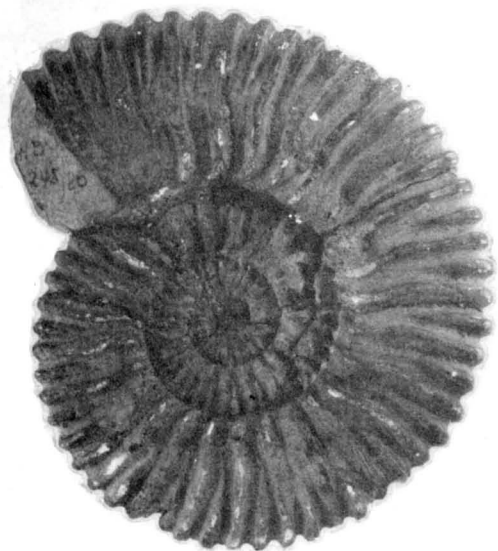


FIG 4

FIGURE 3.— 3A. *Neodeshayesites karsteni* (Marcou), lectotype. Karsten Collection, Humboldt Universitat. x 1.5.

3B. *N. karsteni* (Marcou), Hypotype C-501-43; to show adult ribbing. x 1.

FIGURE 4.— *Riedelites luisdurani* n. sp. Holotype INGEOMINAS HB-245-80; x 0.5.

Measurements

		D	EUW	H	W	NR
Holotype HB-245/80		134.0 mm	61.5 mm	41.6 mm	34.5 mm	55 whole whorl
Paratypes ICNMHN	1002	38.0 "	17.0 "	11.7 "	—	16 half whorl
	1003	50.4 "	18.5 "	17.5 "	16 "	22 " "
	1004	44.8 "	18.7 "	—	—	21 " "
	1005	—	—	19.2 "	17.2 "	— —

Occurrence. Very abundant and frequently flattened as gypsum moulds at base of segment E, Paja Formation, Villa de Leiva section (see Etayo Serna 1968b, fig. 3). The Holotype comes from the neighborhood of Chipatá (Santander); paratypes ICNMHN 1002 to 1004 come from Loma Monsalve, Villa de Leiva (Boyacá) and paratype ICNMHN 1005 from Mesa de los Santos, Department Santander.

REFERENCES

- BASSE, É. Quelques invertébrés crétacés de la Cordillère Andine. *Bull. Soc. géol. France, ser. 4*, 28 (3, 4, 5): 113-147, 7-8 pls., 1-2, figs. Paris. 1928.
- BREISTROFFER, M. Sur la découverte de Knemiceratinae (ammonites albiennes) en Equateur, en Colombie et au Venezuela. *C. R. Acad. Sci.*, 234(27): 2633-2635. Paris. 1952.
- BURGL, H. El Cretáceo inferior en los alrededores de Villa de Leiva, Boyacá. *Inst. Geol. Nat. Colombia, Bol. Geol.* 2(1): 5-22, 1-4 pls. Bogotá. 1954.
- CANTU CHAPA, A. Étude biostratigraphique des ammonites du centre et de l'est du Mexique (Jurassique supérieur et Crétacé). *Mem. Soc. géol. France, ser. 5*, 99: 1-102, 1-8 pls., 1-3 figs., Paris. 1963.
- CASEY, R. The Cretaceous (Albian) ammonite genus *Platinknemicer* Bataller. *Ann. Mag. Nat. Hist.*, ser. 13, 4: 353-357, 1-2 figs., London. 1961.
- A monograph of the ammonoidea of the Lower Greensand. Pt. 5: 289-398, 43-66 pls., 104-144 figs. *Palaeont. Soc.*, (1963). London. 1964.
- A monograph of the ammonoidea of the Lower Greensand. Pt. 6: 399-546, 67-90 pls., 145-206 figs. *Palaeont. Soc.*, (1964). London. 1965.
- A monograph of the ammonoidea of the Lower Greensand. Pt. 8: 583-632, 98-100 pls., 220-240 figs. *Palaeont. Soc. London*. 1978.
- ETAYO SERNA, F. Posición de las faunas en los depósitos cretácicos colombianos y su valor en la subdivisión cronológica de los mismos. *Bol. Geol. Univ. Ind. Santander*, 16-17: 1-142, 8 figs. Bucaramanga. 1964.
- Sinopsis estratigráfica de la región de Villa de Leiva y zonas próximas. *Bol. Geol. Univ. Ind. Santander*. 21: 19-32, 2 figs., 1 map. Bucaramanga. 1968a.
- El Sistema Cretáceo en la región de Villa de Leiva y zonas próximas. *Geol. Colomb* 5: 5-74, 1-18 figs., 1 map. Bogotá. 1968b.
- Zonation of the Cretaceous of Central Colombia by Ammonites. *Publ. Geol. Esp. Ingeominas* 2: 1-186, 15 pls. Bogotá. 1979.
- ETAYO SERNA, F., RENZONI, G., BARRERO, D. Contornos sucesivos del mar Cretáceo en Colombia. *Cong. Colomb. Geol. Mem.*, N. 1: 217-252, 18 figs. Bogotá. 1976.
- GUILLAUME, H.A., BOLLI, H.M., BECKMANN, J.P. Estratigrafía del Cretáceo inferior de la Serranía del interior, Oriente de Venezuela. *Cong. Geol. Venez.*, Mem. 4(3): 1619-1659, figs. Caracas. 1972.
- HUMPHREY, W.E. Geology of the Sierra de los Muertos Area, México (with descriptions of Aptian Cephalopods from the la Peña Formation). *Bull. Geol. Soc. Am.* 60 (1): 89-176, 4-18 pls., 2 figs. Baltimore. 1949.
- KARSTEN, H. Über die geognostischen Verhältnisse des westlichen Columbiens, der heutigen Republiken Neu-Granada und Ecuador. *Amtl. Ber. über die 32 Versammlung. d. Deutsch. Naturforsch. und Ärzte zu Wien im Sept.* 1856: 80-117, 6 pls., 1 map, Vienna. 1858.
- MARCOU, J. Explication d'une seconde édition de la Carte Géologique de la Terre. 1-222, 1 map. (Chapitre XVIII-Geologie de l'Amérique du Sud: 162-181). Zurich. 1875.
- PETZALL, C. ET AL. Venezuela. *Lexique stratigr. internat.*, 5. Amérique Latine, Fasc. 3A: 1-175. Centre Nat. Rech. Sci. Paris. 1978.

RENZ, O. Estratigrafía del Cretáceo en Venezuela Occidental. Bol. Geol. Min. Hidroc., Dir. Geología. 5(10): 3-48, 22 figs. Caracas. 1959.

The lithologic units of the Cretaceous in Western Venezuela
Cong. Geol. Venez., Mem. 5(1): 45-58, 5 figs. Caracas. 1977.

RIEDEL, L. Ammonitas del cretácico inferior de la Cordillera Oriental. Estudios geológicos y paleontológicos sobre la Cordillera Oriental de Colombia, Pt. 2. Depart. Minas y Petról., Min. de Indus. y Trab. Rep. Colombia.: 780, 3-14 pls., Bogotá. 1938.

ROD, E., and MAYNC, W. Revision of Lower Cretaceous stratigraphy of Venezuela. Bull. Amer. Ass. Petr. Geol. 38(2): 193-283, 1-30 figs. Tulsa. 1954.

SPATH, L.F. On the Aptian ammonoidea of Kachh. Appendix to: Revision of Jurassic cephalopod fauna of Kachh (Cutch).

Palaeont. Indica, n.s., 9(2:5): 652-658. Calcutta. 1931.

STOYANOW, A. Lower Cretaceous stratigraphy in South Eastern Arizona. Geol. Soc. Amer. Mem. 38: vii + 169, 1-27 pls. Washington. 1949.

ACKNOWLEDGEMENTS. I would like to thank the British Museum (Natural History), for the loan of specimens Nos. C4284a, b. Special thanks is extended to Dr. R. W. Imlay for supplying ammonites from locality Sta Rosita I, and to Dr. Jochen Helms, who provided the photograph of the type sample of *N. karsteni* (M). Considerable aid with the illustrations was given by S. Fernández (ICNMHN). M. Rodríguez and J.L. Botero (Ingeominas). Dr. G. Botero A. has kindly helped the author by critically reading the manuscript. I also wish to thank Dr. W. Atiken for correcting the English text. This article is dedicated in appreciation to retired Professor L. G. Durán, Departamento de Geociencias, Universidad Nacional de Colombia, Bogotá.