TULANE STUDIES IN GEOLOGY AND PALEONTOLOGY

Volume 16, Number 2 September 17, 1980

PYGMAEPTERYS, A NEWLY DESCRIBED TAXON OF MURICIDAE (MOLLUSCA: GASTROPODA), WITH THE DESCRIPTION OF THREE NEW SPECIES FROM THE CENOZOIC OF THE WESTERN ATLANTIC

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I. ABSTRACT

"Murex" alfredensis Bartsch, 1915, has recently been named as the type species of a new subgenus *Pygmaepterys* Vokes, 1978, along with a second species, *P. maraisi*, described at the same time. *"Murex" funafutiensis* Hedley, 1899, is here tentatively assigned to the same subgenus and three new species are described: *?Pygmaepterys germainae*, from the Recent and fossil fauna of the Caribbean; and *P. pratulum* and *?P. drezi*, from the Miocene Chipola Formation of northwestern Florida.

The subgenus was initially assigned to the genus *Pterynotus* in the subfamily Muricinae but *?P. germainae* proves to have a radula that indicates placement in the subfamily Muricopsinae. The unanswered question is whether *P. alfredensis*, *P. maraisi*, and *P. pratulum*, n. sp., are congeneric with *?P. funafutiensis*, *?P. germainae* and *?P. drezi*, n. sp., or whether the latter are members of a superficially similar genus-group in the Muricopsinae, distinct from *Pygmaepterys*.

II. INTRODUCTION

The smaller species of Gastropoda are among the least well-known members of any fauna and, thus, it is not surprising to find an entire group of small muricids that has been virtually overlooked, although, as this paper will demonstrate, there are at least four Recent and two fossil species. The present geographic range of this group is essentially world-wide tropical, reflecting a geologic history that extends back to the lower Miocene.

Two of the Recent species have been described many years but their affinities were not evident. Vokes previously (1971, p. 14 and 51, respectively) referred *"Murex" alfredensis* Bartsch, 1915, to *Dermomurex* and *"Murex" funafutiensis* Hedley, 1899, to *Pazinotus*. Radwin and D'Attilio (1976, p. 148) placed *M. funafutiensis* in *Favartia* and *M. alfredensis* in Incertae Sedis (*ibid.*, p. 215). Otherwise neither species has received any notice at all.

Our interest in this small group of inconspicuous (and rare) shells was engendered

by a remarkable case of what can only be extreme parallelism between two species, one in the lower Miocene Chipola Formation of Florida and the other in the Recent fauna of South Africa. Among specimens sent to Vokes for identification by Richard N. Kilburn, of the Natal Museum, were examples of a tiny form, obviously related to *"Murex" alfredensis* but not the same. At first sight it appeared to be the twin of an undescribed species from the Chipola Formation, so similar in overall aspect were the two shells. Further work indicated differences, primarily in the protoconch, but the likeness is still amazing (compare pl. 1, fig. 6 and pl. 2, fig. 3). Also included in the same material was apparently the second known example of *"Murex" alfredensis* (see pl. 2, fig. 1).

Needless to say, here was an irresistible area for further research. Examination of *M. alfredensis* indicated that the *Dermomurex* assignment was no longer tenable, but no alternative was available. With the added evidence of other undescribed species, both in the African fauna and in the Caribbean, as well as two Chipola fossil forms, a new subgenus *Pterynotus (Pygmaepterys)* was erected, with *M. alfredensis* as type, inasmuch as it was the only previously described species. The second African species was named at the same time (Vokes, 1978).

Subsequent work brought about the recognition of *Murex funafutiensis* as a third Indo-Pacific member of the group. Six specimens sent to D'Attilio by a collector for identification proved to be examples of *"M." funafutiensis*. All were dredged in coralline algae and sand, at 100 fms., in Pokai Bay, Oahu, Hawaii. One of the specimens is figured here (pl. 2, fig. 5) and it can be seen that it resembles *Pygmaepterys alfredensis*, with the exception of several small denticles on the inner lip.

As noted above, Vokes had considered this form to belong to another little-known subgenus *Pazinotus* Vokes, 1970, which has a superficial resemblance to *Pygmaepterys*. However, the members of *Pazinotus* (type: *"Eupleura" stimpsonii* Dall) have a smooth shell and are considered members of the genus *Poirieria; Pygmaepterys* may be distinguished by the elaborate axial laminae and spiral cords covering the shell. The two groups share the trait of having more than three varices (four to seven in *Pazinotus*, six to nine in *Pygmaepterys);* but the surface ornamentation, which is perhaps the most conspicuous feature of *Pygmaepterys*, is almost totally lacking in *Pazinotus*. If *Pazinotus* (as the name implies) looks like a cross between *Pterynotus* and *Paziella*, then *Pygmaepterys* might be said to resemble a cross between *Pterynotus* and *Favartia* (hence, Radwin and D'Attilio's assignment for *M. funafutiensis).*

The unusually scabrous shell surface in *Pygmaepterys* lends an air of similarity to the members of the Muricospinae (see Radwin and D'Attilio, 1971, p. 64), especially the genera *Favartia* and *Murexiella*. Except for this ornamentation the shells otherwise seem much more closely akin to the muricine genus *Pterynotus* Swainson (type: *Murex pinnatus* Swainson*). Although many members of *Pterynotus* are smooth, the type species has a scabrous surface.

The resemblance to the Muricopsinae is primarily in the scabrous surface, composed of myriad axial growth lamellae. The nature of the aperture is different from most muricopsine genera. In *Murexiella* and *Favartia*, the two groups most likely to be confounded with *Pygmaepterys*, it is almost

*The use of the name *Murex pinnatus* for this species has once again been sanctioned by the International Commission on Zoological Nomenclature. Technically, the name *Purpura alata* Röding, 1798, is older, but for years was assumed to be a secondary homonym of *Murex alatus* Gmelin, 1791, when both forms were referred to the genus *Murex s.l.* Only in the last few years have authors attempted to replace the long established *pinnatus* with the older but unused *alata*, because the International Code of Zoological Nomenclature took a very hard line on *nomina oblita* and demanded application to the Commission to conserve any threatened name. However, after long years of debate the Rules were amended (1974, Bull. Zool. Nomen., v. 31, pt. 2, pp. 77-89) and it was determined that "the Law of Priority is to be used to promote stability and is not intended to upset a long-established name" (Art. 23a-b) and, more importantly, that "a junior secondary homonym rejected before 1961 [as was *alata*] is permanently rejected and cannot be restored" (Art. 59b). The mills of the Commission grind slowly, but they ultimately grind very well, and *Murex pinnatus* is no longer *allowed* to be replaced by *Purpura alata* without petitioning the Commission.

circular, having only small, usually paired, elongate denticles on the inner side of the outer lip, and none on the inner lip. *Muricopsis* has a denticulated aperture similar to that of *Pygmaepterys* but otherwise the shells are little alike. *Murexiella* may have shoulder spines similar to *Pygmaepterys* but *Favartia* has virtually none; however, *Favartia* has the more elaborate axial growth lamellae. None of the Muricopsinae have the varical formation of *Pygmaepterys*, in which the abapical face of the varix is distinctly set apart as a separate flange. This type of varix formation is masked by the axial lamellae when the shell is fresh but is easily seen when the shell is worn (as in the specimen of *P. alfredensis*, pl. 2, fig. 1). Then the varices have a marked *Pterynotus*-like aspect. The same sort of varical formation is also to be seen in *Chicoreus (Naquetia)*, one of the reasons Vokes formerly thought that subgenus was more closely related to *Pterynotus* than it apparently is.

From the above discussion it is obvious that there is no one morphologic trait that may be used to identify positively any genus-group within the Muricidae. Each unit is rather a combination of the same limited variety of characteristics, but with a sum total that differs from that in any of the others. The radula and the operculum are the best means of differentiating between subfamilial groupings, but even they are by no means absolute. For example, the genus *Homalocantha* has a purpuroid operculum, but it belongs with either the Muricopsinae (on the basis of shell morphology and phylogeny) or the Muricinae (on the basis of the radula).

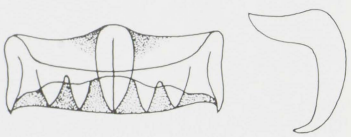
As of this writing there are three described species that may be referred to *Pygmapterys* — *alfredensis*, *funafutiensis*, and *maraisi* Vokes, the second African species (see pl. 2, fig. 3). Another possible member of the group is *Favartia kurodai* Nakamigawa and Habe, 1964, from Japan. This species superficially resembles "*M.*" *funafutiensis*, but with five varices per whorl (*M. funafutiensis* has seven) and less pronounced varical spines at the shoulder. The shell is more elongate than any of the other species here assigned to *Pygmaepterys;* nevertheless, in overall aspect it seems closer to the latter than to *Favartia*, where it was originally described.

All of the above are Indo-Pacific forms. However, there is an undescribed species in the waters of the Caribbean, with examples known from Puerto Rico to the coast of Panamá and also in the Miocene of the Dominican Republic and the Pleistocene beds of Costa Rica. Undoubtedly, once described it will be recognized in collections mis-labeled as "*Favartia cellulosa* (Conrad)." In addition, there are two fossil species from the late lower Miocene Chipola Formation of Florida. Like their modern counterparts these fossil species are not only small but rare, even in the Chipola Formation where size has no effect on the collecting, which is done in bulk, then washed and picked under a microscope. Their rareness is not just a function of being overlooked, as it may well be in the Recent fauna. In spite of the (literally) tons of material washed and picked from 56 localities over the last 20 years only 15 specimens of two species have been recovered.

Within this small group of species there are two major divisions. (One would like to use the word "species-groups," but that term has been preempted by the International Commission for a different meaning.) The first includes the two Recent African forms and one of the Chipola fossils, *P. pratulum*, n. sp. This group has no denticles on the inner lip and is the more *Pterynotus*-like morphotype. It is the one that includes the type species. The second group consists of *P. funafutiensis*, the Recent Caribbean *P. germainae*, n. sp., and the other Chipola fossil form, *P. drezi*, n. sp. In this morphotype there are denticles on the inner lip; the shell is less elongate and more *Favartia*-like. In spite of these differences the writers feel that the two groups are sufficiently similar to be included within the limits of one subgenus.

However, if all of these species are to be referred to the same genus-group, then the original assignment to *Pterynotus* and the subfamily Muricinae is incorrect, for the radula of the Caribbean *P. germainae* is that of the Muricopsinae (see text fig. 1). Thus, we are confronted with a problem that at this time cannot be resolved. Are we, in fact, seeing another of the instances of parallelism that mark the Muricidae, such as that presented by *Pterynotus* and *Pteropurpura*, both of which have three winged varices and appear, at first glance, to be

congeneric? Closer examination of the shells of these two genera reveals a difference in the open vs. sealed siphonal canal and, if one is fortunate enough to obtain the soft parts, different opercula and radulae. At this time we have no soft parts for any of the unquestionable species of *Pygmaepterys*. The soft parts of *P. germainae* indicate that it is undoubtedly a member of the Muricopsinae.



Text figure 1. Radula of *?Pygmaepterys germainae*, n. sp. Paratype B, SDNHM 71305; Grenada, W.I.

The recent report by Houart (1979) of another specimen from the Indian Ocean (here figured, pl. 2, fig. 2) that is very closely related to *P. alfredensis*, and may well be the first known adult of that form, strengthens the impression of the *Pterynotus* affiliation, for it looks most like a six-varixed *Pterynotus*. But it also has denticles on the inner lip, thereby removing the main conchological difference we have noted between these two "groups." More subtle differences that may be observed include a slightly greater number of denticles on the outer lip in the unquestioned *Pygmaepterys* species *(alfredensis, maraisi* and *pratulum)* and a more elongate shell. Also, there is no tendency to abort varices on the last whorl. However, these may well be only specific differences. Certainly, greater degrees of difference than this prevail in many other subgenera of the Muricidae. If these are only conchological differences they can be ignored. But if future work confirms the muricine affinities of the type species of *Pygmaepterus*, then we must concede that this is another of the cases of parallelism in the family.

Until such a time as soft parts are obtained for *P. alfredensis* there is no certain way we can determine whether or not the taxon *Pygmaepterus* should be referred to the subfamily Muricinae, and should comprise only a part of the species here treated, with the others being transferred to a new taxon in the subfamily Muricopsinae, or whether all of the species are members of the Muricopsinae. If all are muricopsine then the taxon should be considered as a subgenus of *Favartia:* if muricine, then *Pygmaepterys* should continue to be allied with *Pterynotus* as before. For the present study we will treat it as a full genus, with the subfamilial assignment only tentative.

III. ACKNOWLEDGMENTS

We wish to thank Richard N. Kilburn, of the Natal (South Africa) Museum, who originally provided the specimens of *Pygmaepterys* that prompted this study; Mrs. Germaine Warmke, Gainesville, Florida, who provided much of the type lot of *P. germainae*, n. sp.; Mr. and (the late) Mrs. Robert C. Hoerle, West Palm Beach, Florida, who collected many of the Chipola specimens, including the holotype of *P. pratulum*, n. sp.; Paul Drez, Houston, Texas, who contributed the holotype of *P. drezi*, n. sp.; Dieter Cosman, Huntington, N.Y., who provided three examples of *P. germainae* with dried soft parts that permitted the radular determination to be made; Richard Salisbury, U.S. Navy, who loaned the specimens of *P. funafutiensis;* and finally Roland Houart, of Ezemaal, Belgium, who loaned the Indian Ocean specimen of *P. (?)alfredensis.*

IV. SYSTEMATIC DESCRIPTIONS

Family MURICIDAE

? Subfamily MURICOPSINAE

Genus PYGMAEPTERYS Vokes, 1978

Pygmaepterys E. H. Vokes, 1978, Ann. Natal Museum, v. 23, no. 2, p. 398.

Type-species: *Murex alfredensis* Bartsch, 1915, by original designation.

? PYGMAEPTERYS DREZI
Vokes and D'Attilio, n. sp.
Plate 1, fig. 5

Diagnosis: Shell large for the group; with five post-nuclear whorls; protoconch unknown. Spiral ornamentation consisting of two major cords on the first and succeeding post-nuclear whorls; with on the body whorl five strong cords and, in

addition, one or more intercalary minor cords. On the short siphonal canal another two major cords and some minor cords. Axial ornamentation of narrow recurved varices, eight in number on each whorl before the adult body whorl; there every other varix tending to be obsolete — only six varices on the body whorl of the holotype with intervarical nodes replacing the "lost" varices. Adapical edge of each varix flexed toward the aperture, reflecting the posterior expansion of the columellar lip. Spiral cords crossing the varices forming short spinelets, largest at the shoulder. Adapertural faces of the varices covered by numerous minutely crenulate lamellae; in addition, intervarical areas crowded with crenulate axial growth lamellae. Aperture oval, inner side of outer lip with six denticles, corresponding to the areas between the spiral cords. Inner lip smooth, appressed, with a wide expansion at the posterior end and three small denticles at the anterior end. Siphonal canal short, broad, slightly recurved at the distal end; former terminations making a small fasciole.

Dimensions of holotype: height 11.8 mm, diameter 7.0 mm.

Holotype: USNM 294289.

Type locality: TU 546, Ten Mile Creek, about 1¾ miles west of Chipola River (NE ¼ Sec. 12, T1N, R10W), Calhoun County, Florida.

Occurrence: Chipola Formation, late lower Miocene; Florida.

Figured specimen: USNM 294289 (holotype). Other occurrences: TU locality no. 830.

Discussion: This new species is unquestionably the ancestor of *P. germainae*, n. sp., the Recent Caribbean form described below. The principal difference between the two is size, *P. drezi* being almost twice the size of the Recent form. (Note that the magnification of most of the figures of *P. germainae* is × 8 but *P. drezi* is × 4). In addition, there is one more varix per whorl in *P. drezi* (eight instead of seven) and the shell is more elongate than in *P. germainae*. However, the resemblances between the two are remarkable, considering the difference in the geologic ages. Whether or not mature examples of *P. drezi* show the *posterior* labial denticles of *P. germainae* must await discovery of more material. None of the three examples of *P. drezi* now in hand do have them, but then, many specimens of *P. germainae* do not either.

PYGMAEPTERYS PRATULUM
Vokes and D'Attilio, n. sp.
Plate 1, figs. 6, 7

Diagnosis: Shell large for the group, with six post-nuclear whorls and a protoconch of two and one-half somewhat bulbous whorls. Spiral ornamentation beginning with first one, then two strong cords, and a faint third at the shoulder, increasing to seven on the body portion of the last whorl and several smaller cords on the siphonal canal. Axial ornamentation of nine lamellar varices on each whorl except the last where there are only six to eight, with no trace of "remnant" varices in the form of intervarical nodes where the varices would have been. Varices composed of a series of laminae pressed together; both the ad- and abapertural faces markedly scabrous. Spiral cords crossing the varices as small channels of outfolded laminae, giving the illusion of spinelets, especially at the shoulder. Varices standing free along the siphonal canal as a laminated frill, in the manner of *Naquetia;* with numerous axial growth lamellae between the varices, elaborately crenulated by invisible spiral threads, giving the intervarical areas a cancellate appearance. Aperture elongate-oval; inner lip smooth, only slightly expanded and appressed at the posterior end; inner side of outer lip with seven denticles, those in the center tending to be paired. Siphonal canal medium in length, only indistinctly set off from body whorl. Distal end slightly recurved, with the tips of former canals forming a long curved fasciole.

Dimensions of holotype: height 10.9 mm, diameter 5.5 mm.

Holotype: USNM 294290.

Type locality: TU 546, Ten Mile Creek, about 1¾ miles west of Chipola River (NE ¼ Sec. 12, T1N, R10W), Calhoun County, Florida.

Occurrence: Chipola Formation, late lower Miocene; Florida.

Figured specimens: Fig. 6, USNM 294290 (holotype). Fig. 7, USNM 294291 (paratype); height 9.0 mm, diameter 4.2 mm; locality same as holotype. Other occurrences: TU locality numbers 554, 830, 950, 951.

Discussion: This is the Florida fossil species so like that from the Recent of South Africa, *P. maraisi* Vokes. In addition to size (the photographs of *P. pratulum* are magnified × 5 but those of *P. maraisi* are × 10) the principal difference is in the nature of the protoconch; that of *P. maraisi* is extremely large (for the size of the shell) and of one and one-half bulbous whorls, but that of *P. pratulum* is relatively small, with two and one-half whorls (see photograph of paratype, pl. 1, fig. 7). Both species show nine varices on the early whorls with a decrease on the body whorl. Whether *P. maraisi* would ultimately reduce the number to only six, as does *P. pratulum*, is not known because of the limited amount of material available. The number of intervarical axial growth lines increases in the wider areas but that is

the only change evident as the varices disappear, indicating simply that a longer growth interval takes place before the varix formation rather than the "aborting" of varices that is usual in most muricine groups; for example, *Pterynotus* with a single intervarical node, or species of *Chicoreus* with two.

The name of this species comes from the Latin, *pratulum*, a "little meadow" and is a Latinization of the Anglo-Saxon "shireleah" (the county assembly ground, or meadow). It is named in honor of the late Shirley (Mrs. R. C.) Hoerle, who over the years, patiently picked out the majority of the specimens in the type lot, including the types.

? PYGMAEPTERYS GERMAINAE
Vokes and D'Attilio, n. sp.
Plate 1, figs. 1-4

Diagnosis: Shell small, with four post-nuclear whorls and a protoconch of approximately one and one-half bulbous whorls, the exact termination being difficult to ascertain among the overlapping varices from the first post-nuclear whorl well onto the protoconch. Spiral ornamentation of two strong cords on the spire; five major spiral cords on the body whorl; three somewhat weaker cords on the siphonal canal. Axial ornamentation of seven varices on each whorl except the last, where there is a tendency to drop one of the varices, leaving a small intervarical node in place of the varix. Intervarical areas covered with elaborately crenulated axial growth lamellae, between and crossing the spiral cords. Each varix forming as a flange, well behind the aperture, with the adapertural face also ornamented by growth lamellae, with small recurved spinelets where the spiral cords cross the varices, that at the shoulder being the longest; a strong adapertural flexure at the adapical end of each varix, reflecting the posterior expansion of the inner lip. Aperture oval, inner lip in adult specimens with about four denticles at the anterior end and another two at the expanded and appressed posterior end. Outer lip with six strong denticles, corresponding to the area between the spiral cords. Siphonal canal short, broad, recurved at the distal end, terminations of former canals forming a small fasciole. Shell color a light beige, aperture a rich mahogany. Operculum straw-colored, typically muricoid, with a terminal nucleus. Radula muricopsine.

Dimensions of holotype: height 7.3 mm, diameter 4.0 mm.

Holotype: USNM 783319.

Type locality: off Pta. Higüero, (or Jigüero) northwestern Puerto Rico, 90 mts.

Occurrence: Cercado and Gurabo Formations, Miocene; Dominican Republic. Moín Formation, early Pleistocene; Costa Rica. Recent, Caribbean Sea, from Puerto Rico to Panamá, depths from 12 to 90 mts.

Figured specimens: Fig. 1, USNM 783319 (holotype). Fig. 2, USNM 783320 (paratype A); height 7.0 mm, diameter 4.0 mm; off Colon, Panamá, 18 mts. Fig. 3, SDNHM 71305 (paratype B); height 8.6 mm, diameter 4.6 mm; Grenada W. I. (Dieter Cosman Coll.). Fig. 4, USNM 294292 (paratype C); height 6.8 mm, diameter 3.8 mm; locality: TU 1215. Other occurrences: TU locality nos. 953, 1227A, 1230, R-98, R-100, and R-112; off Mayagüez, 45-54 mts, and off Puerto Real, western Puerto Rico, 12 mts (Warmke Collection).

PLATE 1

Figure — Page

1-4 *?Pygmaepterys germainae*, n. sp 50
1. (× 8) USNM 783319 (holotype); height 7.3 mm, diameter 4.0 mm.
Locality: Off Pta. Higüero, Puerto Rico, 90 meters (G. Warmke Coll.).
2. (× 8) USNM 783320 (paratype A); height 7.0 mm, diameter 4.0 mm.
Locality: Off Colon, Panamá, 18 meters.
3. (× 6) SDNHM 71305 (paratype B); height 8.6 mm, diameter 4.6 mm.
Locality: Grenada, W.I. (Dieter Cosman Coll.)
4. (× 8) USNM 294292 (paratype C); height 6.8 mm, diameter 3.8 mm.
Locality: TU 1215, Gurabo Formation, upper Miocene, Dominican Republic.

5. *?Pygmaepterys drezi*, n. sp. 48
USNM 294289 (holotype) (× 4); height 11.8 mm, diameter 7.0 mm.
Locality: TU 546, Chipola Formation, late lower Miocene, Florida.

6, 7 *Pygmaepterys pratulum*, n. sp. (× 5) 49
6. USNM 294290 (holotype); height 10.9 mm, diameter 5.5 mm.
Locality: TU 546, Chipola Formation, late lower Miocene, Florida.
7. USNM 294291 (paratype); height 9.0 mm, diameter 4.2 mm.
Locality: Same as holotype.

PLATE 1

Discussion: As noted above, this fossil and Recent species is closely related to *P. drezi*, from the lower Miocene Chipola Formation. It differs primarily in being smaller, the largest specimen seen of *P. germainae* is only 9.4 mm in length. Also, there is one less varix per whorl in the modern form, but on the whole the similarity is striking. The aperture, with its labial denticles, is more like the Indo-Pacific *Pterynotus tripterus* (Born, 1778) than any other known form, but this is almost certainly the result of convergence, as *P. tripterus* is the most denticulate of the species of *Pterynotus*, elaborating on a trend that is to be seen to a lesser degree in certain other members of that group. The specimens of *P. germainae* are somewhat variable in the formation of these denticles and more individuals in the type lot lack posterior denticles (for example, paratypes A and C) than have them. As noted above, *P. drezi* has only the anterior nodes, so far as is known.

The Indo-Pacific *P. funafutiensis* (pl. 2, figs. 4, 5) is very close to this species, but the shell is less elaborately ornamented spirally and more ornamented axially. The varices are more expanded and the "spinelets" more pronounced.

This species is named in honor of Germaine (Mrs. H. E.) Warmke, for her work on the Caribbean fauna and for her contribution of much of the type lot, including the holotype.

V. LOCALITY DATA

The following are Tulane University fossil locality numbers:

546. Chipola Fm. Ten Mile Creek, about 1¾ miles west of Chipola River (NE ¼ Sec. 12, T1N, R10W), Calhoun Co., Florida (= USGS 2212, "one mile west of Bailey's Ferry").
554. Chipola Fm. East bank of Chipola River at power line crossing (SW ¼ Sec. 17, T1N, R9W), Calhoun Co., Florida.
830. Chipola Fm. Ten Mile Creek, at power line crossing about one mile west of Chipola River (SE ¼ Sec. 12, T1N, R10W), Calhoun Co., Florida.
950. Chipola Fm. West bank of Chipola River, about 200 feet above Farley Creek (SW ¼ Sec. 20, T1N, R9W), Calhoun Co., Florida.
951. Chipola Fm. Ten Mile Creek, about 1½ miles west of Chipola River (SE ¼ Sec. 12, T1N, R10W), Calhoun Co., Florida.
953. Moín Fm. Type locality, Moín Hill, railroad cut and adjacent ditches on old road to Sandoval, 4.5 km west of Puerto Limón, Costa Rica.
1215. Gurabo Fm. Rio Gurabo, bluffs on both sides, from the bridge to approximately 1 km above the bridge on the Los Quemados-Sabaneta road, Dominican Republic.
1227 A. Gurabo Fm. Arroyo Zalaya, which crosses the road to Janíco from Santiago de los Caballeros, 11 kms south of the bridge of the Rio Yaque del Norte, at Santiago, Dominican Republic. 1227A is a thin lens, resulting from a turbidity flow, which is located on the north side of the arroyo between the "old" bridge (washed out) and the new bridge over the arroyo.

PLATE 2

Figures — Page

1. *Pygmaepterys alfredensis* (Bartsch) (× 10) 46
   Natal Museum 5461; height 6.00 mm, diameter 4.2 mm.
   Locality: Port Alfred, South Africa.
2. *Pygmaepterys* cf. *P. alfredensis* (Bartsch) 48
   Houart Coll.; height 16.4 mm, diameter 9.3 mm.
   Locality: Indian Ocean, exact locality unknown.
   (figs. 2a, 2b × 4; 2c × 10)
3. *Pygmaepterys maraisi* (Vokes) (× 10) 47
   Natal Museum A-5048 (holotype); height 5.7 mm, diameter 2.6 mm.
   Locality: Mzamba, South Africa.
4, 5 *?Pygmaepterys funafutiensis* (Hedley) (× 6) 46
   4. From Hedley, 1899; height 9 mm, diameter 5 mm (*fide* Hedley).
      Locality: Funafuti Atoll, Ellice Islands, 40-80 fathoms (73-146 meters).
   5. SDNHM 71304; height 9.8 mm, diameter 6.2 mm.
      Locality: Pokai Bay, Oahu, Hawaii, 100 fathoms (183 meters). Salisbury Coll.

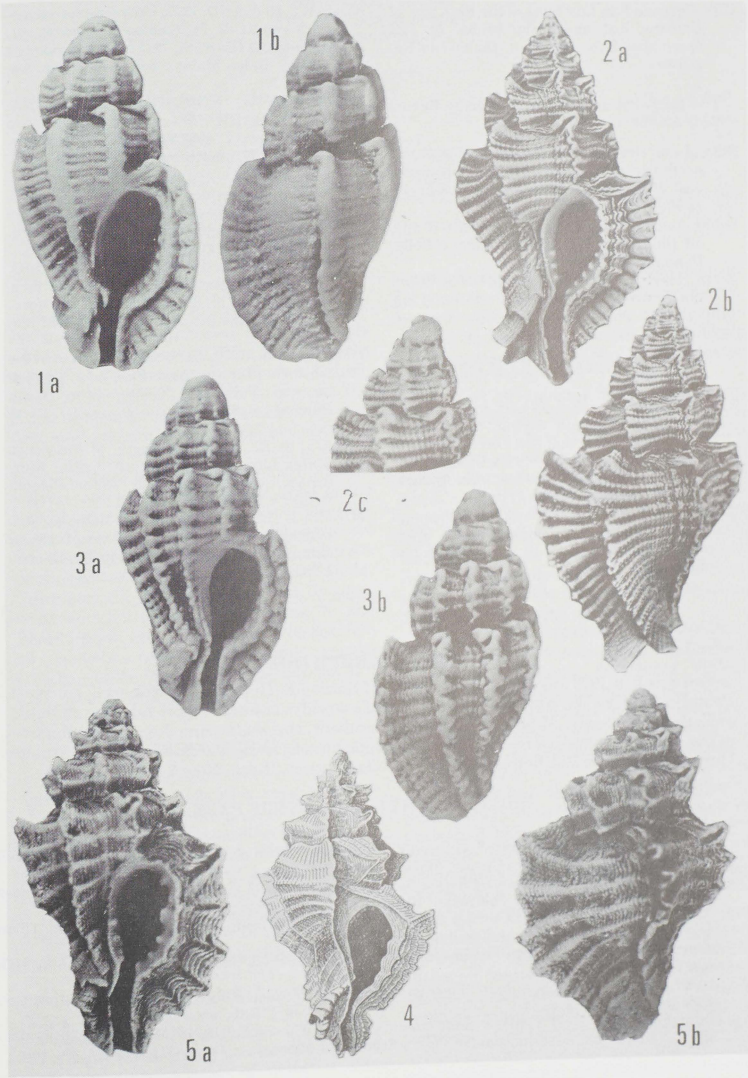


PLATE 2

1230. Cercado Fm. East bank of the Rio Caña, at Caimito, just above the bridge on Los Quemados-Sabaneta road, Dominican Republic.

The following are Tulane University Recent locality numbers:

R-98. *Anton Bruun* Cruise 10, dredged in 40 mts northwest of Holandes Cay and east-northeast of Cape San Blas, Panamá; 9°37′ N, 78°50.3′ W.

R-100. *Anton Bruun* Cruise 10, dredged in 50 mts, off Duarte Cays, northwest of Porto Bello, Panamá; 9°36′ N, 79°40′ W.

R-112. Beach drift, Bocas del Toro, Isla de Colon, north coast of Panamá.

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SHIRLEY ELIZABETH HOERLE

The death in 1979 following a long illness, of Shirley E. Hoerle (Mrs. Robert C.) of West Palm Beach, Florida, has deprived the scientific world of one of the more talented students of Tertiary mollusks. Although a self-taught amateur, she was among the most productive in the field. Her unusual ability lead to her appointment as Research Associate at Tulane University and the Paleontological Research Institution, Ithaca, New York.

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E.H.V.