THE AUSTRALIAN LAND SHELL, THERSITES BIPARTITA, AND ITS ALLIES

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Recently Mr. C. Walton of Peterhead, Port Adelaide, South Australia, presented the United States National Museum with a number of land shells of northeastern Australia and islands in Torres Strait. All of the specimens received belong in the group *Thersites* (*Hadra*) *bipartita* Ferussac. They present a great variation in size and form, and the color varies from bipartite (whitish spire, chocolate base) to specimens which are entirely pale straw color, and to others which are entirely dark chestnut, and to others which are chestnut above, darker, sometimes nearly black below. Most of them have a white or pale spiral band at or near the periphery, and a dark band just below the suture. When the mass of material now in the Museum collection is arranged in geographic sequence, many characteristics which hitherto have escaped attention become evident, and show plainly that specialization has taken place along certain definite lines, and requires the recognition of additional species and subspecies to properly understand the problem presented. Pilsbry in his first study of *Thersites bipartita* [1] placed it in the genus *Camaena*, subgenus *Hadra*, section *Hadra* s. s., and gave the following note:

> The main feature distinguishing *Hadra* from *Chloritis* is that the apex in the former is neither concave, notably flattened, nor sculptured. This group seems more justly regarded as a subgenus of *Chloritis* than as a separate genus. Hedley suggests to me that the microscopic sculpturing of Hadra is a reminiscence of the hair granules of Chloritis.

Later in his analysis of the *bipartita* group [2] he places it in the genus *Thersites*, subgenus *Thersites*, section *Hadra* and uses the following names:

bipartita Ferussac+*semibadia* Albers
form *unicolor* Cox
form *minor* Pilsbry
var. *semicastanea* Pfeiffer+*funiculata* Pfeiffer
forsteriana Pfeiffer+*hetaera* Pfeiffer
form *major* Dohrn
darwini Brazier.

[1] Manual of Conchology, vol. 6, p. 276, 1892.
[2] Man. Conch., vol. 2, p. 132, 1894.

Dr. James C. Cox[3] treated *Thersites bipartita* and *semicastanea* as distinct species, but under the latter he says:

> This species, unquestionably a modified H. bipartita, is so variable that a dozen well-marked varieties might easily be selected from among the hundreds of specimens now before me. I have taken the preceding description from a Lizard Island specimen.

He also treats *funiculata* as a distinct species, but under *semicastanea* he says: "*H. funiculata*, described elsewhere, I would refer to this head without hesitation. * * *."

The land shells from the Northeastern coast of Australia and adjacent islands, the largest of which heretofore have been called *Thersites bipartita* Ferussac and the smaller ones either positively or doubtfully subspecies of that species, have been analyzed in this paper. It should be remembered that the region includes not only the mainland of northeastern Australia but some of the islands off the east coast of Queensland and the islands of Torres Strait. Torres Strait is about 80 miles across and crowded with reefs, shoals, and islands. Isolation and environment undoubtedly have been effective causes producing the characteristics of the various subspecies of mollusks living on these islands.

Restricting ourselves now to specimens known or believed to come from islands in Torres Strait, we find that so far as known they may be divided into two great groups, one of which is characterized by being large, pale, angular at the periphery and with the spire but little lighter than the base. This group includes two species, both new, described in this paper under the names *Thersites waltoni* and *Thersites dalli*. The second group, characterized by being smaller, the spire dark reddish in color, the base much darker, sometimes nearly black, and with the periphery rounded, or at least less angular. This group includes three species, namely: *T. semicastanea* Pfeiffer, *T. bartschi* Marshall, and *T. funiculata* Pfeiffer. The first two are divided into two or more subspecies. Shells from Lizard Island on the east coast of Queensland resemble these dark shells from the islands in Torres Strait, which, however, are easily distinguishable by their very dark colors and unctuous appearance.

In the group of *Thersites bipartita* we now recognize the following species and subspecies:

THERSITES (HADRA)

bipartita bipartita Ferussac.
bipartita minor Pilsbry.
bipartita unicolor Cox.
semicastanea semicastanea Pfeiffer.
semicastenea alma, new.
funiculata Pfeiffer.
lizardensis lizardensis, new.

[3] Monograph of Australian Land Shells, p. 56, 1868.

lizardensis suma, new.
lizardensis rada, new.
bartschi bartschi, new.
bartschi mobiagensis, new.
bartschi yamensis, new.
bartschi oma, new.
bartschi mura, new.
bartschi nesia, new
bartschi paulensis, new.
bartschi murrayensis, new.
bartschi fama, new.
bartschi elfa, new.
bartschi diva, new.
bartschi cepa, new.
waltoni, new.
dalli, new.
forsteriana forsteriana Pfeiffer.
forsteriana major Pfeiffer.
forsteriana ada, new.
darwini Brazier.

At the present time this arrangement makes possible a satisfactory classification of all the material of this group in the collection of the United States National Museum. We believe, however, that when specimens from others of the multitude of islands in Torres Strait are collected, that the list of subspecies will have to be materially enlarged.

THERSITES (HADRA) BIPARTITA BIPARTITA Ferussac

Plate 1, fig. 3

Helix bipartita Ferussac, Histoire Naturelle des Mollusques, vol. 1, p. 176, pl. 75*a*, fig. 1.

Shell large, globosely turbinate, thick. Whorls slightly more than seven, slightly rounded and convex, each appearing to be a little sunken into the succeeding one, giving a somewhat beehive appearance to the spire. Sculpture of many retractive growth riblets which are strongest on the body whorl. Upper whorls with microscopic reticulations, which on the body whorl become minute pittings. Base very convex, widely umbilicated, the face of the umbilicus somewhat flattened. Aperture oblique, whitish but indistinctly showing the bipartite coloring of the exterior. Peristome white, reflected, partially concealing the umbilicus. Parietal wall with a rather thick callus which extends as a glaze some distance within the shell. Periphery rounded, showing no sign of an angle. Suture well impressed, irregularly crenulated by the upper ends of the growth riblets. Body whorl slowly descending about 7 mm. as it approaches the aperture. Color very conspicuously bipartite, the spire pale straw color, the base chocolate, a white spiral line dividing the colors of the spire and base.

The suture marked by a faint band of chestnut below it. The figured specimen, United States National Museum, Cat. No. 100058 measures: Greater diameter, 64 mm.; lesser diameter, 56 mm.; height, 59 mm. It comes from northeast Australia and was received from R. E. C. Stearns, who obtained it from Dr. J. C. Cox. The collection contains also 15 other specimens, 5 of which are labeled Cape York; 6 Australia; 1 northeast Australia; 1 north Australia; 1 Queensland; and 1 Gulf of Carpentaria. Probably all these specimens came from Queensland. Pilsbry cites the following localities: Cape York, Cape Direction, Cape Grenville, Daintree River, and Albany Island, northeast Australia. Albany Island is so close to the mainland that it may be regarded as a part of it. All the localities mentioned are in Queensland.

Specimens at hand vary considerably in size and other features. The specimen figured is the largest; the smallest of all is a specimen labeled Australia (Cat. No. 321077) which measures: Greater diameter, 50 mm.; lesser diameter, 40 mm.; height, 36.5 mm. Four other specimens, part of this same lot, are much smaller than the specimen figured. One labeled Gulf of Carpentaria, North Australia (Cat. No. 333790, U.S.N.M.), received from Mr. Walton, measures: Greater diameter, 51 m.; lesser diameter, 43 mm.; height, 41 mm.

With more material available and with definite locality data, this subspecies as now considered may have further subdivisions.

THERSITES (HADRA) BIPARTITA MINOR Pilsbry

1890. *Euhadra* (*Hadra*) *bipartita minor* PILSBRY, Man. Conch., vol. 6, p. 126, pl. 21, f. 44.

Like typical *bipartita* in all respects but size, which Pilsbry gives as diameter, 31 mm.; altitude, 26 mm. No mention is made of its distribution.

THERSITES (HADRA) BIPARTITA UNICOLOR Cox

1892. *Chloritis* (*Hadra*) *bipartita unicolor* Cox, in Pilsbry's Man. Conch., vol. 8, p. 276.

Similar to the typical *bipartita* in size, form, sculpture and thickness, but of a nearly uniform yellowish color. All four of the specimens in the Museum collection have the white or whitish band which, in typical *bipartita*, marks the division between the yellowish color of the spire and the chocolate color of the base. The distribution of *unicolor* is apparently the same as that of typical *bipartita*, and it may be only a partially albinistic manifestation instead of a zoogeographic race.

THERSITES (HADRA) LIZARDENSIS LIZARDENSIS, new subspecies

Plate 2, fig. 7

Shell globosely conical, rather elevated, moderately thick. Whorls 6½, slowly increasing in size, a little convex. Base convex;

body whorl round, its upper edge descending near the aperture. Sculpture of many retractive fine growth striae and a microscopic reticulation. Sutures moderately impressed, emphasized by a crenulated edging to each whorl, and by a narrow white margin below which is a reddish narrow band. Umbilicus wide, partly concealed by the reflected columellar lip. Parietal wall glazed. Aperture broadly rounded; peristome white, reflected. Color bipartite, the spire light chestnut and the base much darker, rich, glossy chestnut. A distinct white band at the periphery between the two shades of color. Interior showing the exterior colors softened by a glaze.

The type (Cat. No. 317035, U.S.N.M.) measures: Greater diameter, 41 mm.; lesser diameter, 36 mm.; height, 32 mm. It and a paratype (Cat. No. 333791, U.S.N.M.) are in the Henderson collection, and came from Lizard Island off east coast of Queensland. This is the species figured by Cox as *Helix semicastanea* on Plate 5, Figure 10.[4] His specimen came from Lizard Island. It seems to stand midway between *Thersites bipartita* and *T. semicastanea*, partaking of the characters of each and yet distinct from both. Cat. No. 317032, U.S.N.M. includes two specimens from Lizard Island of much lighter colors. Cat. No. 317034, U.S.N.M. includes two specimens labeled Islands of northeast coast of Australia. These probably come from Lizard Island. Cat. No. 321080, U.S.N.M. includes one specimen labeled "Australia." This, too, probably came from Lizard Island. Cat. No. 100032, U.S.N.M. labeled "Northeast Australia," from Dr. J. C. Cox, in the Stearns collection, also are so like specimens from Lizard Island that it seems likely they came from that island.

THERSITES (HADRA) LIZARDENSIS SUMA, new subspecies

Plate 1, fig. 2

Similar to *T. lizardensis lizardensis* but larger, more elevated, and differently colored, the spire being fawn color, the base light chocolate with a chestnut tinge, the white line dividing the colors of base and spire very prominent.

The type (Cat. No. 99944, U.S.N.M.) measures: Greater diameter, 48 mm.; lesser diameter, 41.5 mm.; height, 35 mm. It and a paratype (Cat. No. 333792, U.S.N.M.) form part of the Stearns collection. They are labeled ?Borneo. No similar shells have been found in Borneo, and it seems from their resemblance to Lizard Island specimens that they probably came from some island in its immediate vicinity, and probably belong to a subspecies of *T. lizardensis*.

THERSITES (HADRA) LIZARDENSIS RADA, new subspecies

Plate 2, fig. 4

Shell similar to *Thersites lizardensis lizardensis* but much smaller, more elevated, with the umbilicus largely concealed by the reflected

[4] Monograph of Australian Land Shells, 1868.

columellar lip, the peristome thicker and less expanded, a heavy callus across the parietal wall joining the two ends of the peristome. Colors much lighter but distinctly bipartite, the spire pale yellowish white, the base faded chestnut.

The type (Cat. No. 317033, U.S.N.M.) measures: Greater diameter, 33 mm.; lesser diameter, 28.5 mm.; height, 22.5 mm. It and a paratype (Cat. No. 333793, U.S.N.M.) are part of the Henderson collection and come from Lizard Island on the east coast of Queensland, Australia.

While the condition of the interior of these two specimens show that they were "living" shells when collected, the pale colors of the spire and base seem to be due mostly to loss of nearly all the periostracum, though a few remaining vestiges of periostracum show that the shell was naturally of very light colors. At first glance this subspecies bears a resemblance to *T. bipartita*, but careful comparison with that species and with *T. lizardensis* shows that it is more closely related to the latter.

THERSITES (HADRA) SEMICASTANEA SEMICASTANEA Pfeiffer

Plate 2, fig. 5

1849. *Helix semicastanea* PFEIFFER Zeitsch. fur Malak., vol. 6, p. 77; in Chemnitz Conch. Cab. ed. 2, Helix, no. 319, plate 56, figs. 3–5 (title page dated 1846, but the species is quoted from the Zeitschrift for 1849, thus showing that it was described in that year).

Shell small, rather thin, depressed conic, whorls from 5½ to 6 in number, slowly increasing, slightly convex, body whorl rounded, but just in front of the aperture it is somewhat angular showing that the concealed periphery of the earlier whorls was angular. Surface with numerous retractive growth striae and surface minutely reticulate, with faint indications here and there of spiral striae. Base convex, umbilicus rather narrow. Aperture rounded, scarcely oblique. Peristome thin, reflected, its columellar portion partially concealing the umbilicus. Parietal wall glazed. Color reddish, the base darker than the spire and glossy, a spiral white or whitish band at the periphery. Interior showing the two shades of the exterior and the white line dividing them. Sutures well impressed, irregularly crenulated, marked by a dark line below and a whitish line above. A very slight descent of the body whorl at the aperture.

The figured specimen (Cat. No. 169124, U.S.N.M.) measures: Greater diameter, 34.5 mm.; lesser diameter, 30 mm.; height, 23 mm. Another specimen with the same catalogue number, exactly like the type but smaller, measures: Major diameter, 28 mm.; minor diameter, 24 mm.; height, 19.5 mm. They are labeled "Queensland, Australia," and were presented by Mr. S. W. Jackson. Cat. No. 100033, U.S.N.M., includes two specimens received from R. E. C.

Stearns, who obtained them from Dr. J. C. Cox. These are labeled "Northeast Australia." They are dark reddish chestnut, much darker than the type. In one the light peripheral band is quite marked; in the other it is faint. Apparently the localities "Queensland" and "Northeast Australia" supplied by Jackson and Cox would lie on the mainland, but it seems probable that these localities being general would include islands in Torres Strait. Pfeiffer's type locality "Nova Hollandia?" would include both mainland and islands.

Cox and also Pilsbry say "Islands of Torres Strait, Australia, from Lizard Island to Stephens Island." Doctor Cox in describing and figuring specimens from Lizard Island apparently did not deal with *Thersites semicastanea*, but with larger and differently colored shells. The specimen figured by Cox on Plate 5, Figure 10,[5] is not *T. semicastanea* but rather *bipartita minor* Pilsbry. The specimen figured on Plate 20, Figure 3,[5] is *T. semicastanea semicastenea.*

THERSITES (HADRA) SEMICASTANEA ALMA, new subspecies

Plate 3, fig. 8

Similar to *Thersites* (*Hadra*) *semicastanea semicastanea*, but much smaller, more fragile, slightly less depressed and with the peristome thin and but slightly reflected. The body whorl does not descend near the aperture. It has 5½ whorls.

The type (Cat. No. 100034, U.S.N.M.) measures: Greater diameter, 25.5 mm.; lesser diameter, 22 mm.; height, 15 mm. It comes from Cape York, Queensland, Australia, and was received from R. E. C. Stearns, who obtained it from Legrand.

THERSITES (HADRA) FUNICULATA Pfeiffer

1854. *Helix funiculata* PFEIFFER, Proc. Zool. Soc., p. 147.

Shell umbilicated, depressed, thin, often rudely granulated, somewhat shining, reddish; spire obtusely conic; suture subcanaliculate; whorls 6, somewhat convex, slowly increasing; body whorl rounded, a white band above the periphery and with a cord-like carina, descending anteriorly; base convex, umbilicus moderate, deep, aperture oblique, subangularly lunate; peristome simple, margins scarcely converging; above straight, a little reflected at the base, upper end of columella dilated.

Greater diameter, 29 mm.; lesser diameter, 24 mm.; height, 14 mm.

Habitat.—Torres Strait, Australia.

This may be a subspecies of *Thersites semicastanea* Pfeiffer, but the presence of a cordlike keel at the periphery makes it somewhat doubtful. Unfortunately a definite locality was not cited. Torres Strait includes a multitude of islands.

[5] Monograph of Australian Land Shells, 1868.

THERSITES (HADRA) BARTSCHI BARTSCHI, new subspecies

Plate 2, fig. 1

Shell rather thin, depressed, whorls 6½, somewhat round, slowly descending, each appearing to be a little immersed in the succeeding whorl. Base convex, about as deep as the spire is high, umbilicus moderate, partly concealed by the reflected columellar lip. Body whorl large, with rounded periphery, its anterior upper edge slightly descending at the aperture. Sculpture of numerous retractive growth lines and microscopic reticulations; sutures deeply impressed, crenulated by the ends of the growth striae. Color rich, dark chestnut fumed with darker color, especially along the suture. Base very dark, nearly black, the colors of the spire and base separated by a very distinct white line. Aperture nearly horizontal, widely rounded with the lip moderately reflected. Interior livid purplish. Parietal wall thinly glazed.

The type (Cat. No. 333794, U.S.N.M.) measures: Greater diameter, 44 mm.; lesser diameter, 36 mm.; height, 28.5 mm. It and two paratypes come from Darnley Island, and were presented by Mr. C. Walton.

THERSITES (HADRA) BARTSCHI MOBIAGENSIS, new subspecies

Plate 1, fig. 1

Similar to *Thersites bartschi bartschi*, but thinner, slightly more depressed and less highly colored.

The type (Cat. No. 333797, U.S.N.M.) measures: Greater diameter, 44 mm.; lesser diameter, 37.5 mm.; height, 28.5 mm. It comes from Mobiag Island in Torres Strait, and was presented by Mr. C. Walton. (Cat. No. 333798, U.S.N.M.) contains three specimens from the same island sent by Mr. Walton. One of these is young, but when grown apparently will be quite like the adult. The other two specimens are very thin, more elevated, and have a tendency to globoseness. One is nearly adult. Its sutures do not lie accurately along the periphery of the preceding whorls. The other specimen is adult. The suture of its whole body whorl and part of the penultimate whorl fall below the periphery of the preceding whorl. This irregularity of growth probably accounts for the departure from usual form.

THERSITES (HADRA) BARTSCHI YAMENSIS, new subspecies

Plate 1, fig. 4

Shell similar to *Thersites bartschi bartschi* but larger, more depressed, whorls less rounded, growth riblets more marked, body whorl angulated at the periphery (the angle more appreciable to touch than to sight), base slightly less convex; aperture smaller, less

flaring, with the outer lip indistinctly angulated by the angle of the periphery; the whitish line above the nearly black color of the base less distinct but wider.

The type (Cat. No. 333799, U.S.N.M.) measures: Greater diameter, 48 mm.; lesser diameter, 44 mm.; height, 32 mm. It and three paratypes (one of them juvenile) come from Yam Island in Torres Strait and were presented by Mr. C. Walton.

The angulated periphery, the less convex base and the smaller, less flaring aperture distinctly differentiate this subspecies from *Thersites bartschi bartschi.*

One of the paratypes is juvenile, another varies from the type in form, being depressed and each whorl slightly sunken into the succeeding whorl, due to the fact that the suture does not fall along the periphery but is attached a trifle above it.

THERSITES (HADRA) BARTSCHI OMA, new subspecies

Plate 3, fig. 2

Shell thin, inflated, whorls 6¼, well-exserted, rounded; body whorl rounded, inflated, its upper edge descending near the aperture. Base very convex, umbilicus rather wide, but little concealed by the expanded columellar tip. Sculpture of rather indistinct lines of growth and microscopic reticulations. Sutures well impressed, irregularly crenulated by the upper ends of the growth lines. Color nearly uniformly rich dark chestnut, the color of the base very little darker than the spire except near the aperture where it is several shades darker. In place of the whitish line dividing the colors of the spire and base this shell has a narrow band of chestnut darker than that of either base or spire. Suture obscurely margined below by dark chestnut. Aperture horizontal, widely rounded, peristome thin, reflected, parietal wall glazed. Interior violaceous; by transmitted light distinctly divided by a dark line, into two parts, the upper of which is much lighter in color than the lower.

The type (Cat. No. 333801, U.S.N.M.) measures: Greater diameter, 38.5 mm.; lesser diameter, 30 mm.; height, 26 mm. It comes from Yam Island, Torres Strait, and was presented by Mr. C. Walton.

THERSITES (HADRA) BARTSCHI NURA, new subspecies

Plate 3, fig. 7

Shell small, about one-half the size of *Thersites bartschi bartschi* similar to it in other respects but with characters less pronounced. The band at the periphery is yellowish-white, the peristome very little reflected, interior violaceous, the upper part lighter than the lower, a clear-white band between them.

The type (Cat. No. 333802, U.S.N.M.) measures: Major diameter, 31 mm.; minor diameter, 28 mm.; height, 21 mm. It comes from Yam Island, Torres Strait, and was presented by Mr. C. Walton.

Another specimen (Cat. No. 333803, U.S.N.M.) of this subspecies is larger but somewhat abnormal in that the whorls at places do not attach themselves accurately to the periphery of the preceding whorl, thus making the shell a little more elevated than it should be for its diameter. It measures: Major diameter, 34 mm.; minor diameter, 33.5 mm.; height, 25.5 mm.

This subspecies resembles a typical *Thersites bartschi bartschi* very much reduced in size. It resembles also *Thersites bartschi oma* but is smaller, the whorls less rounded, the aperture very much less flaring and with a light peripheral band instead of a dark chestnut-colored one.

THERSITES (HADRA) BARTSCHI NESIA, new subspecies

Plate 3, fig. 5

Shell very small, thin; whorls 5½, rather flattened. Base very convex, its depth exceeding the height of the spire; umbilicus moderate, but little concealed by the reflected columellar tip. Sculpture of many fine retractive growth lines and microscopic reticulations. Body whorl sloping, periphery rounded except in front of the aperture where it is sharply angulated. Sutures not deeply impressed, crenulated by the upper ends of growth lines. Aperture very oblique, peristome white, slightly reflected. Color dark chestnut brown, the base somewhat darker than the spire, the sutures margined by an irregular darker band at the top of each whorl, the colors of the base and spire divided by a narrow yellowish band at the perphery. Interior dark brown below, whitish mottled with chestnut above and a clear white band marking the periphery.

The type (Cat. No. 333804, U.S.N.M.) measures: Major diameter, 25.5 mm.; minor diameter, 22.5 mm.; height, 20 mm. It comes from Yam Island, Torres Strait, and was presented by Mr. C. Walton.

The small size, the deep base, and the oblique aperture distinguish this shell from all others of the group. Its nearest relative is *Thersites bartschi nura.*

THERSITES (HADRA) BARTSCHI PAULENSIS, new subspecies

Plate 3, fig. 10

Similar to *Thersites bartschi bartschi*, but smaller, whorls a trifle more rounded, base slightly more convex, aperture less flaring. Color nearly uniform dark rich chestnut, a little darker on the base, darkest just behind the aperture. The peripheral band is not whitish but light chestnut. Interior sharply divided into upper lighter and lower darker portions by a very distinct white band.

The type (Cat. No. 333805, U.S.N.M.) measures: Greater diameter, 41 mm.; lesser diameter, 35 mm.; height, 28.5 mm. It and

three paratypes (Cat. No. 333806, U.S.N.M.) come from St. Paul's Island, Torres Strait, and were presented by Mr. C. Walton.

Material at hand from Murray Islands is divisible into two species, namely, the large whitish form described herein as *Thersites waltoni;* and the smaller, dark forms. The latter are divided in this paper into the five subspecies of *Thersites bartschi* which are described below. As Murray Islands are a group of islands, it is probable that these five subspecies come from separate islands, or perhaps in some cases from the same island but from different locations.

THERSITES (HADRA) BARTSCHI MURRAYENSIS, new subspecies

Plate 1, fig. 5

Shell large, rather thick, conic. Whorls 6½ but little rounded. Base moderately convex, umbilicus large, partly concealed by the reflected columellar lip. Body whorl angled at the periphery, the angle more appreciable to touch than to sight, abruptly descending at the aperture. Sculpture rather crude, of many prominent, retractive growth riblets, and with microscopic reticulations, which have a tendency to spiral arrangement, especially on the body-whorl. Aperture moderate, slightly oblique, peristome white simple at its upper part, reflected from the periphery around to the umbilicus. Parietal wall with a transparent glaze. Sutures crenulated by the upper ends of the growth riblets, not deeply impressed, but emphasized by a faint dark line below. Color of spire light chestnut, deepening to dark chestnut on the last two whorls. Base very dark, nearly black, an irregular whitish line suffusing the periphery and dividing the colors of the spire and base. Interior bipartite in color, the upper part nearly white, the lower part light violaceous.

The type (Cat. No. 333807, U.S.N.M.) measures: Greater diameter, 46 mm.; lesser diameter, 41 mm.; height, 28.5 mm. It comes from Murray Islands, Torres Strait, and was presented by Mr. C. Walton.

THERSITES (HADRA) BARTSCHI FAMA, new subspecies

Plate 3, fig. 9

This is somewhat smaller than *Thersites bartschi murrayensis* with the whorls more rounded and more exserted, the sutures more deeply impressed, the colors less pronounced and lighter, the peristome more expanded and the periphery less angulated.

The type (Cat. No. 333809, U.S.N.M.) measures: Greater diameter, 43 mm.; lesser diameter, 35.5 mm.; height, 31 mm. It and a paratype (Cat. No. 333810, U.S.N.M.) come from Murray Islands, Torres Strait, and were presented by Mr. C. Walton.

THERSITES (HADRA) BARTSCHI ELFA, new subspecies

Plate 3, fig. 3

This is a dwarfed form very like *Thersites bartschi fama*, which it approaches in all features but size.

The type (Cat. No. 333811, U.S.N.M.) measures: Greater diameter, 30 mm.; lesser diameter, 25 mm.; height, 21 mm. It and a paratype (Cat. No. 333812, U.S.N.M.) come from Murray Islands, Torres Strait, and were presented by Mr. C. Walton.

THERSITES (HADRA) BARTSCHI DIVA, new subspecies

Plate 2, fig. 2

More elevated than *Thersites bartschi fama*, the whorls still more rounded and more exserted, the base more convex, and the colors lighter and less pronounced, the body whorl rounded, with no angle at the periphery except just in front of the aperture.

The type (Cat. No. 333813, U.S.N.M.) measures: Major diameter, 41.5 mm.; minor diameter, 35.5 mm.; height, 31.5 mm. It comes from Murray Islands, Torres Strait, and was presented by Mr. C. Walton.

THERSITES (HADRA) BARTSCHI CEPA, new subspecies

Plate 3, fig. 1

Resembles *Thersites bartschi diva*, but smaller, whorls not quite so rounded, colors still less pronounced, the body whorl very faintly angulated at the periphery, the angle more appreciable by touch than by sight.

The type (Cat. No. 333814, U.S.N.M.) measures: Greater diameter, 38 mm.; lesser diameter, 32 mm.; height, 29 mm. It and a paratype (Cat. No. 333815, U.S.N.M.) come from Murray Islands, Torres Strait, and were presented by Mr. C. Walton.

THERSITES (HADRA) WALTONI, new species

Plate 2, fig. 3

Shell rather large, thin, much depressed, whorls 6½, flattened, slowly increasing. Body whorl abruptly descending near the aperture, periphery rather sharply angulated. Sculpture of many slightly retractive, nearly obsolete lines of growth, and a microscopic reticulation which has a tendency to spiral arrangement. Sutures not deeply impressed, crudely crenulated by the upper ends of the growth lines. Base convex, its depth nearly equal to the height of the spire. Umbilicus wide, but largely concealed by the reflected columella. Peristome simple at its upper portion and not reflected there. At the peripheral angle the peristome begins to expand and is broadly reflected, especially at its junction with the parietal wall which is covered with a thin glaze. Color of spire pale tawny, base slightly darker, the darker shade more pronounced just behind the aperture; periphery marked by a fairly broad white spiral band.

The type (Cat. No. 333816, U.S.N.M.) measures: Major diameter, 62 mm.; minor diameter, 46 mm.; height, 35 mm. It comes from

Murray Islands, Torres Strait, and was presented by Mr. C. Walton, in whose honor the species is named.

Mr. Walton presented seven other specimens of this species from the same locality (Cat. No. 333817 and 333820, U.S.N.M.). Three of these are immature; one is abnormal in that it has the whorls rounded, and each slightly sunken into the succeeding whorl, has the periphery rounded instead of angular, and is distinctly spirally striate on the body whorl near the suture; the other two specimens are similar to the type but smaller.

The pale colors, flattened whorls, angular periphery and peculiar peristome, sharp at its upper portion and widely reflected from the peripheral angle to the umbilicus, make this one of most distinct species of the fauna of Torres Strait.

THERSITES (HADRA) DALLI, new species

Plate 2, fig. 8

Shell turbinate-conical, thin, rather elevated; whorls 6½, slightly convex, each appearing to be a little sunken into the succeeding whorl. Body whorl suddenly bent down near the aperture; periphery moderately angulated on the back of the body whorl, strongly angulated in front of the aperture, the outer lip showing scarcely any sign of being affected by the angle of the periphery. Sculpture of many slightly retractive growth riblets and a microscopic reticulation of fine lines. Sutures well impressed, somewhat crenulated by the upper ends of the growth riblets. Base convex, its depth slightly less than the height of the spire. Umbilicus wide, largely concealed by the reflected columellar lip. Aperture rounded, upper portion of the peristome simple, scarcely reflected; beginning to expand at the periphery until at the columella it is very broadly reflected and conceals a large part of the umbilicus. Parietal wall with a moderately thick glaze. Color of entire shell tawny, the base very slightly darker than the spire; an indistinct whitish band marking the periphery.

The type (Cat. No. 100176, U.S.N.M.) measures: Greater diameter, 44 mm.; lesser diameter, 38 mm.; height, 30.5 mm. It and a paratype (Cat. No. 333818, U.S.N.M.) were received from R. E. C. Stearns to whom they were sent by Dr. J. C. Cox, with the label "*Helix* (*Camaena*) *semicastanea* Pfeiffer; northeast Australia." These specimens show the wide range of variation allowed by Doctor Cox in his identifications of *Thersites semicastanea*. They bear but little resemblance to that species. They are closely related to *Thersites waltoni* Marshall in color, texture, and general form, but differ from it in being smaller, less angular at the periphery, more elevated, with the whorls slightly more rounded, and in having the

aperture rounded with no sign of an angle in the outer lip to mark the angle of the periphery.

Doctor Cox's locality "northeast Australia" seems to indicate that these specimens came from the mainland. More likely it is simply a general locality and as such would include the islands in Torres Strait. Because of their close relationship to *Thersites waltoni* of Murray Islands which are quite distant from the coast it seems almost certain that they came from an island and not from the mainland.

THERSITE (HADRA) FORSTERIANA FORSTERIANA Pfeiffer

Plate 2, fig. 6

1854. *Helix forsteriana* PFEIFFER, Proc. Zool. Soc., p. 254.
1846–53. *Helix forsteriana* PFEIFFER, Conch. Cab., p. 373, pl. 140, figs. 9–10.
1860. *Helix hetaera* PFEIFFER Proc. Zool. Soc., p. 134.

Shell small, depressed-conic, moderately thick; whorls 6, slightly convex, body whorl narrowly rounded, scarcely descending in front; base moderately convex, umbilicus rather small, partly concealed by the reflected columella. Sutures well impressed, crenulated. Sculpture of fine, slightly retractive growth lines and microsopic reticulations or granulations finer and more plentiful than in other species of the group. Aperture sublunate, peristome thin, reflected at its lower part and broadly reflected at the columella. Color of spire pale yellowish with three spiral bands of light chestnut, one below and one above the periphery and one at the suture. A whitish peripheral band. Base very pale straw color much lighter than the spire. Columella with a tint of chestnut at its upper end. Interior whitish with the three exterior bands showing as tints of lavendar, the peripheral white band very distinct, peristome margined inside with pale lavendar.

The specimen figured (Cat. No. 317037 U.S.N.M.) measures: Greater diameter, 21.5 mm.; lesser diameter, 18.5 mm.; height, 15 mm. It forms part of the Henderson collection and is labeled "Lizard Island, Northeast Australia."

The same lot contains two other specimens in the same collection and from the same place. They are almost exactly like the figured specimen.

This species, although belonging in the group of *Thersites bipartita*, has a different color pattern and has a spire lighter than the base. The granulation or reticulations of the spire while finer and more plentiful than in other species is essentially of the same kind.

Pfeiffer himself[6] says that his *Helix hetaera* is the same as his *Helix forsteriana.*

[6] Monographia Heliceorum Viventium, vol. 5, p. 377, 1868.

THERSITES (HADRA) FORSTERIANA MAJOR Pfeiffer

Plate 3, fig. 6

1859. *Helix forsteriana major* PFEIFFER, Monographia Heliceorum Viventium, vol. 4, p. 174. (Not *Helix forsteriana major* Pfeiffer, Monographia Heliceorum Viventium, vol. 5, p. 377, 1866.)

Similar to *Thersites forsteriana forsteriana* but somewhat larger, with lines of growth more prominent and with the periphery obscurely angulate, and with colors less delicate.

The figured specimen is one belonging with four others under Cat. No. 100188, U.S.N.M. It measures: Major diameter, 24.5 mm.; minor diameter, 21 mm.; height, 17 mm. They belong to the Stearns collection and came from Dr. J. C. Cox, who labeled them "*Helix* (*Camaena*) *forsteriana* Pfeiffer" and quoted the locality as northeast Australia.

It seems almost certain that Pfeiffer described specimens like these as var. *major*. Later he gave another description of *major*[7] which was for a much larger shell and which Dohrn figured.[8] These are not subspecies *major*, but belong to the new subspecies described below.

THERSITES (HADRA) FORSTERIANA ADA, new subspecies

Plate 3, fig. 4

1866. *Helix forsteriana major* PFEIFFER, Monographia Heliceorum Viventium, vol. 5, p. 377. (Not *Helix forsteriana major* Pfeiffer, Monographia Heliceorum Viventium, vol. 4, p. 174, 1859.)

1879. *Helix forsteriana major* DOHRN, Conch. Cab., pl. 171, figs. 8–10.

Shell similar to *Thersites forsteriana forsteriana*, but very much larger, more depressed and the body whorl more descending in front. The type (Cat. No. 317036, U.S.N.M.) comes from Lizard Island, off the east coast of Queensland, and belongs in the Henderson collection. It measures: Greater diameter, 31 mm.; lesser diameter, 27 mm.; height, 18 mm. A paratype (Cat. No. 333819, U.S.N.M.) agrees in all respects with the type. Probably the specimens used by Pfeiffer in his second description of "var *major*"[9] were from the same locality as the specimens used here. He cites Cape Flattery, Australia. Lizard Island lies just off Cape Flattery on the east coast of Queensland. The specimens figured by Dohrn as *Helix forsteriana major* were from the same lot as those used by Pfeiffer in his second description of *major*, though he gives no definite locality. Dohrn's figures agree exactly with our specimens of *Thersites forsteriana ada*.

[7] Monographia Heliceorum Viventium, vol. 5, p. 377, 1868.
[8] Conch, Cab., pl. 171, figs. 8, 9, 10, 1879.
[9] Mon. Hel. Viv., vol. 5, p. 377, 1868.

THERSITES (HADRA) DARWINI Brazier

1871. *Helix* (*Hadra*) *darwini* Brazier, Proc. Zool. Soc., p. 639.

Having no specimens and no illustrations to which to refer, the best that can be done for this species is to reproduce Brazier's original description and remarks.

Shell umbilicated, depressedly globose, very thin, finely granulated and radiately striated; spire moderately elevated, obtuse; whorls 5, slowly increasing, convex, last roundly convex, slightly descending in front, dirty yellow; base convex, sculptured the same as the upper surface; umbilicus rather small, deep; aperture diagonal, ovately lunate; peristome very little reflected, white; margins approximating and joined by a thin callus, columellar margin reflected and half covering the umbilicus.

Diam. maj. 7, min. 5½, alt. 4 lines.

Habitat: North coast of Australia (coll. Brazier). I received two specimens of this species from a friend who collected them in the far north of Australia, but the precise locality was not sent with them. It is allied to *Helix forsteriana* Pfr., from Northeast Australia.

EXPLANATION OF PLATES

(All figures natural size)

Plate 1

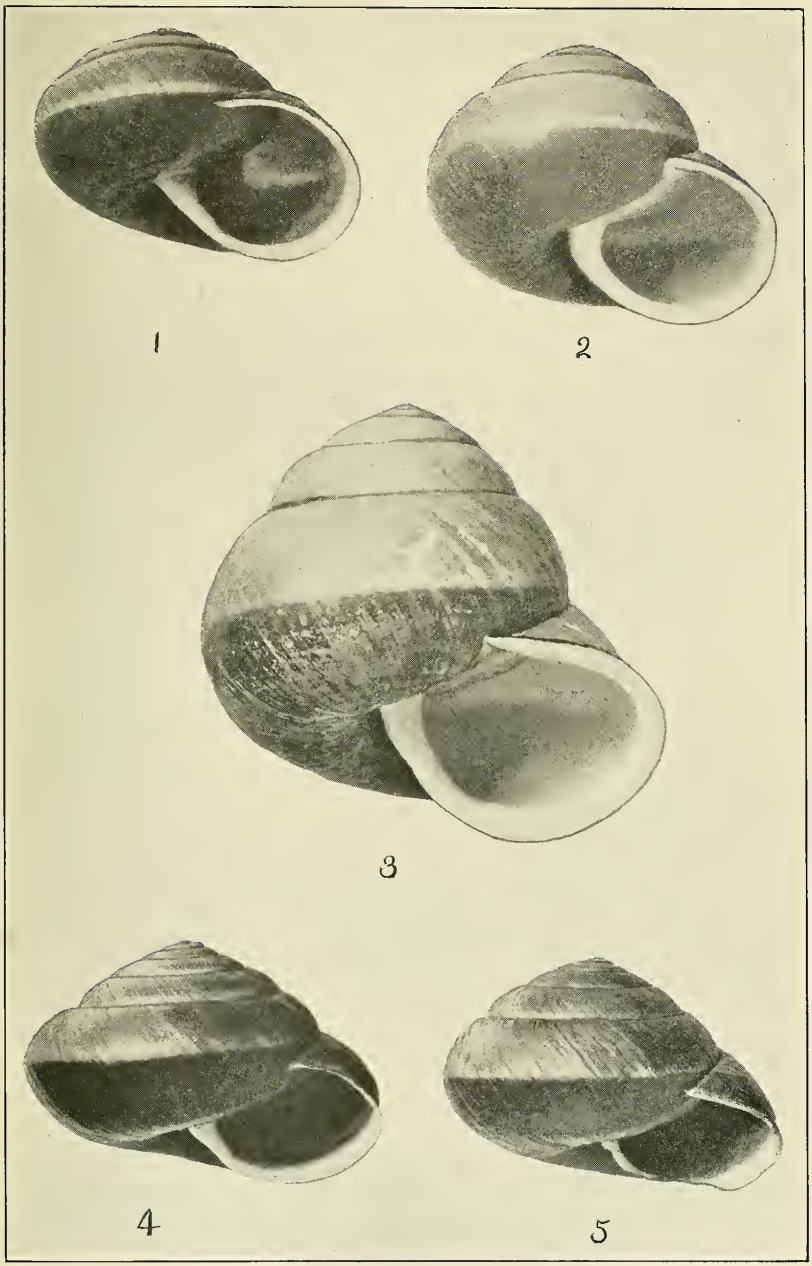
Fig. 1. *Thersites* (*Hadra*) *bartschi mobiagensis*, new subspecies.
2. *Thersites* (*Hadra*) *lizardensis suma*, new subspecies.
3. *Thersites* (*Hadra*) *bipartita bipartita* Ferussac.
4. *Thersites* (*Hadra*) *bartschi yamensis*, new subspecies.
5. *Thersites* (*Hadra*) *bartschi murrayensis*, new subspecies.

Plate 2

Fig. 1. *Thersites* (*Hadra*) *bartschi bartschi*, new subspecies.
2. *Thersites* (*Hadra*) *bartschi diva*, new subspecies.
3. *Thersites* (*Hadra*) *waltoni*, new species.
4. *Thersites* (*Hadra*) *lizardensis rada*, new subspecies.
5. *Thersites* (*Hadra*) *semicastanea semicastanea* Pfeiffer.
6. *Thersites* (*Hadra*) *forsteriana forsteriana* Pfeiffer.
7. *Thersites* (*Hadra*) *lizardensis lizardensis*, new subspecies.
8. *Thersites* (*Hadra*) *dalli*, new species.

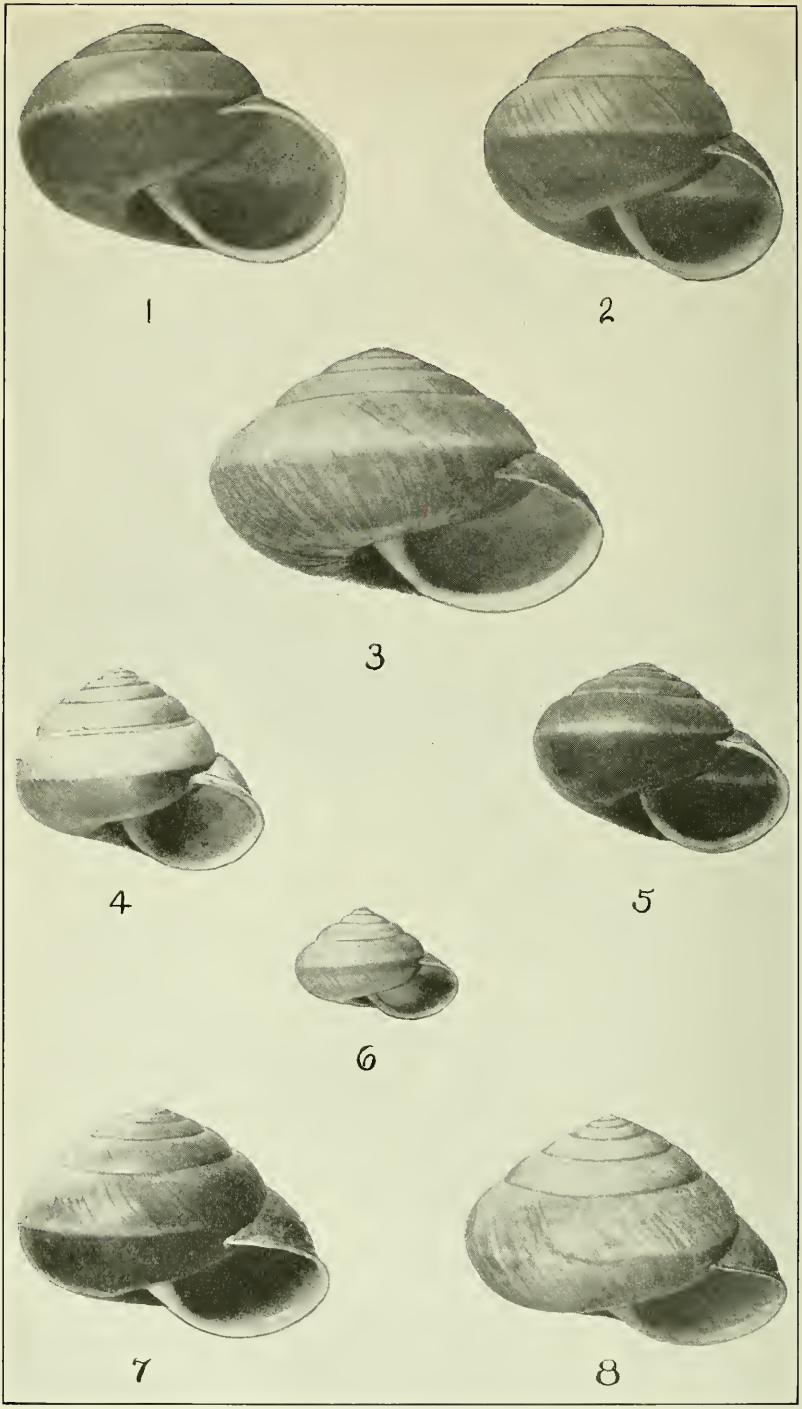
Plate 3

Fig. 1. *Thersites* (*Hadra*) *bartschi cepa*, new subspecies.
2. *Thersites* (*Hadra*) *bartschi oma*, new subspecies.
3. *Thersites* (*Hadra*) *bartschi elfa*, new subspecies.
4. *Thersites* (*Hadra*) *forsteriana ada*, new subspecies.
5. *Thersites* (*Hadra*) *bartschi nesia*, new subspecies.
6. *Thersites* (*Hadra*) *forsteriana major* Pfeiffer.
7. *Thersites* (*Hadra*) *bartschi nura*, new subspecies.
8. *Thersites* (*Hadra*) *semicastanea alma*, new subspecies.
9. *Thersites* (*Hadra*) *bartschi fama*, new subspecies.
10. *Thersites* (*Hadra*) *bartschi paulensis*, new subspecies.



AUSTRALIAN LAND SHELLS

FOR EXPLANATION OF PLATE SEE PAGE 16



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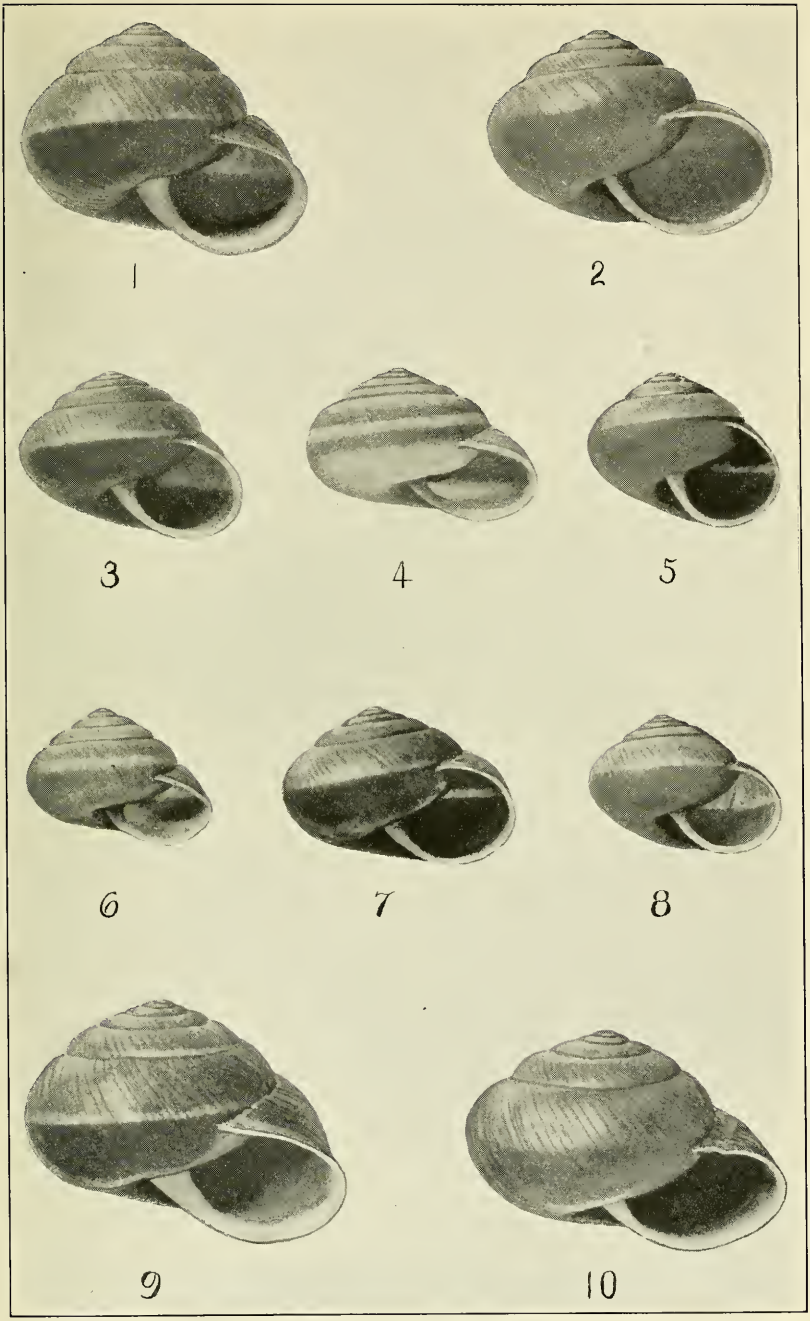

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