University of Texas Bulletin

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Alva Christine Ellisor

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The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

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PREFATORY NOTE

This paper describes the species of the genus Turritella of the Buda and Georgetown limestones of Texas as a beginning of an intensive study of the genus Turritella of the Comanchean and Cretaceous formations of Texas.

The author is deeply indebted to Professor F. L. Whitney for his valuable help and suggestions in the preparation of this paper, and for the use of his private collection of specimens. She also wishes to express her appreciation of Professor Whitney's inspiration and encouragement which led to her paleontological studies.

ALVA CHRISTINE ELLISOR.

MOLLUSCA

GASTROPODA

FAMILY TURRITELLIDAE

Genus Turritella, Lamarck, 1799

Turritella bybeei, n. sp.

Plate I, figures 1, 2

Dimensions.—Apical angle 22°, sutural angle 6°.

Description.—Shell large, thick, elevated, whorls four or more in number, sides of whorls flat, suture well defined. The aperture of the body whorl almost square, the base of the whorl slopes at an angle of about 15° and is covered with four or five nodular threads and striations. The ornamentation of the whorls consists of four rows of rounded tubercles of which the first and third rows from the anterior side are the most prominent. Below the anterior row are two nodular threads which almost disappear in the upper portion of the spire. The anterior row of tubercles is separated from the other three by a broad space. The posterior row and the next one anteriorly are very close together. The tubercles of the anterior row are elongated instead of rounded as in the case of the other tubercles. Very fine striations cover the whorls.

Comparisons.—*Turritella bybeei* differs from *T. bravoensis,* Böse,[1] in the shape of the whorls and in the arrangement of the ribs on the whorls. Our species has two nodular threads in front of the anterior rib, whereas *T. bravoensis* has a fine nodular rib bordering the anterior suture. Between this fine rib and the anterior heavy rib is a band greatly inclined toward the suture. This characteristic does not appear in our species.

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[1]Böse, Instituto Geológico de México, Boletín 25, p. 149, pl. 31, figs. 8-9; pl. 32, figs. 1-2.

Our species also resembles *Turritella nodosa,* Roemer, but varies in the size of the apical angle which is 18°.[1] The two upper ribs are large, rounded, and most prominent, whereas the rib behind the suture is narrow but strongly keeled. The fourth rib is the smallest and lies in a groove, and appears as a thread in specimens not well preserved. The whorls are not of the same shape. Stoliczka[2] in his description of *T. nodosa,* Roemer, says that the spiral angle is 10°-12°. He says that *T. nodosa* has five ribs of which four are of equal size and the spaces between are equal. Böse[3] says that Holzapfel[4] has studied T. nodosa with much care and has found that the distinguishing characteristics of *T. nodosa* are its tall, elongated figure and the existence of four ribs of different size and separated by unequal spaces. We have not had access to Roemer's original description. *T. nodosa,* Roemer, belongs to the Senonien, but Stoliczka described his species from the formation that corresponds to the Cenomanian.

Number of Specimens.—4.

Occurrence.—Lower beds of Buda limestone at Round Rock, Texas.

Turritella whitneyi, n. sp.

Plate I, figures 3, 4

Dimensions.—Spiral angle 3, sutural angle 9°.

Description.—The shell is elongated, and because of its ornamentation resembles a *Nerinea.* However, this species lacks the columellar plaits which are characteristic of a *Nerinea.* Whorls are ten or more in number. Aperture unknown. Whorls about one-half as high as wide. Sides of whorls straight and bordered on the posterior side by a broad band which is the only ornamentation of the whorls.

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[1]Müller, Aachen Kreide, p. 32. pl. 4, fig. 18.

[2]Stoliczka, Cret. Fauna Southern India II, p. 222, pl. 17, fig. 7; pl. 19, figs. 20-21.

[3]Böse, Instituto Geológico de México, Boletín 25, p. 150.

[4]Holzapfel, Aachener Kreide, I, p. 155.

We have only the one specimen, found in the Buda limestone at Austin, Texas.

A species that resembles ours is *Turritella elicita,* Stoliczka, from the Arrialoor formation of India, but it has characteristics not found on this species and is from a much later formation.

Number of specimens.—1.

Occurrence.—Buda limestone, Shoal Creek, Austin, Texas.

Turritella washitensis, n. sp.

Plate I, figures 5, 6

Dimensions.—Apical angle, about 16°, sutural angle 8°.

Description.—Shell tall, turreted, volutions seven or more in number, aperture unknown, spire high, whorls are convex and broader than high, suture well impressed, the posterior rib of the whorls borders the sutural line which lies in a deeply impressed channel. Surface of the whorls is ornamented with six rounded nodular ribs. The anterior rib appears smaller than the other five which are equal. The spaces between the ribs are plain and are slightly narrower than the width of the ribs.

Number of specimens.—1.

Occurrence.—Basal Buda limestone, Onion Creek, Austin, Texas.

Turritella bartonensis, n. sp.

Plate II, figures 1, 2, 3

Dimensions.—Apical angle 16°, sutural angle 8½°.

Description.—Shell elongated, slender, composed of eight or more whorls, suture well impressed, sides of whorls nearly flat, aperture slightly oval. The ornamentation consists of four equal, square, nodular ribs. Between each pair of ribs is found a plain thread, and before the anterior rib are found two plain threads, which cause the anterior portion of the whorl to appear slightly beveled. In addition to this

ornamentation there are striations or lines of growth between the ribs. Sometimes there is a wider space between the two middle ribs than there is between the others.

This species is distinguished from *Turritella vibrayeana,* D'Orb. by the size of the apical angle which is 12° in the latter species, by having plain intermediate lines or ribs instead of nodular ones as occur in *T. vibrayeana.*

Our species resembles *Turritella budaensis,* but in the latter species the apical angle measures 21°, the sutural angle 6°, the whorls are convex, the two middle ribs are much larger and more prominent than the other two ribs, and between the two middle ribs are two lines instead of one. These characteristics readily distinguish *T. budaensis* from our species. *T. bartonensis* is distinguished from *T. planilateris* in the size of the apical angle. *Turritella planilateris* has only one intermediate small rib and the spaces between the ribs are much narrower than in this species.

Number of specimens.—35 and some fragments.

Occurrence.—Upper Buda limestone, Shoal Creek and Barton Creek.

Austin, Texas.

Turritella budaensis Shattuck

Plate II, figures 4, 5, 6

Turritella budaensis Shattuck, 1903
Bulletin of the United States Geological Survey,
No. 205, 1903, Pl. XIX, Figs. 4-6

Dimensions.—Apical angle 21°, sutural angle 6°.

Description.—Shell elongated, slender, whorls numerous; sutures well defined; aperture almost round. Ornamentation consists of four nodular ribs. In the older portion of the spire these ribs are uniformly developed, but in the younger portion of the shell the two middle ribs are larger than those on either side. There are fine lines of growth between the ribs, some of which are larger than others.

Between the two middle ribs there are usually two fine threads as well as striations, but in several specimens representing the senile stage there is only one thread between the two middle ribs and it at times becomes quite prominent. In one specimen representing the senile stage the posterior rib disappears leaving fine lines. Occasionally there are found in some specimens two threads in front of the anterior rib. The shape of the whorls varies somewhat in the different stages. The body whorl and those near it are more globose than those in the older portion of the spire. The base of the body whorl is rounded and is ornamented with five plain, stout threads.

Number of specimens.—45 and some fragments.

Occurrence.—Buda limestone, lower beds in the first creek south of Manchaca, Texas; lower beds near contact with upper beds two and one-half miles north of Round Rock; lower beds Buda, Texas; Barton Creek, Shoal Creek, Austin, Texas.

Turritella felteri, n. sp.

Plate II, figures 7, 8

Dimensions.—Apical angle 10°, sutural angle 6°.

Description.—Shell small, slender, elongated, whorls numerous, seven or more in number, suture poorly defined, sides of whorls straight. From the anterior side of the whorl the ornamentation is as follows: two large tuberculated ribs in front of which are two plain lines; then a space with fine plain threads followed by three finely tuberculated ribs close together, the middle one smaller than the other two; posterior to these there is a pair of large tuberculated ribs separated by a thread. The anterior of this last pair of ribs is the more elevated, and the posterior is double.

Number of specimens.—1.

Occurrence.—Buda limestone, Shoal Creek, Austin, Texas.

Turritella manchacensis, n. sp.

Plate III, figures 3, 4

Dimensions.—Apical angle 25°, sutural angle 9°.

Description.—Shell small, stout, body whorl unknown, whorls slightly convex, suture well marked, height of the whorl half the width, surface of whorl marked with five square nodular ribs. The space between the posterior rib and the preceding one is equal to the width of the latter. The space between the other ribs is less than the width of a rib. The anterior rib is the largest, the one behind it is the smallest. The posterior rib is slightly smaller than the two preceding it. In front of the anterior rib are two fine plain threads. Fine striations are found between the ribs.

Comparisons.—This differs from *Turritella budaensis,* Shattuck, in having five ribs instead of four. In *T. budaensis* the two middle ribs are the most prominent, whereas in this species the anterior rib is the most prominent; in *T. budaensis* the ribs are far apart, but in our species the ribs are close together. In *T. budaensis* the apical angle is four degrees smaller than in our species.

Number of specimens.—1.

Occurrence.—Lower beds[1] of Buda limestone, first creek south of Manchaca, Texas.

Turritella knikeri, n. sp.

Plate III, figures 5, 6

Measurements.—Apical angle 7°, sutural angle 9°.

Description.—Shell is small, elongated, whorls seven or more in number, whorls high, sides of whorls flat, aperture unknown, sutures poorly defined. Ornamentation consists of three prominent nodular ribs. The rib on the anterior

[1]"In the vicinity of Austin the Buda Limestone displays two distinct phases: a lower, chalky, or marly, soft white rock, and an upper, hard, yellowish to reddish rock." Whitney.

margin of the whorl has two prominent nodular threads in front of it, the anterior of these being the larger. The other two ribs are near the posterior side of the whorl. The middle rib is the most prominent. Between the anterior rib and the middle one are two prominent nodular threads plus finer threads. There is a fine line between the two posterior ribs and two lines behind them. In addition to this ornamentation the whorl is covered with fine lines of growth.

Turritella knikeri is distinguished from *T. moorei* by the size of the angles and by the ornamentation. In *Turritella moorei* the suture is well marked and the anterior margin of the whorl is marked by an inclined striated band which does not appear in *Turritella knikeri.* In *Turritella knikeri* the height of the whorls in comparison with the width is greater than in *Turritella moorei.* In *T. knikeri* the suture is not well defined.

Number of specimens.—2.

Occurrence.—Buda limestone, Austin.

Turritella shippi, n. sp.

Plate III, figures 1, 2

Dimensions.—Apical angle 8½°, sutural angle 10°.

Description.—Shell small, elongated, sides of whorls straight, whorls five or more in number, suture well impressed at the bottom of a well defined channel. Ornamentation consists of six ribs arranged in the following order from the anterior side of the whorl: two elevated nodular ribs with an intermediate nodular thread which gives an impression of an elevated band on the whorl. On the anterior edge of this band is a nodular thread bordering the channel in which the suture is impressed. Behind the anterior pair of ribs there is a space covered with lines of growth. This is followed by two smaller nodular ribs close together. Following these there is another striated space in front of two large elevated nodular ribs the first of

which is the more prominent. These are separated by nodular threads. Lines of growth cover the whorls.

Number of specimens.—2.

Occurrence.—Buda limestone, Shoal Creek, Austin, Texas.

Turritella moorei, n. sp.

Plate III, figures 7, 8

Dimensions.—Apical angle 8½°, sutural angle 10°.

Description.—Shell small, tapering, six or more whorls, whorls high in comparison with the width, suture well marked, aperture unknown. The anterior side of the whorl appears somewhat bulging, due to a pair of elevated nodular ribs. Sometimes the anterior of these is less prominent and almost smooth. Between the two are rather heavy lines of growth. Between the suture and the anterior rib is a sharply inclined striated band which causes the whorl to be beveled on the anterior suture. Behind the bulging portion of the whorl are three well defined fine nodular ribs, and on some whorls an additional nodular thread of almost the same size as the ribs. The ribs are far apart and spaces are covered with fine nodular threads and prominent lines of growth.

Turritella moorei is distinguished from *Turritella shippi* by the shape of the whorls and by the ornamentation. *Turritella shippi* lacks the sharply inclined band that characterizes *T. moorei* and has a deep channel marking the sutural division. In *T. shippi* there are two elevated ribs on the posterior side with a pair of smaller ribs occupying the depressed central portion of the whorl. The arrangement of the ribs on *T. moorei* is quite different.

Number of specimens.—2.

Occurrence.—Buda limestone, Austin, Texas.

Turritella georgetownensis, n. sp.

Plate IV, figures 1, 2

Dimensions.—Apical angle 15°, sutural angle 3°.

Description.—Shell tall, turreted, whorls seven or more in number, suture well impressed, sides of whorls flat and square-shouldered on the posterior side, height of whorl about equal to the width. Ornamentation consists of five nodular ribs, the posterior rib slightly larger than the others. The ribs are far apart and the interspaces covered with lines of growth. Between the two anterior ribs is inserted a fine thread. The shell is not preserved well enough to tell whether this thread is plain or beaded.

Comparisons.—Comparing our species with Roemer's *Turritella seriatim-granulata* we find that the size of the apical angle of Roemer's species is 12°, while ours is 15°, and that the middle rib on the whorl of *T. seriatim-granulata* is separated from the others by fine raised lines. Gabb[1] says that the ornamentation of *T. seriatim-granulata* varies greatly and that the posterior and anterior margins of the whorls are very slightly beveled. This condition does not exist in our species which has square-shouldered whorls.

In *Turritella granulata*, Sow., var. *cenomanensis*, D'Orb. the whorls are slightly convex and have two bands that are inclined toward the sutures. This gives the whorls a beveled form, while in our species the whorls lack these bands and are square-shouldered. Also in *Turritella granulata*, Sow., var. *cenomanensis*, D'Orb. the height of the whorl in proportion to the width is greater than in our species.

Number of specimens.—1.

Occurrence.—Georgetown limestone, Shoal Creek, Austin, Texas.

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[1]Geological Survey of California, Vol. 1, p. 132.

Turritella austinensis, n. sp.

Plate IV, figures 3, 4

Dimensions.—Apical angle 18°, sutural angle 11°.

Descriptions.—Shell medium sized, tapering, whorls six or more in number. Sides of whorls flat, suture not well defined, height of whorls narrow in comparison with the width. The whorls are ornamented with five nodular ribs which are largest at the posterior side of the whorl and decrease in size toward the anterior side. In front of the anterior rib are two fine lines, sometimes one. The spaces between the ribs are covered with lines of growth and on the older whorls there is an intermediate fine line between the ribs, but in the other whorls these intermediate lines vary from one to three.

Comparisons.—This species varies from *T. georgetownensis* in its dimensions, in the shape of the shell and whorls, and in its markings. Our species resembles *Turritella manuanensis,* Newton, from South Africa,[1] but the sutural angles differ. The whorls of the South African species are beveled inwards to the suture which is well defined. In addition to the five tuberculated ribs there are eight fine lines between the suture and the anterior ribs behind which is a fine beaded line.

Number of specimens.—2.

Occurrence.—Georgetown limestone, Shoal Creek, Austin, Texas.

Turritella simondsi, n. sp.

Plate III, figures 9, 10

Dimensions.—Apical angle 21°, sutural angle 5°.

Description.—Shell large, thick, turreted, sides of whorls almost flat, suture well impressed, and posterior side of whorls square-shouldered. Whorls twice as wide as high.

[1]Newton, R. B. Cretaceous Gastropoda and Pelecypoda from Zululand.

The ornamentation of the whorls consists of five nodular ribs, the posterior of which begins at the suture and the rest follow at equal distances. The posterior rib is also the largest, the others successively decreasing in size. The anterior rib is rather narrow.

Comparisons.—This species is distinguished from *Turritella granulata,* Sow., var. *cenomanensis,* D'Orb. by the size of the apical angle, which is 15° in the latter species. In our species the posterior rib begins immediately at the suture, causing the whorl to be square-shouldered, whereas in *T. granulata,* Sow., var. *cenomanensis,* D'Orb. the whorl has two narrow bands, one slanting toward the posterior suture and the other toward the anterior suture, causing the whorl to be beveled instead of square-shouldered.

Number of specimens.—1.

Occurrence.—From east side of Mt. Bonnell, Georgetown limestone, Austin, Texas.

Turritella bonnellensis, n. sp.

Plate IV, figures 5, 6

Dimensions.—Apical angle 17°, sutural angle 13°.

Description.—Shell is small, slender, whorls high, about two-thirds as high as wide, side of whorls flat, whorls five or more in number. Suture not well defined. Ornamentation consists of four equal nodular ribs, two posterior and two anterior to the median line. In front of the anterior pair of ribs there is a smaller nodular rib. Between the pair of anterior ribs and the pair of posterior ribs there is a broad excavation or depression slightly wider than the space occupied by either pair of ribs. In this depression there is a nodular rib with a fine nodular thread behind it. In the older portion of the shell a nodular thread appears between the ribs. Ribs are close together.

Number of specimens.—3 and a mould.

Occurrence.—Georgetown limestone, east side of Mt. Bonnell and Shoal Creek, Austin, Texas.

Turritella planilateris Conrad

Turritella planilateris Conrad, Mexican Boundary Report, p. 158, Pl. 14, fig. 1a, b

Plate IV, figure 7

Description.—Shell large, sides of whorls rounded, suture well impressed. Ornamentation consists of four nodular square ribs separated by a wide space. A nodular thread occupies the space between the two middle ribs.

Our specimen is only an external mould.

Occurrence.—Georgetown limestone east of Mt. Bonnell, Austin, Texas.

Turritella mabriensis, n. sp.

Plate IV, figure 8

Dimensions.—Apical angle 28°, sutural angle about 8°.

Description.—Shell is conical, stout, suture well impressed, aperture rounded. The whorls, four or five in number, are convex. They slope abruptly toward the anterior suture, and very gently toward the posterior suture. The ornamentation of the whorls consists of five or six nodular ribs with an intermediate nodular thread between the fourth and fifth ribs from the anterior side. In front of the anterior rib are two nodular threads. In addition to these markings there are lines of growth.

Only casts of this species have been found.

Number of specimens.—14 casts.

Occurrence.—Georgetown limestone, near Camp Mabry, & G. N. R. R. cut, and Barton Creek, Austin, Tex.

PLATE I

Fig. 1, Turritella bybeei n. sp., natural size.
Fig. 2, Turritella bybeei n. sp., ×2.
Fig. 3, Turritella whitneyi n. sp., natural size.
Fig. 4, Turritella whitneyi n. sp., ×5.
Fig. 5, Turritella washitensis n. sp., natural size.
Fig. 6, Turritella washitensis n. sp., ×2.

PLATE I

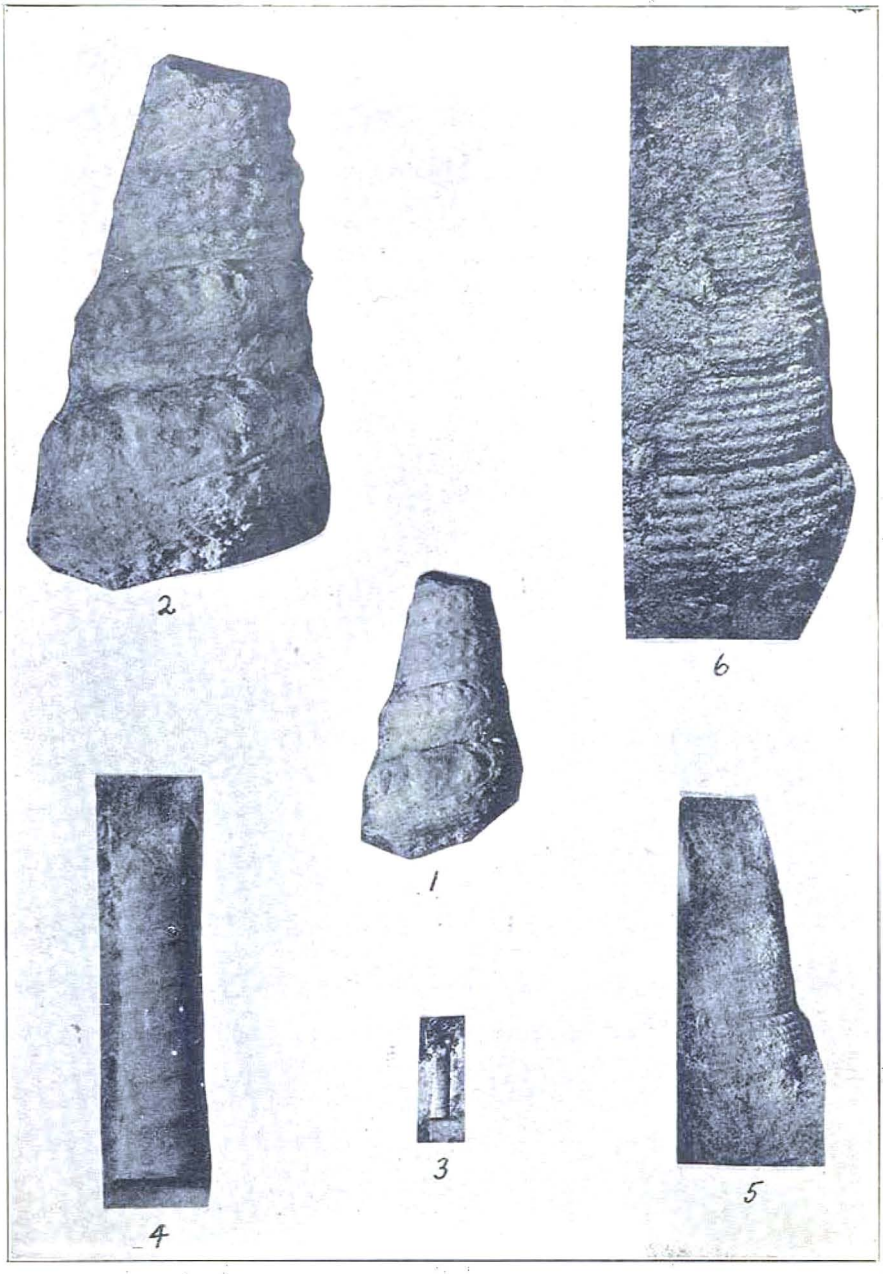


PLATE II

Figs. 1, 3, Turritella bartonensis n. sp., natural size.
Fig. 2, Turritella bartonensis n. sp., ×2.
Figs. 4, 5, 6, Turritella budaensis Shattuck, natural size.
Fig. 7, Turritella felteri n. sp., natural size.
Fig. 8, Turritella felteri n. sp., ×5.

PLATE II

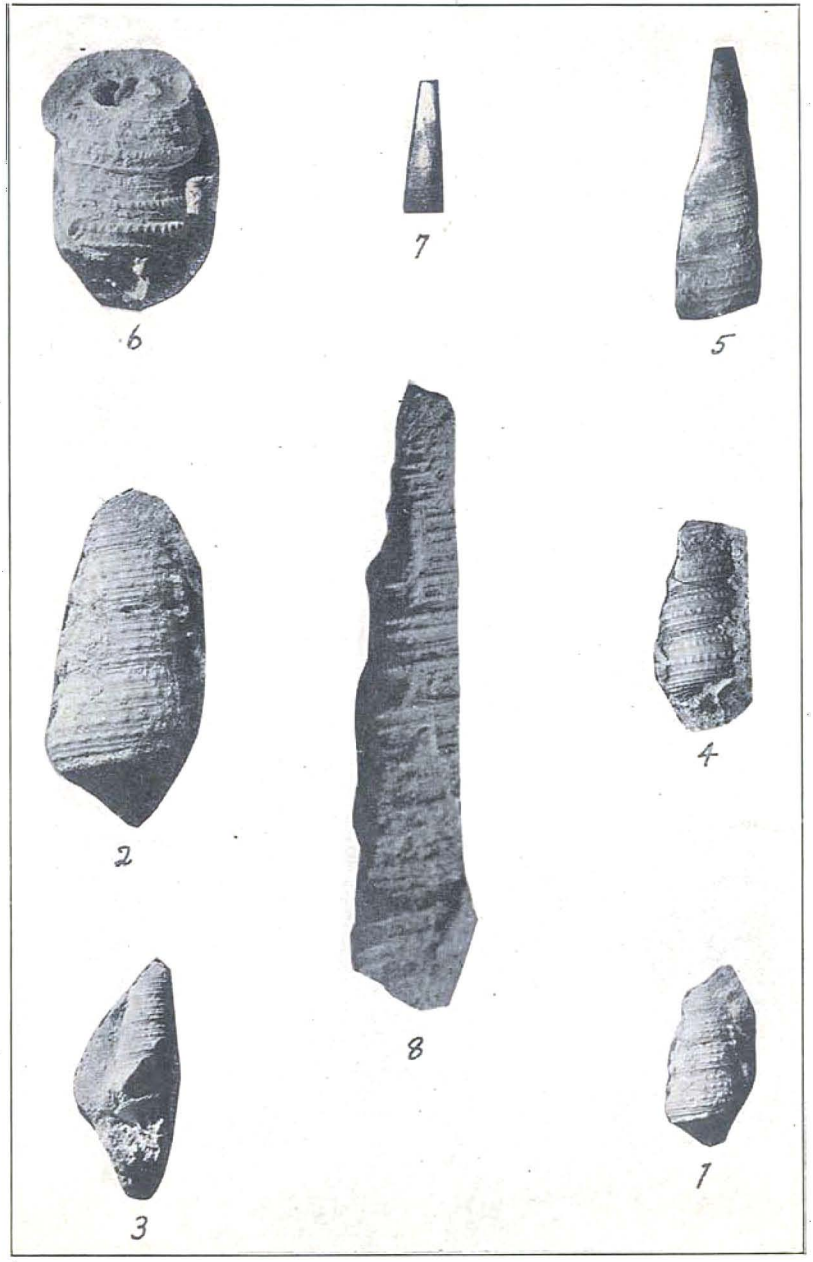


PLATE III

Fig. 1, Turritella shippi n. sp., natural size.
Fig. 2, Turritella shippi n. sp., ×3.
Fig. 3, Turritella manchacensis n. sp., natural size.
Fig. 4, Turritella manchacensis n. sp., ×2.
Fig. 5, Turritella knikeri n. sp., natural size.
Fig. 6, Turritella knikeri n. sp., ×3.
Fig. 7, Turritella moorei n. sp., natural size.
Fig. 8, Turritella moorei n. sp., ×3.
Fig. 9, Turritella simondsi n. sp., natural size.
Fig. 10, Turritella simondsi n. sp., ×2.

PLATE III

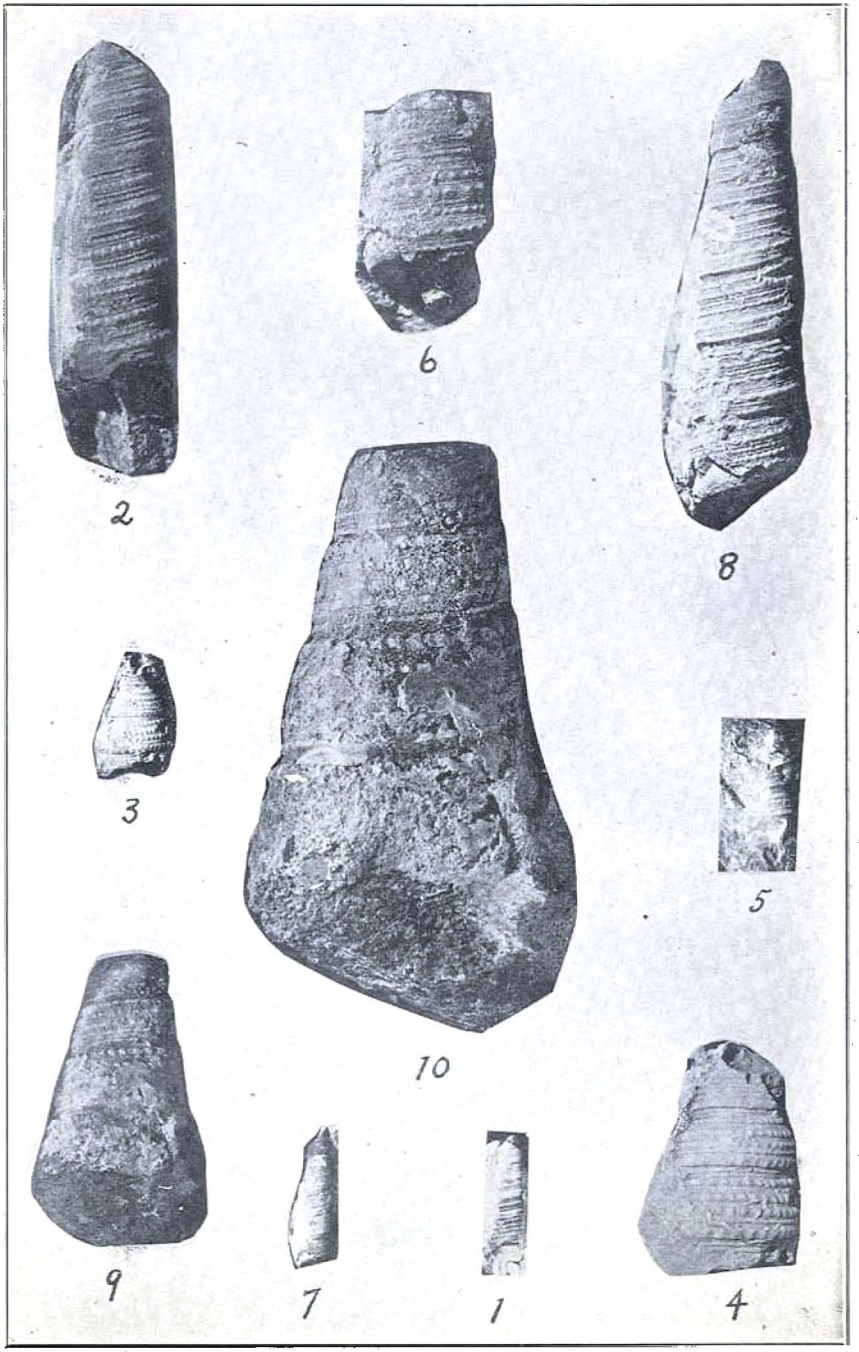
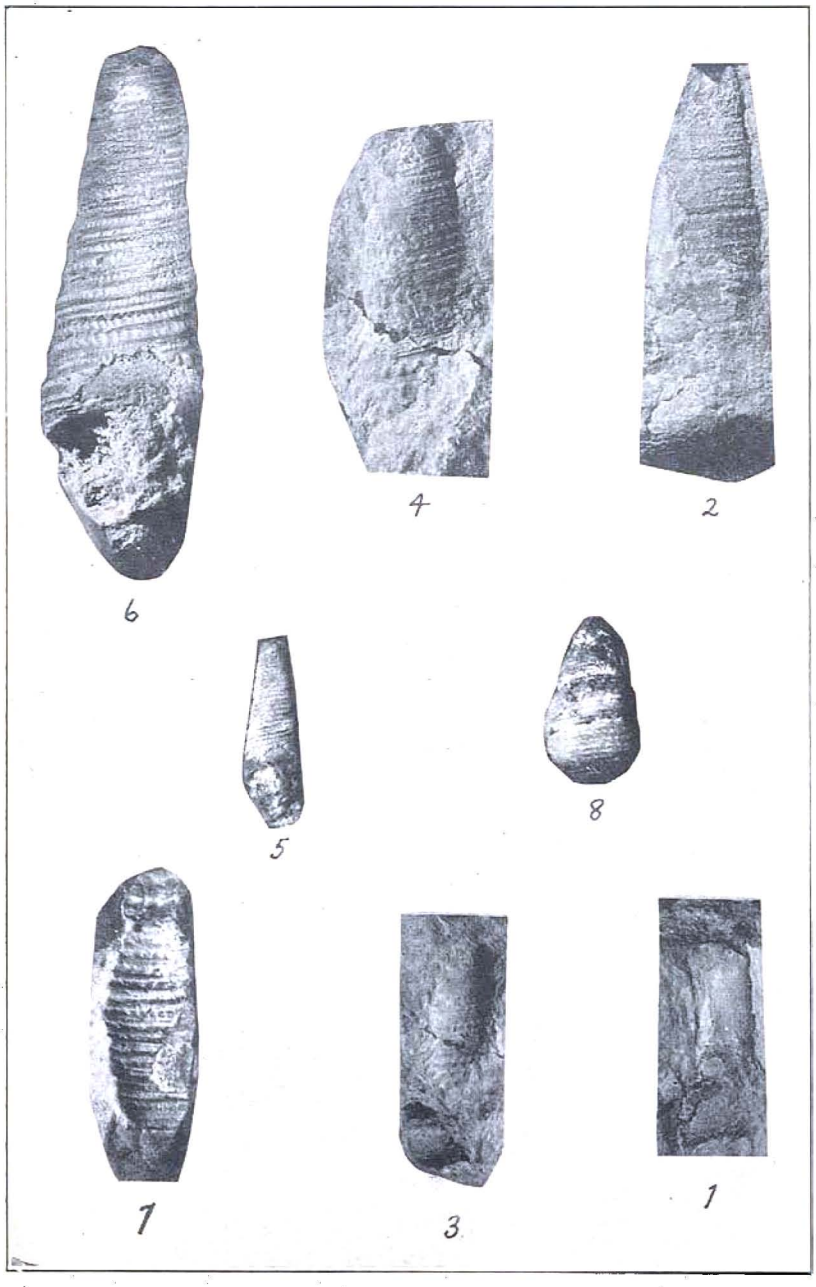


PLATE IV

Fig. 1, Turritella georgetownensis n. sp., natural size.
Fig. 2, Turritella georgetownensis n. sp., ×2.
Fig. 3, Turritella austinensis n. sp., natural size.
Fig. 4, Turritella austinensis n. sp., ×2.
Fig. 5, Turritella bonnellensis n. sp., natural size.
Fig. 6, Turritella bonnellensis n. sp., ×3.
Fig. 7, Turritella planilateris Conrad, natural size.
Fig. 8, Turritella mabriensis n. sp., natural size.

PLATE IV



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