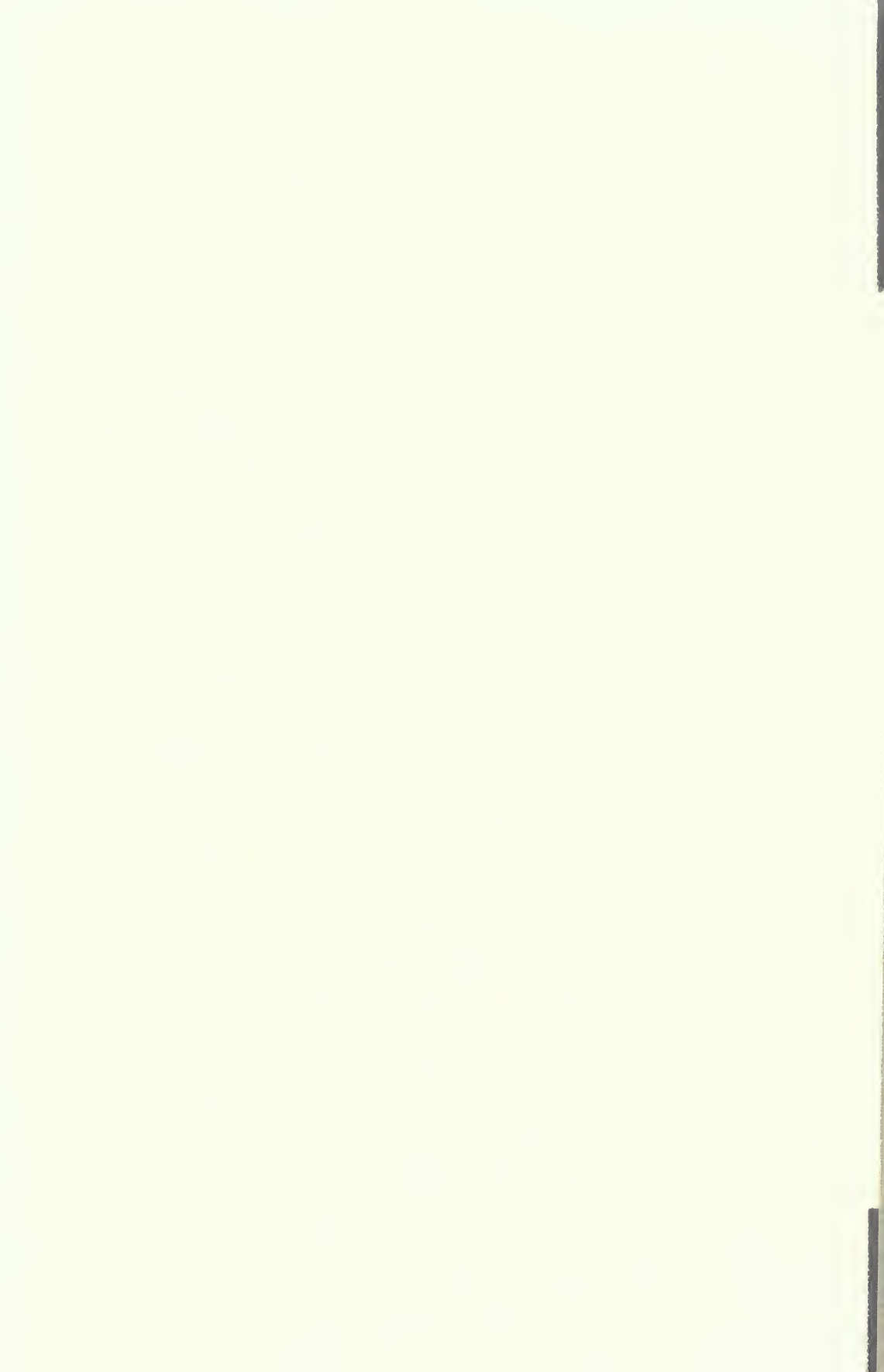


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THE CARBONIFEROUS GASTROPOD GENUS *GLABROCIINGULUM* THOMAS

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The genus *Glabrocingulum* Thomas embraces an important series of Carboniferous gastropods found throughout the world. Species referable to this genus have been described from the mid-continental area of the United States, and from Peru, Argentina, China, French Indo-China, Belgium, and Scotland. At the time *Glabrocingulum* was proposed as a genus Thomas referred to it three species from the Upper Carboniferous of Scotland. They are *Glabrocingulum beggi* E. G. Thomas, the genotype by original designation; *G. armstrongi* Thomas; and *Pleurotomaria atomarium* Phillips.

The genotype, *G. beggi* Thomas, occurs only in the Hollybush limestone of the Calciferous sandstone series of the Carboniferous of Scotland. This is commonly taken to be of Viséan age. *G. atomarium* (Phillips) is of early Namurian age and is found in the Lower Limestone group of the Carboniferous limestone series of Scotland. *G. armstrongi* Thomas occurs in the Upper Limestone group of the Carboniferous limestone series of Scotland, and is somewhat later than *G. atomarium*, although still early Namurian in age.

All three of these species occur in the Midland Valley of Scotland and probably form an ascending phylum. All of them are probably Mississippian in terms of the North American section; the genotype, *G. beggi*, certainly is. All of them are earlier than any members of the genus known to me from North America. The latest species of the Scottish sequence, *G. armstrongi*, is very similar to *G. grayvillense* (Norwood and Pratten), the earliest of the North American species. The earlier species in Scotland have the stepped profile of some of the late Pennsylvanian and Permian members of the genus, in conjunction with the large nodes near the suture, characteristic of *G. grayvillense*.

In 1944, in *Index Fossils of North America*, J. B. Knight referred two species from the Pennsylvanian of North America, *Pleurotomaria grayvillensis* Norwood and Pratten 1855 and *Phanerotrema(?) wannense* Newell 1935, to the genus *Glabrocingulum*. In 1945, Knight proposed a new genus, *Ananias*, for some species previously considered congeneric with the two North American species already mentioned. These species are *Phanerotrema(?) welleri* Newell 1935; *Pleurotomaria marcouiana* Geinetz 1866; *Phanerotrema manzanicum* Girty 1909; and *Ananias whitei* Knight 1945. Halka Chronic in 1952 named four new species from the Permian Kaibab formation of Arizona. They are *Glabrocingulum laeviliratum*, *G. coronatum*, *Ananias gibber* and *A. franciscanus*.

In my opinion the genus *Glabrocingulum* includes all of the species referred to *Ananias*. That genus was differentiated from *Glabrocingulum* by Knight on the basis of "its relatively more turreted spire, which is evident on even the earlier whorls, and by the more elevated carina occupied by the selenizone." Knight was comparing these forms to the North American representatives of the genus of the *G. grayvillense* type, and not to the Scottish genotype, *G. beggi*. However, *G. beggi* combines the characters of the genera *Glabrocingulum* and *Ananias*. This is not clearly evident from the published plates of the original description but I have had the opportunity of studying the holotype and some of the paratypes. These specimens are refigured in this paper (figs. 106-108), and they show that *G. beggi* is intermediate in the form of the spire and in ornamentation between *G. grayvillense* and *A. welleri*. This I believe to be sufficient cause to reduce *Ananias* to the rank of subgenus of *Glabrocingulum*. The content of *Ananias* should remain the same as before with the exception of *Phanerotrema(?) wannense* Newell. This species is sufficiently similar to *G. beggi* to be included in the subgenus *Glabrocingulum* sens. str. *Ananias* is distinguished from *Glabrocingulum* sens. str. as before.

The Pennsylvanian members of *Ananias* are *Glabrocingulum (Ananias) marcouiana* (Geinetz) and *G. (Ananias) welleri* (Newell). The principal difference between these two species, in my opinion, based upon topotypical material from both species, is one of size. When comparisons are made at the same size all the characters seem to be equally developed. As *G. welleri* becomes larger (the largest specimen of *G. welleri* examined is three times as large as the largest of *G. marcouiana*), the selenizone becomes relatively

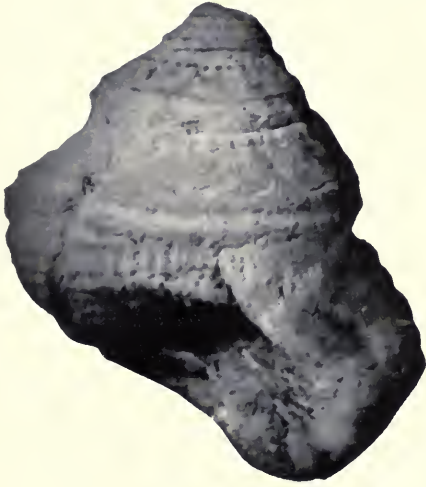


FIG. 106. Apertural view of holotype of *Glabrocingulum beggi*, no. 1939-6 Dunlop Collection, Royal Scottish Museum; $\times 8$.



FIG. 108. Paratype of *Glabrocingulum beggi*, no. S 9064 Hunterian Collection, Royal Scottish Museum; $\times 7.3$.



FIG. 107. Apertural view of figured paratype of *Glabrocingulum beggi*, no. 1939-7 Dunlop Collection, Royal Scottish Museum; $\times 8$.

more elevated above the whorl surface and the suture drops below the selenizone relatively more than before. Both of these growth trends appear also in *G. grayvillense*. The ornamentation on these species lacks the enlarged nodes near the suture characteristic of *Glabrocingulum* sens. str.

The genus *Glabrocingulum*, then, includes *G. (G.) beggi* Thomas, the genotype; *G. (G.) armstrongi* Thomas; *G. (G.) atomarium* (Phillips); *G. (G.) grayvillense* (Norwood and Pratten); *G. (G.) wannense* (Newell); *G. (G.) laeviliratum* Chronic; *G. (G.) coronatum* Chronic; *G. (G.) gibber* (Chronic); *G. (Ananias) franciscanus* (Chronic); *G. (Ananias) marcouiana* (Geinetz); *G. (Ananias) welleri* (Newell); and *G. (Ananias) whitei* (Knight). From the published plates, species that appear to be referable to the genus include *Mourlonia*

nana Yin 1932, from the Upper Carboniferous of Shansi, China; *Pleurotomaria (Mourlonia) sarrauti* Monsuy, from the Upper Carboniferous of French Indo-China; *P. amotapensis* H. D. Thomas 1930, from the Upper Carboniferous of Peru; *P. advena* Reed 1927 and *P. argentina* Reed 1927, both from the Upper Carboniferous of Argentina. Each of these species has the flat upper surface of the whorl, the concave selenizone, the rows of nodes formed by the intersection of growth lines and revolving lines, and the broadly convex base. The plates in each case are of sufficient quality to justify assigning these species to the genus *Glabrocingulum*.

The genus *Glabrocingulum* may best be characterized by its ornamentation. The selenizone lies on the angle between the upper and lower surfaces, between two carinae, the lower one of which generally forms the margin. Both revolving and transverse lines of ornamentation are present on the upper and lower surfaces with small nodes or pustules at the intersections of the two systems of lines. In some species several rows of nodes near the suture are enlarged. The whorl cross section is approximately circular but is generally straight from the suture to the selenizone. The slit is quite deep, approximately 60° of arc on the periphery. The upper surface of the shell may have a steplike profile or it may be straight. The pleural angle varies from 70° to 110°.

***Glabrocingulum grayvillense* (Norwood and Pratten 1855)**

Glabrocingulum grayvillense was originally described by Norwood and Pratten (1855, p. 75). Their description is as follows:

Shell small, being about half an inch in breadth and the same in length. Whorls five, flattened above; the body whorl rounded below. Spiraling angle 102°. Shell covered with longitudinal lines, crossed by lines of growth, giving it the appearance of being garnished with small tubercles. The upper line of tubercles on each whorl, near the suture, is much more prominent than the others, forming a raised ornamental band. The band of the sinus is large, and separated from the inferior part by a furrow. Mouth sub-quadrangular; exterior lip sharp; columella lip thickened, the columella terminating below in a point.

Geological Position and Localities: This species occurs in the coal measures, and is quite common in the shales near the mouth of Rush creek, Posey county, Indiana, and Grayville, Illinois. It is also found near Shawneetown, and in the neighborhood of Galatia, Saline county, Illinois.

Illinois State Collection.

The holotype and the type locality have never been designated. The whereabouts of this "Illinois State Collection" is not known. However, in the collection of Chicago Natural History Museum, cata-



FIG. 109. Neotype of *Glabrocingulum grayvillense*, P-16649 (1) Chicago Natural History Museum; $\times 4.2$.

FIG. 110. The largest paratype of *Glabrocingulum grayvillense*, P-16649 (3) Chicago Natural History Museum; $\times 5$.



logued under P16649, there are three specimens which are listed as having been collected by Henry Pratten in the Grayville locality. Since the species is named for the town, and since the only collecting area near the town is quite restricted in extent, making it possible for the specimens to be localized, I am designating as the neotype of the species the specimen marked no. 1, and the type locality as follows: three-inch limy marl bed in gray shale, 20 feet below the railroad tracks on the west bank of the Wabash River near Grayville, White County, Illinois, SW $\frac{1}{4}$ of SE $\frac{1}{4}$ of NW $\frac{1}{4}$ of Section 21, T. 3 S., R. 14 W. The neotype and the largest paratype are shown (figs. 109-110).

The original description and plates are inadequate and in one case misleading. The columella is described as terminating in a point; actually the point was produced when the lip broke off to the end of the deep slit, leaving the columellar edge of the lip standing. To correct this impression I am figuring the neotype and one of the paratypes in this paper. Girty (1915) redescribed the species on the basis of specimens from the Wewoka formation

of Oklahoma. This description is the one that is commonly used for this species. Girty notes a difference between the original description of the spiral (pleural) angle of 102° and the angles of his specimens, all less than 90° . This difference is real, since a sample of 25 specimens from the Grayville locality had a mean value for the pleural angle of 102.32° and a standard deviation of 7.55° , while a sample of 47 specimens from one of Girty's localities had a mean value of 96.33° and a standard deviation of 5.13° . The probability that these two samples could have been drawn from the same statistical population, based on the standard formula for the significance of the difference of two means (Miller, 1949), is less than 0.001. This appears to be the only large difference between the topotypical materials of *Glabrocingulum grayvillense* and Girty's specimens, and I do not think it sufficiently important to give his specimens a new specific name.

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