

PLATE 131.

CALCEOLA PROTEUS, Nov. Spec.

Niagara.

1. Anterior view of a proliferous corallum, from the Upper Niagara white clay, near Louisville. Collection of the author.
 2. View of portions of some corallets partly imbedded in rock matrix; from the Upper Niagara strata, Falls of the Ohio. Collection of Mr. Nettelroth.
 3. Posterior view of a large corallum, from the white clay of the Upper Niagara, near Louisville. Collection of Mr. Nettelroth.
 4. Posterior view of a corallum of average size, from the red clay of the Upper Niagara, near Louisville. Collection of the author.
 5. View of the calyx and oblique anterior view of a corallum, from the horizon and neighborhood of example 4. Collection of the author.
 6. View of the calyx and oblique posterior *view* of a corallum, from the locality of specimen 5.
 8. 9. Oblique views (8 inverted) of small coralla, from the Upper Niagara white clay, near Louisville. Collection of the author.
 7. Oblique view of a corallum, whose calyx is closed by an operculum; from the white clay of the Upper Niagara, near Louisville. Collection of Mr. Nettelroth.
 14. 15. 16. Oblique views of coralla, with calyces closed by opercula; from the horizon and vicinage of specimen 7. Collection of the author.
 13. View of the exterior surface of the operculum of a corallum of average size; from the horizon and neighborhood of example 7. Collection of Mr. Nettelroth.
 17. View of the operculum of a small corallum from the same place. Collection of the author.
 10. View of a gem detached from its parent.
 11. Posterior view of a gemmiferous corallum.
 12. Posterior view of a fortuitously detached gem.
- Specimens 10, 11, 12, are from the Upper Niagara red clay strata, near Louisville. Collection of the author.

[NOTE.—In Fig. 18 an oblique posterior view of a corallum of *Calceola sandalina*, an European form said to be from the Devonian strata of the Eifel, closed by an operculum, is here presented for comparison with our Niagara species.]

KENTUCKY GEOLOGICAL SURVEY.

PLATE 131.

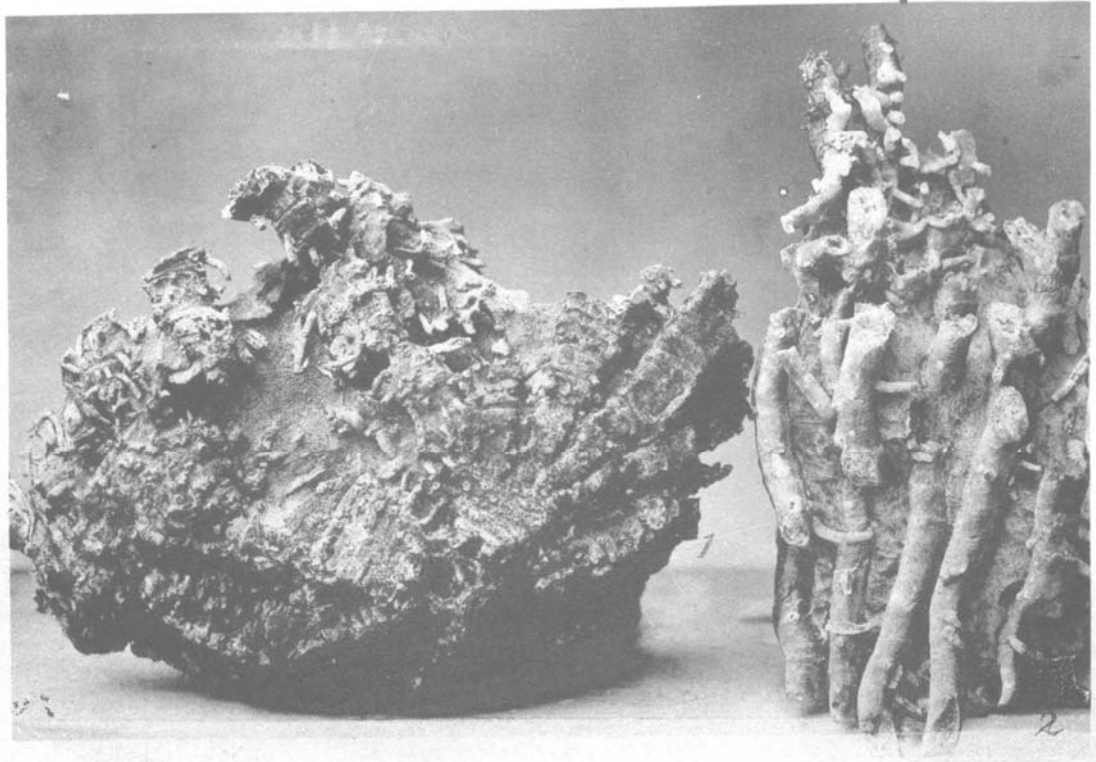
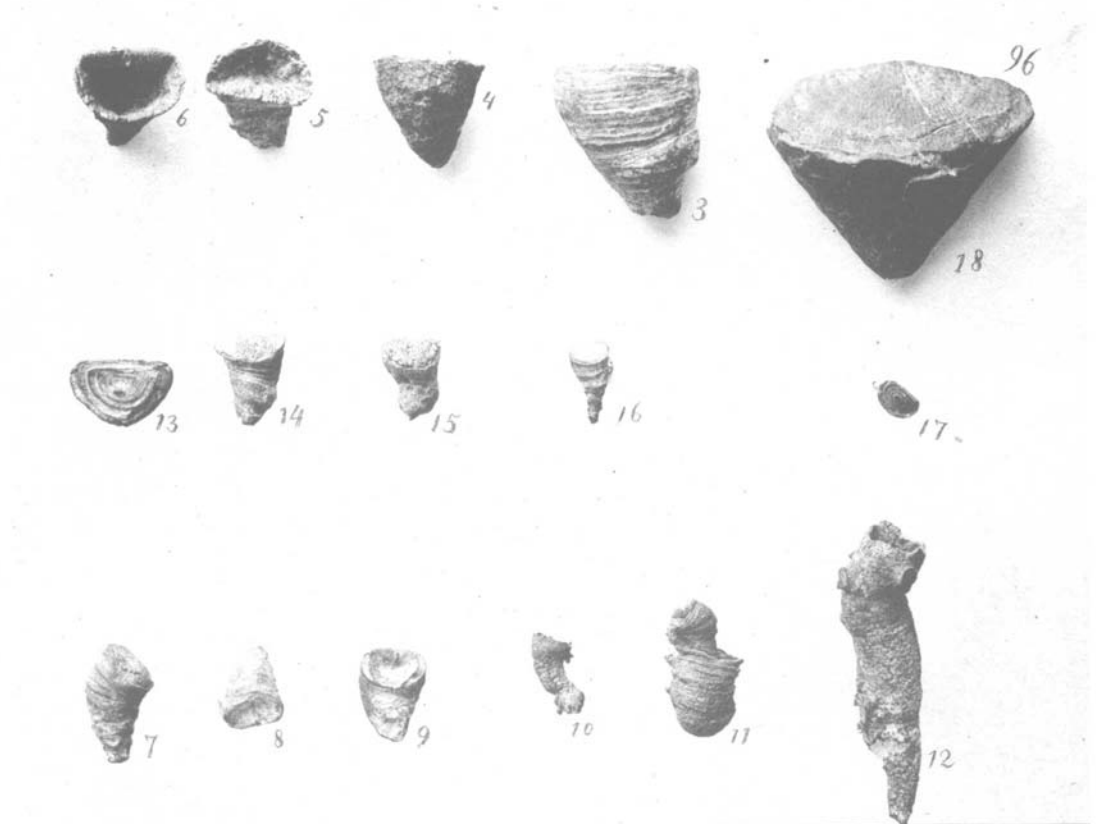


PLATE 132.

ZAPHRENTIS CORNICULUM.

Hudson River Group.

1. Left lateral view of an adult corallum, from the Hudson River Group of the Lower Silurian formation, near Milton.
2. Oblique view of the calyces of two small inosculated coralla from the same place.
3. View of the calyx of a small corallum from the same place.

ZAPHRENTIS SPONGIAXIS.

Niagara.

4. Right lateral view of a corallum, from the white clay of the Upper Niagara, near Louisville.
5. Lateral view of a corallum, with part of the calyx wall removed, so as to show the spongiöse central cone; from the red clay of the Upper Niagara, near Louisville.
6. View of the calyx, with walls fortuitously removed, and oblique anterior view of a corallum, from the horizon and neighborhood of specimen 4. Collection of Mr. Gaines.

ZAPHRENTIS UNICA, Nov. Spec.

Niagara.

7. Left lateral view of a corallum, from the red clay strata of the Upper Niagara, near Louisville.
8. Similar view of a geniculated corallum, from the white clay beds of the Upper Niagara, near Louisville.
9. Right lateral view of a corallum.
10. Posterior view of a corallum.
Specimens 9 and 10 from the horizon and vicinage of example 8.

ZAPHRENTIS RADICANS.

Niagara.

11. Anterior view of a corallum, with apex broken off, from the Upper Niagara red clay, near Louisville.
12. Left lateral view of a corallum, with anterior calyx wall fortuitously removed, from the Upper Niagara red clay, near Louisville.
13. Posterior view of a young corallum, from the horizon and vicinity of specimen 11.

AMPLEXUS SHUMARDI.

Niagara.

14. Fragments of two coralla, partly imbedded in chert matrix, from the Upper Niagara red clay, near Louisville.

The specimens figured in this Plate, with the exception of 6, belong to the collection of the author.

KENTUCKY GEOLOGICAL SURVEY.

PLATE 132.

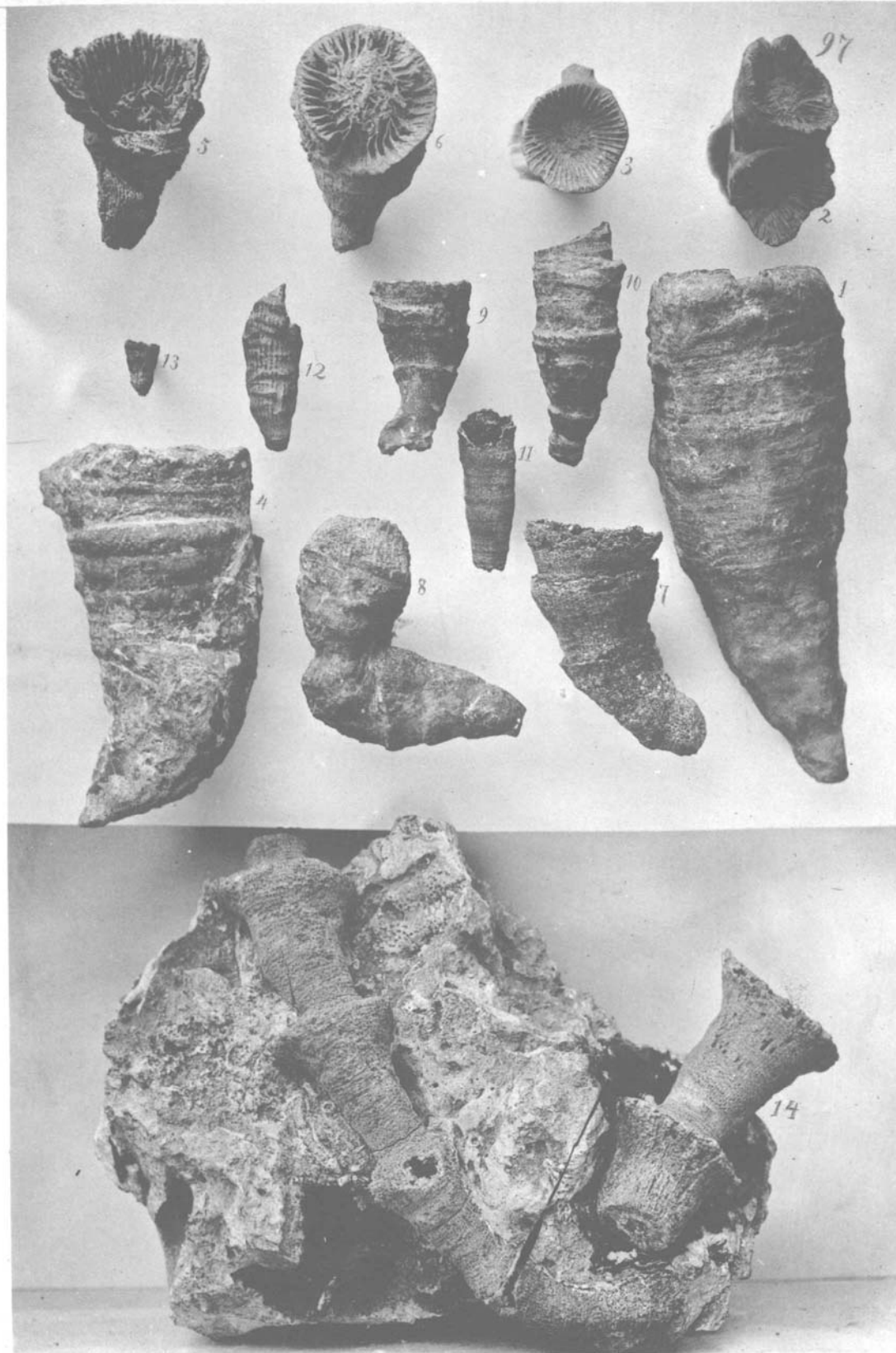


PLATE 133.

ZAPHRENTIS SCUTELLA, Nov. Spec.

Niagara.

1. Left lateral view of a corallum, with calyx filled with rock, from the Upper Niagara, near Louisville. Collection of the author.
2. Similar view of a weathered corallum, from the Upper Niagara red clay, near Louisville.
3. View of the exterior of a corallum, from the Upper Niagara white clay, near Louisville. Collection of the author.

ZAPHRENTIS PATULA.

Niagara.

4. Right lateral view of a corallum, from the lower strata of the Niagara period, near Brunerstown, Jefferson county. Collection of the author.
5. View of the calyx of a corallum.
6. Oblique views of inosculated coralla.
Examples 5 and 6 from the locality of specimen 4. Collection of the author.

ZAPHRENTIS SOCIALIS, Nov. Spec.

Niagara.

7. Right lateral view of a corallum.
8. 9. Views of the calyces of coralla.
From the horizon and vicinage of *Z. patula*. Collection of the author.

ZAPHRENTIS PATENS, Nov. Spec.

Niagara.

10. Left lateral view of a corallum.
11. View of the calyx of a corallum.
Both from the horizon and vicinage of *Z. patula* and *Z. socialis*.
Collection of the author.

ZAPHRENTIS CONULUS.

Niagara.

12. Right lateral view of a corallum.
13. Posterior view of a corallum.
14. View of the calyx of a corallum.
From the Upper Niagara ferruginous clay, near Louisville. Collection of the author.

PLATE 133— *Continued.*

ZAPHRENTIS OBLIQUA, Nov. Spec.

Niagara.

15. Left lateral view of a corallum.
16. Posterior view of a corallum.
17. View of the calyx of a corallum.

From the horizon and vicinage of *Z. conulus*. Collection of the author.

CYATHOPHYLLUM EXIGUUM.

Devonian.

18. View of the calyx of a large corallum, from the Lower Devonian rocks, Falls of the Ohio. Collection of Mr. McConathy.
19. View of the calyx of a corallum of average size, from the horizon and locality of example 18. Collection of the author.
20. Posterior view of a corallum.
21. Right lateral view of a corallum.
22. View of the calyx of a corallum.

[NOTE.—In example 22 the lamellae from the inner rim to the outer rim of the calyx wall seem to be faintly carinated. Other examples are so obscurely carinated as to superficially resemble *Zaphrentis*, with which genus they have been classed by Rominger.]

Specimens 20, 21, 22, are from the ferruginous clay of the Lower Devonian, near Louisville. Collection of the author.

CYATHOPHYLLUM EXIGUUM, varietas ELONGATUM, Nov. Var. *Devonian.*

23. Left lateral view of a robust corallum, from the Lower Devonian rocks, Falls of the Ohio.
24. View of the calyx and oblique anterior view of a corallum, from the Lower Devonian ferruginous clay, near Louisville.
Collection of the author.

ZAPHRENTIS REYNOLDSI, Nov. Spec.

Devonian.

25. Anterior view of a corallum. Collection of the author.
26. Left lateral view of a corallum. Collection of Mr. Nettelroth.
27. View of the calyx of a corallum. Collection of Mr. Nettelroth. From the ferruginous clay of the Lower Devonian, near Louisville.

ZAPHRENTIS LINNEYI, Nov. Spec.

Devonian.

28. Posterior view of a corallum. Collection of the author.
29. Left lateral view of a corallum. Collection of the author.

PLATE 133—*Continued.*

30. Anterior view of a large corallum. Collection of Mr. Nettelroth.

31. View of the calyx of a corallum. Collection of the author.

From the ferruginous clay of the Lower Devonian, near Louisville.

ZAPHRENTIS UNGULA.

Devonian.

32. Posterior view of a corallum, from the Lower Devonian rocks,
Falls of the Ohio.

33. Left lateral view of a corallum, from the same place.

34. Anterior view of a slender corallum of unusual altitude, with laminated structure obscured by the deposition of silica in annular dots during fossilization; from the ferruginous clay of the Lower Devonian, near Louisville.

35. View of the calyx of a corallum, from the horizon and neighborhood of the preceding specimen.

Collection of the author.

KENTUCKY GEOLOGICAL SURVEY.

PLATE 133.



PLATE 134.

ZAPHRENTIS CONIGERA.

Devonian.

1. Left lateral view of a corallum.
2. Right lateral view of a corallum.

Both from the Lower Devonian rocks, Falls of the Ohio.

ZAPHRENTIS COMPRESSA.

Devonian.

3. Posterior view of a corallum, from the Lower Devonian rocks, Falls of the Ohio.

ZAPHRENTIS EXPLANATA, Nov. Spec.

Devonian.

4. Anterior view of an elongated conical corallum of medium size.
5. Left lateral view of a corniform corallum.
6. View of the calyx and oblique anterior view of a corallum of common form.

From the dark-red clay derived from the decomposition of the encrinal limestone of the Upper Devonian, near Louisville.

ZAPHRENTIS EXILIS, Nov. Spec.

Devonian.

7. Posterior view of a corallum.
8. Anterior view of a corallum.

From the blue clay of the Middle Devonian, Falls of the Ohio.

ZAPHRENTIS TORQUATA, Nov. Spec.

Devonian.

9. 10. Lateral views of coralla.
11. View of the calyx of a corallum.

From the red clay of the Middle Devonian, near Louisville.

ZAPHRENTIS NODULOSA.

Devonian.

12. Left lateral view of a corallum, from the Lower Devonian rocks, Falls of the Ohio.
13. Left lateral view of the lower portion of a corallum, from the ferruginous clay of the Lower Devonian, near Louisville.

The examples figured in this Plate belong to the collection of the author.

KENTUCKY GEOLOGICAL SURVEY.

PLATE 134.

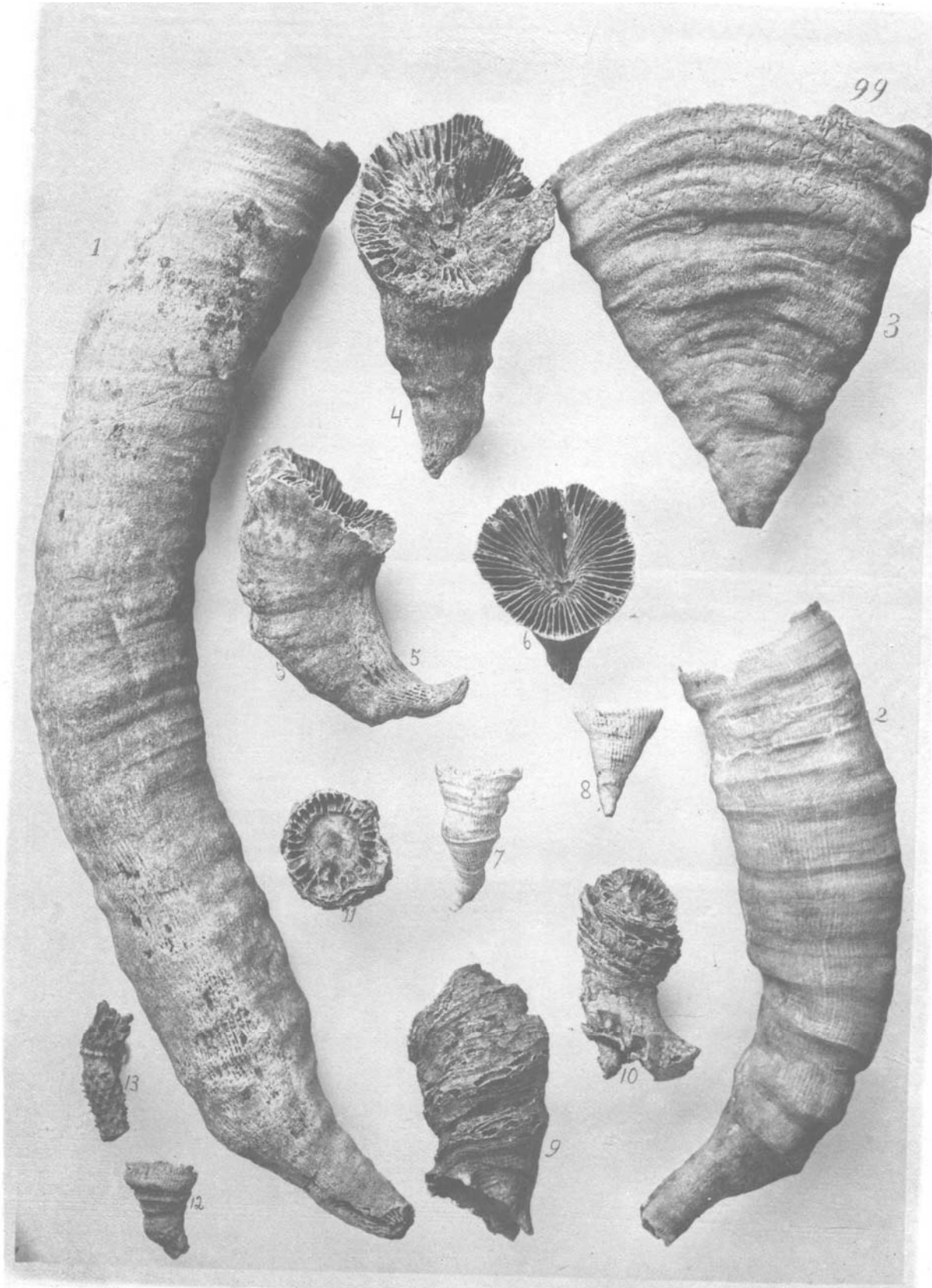


PLATE 135.

ZAPHRENTIS PROLIFICA.

Devonian.

1. Left lateral view of a corallum, from the Middle Devonian red clay, near Louisville.

ZAPHRENTIS RAFINESQUI.

Devonian.

2. Lateral view of a flexuous adult corallum.
3. Left lateral view of a corallum.
4. Right lateral view of a corallum of medium size.
5. Left lateral view of a young corallum, with radiciform processes of attachment.
6. Posterior oblique view of a corallum, with radiciform processes of attachment.

From the blue clay of the Middle Devonian, Falls of the Ohio.

ZAPHRENTIS YANDELLI.

Devonian.

7. Right lateral view of an adult corallum.
8. Right lateral view of a corallum.

Examples 7 and 8 are from the blue clay of the Middle Devonian, Falls of the Ohio.

9. Right lateral view of a fragment, with a portion of the wall removed, so as to show the lamella and the diaphragm of the calyx, and the siphuncular fovea connecting the calyx with the interior cavity; from the red clay of the Middle Devonian, near Louisville.

ZAPHRENTIS ROMINGERI, Nov. Spec.

Devonian.

10. Posterior view of an adult corallum, from the Middle Devonian blue clay, Falls of the Ohio.

The specimens figured in the Plate are from the collection of the author.

KENTUCKY GEOLOGICAL SURVEY.

PLATE 135.

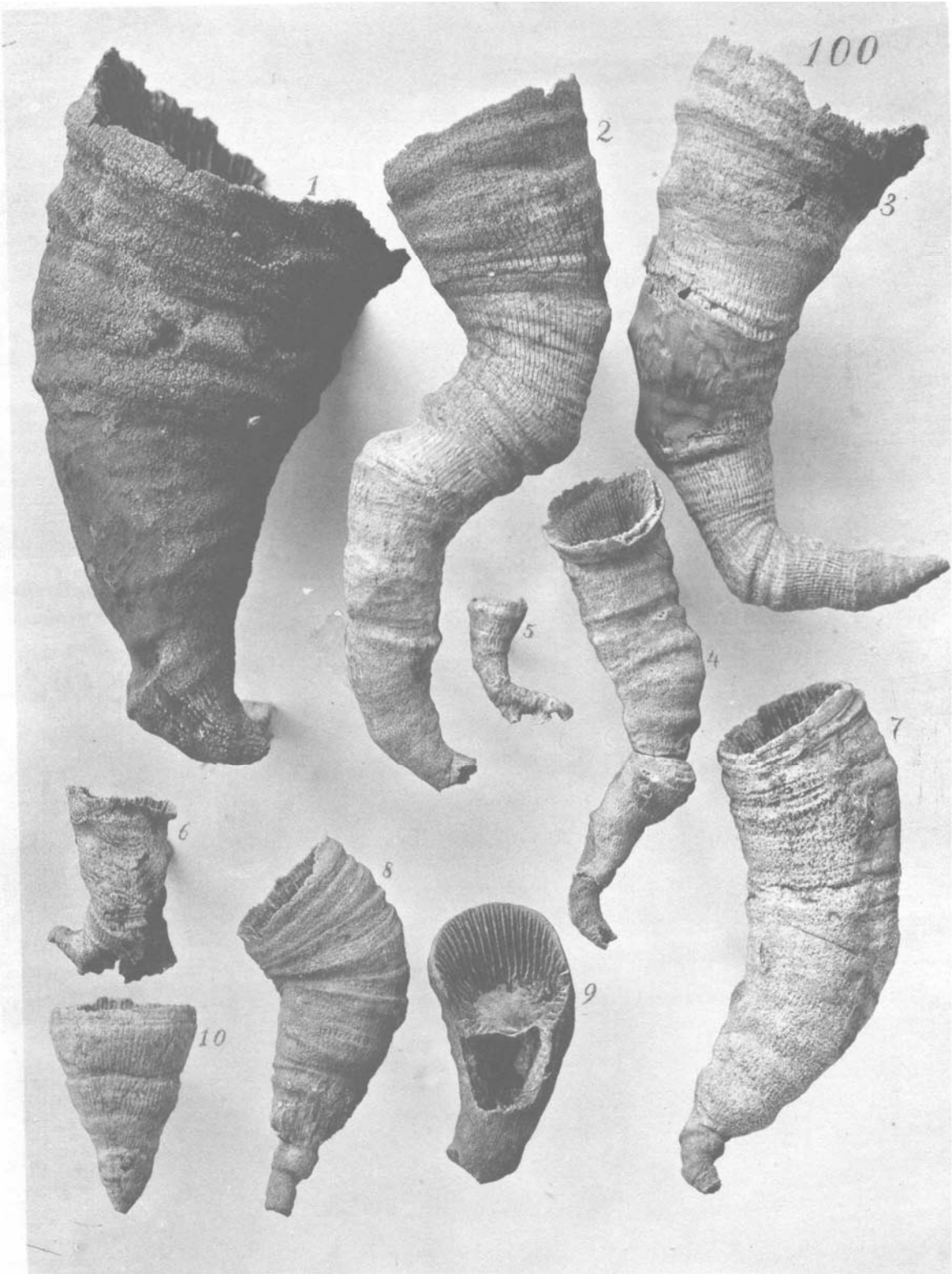


PLATE 136.

ZAPHRENTIS MACONATHI, Nov. Spec.

Devonian.

1. Right lateral view of a corallum of medium size, from the blue clay of the Middle Devonian rocks, Falls of the Ohio.
2. Left lateral view of a corallum, from the same horizon and locality.
3. Anterior view of the upper part of a corallum of gigantic dimensions, with wall broken down, so as to show the radial lamellae and the smooth plane diaphragm of the calyx; from the Lower Devonian rocks, Falls of the Ohio.
4. Right lateral view of a young corallum, from the Middle Devonian red clay, near Louisville.

The specimens figured in the Plate belong to the collection of the author.

KENTUCKY GEOLOGICAL SURVEY.

PLATE 136.

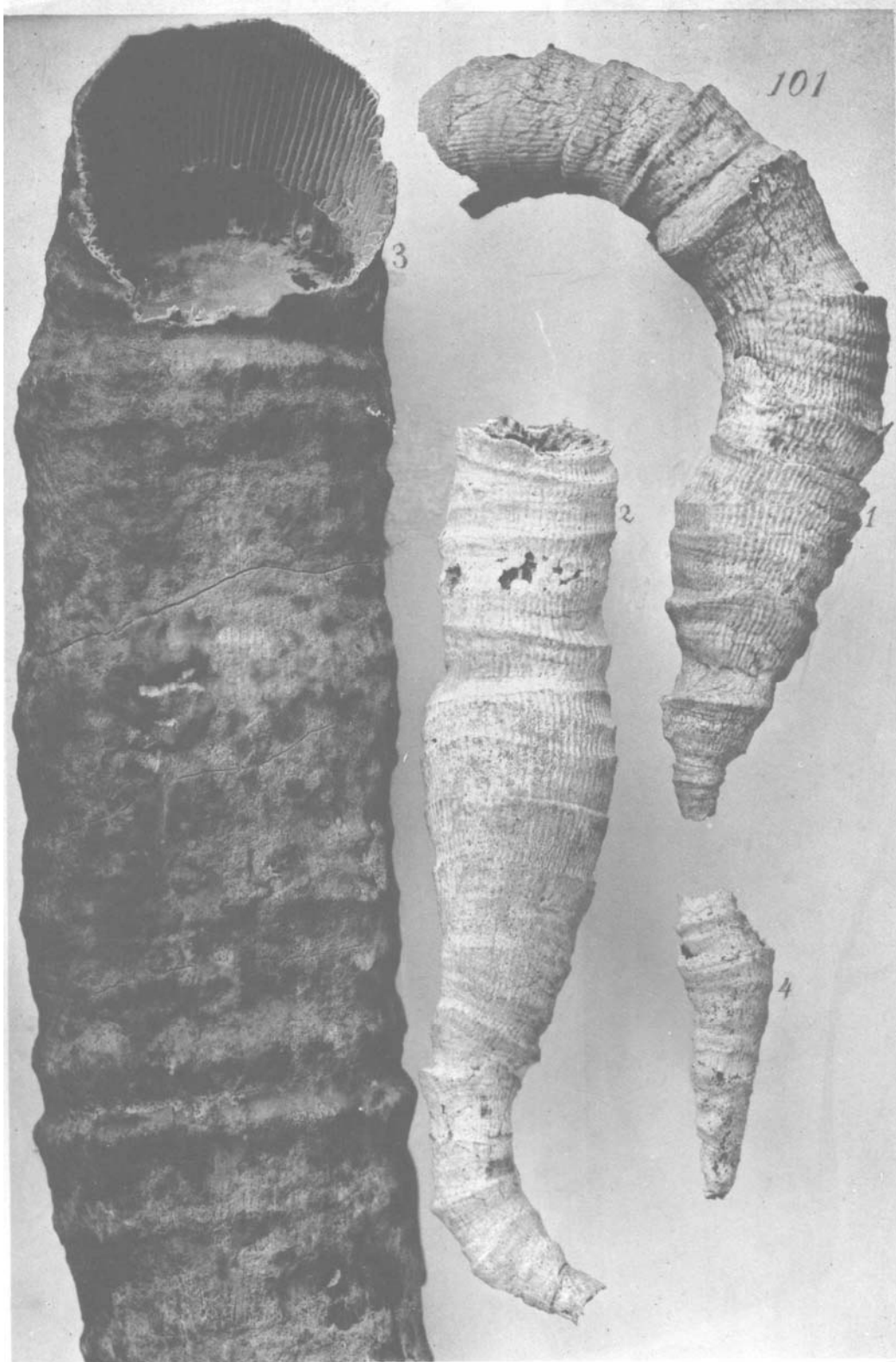


PLATE 137.

ZAPHRENTIS GIGANTEA.

Devonian.

1. Right lateral view of a corallum of medium size, with a portion of the calyx wall removed, so as to show the lamellae and the diaphragm or floor of the calyx carinated by the primary lamellae; from the Lower Devonian rocks, Falls of the Ohio.
2. Section of a fragment, showing the thickness of the wall, the arrangement of the lamellae, and the diaphragms and the inchoate pseudo-diaphragms which, in certain places, appear like dissepiments in the interloculi; from the horizon and locality of the preceding specimen. Collection of the author.

KENTUCKY GEOLOGICAL SURVEY.

PLATE 137.

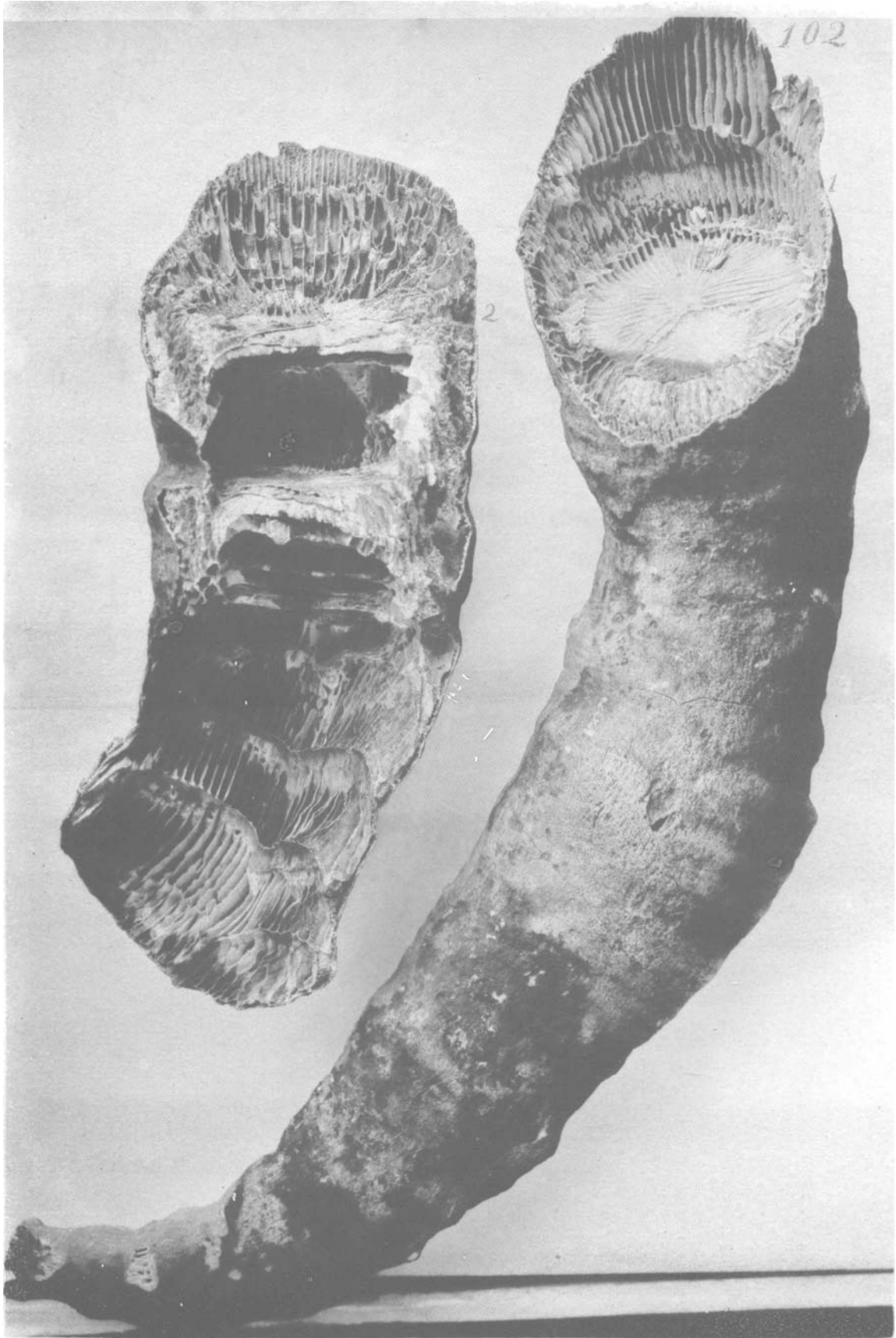


PLATE 138.

1. View of the calyx of *Zaphrentis gigantea*.
2. View of the calyx of *Zaphrentis immanis*.
3. View of the calyx of the *Amplexus shumardi* in Plate 132, Fig. 14.
4. View of the calyx of *Zaphrentis compressa*, with anterior wall partly broken.
5. View of the calyx of the *Zaphrentis linneyi* in Plate 133, Fig. 30.
6. View of the calyx of the *Zaphrentis unguis* in Plate 133, Fig. 32.
7. View of the calyx (anterior wall removed) of the *Zaphrentis nodulosa* in Plate 134, Fig. 12.
8. View of the calyx of an adult corallum of *Zaphrentis corniculum*.
9. View of the calyx of the *Zaphrentis prolifica* in Plate 135, Fig. 1.
10. View of the calyx of the *Zaphrentis exilis* in Plate 134, Fig. 8.
11. View of the calyx of *Zaphrentis yandelli*.
12. View of the calyx of *Zaphrentis conigera*.
13. View of the calyx of the *Zaphrentis rafinesqui* in Plate 135, Fig. 2.
Collection of the author.

KENTUCKY GEOLOGICAL SURVEY.

PLATE 138.

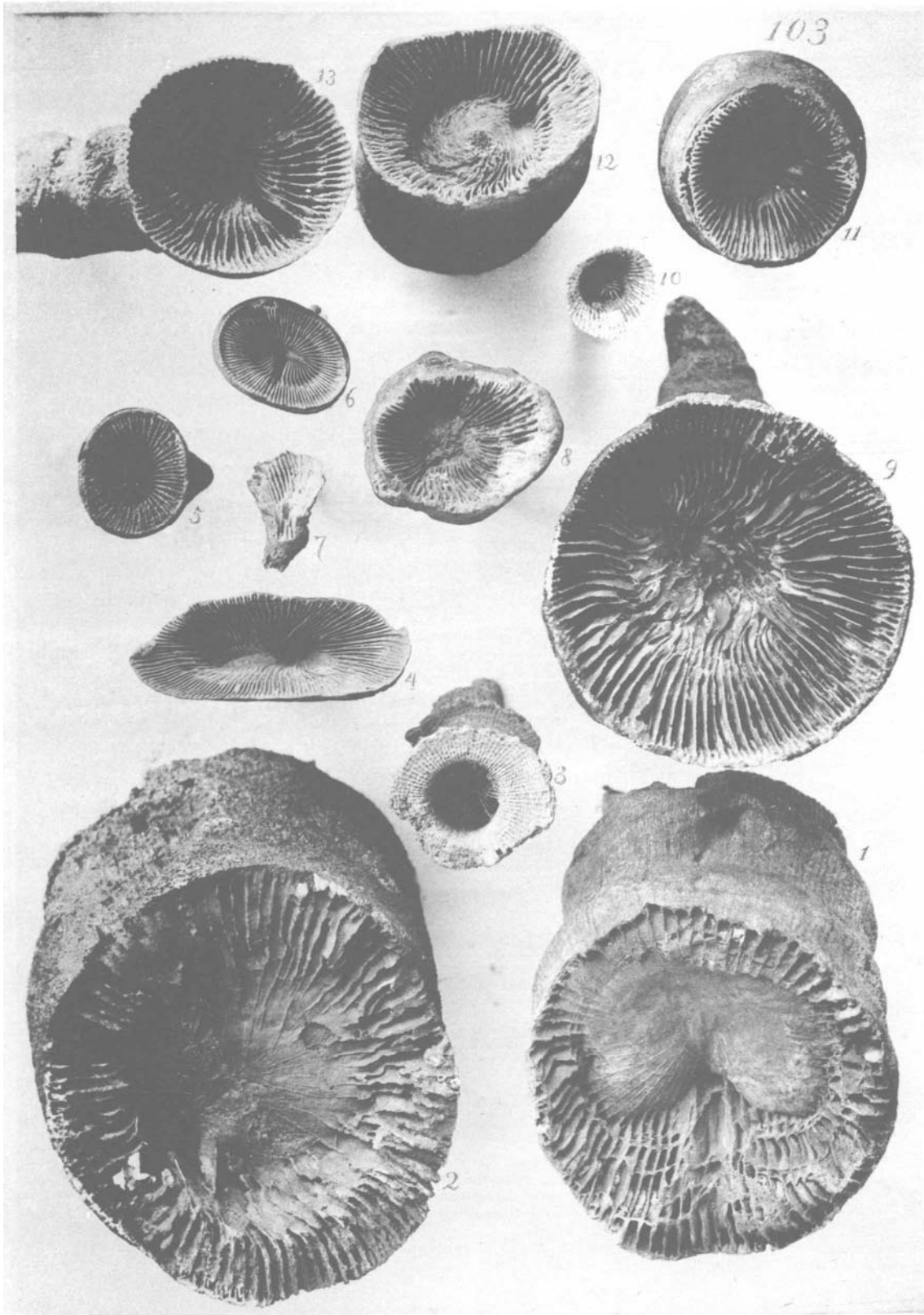


PLATE 139.

ZAPHRENTIS IMMANIS, Nov. Spec.

Devonian.

Right lateral view of a corallum, half natural size, from the Middle
Devonian rocks, Falls of the Ohio. Collection of the author.

