

ON THE WALDRON FAUNA AT TARR HOLE, INDIANA.

BY EDGAR R. CUMINGS.

Perhaps no locality is more famous for its fossils, or better known to collectors than Waldron, Indiana. There is another locality, however, which, though less well known, promises to afford almost as rich a field for collecting. I refer to Tarr Hole, in Bartholomew County, Indiana.

This locality, though mentioned by Foerste and others of the Indiana Geological Survey, has never hitherto afforded an extensive list of fossils. Two years ago the present writer visited the locality in company with a student of the department of geology of Indiana University, and made a collection from which the following species have been identified. The bed is excavated each spring by the high water, the fossils being spread out over a sand spit, making their collection very easy. (The species are listed in the order of identification.)

1. *Eucalyptocrinus* (roots) (c).
2. *Trematopora osculum* Hall (rr).
3. *Saginella elegans* Hall (rr).
4. *Trematopora infrequens* Hall (rr).
5. *Spirifer bicostatus* var. *petilus* Hall (rr).
6. *Chaetetes consimilis* Hall (r).
7. *Lichenalia concentrica* Hall (c).
8. *Trematopora subimbricata* Hall (rr).
9. *Eucalyptocrinus caelatus* Hall (c).
10. *Dalmanites verrucosus* Hall (c).
11. *Fenestella acmea* Hall (rr).
12. *Mytilarca sigilla* Hall (rr).
13. *Trematopora minuta* Hall? (rr).
14. *Coelospira disparilis* Hall (rr).
15. *Spirifer radiatus* Sowerby (rr).
16. *Anastrophia internascens* Hall (a).
17. *Uncinulus stricklandi* (Sowerby) Hall and Clarke (c).
18. *Homospira evax* Hall (a).
19. *Atrypa reticularis* (Linn.) Hall (a).
20. *Streptelasma radicans* Hall (rr).
21. *S. borealis* Nicholson (rr).
22. *Platystoma niagarensis* Hall (c).
23. *Camarotoechia whitei* Hall (aa).

24. *Camarotoechia* (?) *neglecta* Hall (a).
25. *Camarotoechia* (?) *indianensis* Hall (aa).
26. *Camarotoechia* (?) *acinus* Hall (r).
27. *Meristina maria* Hall (c).
28. *Dalmanella elegantula* Hall (c).
29. *D. hybrida* Hall (c).
30. *Spirifer crispus* (*Hisinger*) Hall (c).
31. ———— var. *simplex* Hall (rr).
32. *Leptæna rhomboidalis* (*Wilckens*) Hall and Clarke (c).
33. *Orthotetes subplanus* (*Conrad*) Hall and Clarke (c).
34. *Whitfieldella nitida* Hall (a) (large form).
35. ———— (small form) (a).
36. *Rhynchotreta cuneata* var. *americana* Hall (a).
37. *Dictyonella reticulata* Hall (c).
38. *Nucleospira pisiformis* Hall (c).
39. *Calymine niagarensis* Hall (r).
40. *Eucalyptocrinus crassus* Hall (rr).
41. *Trematopora varia* Hall (r).
42. *Favosites forbesi* var. *occidentalis* Hall (r).
43. *Cornulites proprius* Hall (rr).
44. *Paleschara maculata* Hall (rr) (on *Camarotoechia indianensis*).
45. *Meristina rectirostris* Hall (r).
46. *Homœspira sobrina* (*Beecher and Clarke*) H. and C. (rr).
47. *Strophostylus cyclostomus* Hall (rr).
48. ———— var. *disjunctus* Hall (rr).
49. *Astylospongia præmosa* Goldfuss (rr).
50. *Spirifer* cf. *niagarensis* Hall (rr).
51. *Stropheodonta* sp.
52. *Modiolopsis perlata* ? Hall (rr).
53. *Paleschara* (?) *sphæron* Hall (rr).
54. *Rhodocrinus* (*lyriocrinus*) *Melissa* Hall (rr).
55. *Orthotetes subplanus* ? (specimen 3.5 mm. long).
56. *Lichas boltoni* var. *occidentalis* Hall (rr).
57. *Chonetes nova-scotica* Hall (rr).
58. *Lamellibranch* cf. *pterinea* sp.
59. *Orthotetes tenuis* Hall (rr).
60. *Trematopora granulifera* Hall (r).
61. *Leperditia faba* Hall (rr).

62. *Homalonotus armatus* Hall (rr).
63. *Ceramopora labecula* Hall (rr).
64. *Stropheodonta profunda* Hall (fragment).
65. *Pholidops ovalis* Hall (interior of ventral valve).
66. *Fenistella parvulipora* Hall (rr).
67. *Strophiodonta striata* Hall (rr).
68. *Trematopora echinata* Hall (rr).
69. *Stephanocrinus* (fragment).
70. *Fistulipora maculata* (Hall) (r).
71. *Crania* sp. (rr).

(The relative abundance of species in the above list is indicated by the letters in parentheses, aa indicating very abundant; a, abundant; c, common; r, rare, and rr, very rare.)

In the species *Whitfieldella nitida* no transitional forms were found between the large and small varieties, though a considerable number of specimens of both varieties were obtained.

The form given by Hall as *Lichenalia concentrica* var. *maculata* is here referred to the genus *Fistulipora*, since all the specimens from the present locality in which the maculae are present, also possess mesopore apertures in the interapertural spaces, a character not possessed by *Lichenalia* as defined by Simpson. (See 14th Ann. Rept. State Geologist of N. Y., p. 559.)

THE STREAM GRADIENTS OF THE LOWER MOHAWK VALLEY.

By EDGAR R. CUMINGS.

During a recent study of the area mapped as the Amsterdam (N. Y.) sheet of the U. S. Geological Survey* the writer was struck by certain peculiarities of the streams of this area emptying into the Mohawk River.

As will be seen by a reference to the accompanying map, practically all of these streams have a relatively flat gradient throughout their upper courses. The streams A, D and F have not cut through the glacial till that forms the beds of their lower courses, while all the streams A, D, E, F, G, H, flow over rock beds in their upper courses.

*The results of this study dealing with the stratigraphy and paleontology of the Lower Silurian formation will be published as a part of Bulletin No. 32 of the New York State Museum.