

416

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FROM THE UPPER CAMBRIAN  
OF WYOMING

BY  
VLADIMIR J. OKULITCH AND WALLACE G. BELL

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## GALLATINOSPONGIA, A NEW SILICEOUS SPONGE FROM THE UPPER CAMBRIAN OF WYOMING

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ABSTRACT—A new genus and species of siliceous sponge, *Gallatinospongia conica*, is described from the upper limestone member of the Gallatin formation (Upper Cambrian) on the southeast flank of the Wind River Mountains in central Wyoming. It occurs just above faunas characteristic of the *Prosaukia-Ptychaspis* zone.

### INTRODUCTION

THE sponge described in this paper was discovered by the junior author in 1949 in the upper part of the Gallatin formation (Upper Cambrian) at Beaver Creek Canyon on the southeast flank of the Wind River Mountains in Fremont County, Wyoming. He returned to the locality in 1953 and found several more specimens which were turned over to the senior author for study and description.

All the specimens have come from a single bed 294 feet above the base of the Gallatin formation (170 feet above the base of the upper limestone member as recognized by Miller, 1936) in the NE $\frac{1}{4}$  NE $\frac{1}{4}$  sec. 1, T. 29 N., R. 98 W. (Locality 2998/1A in the University of Wyoming files). From the junior author's collection, Dr. Alan B. Shaw of the University of Wyoming has identified the following (distances measured stratigraphically below the sponge bed; UW = University of Wyoming):

Dikelocephalid remains, UW IT-314, 10 feet

*Syntrophina?* *primordialis*, UW IT-321, 34 feet

*Dartonaspis* cf. *D. knighti* and *Multivascu-*  
*latus ovatus*, UW IT 319, in float, 34 feet

*Ptychaspis* pygidium, UW IT-322, 59 feet  
*Dicellomus* *mosaicus*, UW IT-323, 82 feet  
*Taenicephalus* *cordillerensis*, UW IT-313, 136 feet

*Billingsella* sp. and *Ocnerorthis* *cooperi*,  
UW IT-316-318, 146 feet

*Elwinia* *telonensis*, UW IT-320, 165 feet

From this evidence, Shaw concludes that the stratum which yielded the sponges is younger than the *Prosaukia-Ptychaspis* zone of the Franconian.

### SYSTEMATIC DESCRIPTIONS

Genus GALLATINOSPONGIA Okulitch and Bell, n. gen.

Type species: *Gallatinospongia conica* Okulitch and Bell, n. sp.

Conical sponges with thin walls perforated by transverse and longitudinal canals. The transverse canals are in the outer portion of the wall, the longitudinal canals in the inner portion. Spongocoel wide. Walls made of felted fibrous and loose monoaxial spicules which line the canals and lacunae. Hexactinal spicules have not been observed, and it is the writers' opinion that the sponge should be referred to the Class Desmospongia, and possibly to the Order Monaxonida. The sponge superficially resembles

### EXPLANATION OF PLATE 48

FIGS. 1-3—*Gallatinospongia conica* Okulitch and Bell, n. gen., n. sp. 1, transverse polished section,  $\times 1.5$ , showing transverse radial canals in the outer portion of the wall; 2, longitudinal polished section,  $\times 1.5$ , showing the conical shape and the general characteristics of the wall; 3, transverse thin section,  $\times 3$ , showing vertical canals or lacunae in the inner portion of the wall (lower, left hand corner). All figures are of the holotype, U.B.C. C 108. (p. 461)

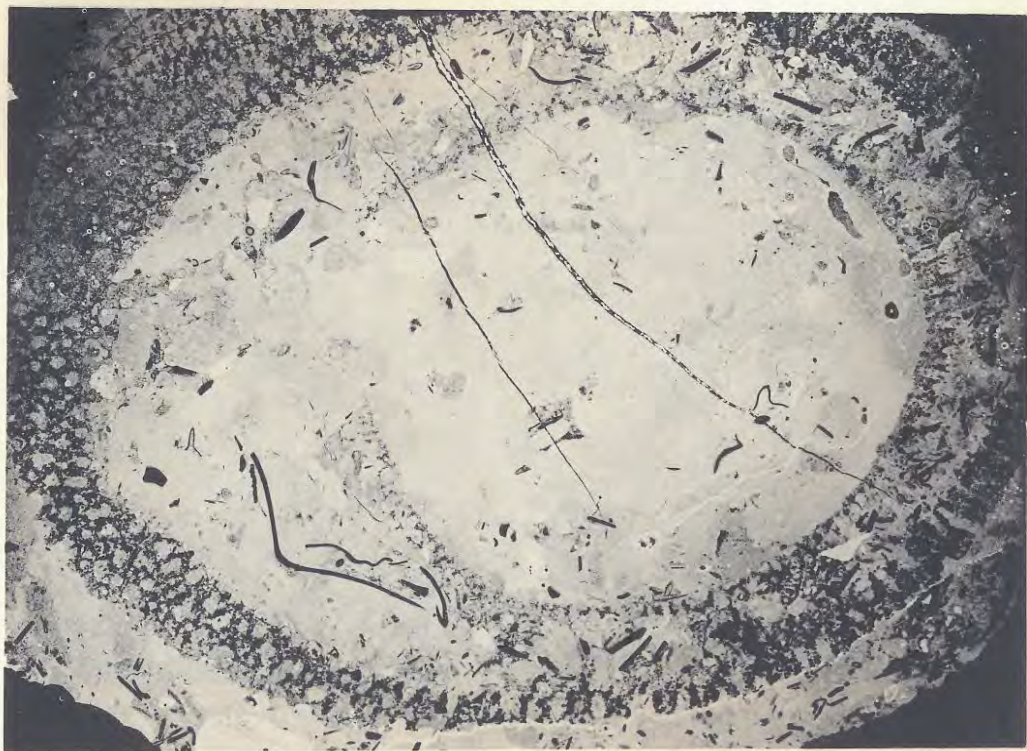




1

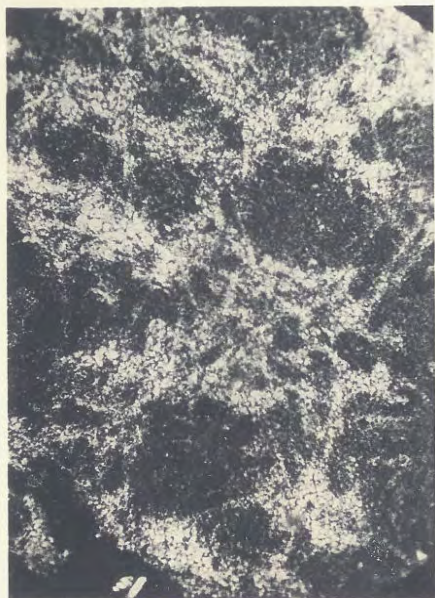


2



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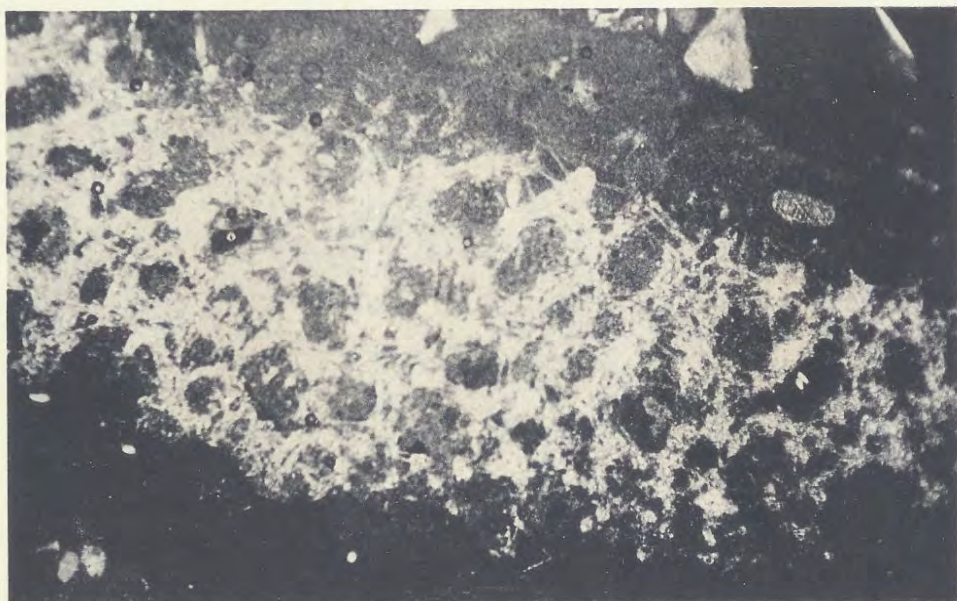




1



2



Okulitch and Bell, Cambrian *Gallatinospongia*, Wyoming

3



*Archaeoscyphia manganensis* (Billings) but differs from it in the possession of longitudinal canals in the part of the wall adjacent to the spongocoel, and much finer, almost fibrous spicules.

GALLATINOSPONGIA CONICA Okulitch and Bell, n. sp.

Pl. 48, figs. 1-3; Pl. 49, figs. 1-3

A conical sponge with an apical angle of about 50 degrees, elliptical in cross section. The best specimen measures about 40 mm. in both diameter and height. A larger but less perfect specimen is 45 mm. in diameter. Both specimens were originally slightly larger, but grinding and polishing have reduced the size somewhat. The wall is relatively thin, about 5 mm. across. The outer portion of the wall shows radial canals; the inner portion shows rounded or elongate lacunae which probably were longitudinal canals paralleling the wall. The central cavity is of exceptionally great diameter, about six times the wall thickness, and is free from all skeletal matter.

The canals and lacunae are surrounded by skeletal elements consisting of semi-isolated calcitic spicules, felted spicules, and calcitic masses. The latter undoubtedly were originally spicular, but recrystallization has obliterated clear outlines and merged the spicules into patches of crystalline calcite. It is the writers' belief, based upon the shape of the spicules, that the spicules were originally siliceous; but during the process of fossilization, the silica was removed and replaced by calcite. Such replacement has been

observed by Hinde (1887-1893, p. 58) who said

on the other hand where the calcite has infilled the molds formed in a matrix of chalcedonic silica, the replaced skeleton presents all the details of the original skeleton, with such even and clearly defined outlines that it has been mistaken for the original substance of the skeleton, and the sponge has been described as calcareous.

Some of the spicules are distinctly monaxons; but a great many are thin and thread-like, forming felted aggregates. Some have a tendency to have paired rays, as in tri-radiate spicules, while some of the calcitic patches may have been desmas. Most of the spicules are connected to form a reticulate meshwork.

*Types.*—Holotype, C 108 (polished section), Department of Geology, University of British Columbia; Paratype, IT-312 (polished section), Department of Geology, University of Wyoming.

*Horizon and locality.*—Collected 294 feet above the base of the Gallatin formation (Upper Cambrian) (170 feet above the base of the upper limestone member as recognized by Miller, 1936) in the NE $\frac{1}{4}$  NE $\frac{1}{4}$  sec. 1, T. 29 N., R. 98 W., Beaver Creek Canyon, Fremont County, Wyoming.

#### REFERENCES

- HINDE, G. J., 1887-1893, Monograph on British fossil sponges; Palaeontographical Soc., vol. 40.  
MILLER, B. M., 1936, Cambrian stratigraphy of northwestern Wyoming: Jour. Geology, vol. 44, pp. 113-144.

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#### EXPLANATION OF PLATE 49

FIGS. 1-3—*Gallatinospongia conica* Okulitch and Bell, n. gen., n. sp. 1, inner portion of the wall showing lacunae and felted spicules. Some spicules appear to be monaxons,  $\times 36$ ; 2, isolated spicules located near the inner surface of the wall,  $\times 36$ ; 3, inner portion of the wall showing felted spicules and calcitic patches,  $\times 18$ . (p. 461)