

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Bulletin of the University of Nebraska State
Museum


Museum, University of Nebraska State

1925

NOTES ON NEBRASKA FULGURITES

Erwin Hinckley Barbour

Follow this and additional works at: <http://digitalcommons.unl.edu/museumbulletin>

 Part of the [Entomology Commons](#), [Geology Commons](#), [Geomorphology Commons](#), [Other Ecology and Evolutionary Biology Commons](#), [Paleobiology Commons](#), [Paleontology Commons](#), and the [Sedimentology Commons](#)

This Article is brought to you for free and open access by the Museum, University of Nebraska State at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Bulletin of the University of Nebraska State Museum by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

THE NEBRASKA STATE MUSEUM

ERWIN H. BARBOUR, *Director*

NOTES ON NEBRASKA FULGURITES

BY ERWIN HINCKLEY BARBOUR

Some six or eight years ago the writer contemplated a study of Nebraska fulgurites, both in the field and in the laboratory. In the meantime however, it proves to be superfluous for, after supplying Mr. A. E. Anderson, of the American Museum of Natural History, with certain material and data he proceeded in a masterful way on a technical inquiry, and it is with pleasure that, although delayed in publication, his findings follow in Bulletin 7 of the Nebraska State Museum. The present paper will deal as briefly as possible with the mode of occurrence and gross structure.

Fulgurites are often reported in Nebraska, and seem to be of fairly common occurrence, especially in well-known sandy areas. When winds blow the sand away, many fulgurites are exposed to view. However, the sandhills of the State have become so stabilized by grass roots and other vegetation, that blow-outs are rare, but when they do occur where the conditions for the formation of fulgurites were favorable, lightning tubes are reported to be numerous.

In the collections of the Nebraska State Museum, The University of Nebraska, are several good specimens and one notable one, collected by Mr. Oscar E. Hans, class of 1917, now a professional geologist and a close observer. Mr. Hans attributes the development of lightning tubes to an exact ratio of moisture in the sand. Hence, in certain seasons many lightning tubes seem to be formed, in others few or none. In digging out fulgurites Mr. Hans finds them branching and diverging along various lines, presumably in response to the moisture content. Thunder bolts travel downward through the sand in a tortuous yet vertical direction, but on reaching layers which are somewhat clayey and capable therefore of retaining a little more moisture, the bolt follows the damp layers, branching and re-branching. Fulgurites taper rapidly, branch more or less, and at ten or fifteen feet often end in flattened bubbles of glass, which seem to represent the

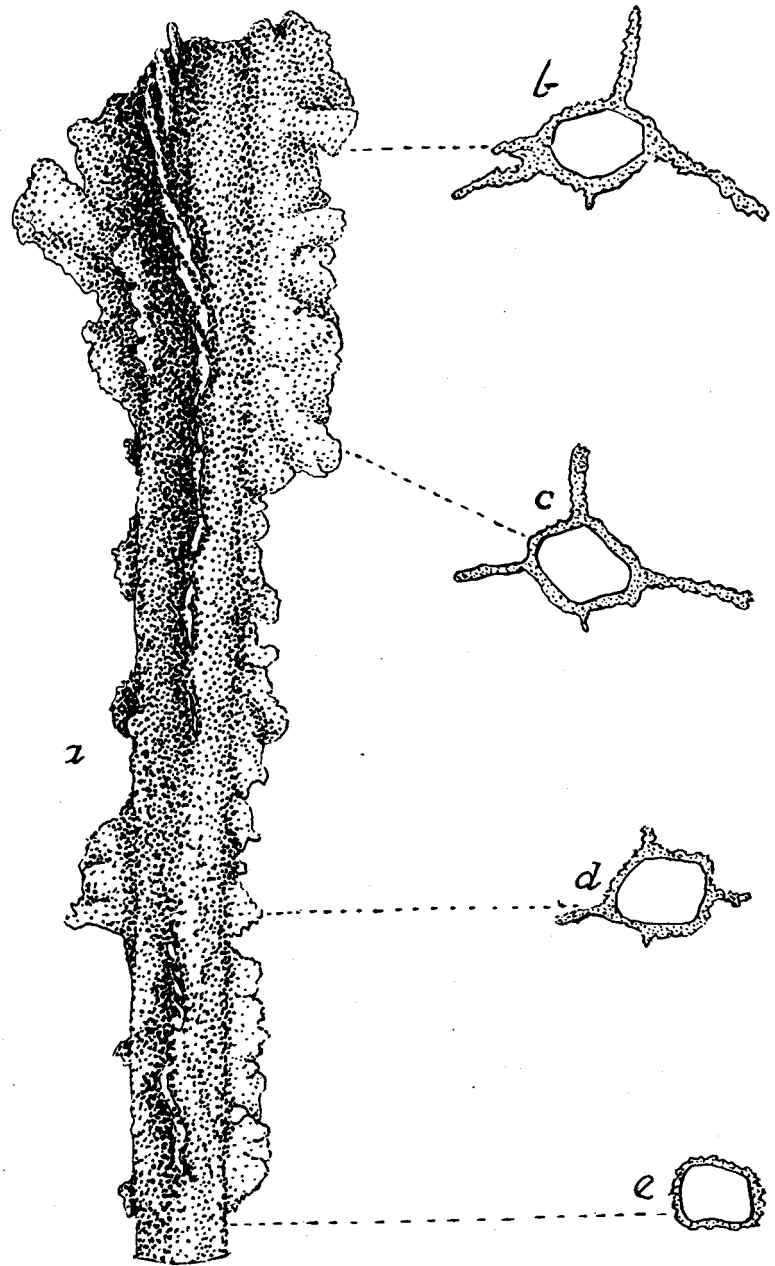


FIG. 23. Top portion of a Stanton County fulgurite, No. 1-7-4-09; a, fulgurite showing wings approximately at right angles; b, c, d, and e, sections at the points indicated, showing roughly the *fulgurite* cross and the sub-quadrante outline of the tube; all natural size.

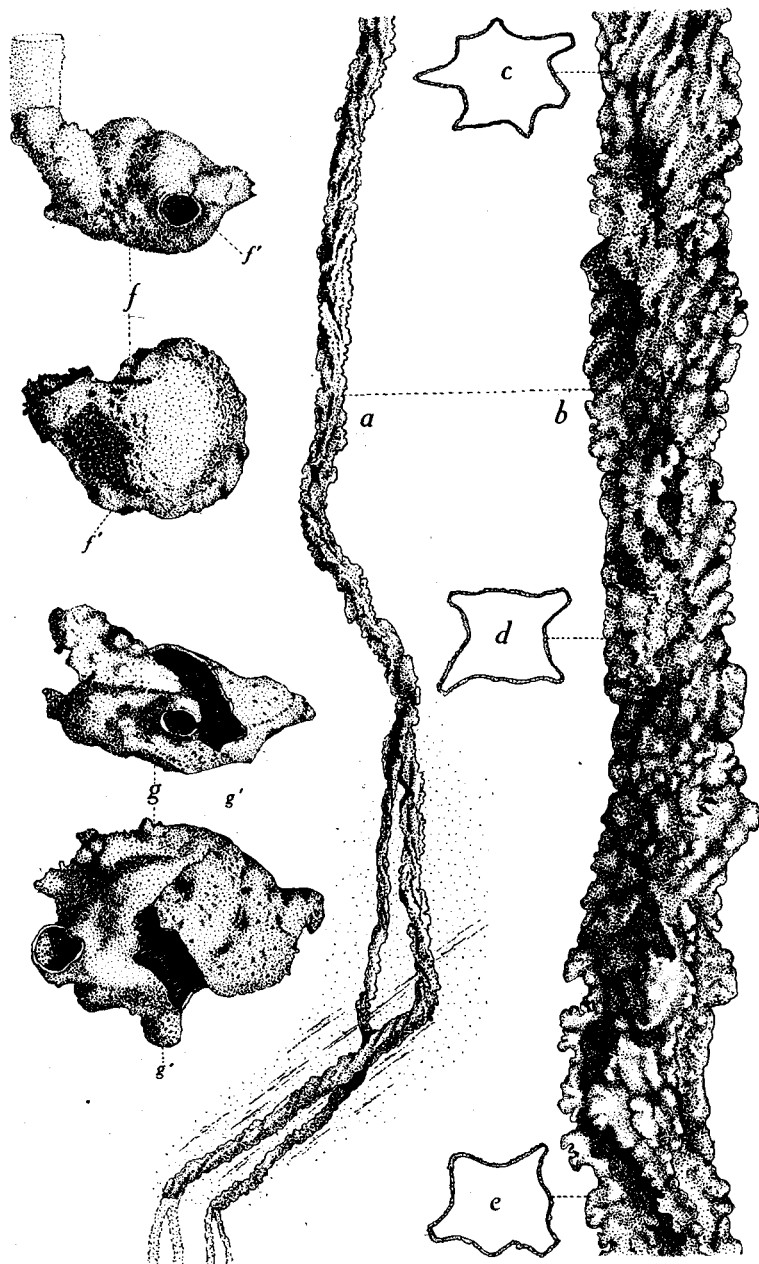


FIG. 24. Fulgurite tubes and fulgurite blebs; a, Stanton County fulgurite, No. 2-7-4-09, a portion of the top omitted; b, a section, 19½ inches long, at the point a, one-third natural size; c, d, and e, sections at the top, middle, and bottom respectively, one-third natural size; f, fulgurite bleb, *fulgurphysa*, side view above, top view below, f', blow-out hole, natural size; g, fulgurphysa, broken, exposing interior, side view above, top view below, g', blow-out hole, Saunders County fulgurite, No. 12-6-97, natural size.

last effective energy in the current. These terminal bubbles seem to have escaped notice heretofore, and since they are unnamed, we shall for convenience, call them lightning bubbles or fulgurphysae. Instead of ending in a flattened bleb the branches may end in rather diffuse sheets, or in half-fused, granular sheets, and sometimes in sand barely affected by fusion.

The external surface of these roughly corrugated tubes are like the sand in which, and of which, they are formed. The inside of the tube is pearly-white glass, flecked and marbled here and there by black. Fulgurite tubes seem to be tortuous, never straight save for short distances. At the top, where the current had unexpended energy, both outer and inner structures are bold, but this is in a diminishing ratio. At all points the *fulgurite cross* seems to be present, being expressed by major ridges or wings at approximately right angles, as illustrated in Fig. 23. In the upper parts of the tube the inside walls conform closely with the outside. Where the walls are unduly thickened by collapse, the inner walls are not necessarily in conformity with the outer.

The word tube, unless used in a very general sense, is a misnomer. It is rarely round. Instead, the bore tends to be roughly quadrangular, especially in the upper portions.

The Stanton County fulgurite, No. 2-7-4-09, collected and given by Mr. Hans, is an uncommonly large and extraordinary example of its kind. Its diameter at the top is about three inches. The outer surface is granular and sandy, the inner surface clean, smooth, and glassy. The wall varies from 1/32 to 1/16 inch or more in thickness. The surface is diversified by innumerable wing-like, longitudinal ridges, set slightly oblique to the axis of the tube. The upper five to six feet of this fulgurite is unbranched, in contact with a layer of clayey sand it forked, following the shaley sand at an angle as shown in the figure. The bulk of this fulgurite averages about two inches in diameter.

The Holt County example was sacrificed in examination and experimentation. The lightning blebs shown in Fig. 24 are from Saunders County and are numbered 12-6-97. These show occasional blow-out holes.