

SECTION B, GEOLOGY

Fossil Freshwater Sponges in Oklahoma

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The report given here is a preliminary account of the discovery of spicules of freshwater sponges in several Oklahoma localities, and in rocks of several ages. Drs. Wilson, Schemel and Bond were involved in the discovery, collecting, preparation and identification of the spicules. Dr. Schemel has written a report on the western deposits (1967).

Freshwater sponges have been found living in Lake Texoma by the staff of the University of Oklahoma Biological Station (Riggs, personal communication, Dec. 1966). Rainbolt (1955) reported four genera and seven species of living freshwater sponges from Oklahoma.

The Oklahoma occurrences of fossil sponges are:

1. In samples of late Pleistocene age at a depth of 4 ft. in clay in an abandoned meander in McCurtain County.
2. In a clay sample at 8 ft. in Jenkins Reilly Slough, an abandoned meander of Red River, McCurtain County, late Pleistocene.
3. In a calcareous phase of the Laverne Formation, Pliocene, Beaver County. Collected by Dr. Schemel.
4. In an outcrop of Wisconsin volcanic ash in eastern Beaver County. Collected by Dr. Schemel.
5. In a volcanic ash deposit of a Wisconsin lake in Harper County containing the Bar-M local fauna and dated by carbon-14 as 21,360 BP (Myers, 1965).

Fossil freshwater sponges have been reported from the Eocene and Miocene of the Lake Baikal area in Siberia (Naletov, 1961), from the Pliocene of the Puy-de-Dôme area in France (Firtion, 1944), and from the Pleistocene of Massachusetts (Wilson, 1949) and Lake Baikal in the Buriat Republic (Naletov, 1961).

The reported occurrence in the Jurassic of England (Hinde, 1893) is probably erroneous, as is that of Jurassic of Russia (Naletov, 1961).

Classification of freshwater sponges is unsatisfactory. They have been placed in the Class Demospongia, Order Haplosclerida. Most authors place all in the Family Spongillidae, but Russians recognize a second family, the Lubomirakidae, with five genera.

Identification of fossil forms is difficult because we have only isolated spicules. Most of these are monaxial megascleres with undistinctive oxeas. Only the amphidiaks of the gemmules offer form which permits differentiation. These are birotulate spicules in the resting bodies formed by amoebocyte cells. These cells have accumulated food and are covered by a layer of cells which secretes a membrane. Scleroblasts secrete amphidiak spicules which are disposed radially. The spicule is rod-like and has a disk (rotule) at each end, making a birotulate spicule.

The Russian literature has, in large part, been so far unobtainable. The best-illustrated article on fossil freshwater sponges is by Firtion (1944) on Pliocene sponges from the volcanic Puy-de-Dôme area of France. Firtion identified eight species in four genera. Russian occurrences are, according to lists, from Paleocene, Eocene, Miocene, and Pleistocene of

the Lake Baikal area (Naletov, 1961). Four genera and ten species are reported.

The five Oklahoma occurrences, and others probably to be found, give information on ecology, on volcanic materials, and on distribution of potentially economic siliceous deposits.

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