“Mountain leather” is an old term that has been used to describe a variety of fibrous minerals that form leather-like mats and masses. Related terms include “leatherstone”, “mountain cork”, “bargkoark”, “mountain paper”, “mountain veil”, “mountain hair”, and “mountain flax”. Dana (1837) defined mountain leather and mountain cork as: “white varieties (of actinolite) composed of minute fibrous particles interlacing one another and forming a mass that will float on water” (p.310). Subsequent studies (Heddle, 1878; Von Fersmann, 1908; Macksoud, 1939) revealed that samples of mountain leather belong to a number of distinct mineral species, the most common being asbestiform varieties of tremolite, chrysotile, kaolinite, sepiolite, and palygorskite. The goal of this project was to examine the 16 samples of “mountain leather” currently in the New York State Museum mineral collection to correctly identify the mineral species represented. Eleven of the samples are from the Balmat-Edwards mining district in the Adirondack Lowlands, one from the Hudson Highlands region, two from the Taconics (Stockbridge dolostone), one from the Manhattan Prong (Briarcliff marble), and one from an iron deposit in the north-eastern Adirondack Highlands.

The samples were examined optically, chemically analyzed with an EDS/SEM system, and analyzed by powder XRD. Of the sixteen samples, twelve belong to the clay mineral sepiolite group, the four remaining samples were unique, with one sample each of serpentine, actinolite, chlorite and calcite. The twelve sepiolite samples are quite variable in morphology. All are fibrous, but the fibers vary in length from 0.2 mm to 12 mm, and in diameter from <1 µm to ~ 5 µm. They also vary in morphology from being very straight, rigid, and aligned to being very sinuous and intertwined. Associated minerals tentatively identified with the sepiolite samples include calcite, dolomite, talc, pyrite, pyrrhotite, sphalerite, celestine, barite, gypsum, halite, and phlogopite.

Sepiolite belongs to the sepiolite-palygorskite group of clay minerals. This group has been studied extensively over the past 50 years because of the widespread occurrence in many soils and sediments, and because of the large number of industrial applications (e.g. filtration, sorption). While sepiolite and palygorskite have complex and somewhat different structures, recent studies indicate there is complete solid solution between the two end-members (Garcia-Romero & Suarez, 2010). All of the sepiolite samples from New York have compositions close to the sepiolite end-member: \( \text{Mg}_8\text{Si}_{12}\text{O}_{30}(\text{OH})_4(\text{OH}_2)_2\cdot 4\text{H}_2\text{O} \). Because sepiolite is stable at very low temperatures and pressures and can be precipitated directly from 25°C solutions (Wollast et. al., 1968), it is very likely that these samples of mountain leather from New York are all fracture-filling precipitates of low temperature hydrothermal origin. While clearly much younger than the rocks that host these deposits, the actual age of formation of the “mountain leather” is unknown.