

was, about ten years ago, among the Shasta Indians in California, saw one of the tribe engaged in making arrowheads from obsidian as well as from the glass of a broken porter-bottle. He describes the method of manufacture in a letter which was published by the American Ethnological Society.\* To this letter I shall refer in a succeeding section of this essay, when treating of the division of labor among the North American Indians. Mr. Bartlett visited, while in California, a locality in the Napa valley (north of San Francisco), where obsidian occurs in pieces from the size of a pea to that of an ostrich egg, which are imbedded in a mass resembling a coarse mortar of lime, sand, and gravel. He found the surface in many places covered, from six to twelve inches in depth, with broken pieces and small boulders of this volcanic substance. The appearance of these spots reminded him of a newly-made macadamized road.†

The most extensive use of obsidian, however, was formerly made in Mexico, before the empire of the Aztecs succumbed to the Spanish invaders. Old obsidian mines are still seen on the *Cerro de Navajas*, or "Hill of Knives," which is situated in a northeasterly direction from the city of Mexico, at some distance from the Indian town Atotonilco el Grande. These mines provided the ancient population of Mexico with vast quantities of the much-prized stone, of which they made those fine double-edged knives, arrow and spear-heads, mirrors, very skilfully executed masks, and ornaments of various kinds. Humboldt speaks of the Hill of Knives in a transient manner;‡ for a precise description we are indebted to the meritorious English ethnologist, E. B. Tylor, who visited that interesting locality in 1856, while traveling through Mexico in company with the late Mr. Christy.§ In describing the mines, Mr. Tylor says: "Some of the trachytic porphyry which forms the substance of the hills had happened to have cooled, under suitable conditions, from the molten state into a sort of slag, or volcanic glass, which is the obsidian in question; and, in places, this vitreous lava, from one layer having flowed over another which was already cool, was regularly stratified. The mines were mere wells, not very deep, with horizontal workings into the obsidian where it was very good and in thick layers. Round about were heaps of fragments, hundreds of tons of them; and it was clear, from the shape of these, that some of the manufacturing was done on the spot. There had been great numbers of pits worked, and it was from these *minillas*, little mines, as they are called, that we first got an idea how important an element this obsidian was in the old Aztec civilization. In excursions made since, we traveled over whole districts in the plains where fragments of these arrows and knives were to be found

\* Bulletin of the American Ethnological Society, New York, 1861, Vol. I, p. 39.

† Personal Narrative, Vol. II, p. 49.

‡ Essai politique sur la Nouvelle-Espagne, Vol. III, p. 122.

§ Tylor, *Anahuac: or Mexico and the Mexicans, Ancient and Modern*, Lond., 1861. This volume contains, besides many facts relating to the archæology and ethnology of Mexico, the best observations on obsidian I have found in any work on that country.