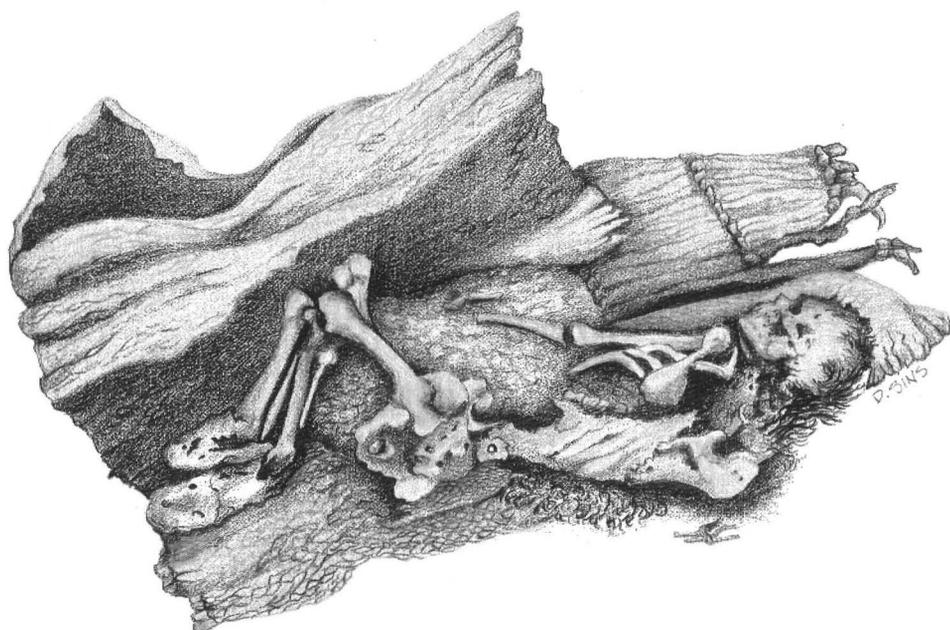


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DATING THE SPIRIT CAVE MUMMY

The Value of Reexamination

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INTRODUCTION

During the summer of 1940, S. M. and G. N. Wheeler conducted archaeological field work for the Nevada State Parks Commission in Churchill County, Nevada. They investigated a number of caves in the vicinity, hoping to find evidence of man's presence during the period when prehistoric Lake Lahontan was receding, approximately 10,000 years ago (Aschmann 1958). The summer's field work resulted in the documentation of twenty-six caves and shelters, most of them containing archaeological remains (Wheeler and Wheeler 1969). The remains were cataloged and stored at the Nevada State Museum in Carson City.

While conducting a collaborative research effort with the Nevada State Museum in 1994, the radiocarbon laboratory at the University of California, Riverside obtained radiocarbon age determinations on the hair and bone from the Spirit Cave mummy, one of the archaeological finds made by the Wheelers in 1940 (Kirner *et al.* 1996). Originally, the mummy was thought to be 1,500 to 2,000 years old. When the first two accelerator mass spectrometer (AMS) radiocarbon dates were done, the Spirit Cave mummy was discovered to be more than 9,400 years old. This article will focus on new data from Spirit Cave, as well as data from the surrounding area. The goal of this study is to demonstrate the value of reexamining existing museum collections using AMS radiocarbon dating.

METHODS

Donald Tuohy and Amy Dansie of the Nevada State Museum submitted a total of seventeen samples for radiocarbon age determinations between 1994 and 1997 from a variety of archaeological projects. The material included textiles, human bone, human hair, wood, and dog pads from a dog burial. Preservation of the material to be dated was good to excellent.

The pretreatment and processing varied according to the material being dated.

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The wood from an arrow shaft fragment from eastern Nevada was subjected to acid-base-water-acid treatment, and dried overnight in a drying oven. The dried wood was then placed in a combustion tube with copper oxide and silver powder and combusted overnight at 900°C. The resulting CO₂ was graphitized on a vacuum line and sent to Lawrence Livermore National Laboratory for analysis.

All of the textile age determinations were performed on the total amino acids. The textile samples were cut into small pieces and sonicated in hydrochloric acid. The material was rinsed with distilled water and dried overnight. The proteins were hydrolyzed in hydrochloric acid, then isolated and purified on an ion exchange column. The total amino acids were collected in a combustion tube and combusted with the appropriate reagents. The CO₂ was graphitized and analyzed in the same manner as the wood samples.

The radiocarbon age determinations on the bone, hair and dog pads were also performed using total amino acids. The material was physically cleaned, then hydrolyzed in hydrochloric acid. The total amino acids were assessed using high performance liquid chromatography (HPLC), then collected and purified on an ion exchange column. The amino acids were combusted, graphitized and analyzed employing the same methods used on the wood and textiles.

DISCUSSION

The radiocarbon age determinations on the Spirit Cave bone range from 9,430±60 to 1,490±50 years B.P. (see Table 1 in Tuohy and Dansie, and background details in Dansie, this issue). Statistically, the radiocarbon age determinations on the hair from the mummy are the same as the associated bone dates. The textiles from Spirit Cave demonstrate a similar pattern, ranging from 9,460±60 to 1,650±60 years B.P. The concordance is striking between associated specimens. These dates identified Burial no. 1 as the adult female, and demonstrated the much later date of the young male individual, from the commingled fragmentary bone of two individuals collected by the Wheelers. In addition, the coiled basket fragment from the cave, similar to Lovelock Culture coiling in other sites, dates to 2,210±60 years B.P. This agrees well with the basketry sequence of the area. The twined grass matting date demonstrates a later visit to the site by an unknown group, and provides a time frame for this unusual specimen.

Crypt Cave, near Winnemucca Lake, Nevada, yielded radiocarbon dates that paralleled those of Spirit Cave. Diamond plaited matting from Crypt Cave was dated at 9,120±60 years B.P. The Crypt Cave dog burial radiocarbon age determination was 6,360±60 years B.P. Diamond-plaited matting was also found in Grimes Burial Shelter, not far from Spirit Cave. It yielded an age of 9,470±60 years B.P.

The Wizards Beach skeleton was dated twice by our laboratory, with consistent results, but somewhat younger than the original date of 9,515±155 by Geochron

(GX19422-G). The UCR results are $9,250\pm 60$ and $9,200\pm 60$, which average to $9,225\pm 60$ (Tuohy and Dansie, Table 1, this volume).

This series of seventeen age determinations demonstrates the value of using AMS radiocarbon dating to reexamine existing museum collections with minimal damage or impact to the specimens. The remains from Spirit Cave were thought to be only 1,500 to 2,000 years old at the time of their discovery. Thus, for over half a century their value to archaeologists had gone unrecognized. Utilizing modern technology we are able to contribute a major new data set to the chronology of the western Great Basin. This provides the archaeologist with the opportunity to make fresh inferences about the prehistory of the area. Clearly, it is possible that existing museum collections may hold important answers to questions about our human past.

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