REPORTS

THE BUHL BURIAL: A PALEOINDIAN WOMAN FROM SOUTHERN IDAHO

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In January 1989 highway workers encountered human skeletal remains in a gravel quarry in south-central Idaho near the town of Buhl. Excavation revealed the remains of a young Paleoindian woman, 17–21 years of age at the time of death, with craniofacial attributes similar to other North American Indian and East Asian populations. She was buried in windblown and colluvial sediments immediately overlying Bonneville flood gravel. Grave goods include a large stemmed biface, an eyed needle, and a bone implement of unknown function. Isotopic analysis suggests a diet of meat and fish, including anadromous fish. Radiographs show numerous periods of dietary stress throughout the woman's childhood. AMS (accelerator mass spectrometry) dating indicates an age of 10,675±95 B.P., and geomorphological studies verify this single radiocarbon date suggesting it is the burial's minimum age. Following Idaho State law, the skeleton was claimed by the Shoshone-Bannock tribes of Idaho and reburied.

En enero de 1989, trabajadores del departamento de carreteras descubrieron restos de esqueletos en una cantera de cascajo en la región sud-central de Idaho, cerca del pueblo Buhl. Las excavaciones revelaron los restos de una mujer Paleoindia de 17 a 21 años de edad al tiempo de su muerte, con atributos craneofaciales similares a otras poblaciones de indios norteamericanos y del este de Asia. Ella fue enterrada en sedimentos soplados por el viento y coluviales, precisamente sobre los cascajos causados por las crescientes del lago Bonneville. Objetos en la tumba incluyen una punta de tallo de tamaño grande, una aguja con ojo, y un instrumento hecho de hueso de función desconocida. Análisis isotópico indica una dieta de carne y pescado, incluyendo pescados anádromos. Radiografías indican muchos problemas de dieta durante la infancia de la joven. La tumba es 10,675±95 A.P. basado en el método AMS (acelerador de espectometrica de masas) de radiocarbono. Estudios geomorfológicos verifican esta fecha, y sugieren que es la edad mínima de la tumba. De acuerdo con la ley del estado de Idaho, el esqueleto fue reclamado por las tribus Shoshone-Bannock de Idaho, y enterrado de nuevo.

Human remains of the early inhabitants of the Americas are rare and typically fragmentary when found. Steele and Powell (1994:Table 1) reported 32 individuals from 16 sites older than 8500 B.P. in North America, while Neves and Pucciarelli (1991) documented 19 individuals from three localities older than 6000 B.P. in South America. However, only five crania from North America were sufficiently intact for Steele and Powell (1994:142) to metrically analyze craniofacial morphology. The recent publication by Morse (1997) describing a Dalton cemetery (ca. 10,000 B.P.) in Arkansas is characteristic of the situation in that only small fragments of human bone were recovered from an area that may have contained as many as 30 burials. In this regard, the recent discoveries at Kennewick (Chatters 1997) and Prince of Wales Island in Alaska (Fifield 1996), the redating of human remains from Spirit Cave (Jantz and Owlsey 1997; Touhy and Dansie

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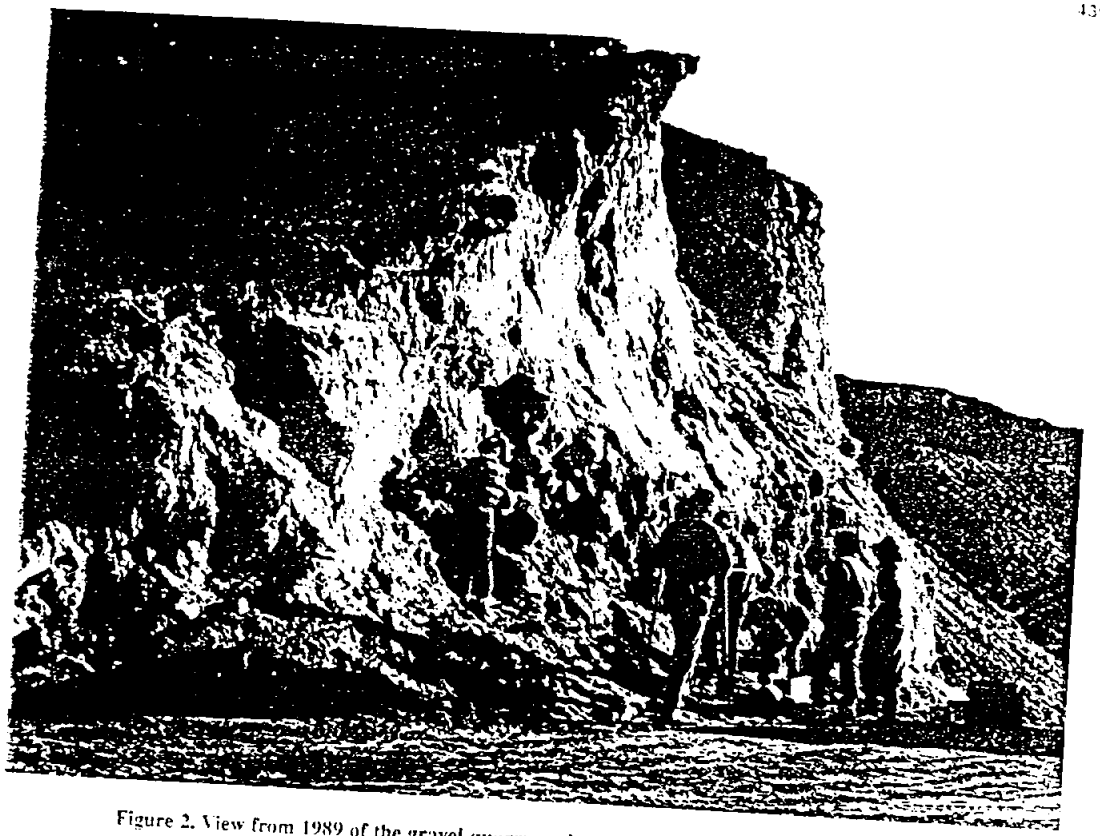

Figure 2. View from 1989 of the gravel quarry and profile undercut by the front-end loader.

Archaeologists from the Herrett Center and the Idaho State Historical Society inspected the site together on January 18, 1989. The deposits containing the bones had been undercut by gravel quarrying operations and were collapsing as the upper soil horizons thawed in the afternoon sun (Figure 2). The imminent collapse necessitated immediate excavation of the bones remaining in situ or all context would be lost and the bones crushed in the rubble. Also, as news of the discovery spread through the local community, increasing numbers of people visited the site and the security of the skeleton could no longer be guaranteed. The height and instability of the profile made it impossible to remove the overburden and excavate the skeleton in a traditional manner. Thus, the bones were gingerly removed directly from the vertical profile as the excavators dodged falling chunks of frozen soil and Lake Bonneville flood boulders. Sediments at the base of the profile were screened for loose bone and artifacts with an ¼-inch mesh.

Most of the bones were displaced by the front-end loader and collected by workers before archaeologists arrived at the gravel quarry. These bones were given to the archaeologists on arrival. Only the cranium, mandible, and a few ribs and vertebrae were still in place in the profile (Figure 3). It was clear from the remaining in situ material that the skeleton was not articulated. The mandible lay 1.2 m north of the cranium and many of the vertebrae and ribs had long ago been displaced. All in situ bones were located in the same depositional unit, approximately 3 m below the sloping surface, and intact, nondisturbed sediments occurred above the bones indicating the displacement of the bones must have occurred sometime after burial. The cause of the displacement was not apparent. No evidence in the soil profile indicated intrusions, such as animal burrows, to explain the distribution of the bones.

Radiocarbon Dating

After recovery and consultation with the Shoshone-Bannock Tribes of Fort Hall, as required by Idaho State law, the tribes permitted a portion of the skeleton to be used for radiocarbon dating.[1] The proximal half

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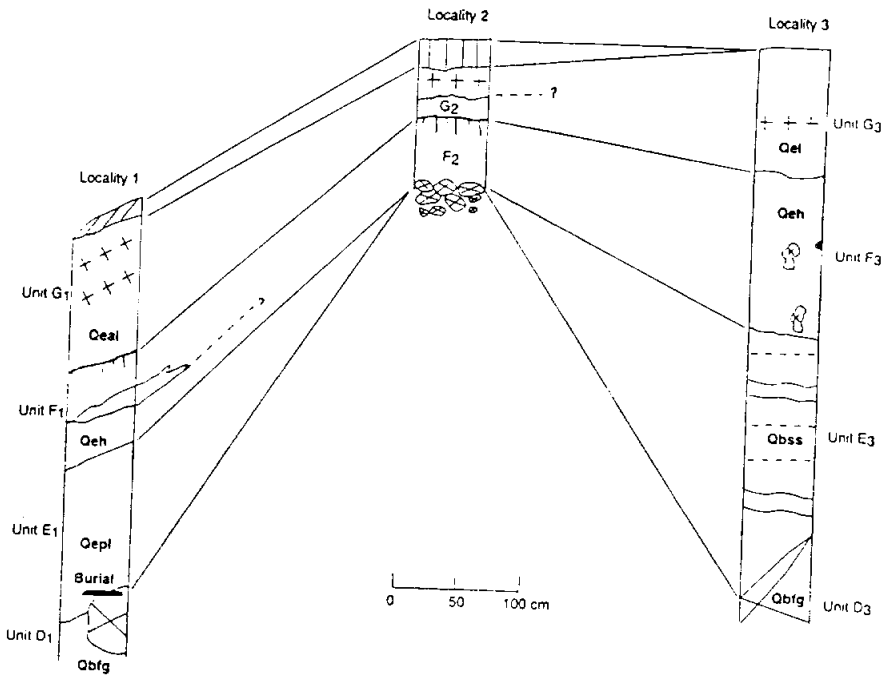

Modern backfill

Modern solum: A, B, C horizons

Truncated paleosol, B2 (Locality 1) and B2t (Locality 2)

Qeal Late Holocene; massive heavily bioturbated (krotovina) matrix supported —eolian sand and colluvial granule gravels capped by modern solum

Qel Late Holocene; massive, moderately bioturbated eolian sand capped by cambic B horizon (locality 3)

Qeh Early Holocene; massive (Locality 3) with intercalations of gravel lenses (Locality 1), moderately bioturbated eolian sand and colluvial granule gravels capped by B2b (locality 1) and B2tb truncated B soil horizons

Qepl Late Pleistocene; massive, nonbioturated eolian sand

Qbss Late Pleistocene; Bonneville flood fine clastics; bedded upward, medium to very fine sand and silt

Qbfg Late Pleistocene; Bonneville flood gravels; poorly sorted angular to well rounded granule-cobble-pebble-boulder gravel

Boulders and cobbles

Krotovina

Figure 6. Correlation of upper sediments in Localities 1, 2, and 3.

carbon age of the human skeleton and to determine its postdepositional history (Figure 4). Between 1989 and 1992, gravel operations removed 2 to 4 m of the original sediments that contained the human remains. While obviously not an ideal situation, the detailed analysis of the 1992 profile, an examination of photographs of the 1989 profile, and the comparison with sediment samples retained from the cranium permitted the correlation of the existing (1992) sedimentary sequence at Locality 1 to the original burial stratum. Sedimentary sequences at two other localities, Localities 2 and 3, were studied to provide additional information pertaining to age and origin of the deposit containing and overlying the human remains (Figures 5 and 6). These investigations confirm the antiquity of the

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rodents did not occupy this portion of the landscape or that the sediment accumulated rapidly. The human remains were located at the base of this deposit, near its contact with the underlying colluvial or lagged Melon-like gravel.

Unit F_1 unconformably overlies Unit E_1 and consists of three beds separated by faint boundaries. Thickness varies between 32 and 100 cm across the complete exposure, but at Locality 1 the deposit is between 52 and 60 cm thick. The beds are composed of moderately bioturbated, poorly sorted, medium to fine sand and silt supporting angular to well-rounded cobble-granule gravel clasts that are partially coated with thin discontinuous layering of $CaCO_3$ on the undersides of the clasts. A truncated paleosol displaying Bcab (Paleosol I) soil horizonation caps the deposit. The peds are moderately developed and are covered by thin (< .2 mm) calcium carbonate coatings. The tubular pores are sealed with $CaCO_3$. Krotovina are confined to the upper part of the deposit, well within the Bca soil horizon. The boundary separating Unit F_1 from overlying deposits is abrupt and wavy indicating that the A horizon of the solum was removed by an erosional episode of unknown duration. In fact, part of the Bca horizon on the downslope part of the exposed profile has been partially eroded.

Depositional Unit G_1 unconformably overlies Unit F_1 and consists of moderately to poorly sorted, moderately bioturbated fine to very fine sand and silt. Thickness varies between 74 and 80 cm across the exposure. The deposit is nonbedded and massive and lacks laminations. Angular to rounded granule and pebble gravel clasts occur randomly throughout the deposit. A modern solum caps the deposit and is characterized by a weakly developed A/B/C soil horizon sequence. At Locality 1, the B horizon displays cambic characteristics including reddish yellow coloration and very weak ped development. The soil grades to a bisequel soil outcropping at the top of the Bonneville gravel bar at Locality 2. At Locality 2, the soil is relict and has been forming since the Bonneville gravels were deposited.

Locality 2. Locality 2 sediments and soils overlay the Bonneville flood gravel and are thin, not exceeding 80 to 100 cm in thickness. The deposits comprise two distinctive layers separated by a buried soil (Paleosol 1). The upper portion of the Bonneville gravel at this locality is cemented with $CaCO_3$. Depositional Unit F_2 consists of poorly sorted, coarse to very fine sand and silt and angular to rounded granule gravel. The deposit is 56 cm thick and unconformably overlies the Bonneville gravel. It is capped by a truncated B soil horizon characterized by strong medium prismatic ped development (Paleosol 1). Depositional Unit G_2 unconformably overlies Unit F_2 and consists of poorly sorted medium to fine sand and silt supporting occasional rounded to angular granule gravel clasts. The deposit is thin, not exceeding 30 cm, has a lower bulk density than the deposit below, and is capped by a cambic B soil horizon extending partially into the underlying deposit and paleosol. The surface of the sedimentary sequence at Locality 2 has been modified by modern scraping activity.

Locality 3. Three sand sheets are exposed at Locality 3. Two of the exposed sand sheets are thick and are considered the source for the sand deposits in Locality 1 (Depositional Units E_1–G_1). The oldest sand deposit at Locality 3, Depositional Unit E_3, overlies the Bonneville gravel and consists of alternating beds (5 to 30 cm thick) of very fine sand/silt and medium sand. The deposit lacks rodent and insect krotovina. Boundaries between the beds are gradational and faint, and the overall thickness of the deposit varies between 120 and 160 cm. Overlying this unit is 90 cm of massive, nonbedded, poorly to moderately sorted, moderately bioturbated, medium to fine sand, designated Depositional Unit F_3. The boundary separating Unit E_3 from Unit F_3 is faint and discontinuous. Depositional Unit G_3 unconformably overlies Unit F_3 and consists of poorly sorted medium to fine sand and silt capped by a truncated B3ca soil horizon. The surface has been modified by modern scraping, and it was not possible to determine whether or not the B3ca horizon was part of the modern solum or belonged to a paleosol.

Discussion. At least 68 m of Bonneville floodwater covered the highest point of the gravel bar (Malde 1968) where the Buhl burial was located. The projection of the low angle, northward dipping bedding planes indicates that the gravel bar has been little modified since it formed and that the part of the gravel bar closest to the present-day channel of the Snake River remained unchanged until it was buried by aeolian sand and silt and col-

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Figure 8. Cranium and mandible indicating excellent preservation.

destroyed by quarry operations. In fact, it was one of the best-preserved Paleoindian skeletons ever recovered (Figure 8), with minimal postmortem damage to the bones. The weight of the bone suggested little or no mineralization had occurred. The outer table of the bones exhibited the characteristic yellow luster of well-preserved cortical bone. There was no cortical exfoliation. The excellent preservation resulted from the skeleton's location on well-drained Bonneville gravel deposits and being covered by dry, windblown silts and sands. Annual precipitation in this part of southern Idaho is less than 30 cm a year and has not varied much in the last 10,000 years (Henry 1984).

The human skeleton from the Buhl burial was incomplete. Most of the bones from the upper skeleton were recovered, including the cranium, the mandible, the right clavicle, the left and right scapulae, the manubrium, seven vertebrae (Cl, one C3-6, C7, T10, T11, T12, and L1), ten left ribs (Numbers 2, 3, 4, 6, 7, 8, 9, 10, 11, 12), five right ribs (Numbers 4, 8, 9, 10, 11), the right humerus, the left and right radii, the right ulna, two left carpals (hamate and lesser multangular), three left metacarpals (Numbers 1, 2, 4), four right metacarpals (Numbers 1, 3, 4, 5), hand phalanges (6 proximal, 5 middle, 3 terminal), and one ear ossicle (the right malleus). With the exception of the right femur, two right tarsals (the cuboid and the navicular), and two right metatarsals (1 and 2), all of the lower skeletal elements, including the pelvis, were missing. The missing skeletal elements are presumed to have been destroyed by gravel operations.

Sex, Age, and Stature

The Buhl skeleton was that of an adult female. In the absence of the pelvis, the determination of sex was made by using morphological and anthropometric assessments of the skull and postcranial elements. The cranium exhibited an overall gracile architecture, with light to moderate muscle markings. The superciliary arches were lightly defined. The superior orbital borders were moderately sharp. The temporal lines were light on the frontal, nonexistent on the parietals. The mastoid processes were small and supramastoid crests were not present. The nuchal lines were fairly smooth. The cranium exhibited marked parietal bossing. Radiographic analysis of the cranium indicated the frontal sinuses were quite small. Anthropometric analyses of the postcranial elements supported the female assessment of sex, including the right femoral head maximum diameter, the femoral circumference at midshaft, the right humeral epicondylar breadth, and the right scapular height and breadth.

The individual was 17 to 21 years old at the time of death. All third molars were occlusally erupted with fused root apices. The basilar synchondrosis of the cranium was fused. There was a lack of epiphyseal union of the right medial clavicle and the inferior angles of both scapulae. Some of the tips of the vertebral spinous processes, some of the annular rings of the vertebral centra, and some of the rib heads had newly fused epiphyses, whereas the remainder did not. The distal ulna and radii exhibited strongly demarcated epiphyseal fusion lines. The distal femur had only a light remnant of an epiphyseal line. Finally, the sternal ends of both fourth ribs were Phase 2, which indicate an age in the late teens (Iscan et al. 1985:853–863).

The living stature of this individual was about

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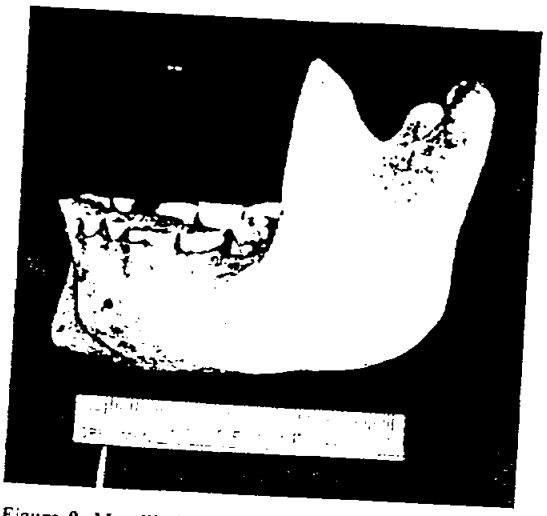

Figure 9. Mandibular dentition showing wear and buccally sloped wear planes.

1990). The external auditory meatus had a pinched morphology, and the oval window was not visible in the inner ear (Napoli and Birkby 1990). The occipital shelf was short and angled upwardly. There was moderate keeling of the skull. The palate exhibited a squared-off U-shape. The ascending ramus of the mandible was wide and vertically oriented. Cranial metric data (Table 2) were collected using the University of Tennessee protocol (Moore-Jansen and Jantz 1986).[3]

Due to extreme occlusal wear of the teeth, it was not possible to make observations on numerous key morphological traits of the dentition (Turner et al. 1991). However, the mandibular third molars exhibited a protostylid pit. The frequency of this trait is considered high in American Indian and Asian groups (Dahlberg 1963; Hanihara 1967). Due to the heavy enamel attrition, protostylid pits on the other mandibular molars were not observable. Three-rooted mandibular first molars were not evident in periapical radiographs (Turner 1971).

Dentition

Twenty-five teeth were recovered, 15 from the mandible and 10 from the maxillae. Tooth loss was postmortem. All soil surrounding the skeleton and at the base of the profile was screened through ¼-inch mesh to find the missing teeth. The cranium and mandible were not displaced by the gravel operations. The teeth must have been lost when the skeleton was disturbed and disarticulated sometime after burial.

The most striking aspect of the dentition was the exceptionally high degree of occlusal wear for the young age of the individual (Figure 9). Dentin was exposed on all teeth except the third molars. Stages of occlusal wear were assigned to each tooth using Smith's (1984) scale, which begins with O for a missing tooth, 1 coding the least amount of wear, and 8 for the greatest amount of wear. All of the recovered incisors, canines, and premolars exhibited stage 6 wear; the first molars were stage 7; the second molars stage 6; and the third molars stage 3.

The Buhl mandibular dentition also exhibited unusual oblique wear planes for an individual of this age. Normally, the occlusal planes on the premolars, first molars, and second molars have an initial lingual inclination. Through occlusal wear the planes can shift and exhibit a flat or buccal wear pattern. In the Buhl mandible these teeth were inclined buccally at a comparatively early age (Butler 1972). Such oblique occusal wear is often indicative of actual tooth-to-tooth contact caused by eating prepared foods, whereas flat occlusal wear is thought to be produced by "puncture-crushing" tough, fibrous foods (Smith 1984).

In this case, the oblique occlusal wear resulted in a helicoidal wear pattern. This helicoidal pattern can be seen in the Buhl mandibular arcade as the third molar retains its original lingual occlusal plane, but the premolars, first molar, and second molar occlusal planes have shifted to a buccal inclination, producing a helixlike pattern (Reinhardt 1983:228). This pattern is commonly observed in dentitions processing diets containing large amounts of gritty substances (Osborn 1982). Furthermore, the well-cupped dentin morphology of the Buhl mandibular second molars is consistent with this suggestion. Cupping has been experimentally linked to the presence of fine particles in food (Costa and Greaves 1981). The presence of cupping suggests the Buhl woman's food contained fine, gritty particles.

No labial rounding was evident on any of the Buhl woman's teeth to indicate the teeth had been used as tools for processing hides or baskets (Hinton 1981; Molnar 1971). The occlusal-buccal enamel edge was consistently sharp on all teeth (Figure 9).

The degree of dental wear and amount of enamel cupping are artifacts of an individual's life

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animal resources in the Great Plains, which may be more positive.

The $d^{15}N$ of 15.5 percent is quite positive and well above the value expected from a normal trophic shift (+3 percent) in Great Plains bison and elk reported at 6.4 percent and 7.0 percent (Tieszen 1994) or other modern and prehistoric animals from the northern Great Plains (Loken et al. 1992). Data from natural streams in western Montana show $d^{15}N$ values higher than 8 percent in cutthroat trout (Odney and Spencer 1994), still well below the value required to explain 15.5 percent in the Buhl collagen sample. However, Cabana and Rasmussen (1994) report values as high as 15.5 percent for fish and indicate that such values are clearly a function of the type of lake that determines the number of associated trophic steps. Hodson (1993) has shown that Arctic seabirds have values ranging from 12 to 17.5 percent, consistent with a range of 14.5 to 17.5 percent reported for Arctic seals and polar bears (Ramsay and Hobson 1991). Furthermore, Schwarcz et al. (1985) report a number of values for human specimens from southern Ontario that are near the 15.5 percent for the Buhl woman.

In the absence of diagenetic alteration, the only explanation for a value as large as 15.5 percent found in the Buhl woman is a substantial reliance on meat and fish resources—most likely animals at the end of a long food chain. Supplementation of terrestrial resources by anadromous fish would account for the high nitrogen value as well as a carbon isotope value more positive than expected from a solely terrestrial or freshwater resource base.

Associated Artifacts

Four artifacts and one unmodified badger baculum were found with the Buhl skeleton. The badger baculum appears to be an intentional grave offering because no other badger bones were found at the site. The artifacts included one pressure-flaked stemmed biface (Figure 10), a portion of a bone needle (Figure 11), and two fragments of an incised bone awl or pin (Figure 11). The biface was found in situ immediately under the cranium. The other artifacts were found while screening soil that fell from the profile during gravel extraction. As no other archaeological components or features were observed in the deposits, it is likely that these items were burial offerings.

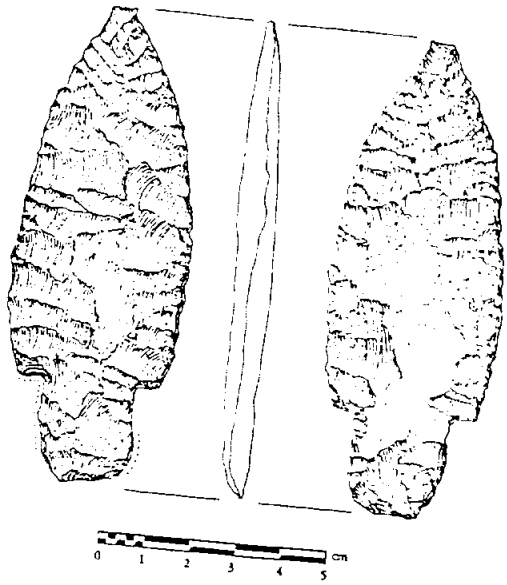

Figure 10. Stemmed biface.

The stone biface is made of a black, opaque obsidian, locally called ignimbrite or vitrophyre. It is stemmed, with well-defined, squared shoulders, and the basal margin is rounded. Lateral margins of the stem are nearly parallel and are dulled with striations oriented inline with the margin. The heaviest zones of dulling are at the intersection of the stem and blade where the striations are multidirectional. Basal margin dulling was apparently accomplished using a coarse abrader, in contrast to the highly smoothed margins, which are more typical of other basal-dulled points from the Snake River Plain (Titmus and Woods 1991). Lateral margins of the blade are excurvate and terminate in a chisel-shaped distal end. The chisel-shaped distal end was intentionally produced by the removal of one flake from each face, which detached the extreme distal end of the point in a transverse orientation. This termination has been called a "tranchet tip" and has been reported on stemmed points from the southern Great Basin (Tuohy 1968). The point is 9.66 cm long x 3.75 cm wide x 0.89 cm thick. The chisel-shaped end is .6 cm wide, and the stem is 2.05 cm wide at the juncture with the blade and 2.2 cm long.

The biface has been bifacially pressure flaked, with most flakes oriented perpendicular to the tool margin. Flakes are widely expanding and highly variable in width and length. Examination of the pressure-flake initiation points indicates the pres-

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are round and .8 mm in diameter. Microscopic examination of the eye suggests it was carefully gouged with a hand-held perforator and was not drilled with a rotating drill. The perforation is biconical; the conical depressions are slightly irregular, which would not be the case if a rotary bit were employed (Flenniken 1978).

The perforating tool used to form the eye of the needle was a percussion flake with a small protrusion based on replications studies by Wood and Titmus for this report. The flake-perforator was rotated in a back-and-forth reciprocal motion with the hole being drilled halfway from each side. The arc of the rotation was just under 360°, leaving a discontinuity in the concave indention. No eyewear was observed on the needle and, as with the biface, it may have been made specifically as a grave offering.

In the Northwest, similar bone needles were found in early deposits at the Lind Coulee site (Daugherty 1956; Irwin and Moody 1978), Marmes Rockshelter (Fryxell et al. 1968), and the Shoup Rockshelters (Swanson and Sneed 1966). The needles from these locales reveal morphology and dimensions similar to the specimen from the Buhl burial. Similar needles have been found at Paleoindian sites in Alaska (Office of History and Technology 1992), Colorado (Wilmsen and Roberts 1978:131), Wyoming (Frison and Craig 1982:166), Montana (Davis 1993:272), and Texas (Redder 1985:43).

The two bone ornament fragments may be parts of a single artifact. Both pieces are elliptical in cross section and taper gently to a blunted end. The surfaces are polished and show signs of being scraped, possibly with an obtuse angle cutting edge (Crabtree 1977). One fragment is 2.4 x 0.6 x .3 cm, the other is 1.8 x 0.6 x .3 cm. The longer piece has 11 distinct incisions or notches, several indistinct scratches along one margin, and five incisions on the opposite margin. These incisions are each about 2 mm long and are evenly spaced. The smaller fragment has two incisions. These incisions follow the rounded contour of the margin and are half-round in cross section. The incisions were carved with either a rounded abrader, such as a string saw, or fine-grained abrasive stone.

Similar notched pieces of bone were recovered at the Lindenmeier site (Wilmsen and Roberts 1978:Figure 128j–m), but the notches were placed on split-bone shaft sections from small animals. The Buhl specimen is made on a whole piece of bone.

Discussion

A number of important Paleoindian sites have been discovered on the Snake River plain in southern Idaho. These include Wilson Butte Cave (Gruhn 1961, 1965), the Simon cache (Butler 1963; Woods and Titmus 1985), the Wasden site (Miller 1982, 1983, 1989), and, more recently, Kelvin's Cave (Titmus et al. 1988). In addition, numerous Paleoindian points have been found across the Snake River plain (Butler 1986; Titmus and Woods 1991). These sites have contributed significant information on Paleoindian use of the area and on late Pleistocene and early Holocene environments. Summaries of this information are available in Butler (1986), Meatte (1990), Pavesic and Studebaker (1993), and Plew (1994). The Buhl woman contributes direct information about diet and dietary stress, burial patterns, and the physical characteristics of one of these early peoples.

Diet and Stress

Isotopic analysis of the collagen suggests a heavy reliance on meat and the use of some marine resources, presumably anadromous fish. Meat resources in the Snake River Plain at this time period included bison, elk, deer, and many small animals. The use of anadromous fish is not surprising in that the burial site is less than a kilometer from Kanaka Rapids, one of the major anadromous fishing sites on the Snake River in southern Idaho. In the interior Northwest, anadromous fish remains have been recovered from pre-Mazama ash levels at a number of different localities (see Carlson 1997 for discussion). In Idaho, anadromous fish have been recovered from pre-Mazama ash levels in the Bernard Creek Rockshelter on the Snake River in Hells Canyon (Randolph and Dahlstrom 1977), and from many middle- to late-period prehistoric occupations in southern Idaho (Meatte 1990:66–67; Plew 1988). Isotopic analysis of the Buhl skeleton indicates occasional use of anadromous fish, but not intensive use. This is consistent with other evidence for anadromous fish use by early people in the northwestern interior (Carlson 1997).

The isotopic analysis clearly supports Kelly and Todd's (1988) argument that Paleoindians were

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Notes

1. The 1984 Idaho law protecting unmarked graves and regulating the archaeological excavation of Indian skeletons requires written consent from the appropriate Indian tribe for the excavation of Indian graves. The appropriate tribe is designated by the director of the Idaho State Historical Society. The law does allow the emergency excavation of Indian graves if such action is necessary to protect the site from foreseeable destruction. The Buhl burial was clearly in danger of total destruction from the collapse of the profile and from looters and was an emergency excavation. Reinterment of Indian skeletons is expected under Idaho law. At the request of the Shoshone-Bannock Tribes at Fort Hall, in whose aboriginal territory the Buhl skeleton was found, the skeleton and associated artifacts were turned over to tribal authorities and reburied on December 20, 1991. Prior to reburial, all elements of the skeleton were photographed and radiographs were taken of the cranium, maxilla, mandible, and long bones. Casts of the lower and upper dental arcades and epoxy resin replicas of individual teeth suitable for use in light and scanning electron microscopy were made from the Buhl dentition. The photographs, radiographs, and dental

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