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A Cremation and an Inhumation from the Dover Overflow Site (CA-MER-415), Merced County, California

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In 2003 and 2004, the Center for Archaeological Research at California State University, Bakersfield, conducted Phase I and II studies at CA-MER-415 (also known as the Dover Overflow site), a prehistoric (or possibly protohistoric) site located in western Merced County north of Los Banos, California. During the Phase II study, a cremation and an inhumation were discovered. The cremation feature contained the remains of at least two individuals, an adult and a juvenile. The inhumation feature consisted of the remains of a young female who stood just over five feet tall. Radiocarbon dates associated with these individuals demonstrated that CA-MER-415 was likely inhabited between approximately A.D. 1520 and 1700. In this article, the cremation and inhumation features are described in detail, and a discussion is provided regarding their potential significance for the archaeology of the northern San Joaquin Valley.

As part of a multiyear project to rehabilitate a portion of State Route 165 in western Merced County north of Los Banos, the California Department of Transportation requested that the Center for Archaeological Research at California State University, Bakersfield (CSUB), conduct Phase I and II studies to determine the extent and nature of a prehistoric (or possibly protohistoric) site (CA-MER-415) located in the project area (Gardner

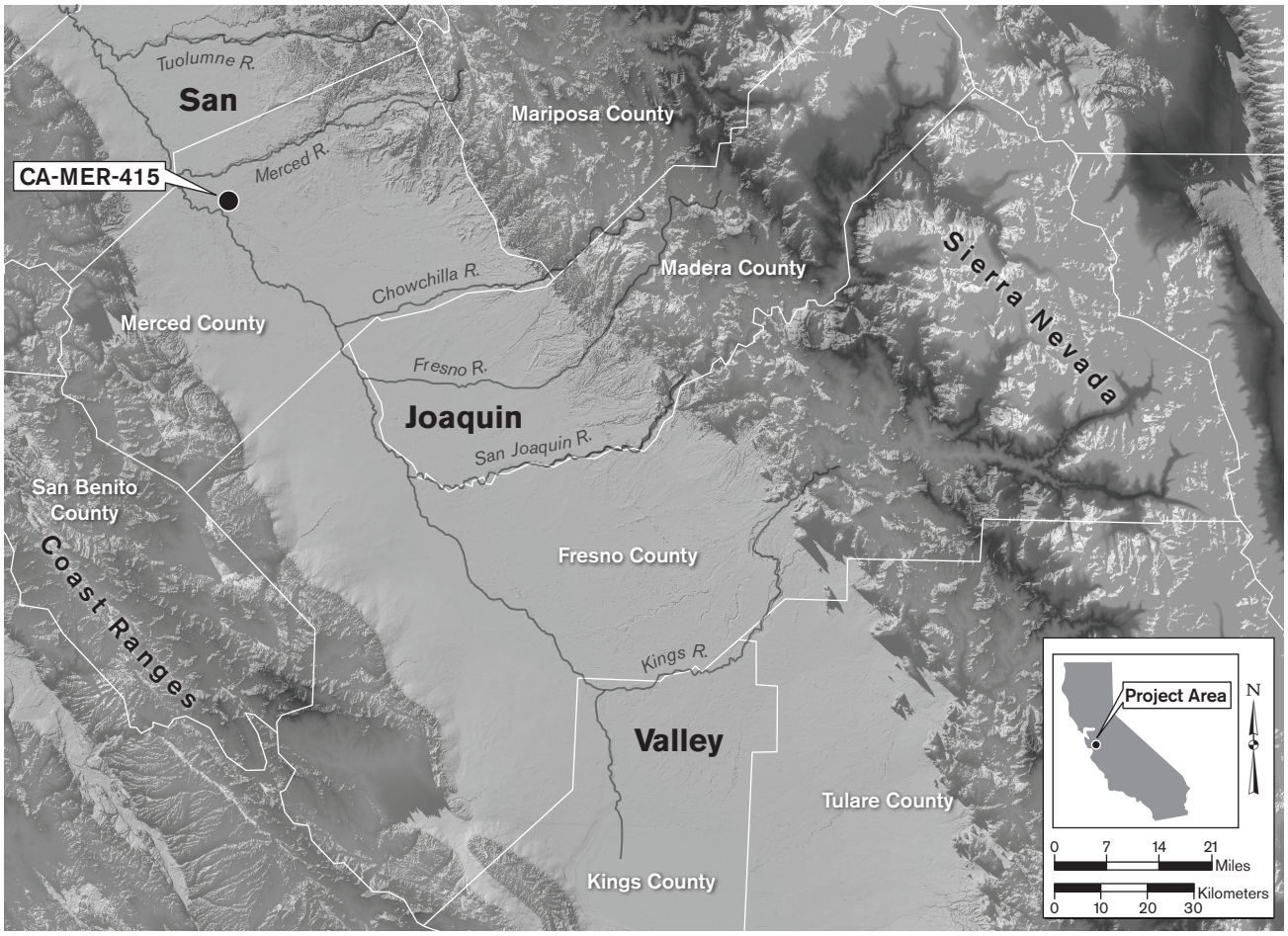

Figure 1. Location of the Dover Overflow site (CA-MER-415).

Figure 2. Organic layer in Trench 7 where the cremation was discovered after the backhoe bucket picked it up in its entirety.

2003, 2005). The project was known as the Wolfsen Road Rehabilitation Project, and the site was colloquially named Dover Overflow (Fig. 1). The site is situated on the floor of the northern San Joaquin Valley, at an elevation of about 25 m. (82 ft.). The Great Valley Grasslands State Park abuts the southwest end of the site, and the San Joaquin River flows along its southern end. The site rests on undulating topography dissected by sloughs and overflows channels, and is located within the traditional territory of the Northern Valley Yokuts (Wallace 1978).

During the Phase II study in 2004, a cremation and an inhumation were discovered. The cremation feature was revealed during trenching activities as the backhoe bucket picked it up in its entirety in Trench 7 at Locus A, at an approximate depth between 100 and 130 cm., leaving behind a dark organic layer (Fig. 2). The inhumation feature was discovered a few days later in Test Unit 8 (TU-8), which was placed a few meters east of Trench 7.

The following is an inventory and description of the cremation feature from Trench 7 and the inhumation feature from TU-8. The analysis of the inhumation was performed on-site during the Phase II investigations in the spring of 2004, while the cremation was analyzed in the archaeological laboratory at CSUB during the same period of time. Upon completion of the analysis, the human remains and artifacts from both the inhumation and cremation features were reburied in TU-8 at the request of the Native American monitors from Repatriation, Inc. Discussions of the age assessment and significance of the site, including the cremation and inhumation features, are offered at the conclusion of this report.

THE CREMATION FEATURE

The cremation feature from Trench 7 contained the remains of at least two individuals, an adult and a juvenile. There were other items within the feature as well (see

below), some of which may not have been related to the cremation event. Table 1 presents a summary of human remains from the cremation, all of which were highly fragmented and most of which were burned and at least partly calcined. The unidentified large mammal and unidentified mammal bones shown in the table were too fragmented to identify as being definitely human, although many were likely human given the context of the feature and the degree of burning on the bones.

Table 1

SUMMARY OF SKELETAL ELEMENTS FROM THE CREMATION FEATURE IN TRENCH 7 AT CA-MER-415

Skeletal Element	Number
cranial vault fragments	19
maxilla fragment	1
tooth roots	3
metacarpal fragments (proximal)	2
metatarsal fragments (distal)	2
phalanx fragments (distal)	3
femoral fragments (posterior shaft)[a]	3
femoral epiphysis fragments (distal)[b]	2
tibial epiphysis fragment (proximal)	1
indeterminate epiphysis fragments	4
unidentified large mammal bone	207
unidentified mammal bone	450

[a]Two of these fragments conjoined and all were adult-sized.
[b]Both of these fragments were subadult-sized.

Note: While the unidentified mammal bones in the last two rows could not be positively determined to be human, it is likely that at least some were human given the context.

The identification of adult femoral shaft fragments and subadult femoral epiphyseal fragments indicated the presence of at least two individuals. Unfortunately, the fact that the backhoe bucket picked up this feature, apparently in its entirety—thus disturbing the context and association of the human remains, artifacts, and ecofacts—leaves some question as to whether this cremation was primary or secondary. Nevertheless, due to the general lack of associated charcoal, the small area that encompassed the feature, and the commingling of the remains, the cremation is interpreted as most likely secondary.

Also recovered within the backhoe bucket, but not necessarily associated with the cremation feature, were ten nonhuman mammal and bird bones, six waterworn cobbles, and six baked clay fragments. Two artifacts were also recovered, a chert flake and a steatite pendant. The pendant, which was most likely associated with the cremation, measured 4.0 x 1.0 mm. in size and had a partial perforation at one end (Fig. 3). It is possible that the waterworn cobbles represent magico-religious objects (see Koerper et al. n.d.), or the remains of a cremation cairn (Pritchard 1970: Table 15). As the context of these cobbles was destroyed by the backhoe before they could be documented *in situ*, however, it is not possible to determine their potential function with any certainty. Moreover, at the time of the excavations, the cobbles were not considered significant enough to document in detail (e.g., size, shape, material), and they have since been reburied. As a result, there is no additional information on these cobbles for comparative purposes.

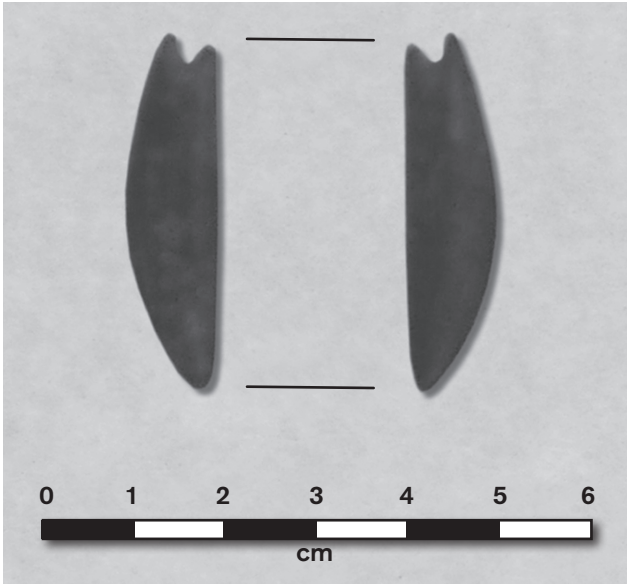

Figure 3. Steatite pendant from the cremation. Regrettably, this photo is blurred and there was no opportunity to take another photo prior to reburial.

Upon discovery of the human remains from the cremation and the inhumation, Steve Morris of the Merced County Coroner's Office and Katherine Perez of Repatriation, Inc. were contacted and made aware of these remains. Ms. Perez granted permission to radiocarbon date the cremated remains. All of the items recovered from the cremation feature, with the exception of the human remains that were submitted for radiocarbon dating (see below for details), were reburied with the inhumation in TU-8 at the request of Ms. Perez.

THE INHUMATION

A few days after the cremation was discovered, an inhumation was revealed in TU-8 (Fig. 4). Upon initial discovery, the skull was visible at a depth of 60 cm. in the north half of the unit. At that time, the Native American monitors requested that excavations be halted in the north half of the unit and continued only in the south half. It became almost immediately obvious that the burial extended into the south half of TU-8, whereupon permission was granted to completely expose those elements that were within the test unit and analyze them in the field prior to reburial. In addition, there were elements from the inhumation that extended into the east wall of TU-8, which were documented *in situ* but not removed for in-field analysis per the request of the monitors. All bones that were removed or observed in TU-8 are listed in Table 2, while Tables 3 and 4 provide the cranial and postcranial measurements, respectively.

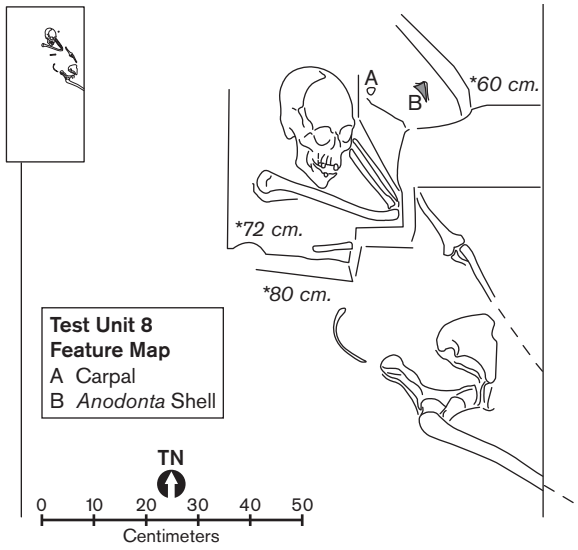

Figure 4. Sketch drawing of the inhumation in TU-8, showing orientation and flexure (top left inset shows the inhumation in relation to the entire unit).

Table 2

SUMMARY OF CRANIAL AND POSTCRANIAL ELEMENTS FROM THE INHUMATION FEATURE IN TU-8 AT CA-MER-415

Element[a]	Condition	Side	Comments
Cranial Elements			
cranium	complete	–	–
mandible	complete	–	–
maxilla	complete	–	–
teeth (30)	–	–	missing right upper central and lateral incisors, crown on right upper canine; spatulate incisors
Postcranial Elements			
scapulae	~30% complete left, complete right	both sides	body of left scapula partially degraded
clavicles	complete	both sides	–
humeri	complete	both sides	
ulnae	complete	both sides	left ulna visible but not removed, presumed to be complete
radii	complete	both sides	left radius visible but not removed, presumed to be complete
carpals (4)	complete	undetermined	navicular, lesser multangle, hamate, triquetral
metacarpal (1)	complete	right	–
manual phalanx (1)	complete	undetermined	–
ribs (12)	complete	6 right, 6 left	1 right 1st rib, 1 right 11th rib, 10 undetermined
innominates	complete	both sides	–
cervical vertebrae (6)	complete	–	C1 through C6
thoracic vertebra (1)	complete	–	T2
femur (1)	complete	right	–
patella (1)	complete	right	–
pedal phalanx (1)	partial	undetermined	distal terminal fragment

[a]Numbers in parentheses represent number of elements present.

Table 3

CRANIAL MEASUREMENTS FOR THE INDIVIDUAL FROM THE INHUMATION FEATURE IN TU-8 AT CA-MER-415[a]

Skeletal Element	Measurement (in mm.)
Maximum cranial length	166.0
Maximum cranial breadth[b]	140.0
Bizygomatic diameterb	126.0
Basion-bregma heightb	115.0
Cranial base length	93.0
Basion-prosthion length	90.0
Maxillo-alveolar breadth	53.0
Maxillo-alveolar length	49.0
Biauricular breadth	120.0
Upper facial heightb	66.0
Minimum frontal breadth	90.0
Upper facial breadth	110.0
Nasal height[b]	39.0
Nasal breadth	20.0
Orbital breadth[b]	34.0
Orbital height[b]	32.0
Biorbital breadth[b]	92.0
Frontal chord	105.0
Parietal chord	100.0
Occipital chord	_[c]
Foramen magnum length	31.0
Foramen magnum breadth	29.0
Mastoid length	25.0
Chin height	29.0
Height of mandibular body	27.0
Breadth of mandibular body	8.9
Bigonial width	86.0
Bicondylar breadth	109.0
Minimum ramus breadth	27.0
Maximum ramus breadth	38.0
Maximum ramus height	57.0

[a]Following Buikstra and Ubelaker (1994).
[b]Approximate measurements due to partial degradation.
[c]Measurement erroneously recorded in the field and could not be checked prior to reburial.

Table 4

POSTCRANIAL MEASUREMENTS FOR THE INDIVIDUAL FROM THE INHUMATION FEATURE IN TU-8 AT CA-MER-415[a]

Element/Attribute	Measurement (in mm.)[b]
Clavicle	
Maximum length	128.0[c]
Anterior-posterior diameter at midshaft	8.0
Superior-inferior diameter at midshaft	6.7
Scapula	
Height	129.0
Breadth	90.0
Humerus	
Maximum length	285.0
Epicondylar breadth	48.7
Vertical diameter of head	36.0
Maximum diameter at midshaft	18.3
Minimum diameter at midshaft	12.5
Radius	
Maximum length	210.0
Anterior-posterior diameter at midshaft	9.2
Medial-lateral diameter at midshaft	12.3
Ulna	
Maximum length	225.0
Anterior-posterior diameter	11.0
Medial-lateral diameter	10.3
Physiological length	197.0
Minimum circumference	_[d]
Os Coxae	
Height	175.0
Iliac breadth	120.0
Pubis length	75.0
Ischium length	65.0
Femur	
Maximum length	_[d]
Bicondylar length	_[d]
Epicondylar breadth	_[d]
Maximum head diameter	37.0
Anterior-posterior subtrochanteric diameter	20.6
Medial-lateral subtrochanteric diameter	31.0
Anterior-posterior midshaft diameter	22.9
Medial-lateral midshaft diameter	23.0
Midshaft circumference	78.0

[a]Following Buikstra and Ubelaker (1994)
[b]All measurements were taken on the right element.
[c]Epiphysis missing.
[d]Measurement erroneously recorded in the field (see text for details).

Condition and General Description of the Remains

Overall, the skeleton in TU-8 was in good condition. Missing elements included most of the vertebrae, metapodials, and phalanges, as well as the sternum, half of the ribs, the sacrum, left femur, left patella, both tibiae, and both fibulae (Table 2). It is likely that most of these bones were present in the site deposit (undoubtedly including the lower extremities; see Fig. 4), but since the excavations did not extend beyond the test unit (with the exception of removing the right femur in order to determine stature; see below), those elements were not recovered. One interesting aspect of the inhumation is that the skeleton was coated with an unknown black substance. It was probably manganese, which can occur as natural accretions in the soil.

The skull appeared to have some intentional deformation on the top of the cranium, although this may have been due to some taphonomic process (such as soil compaction; see Schiffer 1987:203–204). The top of the skull was flattened and slightly depressed. In addition, there was some flaring at the juncture of the coronal and squamosal sutures, and portions of the frontal and the parietals at that juncture were broken postmortem. This suggests a natural "crushing" effect rather than intentional deformation. There are few data on the incidence of cranial deformation among native California groups. Silver (1978:217) reported that the practice occurred among the Shasta of northwestern California and southern Oregon, but provided no details about the process. Immediately north of the Northern Valley Yokuts, the Eastern Miwok also practiced cranial deformation, in which the head was "flattened in the back by the hard cradle," and the "forehead was pressed and rubbed from the center to the sides to produce a short flat head" (Levy 1978:408). Neither of these types of deformation was apparent on the skull from this inhumation, lending support to the suggestion that this was not intentional.

The maxilla retained all of its teeth except the right central and lateral incisors, although some of the teeth had fallen out and were recovered either within the test unit or during screening. The mandible also retained all of its teeth.

Orientation and Flexure

The individual in the inhumation feature was oriented northwest (at approximately 340° from true north). The skeleton was fully extended with the exception of the right arm, which was raised up toward the skull (see Fig. 4). Semiflexed burials with folded arms were reported by Pritchard (1970:29) from the Menjoulet site (CA-MER-3) in Merced County, about 40 miles southwest of Dover Overflow, although in all cases both arms were folded across the chest.

Flexure and orientation were variable at other sites near Dover Overflow (e.g., Olsen and Payen 1969, 1983; Pritchard 1970). Some 24 of the 41 burials reported by Olsen and Payen (1969:36–37) were flexed in various positions, including on the back, the right side, and the left side; one burial was semiflexed on the left. Orientation was documented for 27 individuals and was highly variable, with five or fewer oriented north, northwest, northeast, west, east, south, southwest, and southeast (Olsen and Payen 1969:37). Pritchard (1970:28–30) reported 54 burials and cremations from the Menjoulet site (CA-MER-3), of which 21 were burials. Flexure among those was almost equally distributed between tightly flexed, semiflexed, and extended. Orientation was determined for 13 individuals and was also variably distributed, with four or fewer oriented east, northeast, northwest, southeast, and southwest. No data regarding degree of orientation were provided by Olsen and Payen (1969) or Pritchard (1970).

Vital Statistics

Several visual techniques were employed in the field for making determinations of sex, age, population affiliation, stature, and pathological conditions of the individual in this burial. The cause of death could not be determined.

Sex Determination: Most Likely Female. Standards for determining the sex of human skeletal remains must take into account that sexual dimorphism varies among human populations, and that certain features can vary markedly, even within populations (Buikstra and Ubelaker 1994). Keeping that in mind, several techniques were cross-referenced to determine the sex of this individual. The most reliable method for determining sex is by analysis of the innominate (e.g., Phenice 1969). Three landmarks on the innominate (ventral arc, lateral recurve, ischiopubic ramus) are highly reliable for sexing.

For this individual, the presence of a ventral arc and lateral recurve, the sharp ischiopubic ramus ridge, the wide sciatic notch, and the presence of a preauricular sulcus were all strongly indicative of a female. The ventral arc, the lateral recurve, and the ischiopubic ramus ridge all have a statistical reliability of approximately 96%. No information regarding statistical reliability is available for the other two criteria; however, they provide additional but more subjective evidence of sex.

The maximum diameter of the femoral head can also be used to assess sex. Generally speaking, a femoral head diameter of 42.5 mm. or less is indicative of a female. The head diameter of the right femur of this individual was 37.0 mm., which falls under the category of "probable" female (e.g., Burns 1999:152). Additionally, the gracile nature of the bones, as well as the slight muscle attachments that were evident on the bones,

further support the determination that this individual was most likely female.

Cranial attributes can also provide evidence of sex, although the reliability of this method can be affected by poor preservation conditions and/or population variation. The sexing characteristics of the cranium in this case included the following: (1) slight brow ridges; (2) sharp supraorbital margin; (3) some parietal bossing; (4) small mastoid processes; (5) near absence of nuchal crest/torus; and (6) slight muscle markings along the temporal, zygomatic, and nuchal lines. All of these traits strongly suggested that the individual was female. Discriminant function analysis of the metrics from this skeleton further supported the assessment of sex when compared with a worldwide sample (Howells 1995; Ousley and Jantz 1996).

Age Estimate: 16 to 22 Years Old. Several techniques were utilized to determine an age range for this individual. For children and young adults, the most reliable of these techniques is the degree of dental eruption. On the mandible, the third molar on the left side was partially erupted, and the third molar on the right side was visible but unerupted. According to Buikstra and Ubelaker (1994:51), this places the age of the individual between 15 years ± 36 months and 21 years old at the time of death. Because there was partial eruption of the third molar on the right, however, the lower end of the age range is likely no less than 16. In addition, the epiphyseal union of the medial clavicles was at Stage 2 (nonunion with separate epiphyses), indicating an age range between 16 and 22 (Owings Webb and Suchey 1985).

The pubic symphysis can also be used to estimate age (Brooks and Suchey 1990). While this technique has been shown to be unreliable (e.g. White 1991:315), it is often used primarily as a cross-reference for other methods or in instances where the pubis is the only bone available. Using the method of Brooks and Suchey (1990), the pubic symphysis most closely resembled a Phase I, indicating an age range between 15 and 24, although given the lack of eruption and partial eruption of the third molars on the mandible, it is highly unlikely that the individual was older than 22. Therefore, the combined evidence for age strongly supported an age range between 16 and 22.

Population Affiliation: Most Likely Native American. While biological anthropologists have developed specific techniques for the identification of population affiliation, they are limited in scope and prone to misinterpretation (Burns 1999:152). One of the most reliable techniques for determining population affiliation in North America is the presence of spatulate (shovel-shaped) incisors, in which there is a deep fossa on the lingual surface. Spatulate incisors are almost always present on the teeth of Mongoloid populations, which include Asians and Native Americans, and are extremely rare in Europeans or persons of European descent.

Because the female from Dover Overflow had spatulate incisors, along with the archaeological context of the site, the determination was made that this individual was most likely Native American. This was supported by several cranial traits, which included a low and sloping forehead, somewhat flaring zygomas, moderate alveolar prognathism, and a relatively elliptical palate (Burns 1999:154).

Stature Estimate: 150.22 to 160.94 cm. Stature reconstructions can be made on human remains if certain long bones are in measurable condition. By using the corrected formulae in Trotter and Gleser (1952, 1958, 1977), stature can be reasonably estimated. In order to make such an estimate, it is necessary to know the sex and population affiliation of the individual. All of the criteria used to determine sex and population affiliation for this individual suggested a Mongoloid female, but as there is no such category in Trotter and Gleser, the formulae for Mongoloid male and white female were used as cross-references.

To use these formulae, the long bone in the best condition is accurately measured and fitted to its appropriate formula. For this individual, the best bone to use would have been the femur; however, the femoral maximum length was incorrectly recorded in the field and since the individual was reburied, there was no opportunity to correct it. Therefore, the right radius (length = 21.0 cm.), the next best bone, was utilized (Table 5). Taking the minimum and maximum numbers from both formulae, these results indicate that the stature of this individual was between 150.22 and 160.94 cm. While neither formula was for a Mongoloid female, the generally small size and gracile nature of the bones support this stature range.

The low end of this stature calculation (150.22 cm.) is in general agreement with the formula developed by

Table 5

STATURE FORMULAE AND RESULTS FOR THE INDIVIDUAL FROM THE INHUMATION FEATURE IN TU-8 AT CA-MER-415[a]

Mongoloid Male	White Female
3.54(radius) + 82.00 ± 4.60	4.74(radius) + 54.93 ± 4.25
3.54(21.0 cm.) + 82.00 ± 4.60	4.74(21.0 cm.) + 54.93 ± 4.25
156.34 ± 4.60 cm.	154.47 ± 4.25 cm.
mean = 61.55 in. (5 ft. 1 in.)	mean = 60.81 in. (5 ft. 1 in.)
maximum = 63.36 in. (5 ft. 3 in.)	maximum = 62.49 in. (5 ft. 2 in.)
minimum = 59.74 in. (5 ft.)	minimum = 59.14 in. (5 ft.)

[a]Using Mongoloid Male and White Female formulae from Trotter and Gleser (1952, 1958, 1977) as cross-references.

Genoves (1967) for a Mesoamerican population, which produced a stature of 149.50 cm. for this individual (using radius length). It is also in accordance with the data reported by Gifford (1926:Table 14) on 24 living Yokuts women, whose stature ranged between 151.0 and 155.0 cm.

Pathological Conditions and Other Anomalies. There was evidence of hypoplasia on the mandibular canines, with six to eight prominent bands visible, indicating multiple periods of nutritional or disease-related stress in the life of this individual. Heavy calculus was evident on the canines and incisors, with moderate calculus present on most of the other teeth. The left central incisor and left second premolar on the maxilla were turned at about a 45° angle. There was moderate tooth wear on most of the teeth. As noted above, the skull may have had some intentional cranial deformation, but it seems more likely that this anomaly was noncultural in nature.

Summary of Vital Statistics. In summary, the individual discovered in TU-8 was most likely a Native American female who was approximately 16 to 22 years of age at the time of her death. Her living stature was between 150.22 and 160.94 cm. Other than the hypoplasia that was evident on the mandibular canines and the possible cranial deformation (see above), this individual displayed no obvious pathological conditions. The cause of death for this young woman could not be determined.

Possibly Associated Artifacts

Although they could not be directly associated with the inhumation, three artifacts were found in the level above it. The first was the base of an obsidian projectile point (Fig. 5) that measured 6.1 x 9.1 x 2.7 mm. in size and was identified as a Desert Side-notched point (Thomas 1981). The second was an *Olivella* sp. small spire-lopped bead (Type A1a per Bennyhoff and Hughes [1987:118]) that measured 8.9 x 5.3 mm. in size, with a perforation diameter of 2.4 mm. The third was a steatite disk bead with a diameter of 6.2 mm. and a perforation diameter of 2.0 mm. All three of these artifacts were documented in the field and reburied with the inhumation. The species of the *Olivella* bead could not be determined in the field prior to reburial.

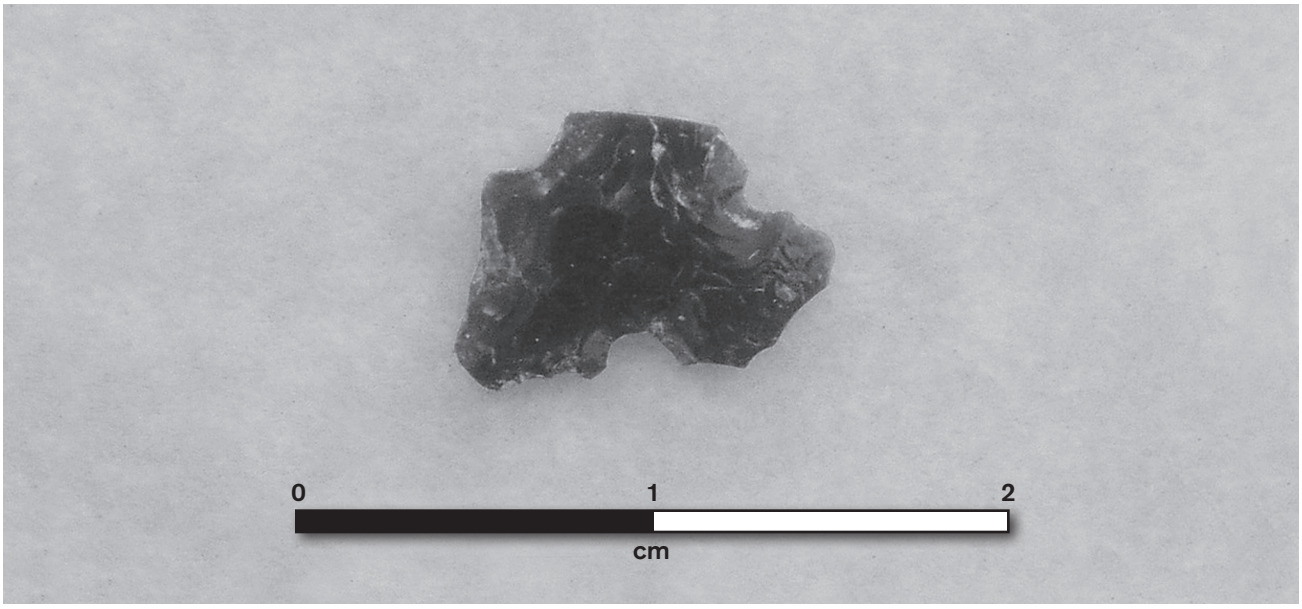

Figure 5. Projectile point from TU-8.

DATING THE SITE

The chronological data from CA-MER-415 were derived primarily from radiocarbon assays and artifact typologies from both the Phase I and Phase II studies, with obsidian hydration analysis providing equivocal evidence of age. Each of these categories employed for age assessment of the site, including the cremation and inhumation, is discussed below.

Radiocarbon Assays

The fragmentary human remains from the cremation in Trench 7 were submitted to Beta Analytic for an AMS assay. This assay returned a result of 260 ± 40 RCYBP (Beta-202073), calibrated between A.D. 1520 and 1590, A.D. 1620 and 1670, A.D. 1770 and 1800, and A.D. 1940 and 1950 (at two sigma). These results demonstrate inconsistencies as a result of problems related to post-sixteenth century De Vries effects, or what Taylor (1987:30) has referred to as "kinks" or "wriggles" in the calibration curve. Moreover, the latter range (A.D. 1940 to 1950) is almost certainly an outlier associated with the "bomb effect," which relates to uncertainties in ^{14}C distribution due to nuclear testing post-A.D. 1950. It is most likely, then, that the age of this cremation (and hence the site) falls between A.D. 1520 and 1800.

A cervid long bone from the 40 to 50 cm. level of TU-8 was also submitted to Beta Analytic for an AMS assay, which returned a result of 290 ± 40 RCYBP (Beta-202072), calibrated between A.D. 1490 and 1660 (at two sigma). As this cervid bone was discovered in the level immediately above the inhumation, it most likely dates that burial event as well. Given the date of the burial, then, it seems reasonable to conclude that the terminal age of the site is no later than ca. A.D. 1700.

Artifact Typologies

As noted above, the base of an obsidian projectile point recovered from TU-8 during the Phase II study was identified as a Desert Side-notched form (Thomas 1981). This type of point is generally considered to date between about A.D. 1200 and the historic era (Baumhoff and Byrne 1959; Heizer and Hester 1978). In addition, the Phase I investigation produced a chert projectile point identified as a Delta subtype of the Desert Side-notched form (see Olsen and Payen 1968, 1969; Pritchard 1970). The Delta subtype has been dated to the Madera Phase (ca. A.D. 1500 to 1850) in the Buchanan Reservoir area southeast of Dover Overflow (Moratto 1984:320).

The *Olivella* spire-lopped bead recovered during the Phase II study has little temporal significance, although such artifacts do occur in late and protohistoric period contexts in California (Bennyhoff and Hughes 1987), a fact that aligns with the other chronological data from the site. Another *Olivella* sp. bead (3.7 mm. diameter, 1.3 mm. perforation diameter), discovered during the Phase I study, was identified as either a Type G1 tiny saucer or a Type H1a ground disk (Bennyhoff and Hughes 1987:132, 135). The former type has little temporal significance, but the latter has been dated to what Bennyhoff and Hughes (1987:135) referred to as the Early Mission Period, from about A.D. 1770 to 1800. The steatite disk bead from TU-8 and a bone bead (4.7 mm. diameter, 2.7 mm. perforation diameter) from TU-9 (about 15 m. north of TU-8) also have little temporal significance, although both have occurred in late contexts at California sites (e.g., Moratto 1984; Olsen and Payen 1983).

Obsidian Studies

Obsidian sourcing and hydration analyses were conducted by Northwest Research Obsidian Studies Laboratory in Corvallis, Oregon, on the sole obsidian flake recovered from the site. The specimen was chemically characterized as coming from the Bodie Hills source in Mono County, California. The rim measurement on this flake was 10.8 microns, which is unusually large for an artifact from this source and constitutes the second largest rim of 959 Bodie Hills artifacts in the database (C. Skinner, personal communication 2005).

This is in stark contrast to the radiocarbon dates and the artifact typologies. While it is difficult to make an argument for age based on a single hydration rim measurement, the 10.8 micron reading is suggestive of some antiquity, perhaps a much earlier component of the site. This is supported by similar hydration readings on Bodie Hills specimens identified as Clovis and stemmed projectile points from Nevada with rim readings of 9.9, 10.2, and 11.9 microns (Tuohy 1984:214). Since there is no other chronological evidence from the site indicating such antiquity, however, it is possible that this rim measurement is an anomaly or that the flake was deposited into the site from somewhere else by fluvial or other natural processes (e.g., bioturbation). Alternatively,

it could indicate that this specimen was scavenged and curated subsequent to an earlier occupation of the site.

DISCUSSION

The following discussion provides interpretive comments on the Dover Overflow site (CA-MER-415) based on the excavations conducted during the Phase I and Phase II studies in 2003 and 2004. The topics under consideration below include site age and chronology, site function, burial techniques, evidence of secondary cremations near the site, and the significance of the co-occurrence of cremations and inhumations.

Site Age and Chronology

Disregarding the obsidian hydration results, the combined chronological data from the Phase I and Phase II studies places the age of the Dover Overflow site between roughly A.D. 1500 and 1700, a time that falls within the Panoche Complex of the northern San Joaquin Valley (see Olsen and Payen 1969). This supports the data from other sites in Merced and Fresno counties that are within about 40 miles of the Dover Overflow site (Table 6), most of which contained at least one component that dated to the Panoche Complex.

As defined by Olsen and Payen (1969:39), the Panoche Complex (ca. A.D. 1500 to 1800) is characterized by the presence of small, side-notched, concave-base projectile points referred to as Panoche points; small, triangular, concave-base points; and shell beads and other ornaments of *Olivella*, *Haliotis*, and *Tivela*. Structures of the Panoche Complex have included large, circular assembly or ceremonial houses and smaller dwellings. Primary and secondary cremations (as well as primary flexed burials) have been documented, but do not appear to have been common, with the notable exception of the Menjoulet site (CA-MER-3; Pritchard 1970), at which 33 cremations were reported (see below).

Table 6

COMPARISON OF CA-MER-415 WITH OTHER SITES IN MERCED AND FRESNO COUNTIES[a]

Site (CA-)	Inhumations/ Cremations	Description	Complex[b]	References
MER-8	none known	limited occupation	Unknown	Treganza 1960
MER-9	none known	Yokuts part-time camp	Late Panoche	Treganza 1960
MER-56	3 inhumations	Indian village	Unknown	Treganza 1960
MER-88	none known	village/campsite	Late Panoche?	Riddell 1960
MER-89	none known	occupation site	Unknown	Riddell 1966; Woodward and Barrett 1989
FRE-128	2 inhumations	Yokuts short-term occupation	Early Gonzaga	Olsen and Payen 1968
FRE-129	16 inhumations	Yokuts summer village site	Panoche	Olsen and Payen 1968
MER-S94	40 inhumations	long-term occupation	Pacheco	Olsen and Payen 1969
MER-3	21 inhumations, 33 cremations	two-component village	Gonzaga, Panoche	Pritchard 1970
MER-27	1 inhumation	two-component site	Pacheco, Panoche	Nissley 1975
MER-215	20 inhumations	Yokuts village	Gonzaga	Peak and Weber 1978; Peak 1979
MER-220	none known	multicomponent, special-use site	Pacheco, Panoche/Gonzaga	Scientific Resource Surveys 1979
MER-221	none known	large Yokuts village	Panoche/Gonzaga	Scientific Resource Surveys 1979
MER-223	6 inhumations	unknown	Pacheco	Scientific Resource Surveys 1979
11 sites[c]	none known	habitation/occupation sites	Late Gonzaga/Early Panoche?	Woodward 1993; Laylander and Silva 1999; Baker 2000
MER-295	1 inhumation	large occupation site	Panoche?	Woodward 1993; Parr 1994
MER-342	none known	small village	Panoche?	Clift 1994

[a] In order by date of investigations.
[b] Per Olsen and Payen (1969).
[c] CA-MER-46, -89, -293, -294, -295, -296, -297, -298, -299, -300, -301.

Site Function

Evidence for site function was sparse in the Phase I study, although a comparison with nearby sites initially suggested that it may have been an occupation or village site (see Table 6). During the Phase II study, attempts to identify structures and features to clarify this issue were only moderately successful, including the documentation of a possible floor and what were believed to be structural materials (baked clay fragments, possibly the remains of daub structures). The fact that no structures were found suggests that the function of the site was primarily for interment of the dead and not for habitation.

The paucity of artifacts recovered from the site tends to support this suggested site function. Between the two studies, there were 161 baked clay fragments, 144 pieces of debitage (mostly of chert and basalt), 10 red ochre fragments, four beads (two shell, one bone, and one steatite), three ground stone fragments, two projectile points, one burin (or drill), one biface, one possible clay pipe fragment, and less than 1,000 terrestrial vertebrate and fish remains (most of which were considered intrusive).

Alternatively, it is possible that there were structures, but evidence of their presence has been virtually obliterated by erosion, bioturbation, and/or other natural processes. As the typical Northern Valley Yokuts dwelling consisted of small structures covered with tule stalks (Wallace 1978:465), there would be little evidence of their existence.This does not explain the sparse artifact inventory, however, which supports a more restricted function for the site; i.e., disposition of the deceased, suggesting limited duration of site use.

Burial Techniques

Although the two radiocarbon samples came from very different levels (40 to 50 cm. for the cervid bone in TU-8 and 100 to 130 cm. for the cremation), the dates are statistically identical. There are several possible explanations to account for this. One is that it could be a function of the digging technique used by the original depositors, in that perhaps cremation pits were excavated deeper than burial pits. Typically, only shamans or other important individuals were cremated (Wallace 1978:468); thus, pit depth could be related to status (see below).

On the other hand, although Dover Overflow appears to be a single-component site, it is remotely possible that the cremation and inhumation represent different groups at slightly different times, with different mortuary practices. The age of the site appears to fall sometime between A.D. 1500 and 1700. Much of this time span was postcontact, a period of devastating diseases and other population disruptions of Yokuts and other native groups (e.g., Erlandson and Bartoy 1995, 1996; Milliken 1995; Preston 1996). As a result, some areas could have been vacated by one group and reoccupied relatively rapidly by another group with different burial techniques (see Riddell 2002).

It is also possible that the depths of the cremation and inhumation features have nothing to do with cultural processes; rather, it may be related to dune undulation. The north end of the site where the cremation and inhumation were discovered rests on low, undulating dunes with high and low spots. Therefore, if the cremation was placed in one of the low spots (an inter-dune trough), it would have the appearance of being placed deeper than the inhumation, which may have been deposited on a dune crest. This would also reflect differences in the original dune topography at the time of site occupation (J. Meyer, personal communication 2005). While the site displayed evidence of erosion and bioturbation, it is unlikely that the pit depths have anything to do with these depositional processes, as both the cremation and inhumation features appeared to have been in their original contexts.

Evidence of Secondary Cremations Near Dover Overflow

The cremation feature from the Dover Overflow site is interpreted as a secondary cremation. Scant archaeological evidence of secondary cremations has been documented near the Dover Overflow site. Of the nearly 30 sites discussed by Gardner (2003, 2005) as part of the archaeological background for the study area, only the Menjoulet site (Pritchard 1970) contained cremations (a noteworthy total of 33), all of which were considered to be secondary. Pritchard (1970:29) reported that the bodies of the deceased at this site were "burned elsewhere and the ashes were gathered and deposited in small grave pits." A similar practice was reported at the Slick Rock Village site in Tulare County (roughly 100 miles southeast of Dover Overflow), where cremations "had apparently taken place at some distance from the spot

of ultimate disposal and the burned bones … had been collected and placed in shallow pits" (Fenenga 1952:342). In both of these instances, however, the cremation features contained only one individual each.

While there are few ethnographic data regarding primary or secondary cremations for the Northern Valley Yokuts, Gayton (1948a:168) provided accounts of secondary cremations for the Kechayi and Chukchansi tribes of the Foothill Yokuts. For the Kechayi, Gayton (1948a:168) reported that the remains of a cremated individual were gathered up, placed in a basket, and buried. While he did not specify which tribe he was discussing, Spier (1978:480) noted that cremation for the Foothill Yokuts entailed gathering up the bones and ashes of the deceased and placing them in a basket for secondary burial. Among the Yokuts of the southern San Joaquin Valley, the Tachi and Chunut cremated their deceased and the remaining bones and ashes were subsequently buried (Gayton 1948b:30–31). None of these accounts suggested that cremation involved more than a single individual.

The presence of two individuals within the secondary cremation feature at Dover Overflow likely indicates a relationship between these two people. As cremation was generally reserved for Yokuts shamans and other important persons (Wallace 1978:468), if the adult in this feature was such a dignitary, the presence of the juvenile may indicate that this was the child (or other close relative) of that individual. Even if the adult was not an individual of high status, the fact that the two individuals were placed in the same cremation pit suggests some type of familial or other close relationship (perhaps affinal or fictive) between them. As there are so few archaeological or ethnographic data regarding cremation as a Yokuts mortuary practice (but see above), this suggestion remains tentative.

The Significance of the Co-occurrence of Cremations and Inhumations

The significance of the co-occurrence of a cremation and an inhumation at a single site is unclear, although "mixed cremation and burial was not exceptional in aboriginal California" (Wallace 1978:468; also see Gould 1963). While the site falls within the ethnographic territory of the Northern Valley Yokuts (e.g., Kroeber 1925; Latta 1977; Wallace 1978), Gould (1963:161) noted the difficulty of making inferences about their mortuary practices due to the paucity of direct ethnographic data. Nevertheless, it is worth quoting him at length regarding mortuary practices for some California native groups in general:

> …it may be assumed that [some California cultures] practiced burial as the primary means of disposal of the dead and cremated only those individuals who, for one reason or another, died away from home. For the most part, these individuals were men killed in skirmishes with neighboring groups while on hunting trips or raids. The most obvious reason one can point to for the cremation of the body on the spot was to make it easier to carry the remains back to the home village. If the person was killed at a considerable distance from home, it would be much simpler for his companions to carry the ashes back in a container than to attempt transport of the complete corpse [Gould 1963:155].

Specifically referring to the Northern Valley Yokuts, Gould (1963:161) added that "[w]hile sharing boundaries mainly with groups which cremated, it must be noted that most of the other, more southerly Yokuts groups practiced burial as the major means of disposal of the dead."

The co-occurrence of inhumations and cremations at Yokuts sites is somewhat supported by archaeological evidence (e.g., Fenenga 1952; Pritchard 1970), although it appears to have been rare. Whether an individual was cremated or buried is thought to have depended largely on the status of the deceased; i.e., most people were buried, while cremation was reserved for shamans, those who died away from home, and "persons of any consequence" (Wallace 1978:468; also see Kroeber 1925:499).

It is interesting to note that for many California native groups, there was a strong tendency to bury their dead in the village where the deceased had resided, and in some cases adjacent to their birth home (Kroeber 1925:499). This does not seem to have been true for the Foothill Yokuts, who apparently did not bury their deceased within their villages (Hewes 1941:126). It also does not appear to be the case at the Dover Overflow site, presumed to be affiliated with the Northern Valley Yokuts, as no village was identified there.

With the exception of the Menjoulet site (Pritchard 1970), then, there have been few cremations documented in the region in and around the Dover Overflow site

(see Table 6). This supports the ethnographic and archaeological evidence for inhumations being the primary mortuary practice during the Panoche Complex, at least for the Northern Valley Yokuts.

CONCLUSION

While numerous investigations were conducted during the 1960s and 1970s in and around the area of the northern San Joaquin Valley where the Dover Overflow site is located (e.g., Nissley 1975; Olsen and Payen 1968, 1969; Peak 1979; Pritchard 1970; Riddell 1960, 1966; Riddell and Olsen 1965; Scientific Resource Surveys 1979; Treganza 1960), little research has been performed in this region since that time (but see Baker 1999, 2000; Clift 1994; Layland er and Silva 1999; Parr 1994; Woodward 1993). It is clear from current archaeological evidence that this part of the valley has witnessed human activity for at least 5,000 years (Olsen and Payen 1969), although people have most likely been in the area much longer than that. The excavation of this site provided an excellent opportunity to further explore the prehistory of this region of California, including the association of a secondary cremation and an inhumation at a single-component site in the San Joaquin Valley.

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