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# A Prehistoric Dog Burial from the Intermediate Period at CA-ORA-1055, Laguna Canyon, Orange County, California

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*The skeleton of an aboriginal dog was exhumed at CA-ORA-1055, a lakeside camp site, whose occupants focused on local resource extraction in Laguna Canyon, central Orange County, California. The burial dates to the later Intermediate Period. ORA-1055 was originally occupied during the Intermediate Period and abandoned during the Late Period when Laguna Canyon was within the southern territory of the Gabrielino (Tongva) peoples. The feature consists of a dog buried in a folded position, with the head located above the hindquarters, and covered by a cairn comprised of parts of a deep-basin metate. A possible stone ball is the only potential artifact occurring with the burial. The physical attributes of the animal's skeleton are consistent with the morphotype known as a Small Indian Dog or Tachichi. The feature most likely represents the burial of a pet, but could be associated with the destruction of personal property associated with funerary activity.*

A dog burial found in association with other archaeological features and isolated artifacts was recovered during grading monitoring at CA-ORA-1055, located in the central part of Laguna Canyon, Orange County, California (McLean et al. 2008). Ethnographic studies in the California culture area imply that such burials are likely to be the result of property destruction associated with the dog owner's death, the burial of a spirit guide, pet burials, or the burial of totem and religious symbols (Heizer and Hewes 1940; Langenwalter 2005). The ORA-1055 dog burial provides evidence of one or more of these activities in the southern part of Gabrielino territory during the Intermediate Period (1,000 B.C. to A.D. 500 [2,950 B.P. to 1,450 B.P.]). The location of ORA-1055 places the site less than 5 kilometers north of the Gabrielino-Juaneño territorial boundary, in the southernmost part of Gabrielino territory (Kroeber 1925:621). Dog burials of varying ages have been discovered within the territories of both groups (Langenwalter 1986, 2005).

This study addresses the cultural context of dog-related ritual and the biological attributes of aboriginal dogs in southern California. Ethnographic data about the cultural context and ritual treatment of dogs by the protohistoric and early historic Gabrielino peoples is limited and largely lacking for the Juaneño peoples to the south. The ORA-1055 dog burial provides evidence that helps to clarify the function of the feature and similar burials in the region. Alternative interpretations based on ethnographic analogy include property destruction, pet burial, burial of a spirit guide, and burial of totems and religious symbols. These alternative hypotheses are addressed through an evaluation of the regional ethnographic literature concerning dogs and animal ceremonialism, and of the attributes of the burial. Pet burial seems to be the most appropriate interpretation for the ORA-1055 feature. The attributes of the feature provides evidence of cultural continuity for the practice of dog burial between the Intermediate and Late periods in southern California. Questions of biological concern that are addressed with the ORA-1055 dog burial include the physical appearance, breeding, and diet of aboriginal dogs in the region.

## THE SITE

ORA-1055 is located in the central part of Laguna Canyon, about 9 kilometers inland from the coast (Fig. 1). The canyon dissects the San Joaquin Hills in a northeast to southwest direction in central Orange County, California, and provides access to the coast from the interior. ORA-1055 is situated on the flood plain of Laguna Creek, covering an area of 60 by 140 m., with the long axis of the site oriented along the western side of the creek. The site is located along a part of the creek bed where the water table is near surface today, and where there may have been intermittent standing water in the past. During the period of site occupation the area was covered by a lake, and the site was located

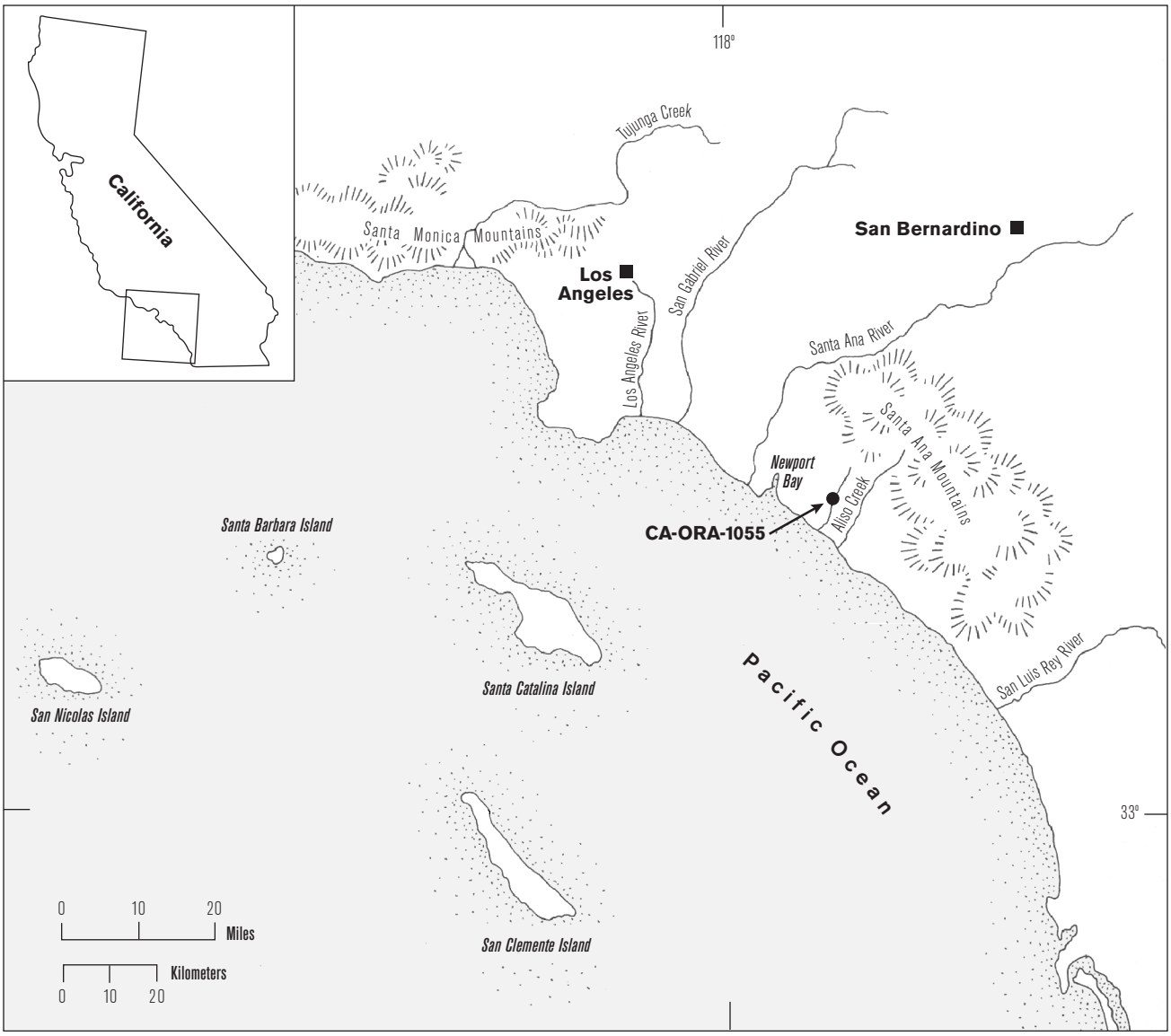


**Figure 1. Map showing the location of CA-Ora-1055.**

along the southern edge of this water feature (McLean et al. 2008). Paleoenvironmental evidence indicates that the lake progressed through a natural cycle, ultimately transitioning into meadow.

ORA-1055 has been investigated on several occasions. The first two investigations did not extend into the deeper parts of the site. These excavations identified it as a seasonal camp associated with local resource extraction. The artifacts recovered at that time included chipped stone artifacts associated with moderate amounts of chipping waste. Bone tools were rare, and groundstone and shell artifacts were not encountered. Small amounts of invertebrate and vertebrate remains were recovered. The site was estimated to be Late Period in age, based on projectile point forms (Padon and Breece 1987; Rosenthal et al. 1987).

The excavation resulting in the recovery of the dog burial focused on feature recovery related to monitoring of grading, and penetrated to greater depths than the earlier excavations (McLean et al. 2008). The result was the recovery of groundstone artifacts in numerous features, several stone-filled hearths, a human burial, and one dog burial. The hearths yielded carbonized plant remains, including lemonade berry. Chipped stone debris was common. Groundstone was recovered in features and as isolates, including manos, metates, and

pestles. Evidence indicates that some of the groundstone features represent intentional caches. These features were developed over a long period of time during intermittent occupations. Although there is probably cultural continuity between them, most features seem to represent discrete, unrelated occupational episodes (McLean et al. 2008).

The artifact assemblage indicated that ORA-1055 was a multi-component, seasonally-occupied camp used primarily for foraging within Laguna Canyon. The presence of several species of marine fish and shellfish indicates that there was some marine resource extraction activities associated with the site. The limited number of marine resources represented in the ORA-1055 sample is consistent with the limited beach area along the rocky shoreline at the mouth of Laguna Canyon.

Radiocarbon dating places the first occupation of ORA-1055 during the late Intermediate Period, with an abandonment during the Late Period. Fourteen AMS dates from selected features indicate that the occupation began between ca. 1,050 and 850 cal B.C., and extended to between ca. cal A.D. 1450 and 1640 (2,780 ± 40 B.P. [BETA-242713] to 359 ± 31 B.P [Wk-18376]). The calibrated dates are based on 2-sigma calibrations using Beta Analytic calibration software (Beta Analytic 2013), following the Pretoria Calibration Procedure (Vogel et al. 1993), and include multiple intersects.

McLean et al. (2008) have concluded that ORA-1055 was intermittently visited by small groups throughout its period of occupation. They suggest that the site alternately functioned as a camp and a resource extraction station for the procurement of local resources supplying one or more villages in the region. They infer that the site was most intensively used during the Intermediate Period, perhaps becoming a residential base occupied by a larger population, but remaining associated with one or more local villages for an extended period. They did not determine if the cycle of use was *ad hoc* or tied to a seasonal schedule.

## METHODS

The dog burial was recovered by exposing the upper portion, pedestaling, and encasing the feature and surrounding matrix in a plaster jacket. Compass orientation was indicated on the jacket. Additional field documentation included a feature record and photographs. The specimen was prepared in the lab with dental picks and small brushes. Once it was fully exposed in relief, it was photographed and the position of the torso and appendages recorded, along with observable anatomical features. The abdominal area was explored, with a separate screening of the matrix through one-sixteenth-inch screen, to determine if stomach (alimentary canal) contents were present. The skeleton was then disassembled, inventoried, and examined for morphologic attributes, pathologies, and evidence of alteration or tool marks. Most skeletal elements of the dog and of the gopher remains recovered were examined using a low power (3–7×) microscope. Samples of the femur and tibia were taken for radiocarbon dating. The specimen was assessed for possible DNA analysis, and the grave sediments inspected for the presence of alimentary canal residuum and botanical remains.

## THE SPECIMEN

The burial (Feature 17; Catalog #309) consists of the remains of a dog placed on its right hip and folded over so that the thorax lay above the hindquarters, with the head adjacent to the hind feet (Fig. 2). The hindlimbs were flexed at about 80 degrees, which is "at rest" (neither tightly flexed, or extended; Langenwalter 1986:74). The animal's body was covered by two pieces of a broken metate.

The grave was discovered when a grader exposed the uppermost surface of the metate which covered the burial. Both metate and skeleton remained in situ and were undamaged, except for marks on part of the upper surface of the metate. The deep-basin metate was broken (perhaps "killed" or broken as part of funerary property destruction) and the feature covered with two of three pieces (Fig. 3). The third piece of the metate was not part of the feature, and was not recovered. The cairn covered a shallow pit which contained the skeletal remains of a single canid. The pit penetrated the silty sand which comprised the lowermost part of the midden, and penetrated 3 to 5 cm. into the cobble bed that forms the substrate. The cobble bed consists of rounded to subangular clasts, mostly averaging 5 to 15 cm. in diameter, accompanied by silty sand, granules, and gravel. This bed is difficult to excavate by hand,

**Figure 2. Ora-1055, Feature 17 dog burial exposed in plaster jacket.**

which seems to have influenced the depth to which the grave pit was excavated.

The skeleton had been disturbed in antiquity by rodent burrowing, with the remaining portion of the skeleton consisting of 37 complete and fragmentary articulated skeletal elements (11 percent of the average dog skeleton). A cooking stone and two gopher (*Thomomys bottae*) bones were recovered from the central part of the burial. These are presumed to be incidental inclusions in the grave. The cooking stone is a semi-round piece of heat-altered granite, about 4.5 cm. in diameter. The heavily burnt piece is exfoliating granules, but remaining intact parts of the edge show wear from usage. There was no evidence of etching to the exterior surfaces of the gopher bones that would indicate that they had been in the digestive tract of the dog when it died.

The surviving parts of the skeleton include an incomplete skull with teeth, vertebrae, and forelimb and hindlimb elements (Table 1). The bones are leached, which is consistent with the waterlogged nature of the site, and with the decalcification associated with burial-in-the-flesh. The larger bones are brittle because of

**Figure 3. Metate fragments used as a cairn in the Feature 17 dog burial at Ora-1055.**

**Table 1**

**FEATURE 17 SKELETAL INVENTORY**

| | |
|---|---|
| Left Parietal | Right Proximal Metacarpal 5 |
| Occipital Fragment | Proximal Phalanx (5 specimens) |
| Squamosal ? Fragment | Distal Phalanx |
| Right Temporal Fragment | Right Ischium Fragment |
| Cranial Fragment (5+ specimens) | Left Innominate |
| Right $P^2$ | Left Femur |
| Right $P^3$ | Right Proximal Femur |
| Right $P^4$ | Right Proximal Tibia |
| Right $M^1$ | Right Distal Tibia |
| Mandible Fragment | Proximal Tibia Fragment |
| Right $I_3$ | Left Cuboid |
| Right $P_1$ | Right Cuboid |
| Right $P_2$ | Navicular |
| Right $P_4$ | Distal Metatarsal |
| Premolar Fragment (2 specimens) | Right Proximal Metatarsal 5 |
| Atlas? Fragment | Left Distal Metatarsal 5 |
| Lumbar | Metatarsal Shaft |
| Caudal (3 specimens) | Medial Phalange |
| Distal Radius Fragment | Sesmoid |
| Left Proximal Metacarpal 2 | Metapodial Fragment |
| Left Distal Metacarpal 5 | |

decalcification and heavily fragmented. The edge of the inverted metate lay directly on the skeleton, crushing one tibia shaft and part of the skull. The condition of the dog bone differs from that of the other animal remains recovered from the site, which are slightly leached and dry, but not to the extent of the dog remains. The specimen was assessed for possible DNA analysis, which can aid in the classification process (cf. Byrd et al. 2013), but it was decided that the specimen was not suitable due to leaching. There was no evidence of any "stomach contents" or other remains from the alimentary canal in the grave sediments, nor were botanical specimens recovered from the flotation of these sediments.

The ORA-1055 specimen is a dog (*Canis familiaris* Linnaeus), based on multiple anatomical features (e.g. Howard 1949; Olsen 1985; Reynolds 1985). The maxilla is foreshortened and the maxillary dental arcade crowded. The $P^1$ is absent. Diastemata (spaces) between the maxillary and mandibular premolars are minimal or absent. These characteristics contrast with the attributes of coyotes (*Canis latrans* Say).

The dog was an adult at the time of death. The right fourth premolar and first molar were recovered. Both were fully erupted and had closed roots at the time

of death. This indicates a minimum age well beyond 4.5 months, which approximates the age of eruption for both teeth in beagles (Kremenak 1967; Shabestari, et al. 1967). None of the surviving teeth exhibit significant wear. Epiphysieal fusion in the proximal femur and tibia indicate the animal was older than 18 months, using the closure data of Schmid (1972). The ORA-1055 dog can be assigned to the "Adult" age class used for aboriginal dogs in California (Langenwalter 1986:84). The adult category includes animals with fused epiphyses in the appendicular skeleton, and wear on the premolars and molars that has not resulted in penetration of the enamel.

Radiocarbon assay of the right femur yielded a calibrated AMS date of cal A.D. 380 to 660 (1,786 ± 29 B.P. [Wk-18370]) from bone collagen. This places the dog on the site during the Intermediate Period, and is consistent with the type of metate used as the cairn. A second sample (Wk18375) from the skeleton was insufficient to yield a date, and was abandoned.

## PHYSICAL ATTRIBUTES

The condition of the specimen limited most observations. Some of the morphological attributes of the skull, pelvis, and hindlimbs were observable. The skull of the animal is relatively small. Although the skull is too fragmentary to measure, it is approximately the same size and proportions as the Pit 10 dog from Rancho La Brea Tar Pits, which has been identified as an adult Tachichi with a skull length of 144.0 mm. (Reynolds 1985). The facial skeleton was the most complete part of the skull. The maxillary portion, or muzzle, was relatively short with no diastemata between the premolars or molars. The mesial-distal axis of the $P^3$ is slightly angulated (less than 45°), compared with the axis of the $P^4$, with the mesial end being closer to the midline of the skull than the distal end. The remaining facial skeleton, primarily the left nasal, indicated moderate to steep sloping of the mid-nasal area of the face. The right $P^4$ and $M^1$ were measurable. The biometrics of these teeth have not been used to characterize morphometric variations among aboriginal American dogs, but are instructive. The right $P^4$ has a length of 16.96 mm. with a greatest breadth of 8.36 mm. (von den Driesch 1976:42, 45; measurements 18 and 18a), while the right $M^1$ has a length of 10.43 mm. and a greatest breadth of 12.29 mm. (von den Driesch 1976:42, 45; measurements 20, length and breadth). These dimensions are slightly larger than the maximum for the Small Indian Dog or Techichi ($P^4$ length) and slightly less than that reported for the Plains Indian Dog ($P^4$ length), but within the range of the Short-nosed Indian Dog as reported by Allen (1920:453, 489, 499). The length and greatest breadth of the $P^4$ from ORA-1055 is slightly larger than those reported for the Rancho La Brea specimen (Reynolds 1985:77). The lengths and breadths of the $P^4$ and $M^1$ of five dogs with measurable teeth from the Encino Village Site (CA-LAN-43) are greater than the ORA-1055 specimens (Langenwalter 1986). Although the differences are relatively small, they are consistent with the ORA-1055 dog being a small animal, comparable in size to the Techichi and Short-nosed Indian Dogs.

The ileum and femur are robust (heavily built, relative to evident length). Stature was estimated from *in situ* measurements of the greatest length of the femora (after von den Driesch 1976; left femur, 129.7 mm. est.; right femur, 124.9 mm. est.). Both femora were damaged at the distal ends, so that the measurements may be 3 to 5 mm. shorter or longer. Using the formula developed by Harcourt (1974:154) for estimating stature from femur length, the stature of the ORA-1055 dog is estimated to have been between 379.3 and 394.4 mm. (about 15.2 to 15.8 inches).

There are a number of forms of aboriginal dog reported from southern California (Allen 1920). These include a generalized form (Plains Indian Dog), a small narrow-nosed form (Small Indian Dog or Techichi), and a short-faced form (Short-nosed Indian Dog)(Allen 1920:495–500; Reynolds 1985). While these are sometimes referred to as breeds, they are unlikely to have been selectively bred and the appellation is inappropriate. They are better referred to as morphotypes or varieties that emerged as regional variants in response to localized environmental and cultural factors (cf. Reynolds 1985:80). The study of the aboriginal dogs from the Encino Village Site (LAN-43) indicated that there was considerable variation in the California population (Langenwalter 1986). The evidence presently suggests that as larger samples of aboriginal dogs are studied, many of the separate varieties may be subsumed in a continuum of allometric variations in a single gene pool with considerable internal variation that originated from one or more domesticated dog lineages entering North

America during the Late Pleistocene (cf. Leonard et al. 2002; Valadez 2000).

Most of the known California aboriginal dogs fall into the morphotype described by Allen (1920:449–454) as the "Plains Indian Dog," a term later revised by Haag (1948), who referred to the group as the "Common Indian Dog." The second morphotype is represented by Allen's "Small Indian Dog" or "Techichi," which has been identified at Rancho La Brea (Reynolds 1985). Haag (1948) includes this morphotype in his "Small Indian Dog" category, while the third morphotype, the "Short-nosed Indian Dog," has been described from San Nicholas Island off the southern California coast (Allen 1920:495–500; Vellanoweth et al. 2008).

The ORA-1055 dog—in skull attributes, tooth dimensions, and femoral lengths—compares favorably with a "Techichi" (Allen 1920) or "Small Indian Dog" (Haag 1948). The muzzle is small, but too narrow to be comparable to Allen's (1920:495–500) Short-nosed Indian Dog, which had a short, broad maxilla. The orientation of the $P^3$ relative to the $P^2$ and $P^4$ is consistent with both the Plains Indian Dog and Small Indian Dog varieties in the California Culture Area. The Short-nosed Indian Dog had a considerably greater mesial-distal angulation of the $P^3$ and attending shorter face. The dimensions of the $P^4$ and $M^1$ are consistent with a smaller animal, but representative of a specific morphotype. The femoral lengths of the ORA-1055 dog fall within the upper part of the known range of the Small Indian Dog reported by Langenwalter (1986:Figure 14).

The physical characteristics of the Small Indian Dog (Techichi) variety were never described in the California Culture Area prior to their extinction. The only description of aboriginal dogs in southern California comes from Father Antonio de la Ascensión, who accompanied Sebastian Vizcaino on his voyage along the California coast in 1602. Ascensión commented on the dogs of Santa Catalina Island, saying that "the Indians have many dogs of medium size and of good appearance like our spotted retrievers, only they do not bark, but howl like coyotes" (Wagner 1929:237). Ascensión compared the medium-sized Catalina Island dogs to "spotted retrievers," implying that the dogs had a build similar to modern European hound-like dogs of medium size. This description best fits larger forms of dogs common in California that are considered to belong to the Plains Indian Dog or Common Indian Dog varieties, but may reflect the characteristics of the Small Indian Dog variety as well. Recent studies of California Indian dog skeletons indicate that most were more heavy bodied, and often shorter legged, than coyotes, which is consistent with Ascensión's description (Langenwalter 1986, 2005). Allen (1920:482) developed a generalized description of the Techichi from elsewhere on the North American continent. He described the Techichi as "a small, light-limbed dog, of rather slender proportions, narrow delicate head, fine muzzle, erect ears, well-developed tail, which may have been close-haired. Colors black, black and white, or perhaps brownish or yellowish" (Allen 1920:482). Both Ascensión's and Allen's descriptions provide word pictures that assist in visualizing the Techichi, but contain a number of largely subjective terms difficult to evaluate and apply to comparative anatomical studies.

## ETHNOGRAPHY AND ARCHAEOLOGY

The position of aboriginal dogs in prehistoric southern California society is poorly documented. The site in Laguna Canyon was in southern Gabrielino (Tongva) territory at the beginning of the historic period, and was only 5 kilometers north of the Gabrielino border with their southerly neighbors the Juaneño or Acagchemem (Kroeber 1925). The ethnographic record of dogs among the Gabrielino touches on few aspects of the animal's uses and functions (McCawley 1996). Dogs were kept by the Gabrielino, and were given special names (Harrington 1942:43). In addition, Kroeber (1925:631) states that the Gabrielino ate dogs, while Harrington's (1942) Gabrielino consultants either were unable to give information or only provisionally indicated that dogs were eaten. It is not known if dogs were used in hunting. The explorer Vizcaino (Wagner 1929:85) states that dogs were used in some ceremonies by the Gabrielino, but fails to describe how they were used. The position of dogs among the Juaneño is even more sparsely recorded. The Luiseño, of whom the Juaneño were a linguistic branch, kept dogs, but ethnographers did not report much on their use. Kroeber (1925:652) states that the Luiseño avoided dogs as a food source. Drucker's (1937:8) Luiseno respondents denied eating dogs as well, but indicated that they were used in hunting. It is

likely that dogs functioned as pets, food sources, and as working animals in the study region, much as they did in adjacent areas (Langenwalter 1986).

Archaeological evidence of dogs in the region has provided additional information and added breadth to the ethnographic image of these animals. Excavations at CA-ORA-64 in the 1970s established that dogs were present in Orange County as early as 4,000 to 6,000 years ago (Drover et al. 1983). Unfortunately, the remains from ORA-64 and other early sites are fragmentary. Variation in the size of specimens implies the presence of animals ranging in size from small terrier-sized individuals to animals nearly the size of a wolf.

Late prehistoric Gabrielino and Juaneño sites in the region have provided ample evidence that dogs were used as a source of food and that their bones were occasionally used in tool making. Dog remains comprise a portion of the food waste at many Orange County sites, including late prehistoric Gabrielino sites. Excavations at CA-ORA-855, which is believed to be the protohistoric-historic Juaneño village of Pituidem north of Mission San Juan Capistrano, revealed the fragmented and sometimes burned bones of several dogs and coyotes. The practice has considerable time depth. A large sample of dog remains was recovered from the University Village site, CA-ORA-119A. These specimens are nearly all fragmented, and many are butchered or burned. These remains were concentrated in the Intermediate Period portion of the site, in association with a variety of artifacts and other animal remains that suggested that the site had been a center of group activities. Dog bones occurred as food remains in the Late Period component of ORA-119A as well. Several of the dog burials recovered from CA-SCII-1524 on San Clemente Island bear evidence of butchering (Hale and Salls 2000), which may indicate that the animals were eaten prior to burial. The eating of dogs in the region probably occurred as early as 4 to 6 thousand years ago, during the Milling Stone Period (Drover et al. 1983:54). The largest concentrations of dog remains occur at main villages, rather than at lesser villages or camps. This suggests that the use of dogs as food was more important at larger population centers than in camps where family groups were primarily engaged in foraging activities.

Dog bone was sometimes used in tool manufacture. An awl made of dog bone was recovered from CA-ORA-193, a Gabrielino fishing camp on Newport Back Bay (Lyneis 1981). The ORA-193 awl was probably used in some aspect of shellfish processing, rather than for basketry manufacture (which was the most common use of awls in prehistoric California). Dog bone tools are known from several of the Gabrielino and Chumash sites in Los Angeles and Ventura counties. Two of the dog burials found at SCII-1524 on San Clemente Island had femur ends that had been cut (production waste), implying that the femur shafts were used in tool production (Hale and Salls 2000).

Dog remains are occasionally found within ritual contexts. The archaeological evidence for the burial of dogs in southern California is limited to eight mainland sites, and several San Clemente Island sites in Luiseño and Gabrielino territories. The burial of these animals was most likely the result of property destruction during the funeral ceremony for the dog's owner, rather than representing the burial of pets or ceremonial items.

Goff's Island, located on the coast south of the mouth of Laguna Canyon, is the closest site to ORA-1055 that is known to have yielded animal burials. Three canid burials were recovered from Goff's Island during a Work Projects Administration excavation in 1939 and 1940 (Winterbourne 1967). Although Johnston (1962:86) described them as dog burials, Winterbourne (1967:43, 52, 151) identified all three of them as coyote burials in his text and one as a dog in a photographic caption. Whether the Goff's Island canids were dogs or coyotes is clouded. These specimens were never identified by a qualified taxonomist and recent efforts to locate them have been unsuccessful. Other prehistoric dog burials from the Late Period in Orange County include a small dog from the Fairview site, CA-ORA-58. The ORA-58 burial involved a small dog that should be considered a "Techichi" or "Small Indian Dog" that was common throughout many parts of North America (Langenwalter 1986). The other definitely identified dog burial came from CA-ORA-849, a Juaneño camp along Aliso Creek at the Juaneño-Gabrielino territorial boundary. The ORA-849 dog was buried in a flexed position in a small grave pit, and was found with the remains of rabbit, gopher, and deer which had been in its alimentary canal (Langenwalter 2005). The ORA-849 dog was still a juvenile when it died, but it would have been relatively small as an adult had it lived another six months.

Other dog burials occur in Gabrielino territory to the north. A canid burial was found by Van Valkenberg at Malaga Cove on the Palos Verdes Peninsula in Los Angeles County (Wallace, personal communication 1986). The animal was said to be relatively large, possibly a "Large Indian Dog," sometimes called a "Common Indian Dog." The whereabouts of this specimen is unknown. Eleven dog burials, a canid cremation, and a hawk burial were recovered from LAN-43 in the San Fernando Valley (Langenwalter 1986). The dog burials included interments containing as many as four individuals in flexed or extended burial positions. The canid cremation was found inside an inverted abalone shell and was accompanied by clam disc beads. Several other dog burials have been reported from the same region (Pence, personal communication 1986).

Dog remains from the Channel Islands adjacent to the southern California coast have contributed significantly to the record of dogs and dog burials in recent decades. Rick et al. (2008) have summarized the known dogs and dog burials from both the northern and southern Channel Islands. They identify a fragmentary dog mandible from Daisy Cave on San Miguel Island as being perhaps the oldest known dog remains in the Americas. The Daisy Cave specimen is dated by stratigraphic association with layers that may correlate with the site's early-Holocene (ca. 10,000–8,600 cal. B.P.) deposits (Erlandson 1994:194; Walker et al. 1978).

Estimating the true numbers and kinds of dog burials from Channel Islands sites identifiable from the known remains is difficult because of degradation through taphnomic processes at some sites and the poor collection methodology that was employed prior to the 1970s. Many of the samples that include multiple specimens likely represent unrecognized burial features. The northern Channel Islands (San Miguel, San Nicholas, Santa Cruz, and Anacapa) have provided at least 9 identified examples of dog burials which date from Late Holocene [Late Period?] to historic contexts (Hoover 1971:120; Kerr et al. 2002: 33; Reinman and Townsend 1960; Rick et al. 2008:1080–1081; Vellanoweth et al. 2008). These burials are from Channel Island sites in Chumash territory (cf. Bryan 1970:59–60), and contrast with mainland Chumash sites where such burials have not been reported.

Dog burials from the southern Channel Islands (Santa Barbara, Santa Catalina, San Clemente, and San Nicholas) are more abundant. At least 28 dog burials have been collected from these islands, occupied historically by Gabrielino-speaking peoples (Hardy 2000; Kerr et al. 2002:33; McKusick and Warren 1959; Porcasi 1995:9; Raab et al. 1994; Reinman and Townsend 1960; Rick et al. 2008:1080; Salls 1990:38; Woodward 1941). Most of the dog burials from the southern Channel Islands are from Late and historic period contexts, although some may date to the Intermediate Period (ca. 2,000 B.P.; cf. Rick et al. 2008:1080). The numerous dog and island fox burials found at CA-SCII-1524 and CA-SCII-43C on San Clemente Island are among the best documented and reported (Hale and Salls 2000). These animals were buried in flexed, extended, and atypical positions. Most were accompanied by grave goods and many had associated cairns. Two of the dogs had been partly butchered and their femoral shafts apparently used for bone tool manufacture. The addition of skeletal elements from additional individuals is a common occurrence in Channel Island burials. Previously, a historic dog burial was reported from Big Dog Cave on San Clemente Island (McKusick and Warren 1959; Woodward 1941). The Big Dog Cave dog is an introduced breed, not an aboriginal dog, but reflects apparent cultural continuity into the historic period. The collective sample of Channel Island dog burials includes all of the burial attributes documented on the adjacent mainland, except for the "folded" position and the more frequent occurrence of grave goods in the dogs' graves.

Early records of dog burials on the southern California mainland are rare. A dog burial from CA-ORA-423 was recovered from the Intermediate Period component, and is dated to ca. 2,000 B.P. Only one dog burial has been reported from the San Diego region (May, personal communication 1986; Reynolds, personal communication 1986). This animal is supposed to have been buried in a flexed position in a La Jollan (Milling Stone Period) site.

The evidence indicates that dog burials in southern California occur as primary inhumations (flexed and extended), with the exception of the LAN-43 canid cremation. Apparently none of these animals occurred with grave goods or cairns, with the exception of the LAN-43 canid cremation (found with beads and an abalone shell cairn; Langenwalter 1986). When the animals have been described, they almost always occur in some form of a flexed position. Notable exceptions

to the burial position are the CA-SJO-68 dog, which was buried head down and tail up (Haag and Heizer 1953), and Features 46, 117, and 132 at LAN-43, which were extended (Langenwalter 1986). Although ethnographic documentation is lacking on the subject, dog burial practices parallel the disposal of human remains, suggesting that the method of disposal was taken from tribal mortuary ritual. Furthermore, animal burials of all kinds found in California are usually located in the vicinity of human burials, supporting minimal ethnographic evidence indicating that they were deliberately placed in cemetery areas (cf. Strong 1929:83). One report states that the Gabrielino frequently buried dogs over human interments (Bean and Smith 1978:545). However, no archaeological examples of a dog-over-human burial have ever been discovered, despite the excavation of several thousand prehistoric graves in archaeological sites in southern California.

Evidence of ritual animal burials in southern California and the south-central coastal area of the state is limited in comparison to the San Joaquin Valley and the Delta regions of central California. In central California, a large number of animal burials have been recovered, consisting primarily of prey animals (bears, coyotes, badgers, hawks, eagles, and condors) important in native mythology, and dogs (Cowan et al. 1975; Gifford 1955; Heizer and Hewes 1940; Langenwalter 2004, 2005; Peak 1976; Wedel 1941). The ethnography of the region indicates that these ritual burials were part of an elaborate tradition of ceremonies related to tribal and lineage religious practices. Dogs in particular were valued animals, and many of the dog burials encountered in archeological sites may have been buried like humans as a way for their owners to work through the grief resulting from the dissolution of the owner-pet bond at death, or perhaps as a form of veneration, rather than for religious or totemic purposes, or as representing property destroyed during the owner's funeral (Langenwalter 1986, 2005).

## DISCUSSION

The domestic dogs ancestral to Native American dogs are likely to have entered the Americas with the first humans during the Late Pleistocene. The dog from Pit 10 at the Rancho La Brea tar pits is potentially the oldest known domestic dog in California, with a loosely associated, uncalibrated radiocarbon date of 9,000±80 B.P. (Reynolds 1985). However, artifacts from the same context are consistent with the Milling Stone Period. One of these, an atlatl dart foreshaft, has been dated at 4,450± B.P. (Hubbs et al. 1960), suggesting a younger age for the Pit 10 dog. The temporal dissociation between the badger burial and the human burials at Hellman Ranch in Seal Beach, despite apparent stratigraphic continuity, indicates that dates obtained directly from burial features are desirable (Langenwalter 2007).

A dog burial recovered from ORA-423 on Aliso Creek is slightly older than the ORA-1055 animal, with a radiocarbon date of ca. 2,000 B.P., making it the earliest known dog burial in the Orange County region. The remaining dog and canid burials from other sites in the southern Los Angeles Basin and adjacent areas are all Late Period in date (Goff's Island, ORA-58, and ORA-849).

Presently, the ORA-1150 dog is the only ritually buried animal known from the Intermediate Period in the region. It provides evidence—along with other animal burials in the region—of a cultural continuation in southern California of a broad and ancient tradition of animal ceremonialism in the larger California Culture Area. This tradition included the ritual burial of dogs, bears, coyotes, badgers, hawks, eagles, condors, and other species (Cowan et al. 1975; Gayton 1948; Gifford 1955; Heizer and Hewes 1940; Langenwalter 2004; Wedel 1941). Many of the species were important as earthly representatives of the "First People" in Native Californian creation stories.

Dogs were not important in the creation stories of the California Indians, and it is unlikely that their burial is evidence of totemism or corporate social functions (annual mourning ceremonies, etc.). The general social context of dogs was that of pets, working animals, and food source. Since they were primarily pets and working animals (Aginsky 1943:402; Barrett and Gifford 1933:271; Driver 1937:65), the most likely inferences regarding their interment involve pet burial and property destruction.

The suggestion of pet burial is attractive to contemporary Americans who often dote on their pets. The burial of dogs and other pets can help a person grieving over the death of an animal (Nieberg and Fischer 1982). This function of animal burial has not been documented ethnographically in southern California,

and it is difficult to demonstrate through archaeological evidence. Evidence which implied pet burial would include the presence of grave goods and cairns, like those found with the Encino Village canid cremation (Langenwalter 1986). Those kinds of burial attributes would suggest a ritual focused on the deceased animal. The inclusion of a cairn over the ORA-1055 dog is an important attribute that identifies the feature as an intentional burial. The cairn and the location of the burial away from other features, including the human burial, implies ritual focused on the animal. The semi-round fire-affected rock present in the grave may have been used as a ball, and consequently have been a grave good.

In central California and elsewhere in North America, dogs were often killed during the property destruction which accompanied an individual's funeral (see Driver 1961). Bean and Smith state (1978) that among the southern California Gabrielino people, a dog was ritually buried when its owner died as part of the destruction of personal property; such a practice would explain the association of dogs with human graves. Although no archaeological evidence of dogs being included within a human grave has been found in southern California, dog burials are only found at sites which contain human graves as part of the assemblage, as is the case at ORA-1055. The ORA-1055 dog was buried in its own grave, which lay on undisturbed substrate. The burial of dogs as part of their owner's funerary activity is a narrow use of the animals in funerary contexts. The animal is killed, but since it is not the focus of the ritual, it is less likely to have accoutrements included in the grave. The presence of perimortem trauma on the dog skeleton would support an inference of ritual sacrifice. The purpose of the burial then would be to include the animal in the journey of the deceased to the spirit world. Some Native Americans intended the dog to act as a guide in the spirit world (Allen 1920). This is not documented for California. The exclusion of the dog from the owner's grave may reflect notions of ritual purity. Dogs were considered polluted by some California Indian tribes (Kroeber 1941).

## CONCLUSION

The practice of burying dogs began in California more than 4,000 years ago and persisted into the historic period. Early ethnographic studies indicate that people in California kept dogs as pets, and used them as guard dogs and working animals. Some dogs were eaten. Occasionally, they served other functions.

The characteristics of these canid burials, including burial position, grave goods, grave pit size, and the presence of cairns, vary. The most common canine burial position was flexed, followed by extended burial, both lying on one side (Hale and Salls 2000; Langenwalter 1986, 2005). One exception is the Feature 130 dog burial from the Encino Village site (LAN-43), which dates to the Late Period. This animal was placed in its grave in a folded position, with the rear legs lying above the head (Langenwalter 1986:74). This is the only other documented example of a "folded burial" in southern California. It differs from the ORA-1055 burial, which was placed with the hindquarters below the head. Another variant is the SJO-68 dog burial, which is described as having the head down and tail up (Langenwalter 1986), and may have been folded as well. The only dog burials found with grave goods or rock cairns, thus far, have been from central California and San Clemente Island. In the case of the few burials where the grave pit was observed, it seems that most dogs were placed in graves just large enough to accommodate the carcass.

The position of the ORA-1055 dog differed from the flexed and extended types and the attending variations described elsewhere by Langenwalter (1986), or those variants described by Hale and Salls (2000). The ORA-1055 dog burial should be described as folded, in that the animal's position resulted from the lateral flexure of the carcass in the grave, so that the left side of the forequarters lay against the left side of the hindquarters. In this case, the forequarters lay, more or less, above the hindquarters. The purpose of positioning the animals in the ORA-1055 feature and in Feature 130 at LAN-43 may have been to fit the animals into holes of limited size. In the case of the ORA-1055 feature, this may have been related to the relative difficulty of digging a grave pit into a cobble-laden substrate. The metate would have helped to hold the carcass in this unusual position. The lower part of at least one forelimb extended beyond the perimeter of the metate. The ORA-1055 dog burial is the only example (except for the LAN-43 canid cremation) of a southern California mainland dog burial that is accompanied by a cairn.

Prior discoveries of dog burials in southern California have been in association with human burials, but never within a human grave. The ORA-1055 dog burial follows this pattern. The function of the ORA-1055 dog burial is uncertain. Since it was not in close association with human graves, it seems unlikely that it represents a destruction of property. The presence of a cairn may be evidence of animal-focused ritual, but the cairn could have been a pragmatic device employed to hold the dog's folded carcass in place within the confines of a small, shallow grave pit. Burials with possible grave goods or a cairn are most likely to represent the burial of a pet, or some other kind of animal-oriented ritual. Whether the ritual was for the animal or not, the ORA-1055 dog was buried respectfully, which is consistent with the animistic worldview of the California Indians.

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