CULTURAL ECOLOGY OF THE KENYON ROCKSHELTER AND THE CUNNINGHAM SITE, CANYON CREEK DEVELOPMENT, TRAVIS COUNTY, TEXAS

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APPENDIX E: Molluscan Remains and Environmental Reconstruction at the Kenyon Rockshelter, 41TV742

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INTRODUCTION

Shells of nonmarine molluscs recovered from documented strata can allow an understanding of the environmental history of the area surrounding the study site. Little such work has been performed in Travis County or the surrounding Central Texas area. Studies of paleomolluscan faunas are needed to complement ongoing studies of the modern faunas (Neck 1975). Additionally, cultural inferences concerning usage of molluscs as food, tools, or ornaments often can be made following an analysis of shells from an archeological site.

METHODS

The occurrence of molluscan remains in the Kenyon Rockshelter (41TV742) has provided an opportunity to investigate the cultural significance of molluscan resources at the site and the recent environmental history of this region. Presorted molluscan remains were provided to this author. Portions of the samples were coarse-screened while others were fine-screened. Analysis of these samples, including both snail and mussel shells, is presented. A discussion of an initial sampling of the modern molluscan faunas also are presented. The modern faunas form a baseline to which the sampled paleofaunas can be compared.

MODERN MOLLUSCAN FAUNAS

At the time of the field survey, the small spring-fed stream supported two species of aquatic snails. Physella virgata is an extremely widespread species which has a very wide ecological tolerance. Gyraulus parvus is found in quiet waters which support moderate amounts of aquatic vegetation.

The terrestrial snail faunas, as determined from screened soil samples, are rather diverse for the general area, particularly with regard to the microsnails. However, this diversity is not unexpected given the existence of downed wood, leaf litter, and a spring (which enhances local soil moisture). Species present are Carychium mexicanum, Gastrocopta pellucida, Gastrocopta procera, Gastrocopta contracta, Strobilops texasiana, Helicodiscus eigenmanni, Helicodiscus inermis, Glyphyalinia umbilicata, Hawaiia minuscula, Euconulus chersinus, Striatura meridionalis, and Polygyra mooreana.

The recovered snail faunas only contain species which have been recorded from Travis County previously. G. contracta, S. texasiana, G. umbilicata, and E. chersinus are typical of mesic areas with wood or rock present as cover. Especially significant is the presence of S. meridionalis, which generally is found in riparian woodlands with abundant leaf litter, and C. mexicanum, which requires saturated soil or rock rubble to survive drought periods.

No mussel shells were found in the then-dry ponds in the fork of Bull Creek. No shell fragments were found in the bottom of the pool. At present most of the pond has a rocky bottom, although remnants of a past mud covering are present along the shallow periphery of the pond bottom. The limited size of these ponds would allow only limited development of mussel populations.

RECOVERED MOLLUSCAN PALEOFAUNAS

Mussels

The distributions of burned and unburned mussel remains and species identifications, where possible, are presented in Table 94. A total of six species of freshwater mussels were recovered from 41TV742: Anodonta grandis, Amblema plicata, Lampsilis teres, Leptodes fragilis, Cyrtonaias tampicoensis, and Potamilus purpuratus.

Occurrence of A. grandis at the Kenyon Rockshelter is unusual because remains of the thin-shelled species of the genus Anodonta are generally not found in archeological sites (Murray 1981). Some possible reasons are the small amount of food resources present, the fragility of shell materials, and recent habitat expansion. This author feels that the last factor is probably the most important, although the first two factors cannot be overlooked.

Species present in the samples indicate a sizable body of water -- either a sluggish stream or large permanent pool. Substrate is soft -- probably mud. L. fragilis generally is found in slow-moving water, but it has been found in isolated, mud-bottom pools in limestone creeks with subterranean water moving between these isolated surface ponds.

The source of these specimens is most likely an isolated pool on Bull Creek, as opposed to the rather distant Colorado River. Certain stream species -- Quadrula aurea, Quadrula petrina, Elliptio mitchelli, and Tritogonia verrucosa -- would be present if the free-running Colorado River was the source of these mussels. Absence of the presently widespread Quadrula apiculata is noteworthy, but the environmental significance of its absence is unknown.

Most likely, cultural utilization of these mussels was as food. Consumption apparently occurred in the shelter. Identifiable fragments of all six species are represented in materials from within the shelter; only identifiable fragments were found in samples originating outside the shelter.

Most of the mussel shells are unburned. However, burned shells have a shorter lifetime in sediments and are more likely to fragment upon extraction than are unburned shells. Burned and unburned shells generally occur in the same columns and often in the same lots. Occurrence of both types of shells probably is the result of localized postconsumption midden fires as opposed to variation in food production techniques.

Some linear cut marks and remnants of near-circular holes in a few pieces of mussel shell indicate probable utilization of mussel shells as tools and/or ornaments. The fragmented condition of most of the mussel shell materials does not allow further conclusions regarding non-nutritive utilization of these shells by the inhabitants of 41TV742.

The location of the proposed pool on Bull Creek is unknown. The modern pools close to the site appear to be too small, even if permanent water were available. However, the existence of a series of these pools allows the possibility of a source of mussels very close to 41TV742. Such a close source of these mussels would indicate major changes in the hydrodynamics of Bull Creek. Recent reduction of springflow is due to aquifer depletion

TABLE 94

DISTRIBUTION OF MUSSEL SHELLS, 41TV742

	Species Identification	Undifferentiated Count	Undifferentiated Weight	Presence of Burned	Presence of Unburned
N1011/W975					
Level 2	-	1	0.1	x	
Level 4	Lampsilis teres	4	2.15		x
Level 5	-	1	0.1	x	
Level 6	-	2	0.2	x	x
Level 7	-	2	0.2		x
N1012/W974					
No recovery					
N1012/W975					
Level 3	-	3	0.8	x	x
Level 4	Lampsilis teres	1	0.6		x
Level 4	-	3	0.1		x
Level 5	Lampsilis teres	2	0.1	x	x
Level 5	-	2	0.5	x	x
Level 6	Amblema plicata	1	0.2		x
Level 6	-	4	0.2		x
Level 7	Leptodes fragilis	15	1.8	x	x
N1012/W976					
Level 3	-	2	0.1		x
Level 4	-	11	2.5	x	x
Level 5	Lampsilis teres	1	4.3		x
Level 5	-	1	0.1		
Level 6	-	1	< 0.1		x
Level 7	-	4	0.5		x
N1013/W974					
Level 4	-	2	< 0.1		x
Level 6	Anodonta grandis	1	0.2		x
Level 6	-	6	0.1		x
Level 7	Lampsilis teres	1	0.7		x
Level 7	-	2	< 0.1		x
Level 11	-	1	< 0.1		x

Table 94, continued

	Species Identification	Undifferentiated Count	Undifferentiated Weight	Presence of Burned	Presence of Unburned
N1013/W975					
Level 3	-	2	0.1	x	
Level 4	-	1	0.2	x	
Level 5	Potamilus purpuratus	13	2.8	x	x
Level 5	-	1	0.1		x
Level 6	Potamilus purpuratus	7	1.8		x
Level 6	-	7	1.3	x	x
Level 7	-	27	1.3	x	x
Level 7	-	14	0.1	x	x
N1013/W976					
Surface	-	1	< 0.1	x	
Level 4	-	1	0.1		x
N1014/W974					
Level 3	-	2	< 0.1	x	
Level 5	-	1	< 0.1	x	
Level 6	-	16	5.7		x
N1014/W975					
Level 2	Potamilus purpuratus	1	< 0.1		x
Level 3	Anodonta grandis, Lampsilis teres	22	4.5	x	x
Level 3	-	4	< 0.1		x
Level 4	-	1	< 0.1	x	
Level 5	Cyrtonaias tampicoensis, Amblema plicata	16	26.2		x
Level 5	-	6	0.2	x	x
Level 6	Potamilus purpuratus	16	12.0		x
Level 6	-	3	< 0.1	x	
Level 7	-	1	< 0.1		x
N1015/W974					
Level 1	-	7	2.1		x
Level 2	-	2	< 0.1	x	
Level 3	-	1	0.2		x
Level 4	-	1	0.1		x

Table 94, continued

	Species Identification	Undifferentiated Count	Undifferentiated Weight	Presence of Burned	Presence of Unburned
N1015/W975					
Level 1	Lampsilis teres	1	0.1		x
Level 4	Amblema plicata	21	7.2		x
Level 4	-	3	0.2		x
N1012/W968					
Level 2	-	17	0.9	x	x
Level 3	-	3	0.9		x
N1012/W969					
Level 3	-	1	<0.1		x
N1012/W970					
Level 1	-	2	<0.1		x
N1012/W972					
Level 5	-	1	<0.1		x
Features					
Feature 6	Cyrtonaias tampicoensis	1	<0.1		x
Feature 6	-	3	0.2		x
Feature 8	-	18	2.0	x	x
Feature 9I	-	1	0.1	x	
Feature 9II	-	2	<0.1	x	
Feature 17	-	1	<0.1	x	

because of increased runoff (due to land-use alterations) and water mining. The most likely source of these mussels was farther downstream on the main channel of Bull Creek.

Snails

The distributions of snail shells are presented in Table 95. Shells representing 15 species were recovered from samples provided from 41TV742. These species indicate mesic deciduous woodland habitats which are able to support a rather diverse land snail fauna.

TABLE 95

DISTRIBUTIONS OF TERRESTRIAL AND FRESHWATER SNAILS, 41TV742

	Bo*	Dl*	Ec*	Es*	Gci*	Gco*	Gr*	Gu*	He*	Ho*	Hs*	Pm*	Pv*	Rm*	St*
N1011/W975															
Level 2	-	-	-	-	-	7	3	5	16	2	19	2	-	-	4
Level 3	-	-	1	-	-	1	-	-	-	-	1	1	-	-	2
Level 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Level 6	-	-	-	-	-	-	-	-	-	1	-	-	-	3	-
Level 8	-	-	-	-	-	-	-	-	-	2	-	1	1	-	6
Level 9	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Level 10	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-
N1012/W968															
Level 2	-	-	-	-	-	-	-	-	-	5	1	-	-	-	1
Level 3	-	-	-	-	-	-	-	1	1	-	-	1	-	1	1
N1012/W969															
Level 1	-	-	-	-	-	-	-	-	1	1	-	1	-	-	7
Level 2	-	-	-	-	-	-	-	1	1	6	-	2	-	-	3
Level 3	-	-	-	1	-	1	-	1	-	9	1	1	-	-	2
N1012/W970															
Level 1	-	-	-	-	-	-	-	1	1	6	-	1	-	-	3
Level 2	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Level 3	-	-	-	-	-	-	-	-	1	-	-	2	-	3	-
N1012/W971															
Level 1	-	-	-	-	-	-	-	1	-	-	1	-	-	-	5
Level 2	-	-	-	-	-	-	-	-	-	5	-	1	-	-	-
Level 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

*Bo	Biomphalaria obstructa	He	Helicodiscus eigenmanni
Dl	Deroceras laeve	Ho	Helicina orbiculata
Ec	Euconulus chersinus	Hs	Helicodiscus singleyanus
Es	Euglandina singleyana	Pm	Polygyra mooreana
Gci	Gastrocopta cristata	Pv	Punctum vitreum
Gco	Gastrocopta contracta	Rm	Rabdotus mooreanus
Gr	Glyphyalinia roemeri	St	Strobilops texasiana
Gu	Glyphyalinia umbilicata		

Table 95, continued

	Bo	Dl	Ec	Es	Gci	Gco	Gr	Gu	He	Ho	Hs	Pm	Pv	Rm	St
N1012/W972															
Level 3	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Level 5	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Level 7	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
N1012/W973															
Level 1	-	-	-	-	-	-	-	-	1	-	2	-	-	-	1
Level 2	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
Level 4	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
N1012/W974 (west of boulder)															
Level 1	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-
Level 2	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Level 3	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Level 4	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-
Level 5	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-
N1012/W975															
Level 2	-	-	-	-	1	-	-	-	2	1	1	-	-	2	4
Level 3	-	-	-	-	-	-	-	-	-	1	-	-	-	5	-
Level 4	-	-	-	-	-	-	-	-	-	3	-	1	-	5	1
Level 5	-	-	-	-	-	-	-	-	1	3	1	-	-	3	-
Level 6	-	-	-	-	-	-	-	-	-	1	4	-	-	3	-
Level 7	-	-	-	-	-	-	-	-	-	1	-	-	-	24	-
Level 8	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-
Level 9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
N1012/W976															
Level 2	-	-	-	-	-	-	-	-	2	2	1	1	-	-	-
Level 3	-	-	-	-	-	-	-	-	1	-	3	-	-	-	2
Level 4	-	-	-	-	-	-	-	-	1	2	-	-	-	9	-
Level 6	-	-	-	-	-	-	-	-	-	-	-	1	-	3	-
Level 7	-	-	-	-	-	-	-	-	-	-	-	1	-	6	-
N1013/W974															
Level 3	-	-	-	-	-	-	-	-	-	-	1	1	-	3	1
Level 4	-	-	-	-	-	1	-	-	2	3	-	-	-	-	10
Level 5	-	-	-	-	-	-	-	-	-	1	-	-	-	2	4
Level 6	-	-	-	-	-	-	-	-	-	2	-	-	-	6	-
Level 7	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-

Table 95, continued

	Bo	Dl	Ec	Es	Gci	Gco	Gr	Gu	He	Ho	Hs	Pm	Pv	Rm	St
N1013/W974, continued															
Level 8	-	-	-	-	-	-	-	-	-	-	-	1	-	8	-
Level 9	-	-	-	-	-	-	-	-	-	1	-	-	-	23	-
Level 10	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-
N1013/W975															
Level 3	-	-	-	-	-	-	-	-	1	6	-	-	-	7	5
Level 4	-	-	1	-	-	-	-	-	1	1	-	-	-	1	1
Level 5	-	-	-	1	-	-	-	-	33	10	6	6	-	4	-
Level 6	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-
Level 7	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-
Level 8	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Level 9	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
N1013/W976															
Surface	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Level 2	-	-	-	-	-	1	-	-	-	-	10	-	-	2	6
Level 3	-	-	-	-	-	-	-	-	3	5	4	1	-	-	5
Level 4	-	-	-	1	-	1	-	-	2	1	3	-	-	5	2
Level 5	-	-	-	-	-	-	-	-	1	1	2	-	-	-	4
N1014/W974															
Level 1	-	-	-	-	-	3	-	3	25	8	5	4	-	-	15
Level 2	-	1	2	-	-	3	-	-	9	8	4	4	-	3	46
Level 3	-	-	-	1	-	10	-	-	10	8	8	11	-	1	62
Level 4	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-
Level 5	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Level 6	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Level 7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
N1014/W975															
Surface	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Level 1	-	-	-	-	-	-	-	-	1	5	-	2	-	-	-
Level 2	-	-	1	-	-	2	-	-	3	3	6	1	-	4	12
Level 3	-	-	-	-	-	1	-	-	1	3	1	2	-	4	15
Level 4	-	-	-	-	1	-	-	-	-	2	1	1	-	-	3
Level 5	-	-	-	-	-	-	-	-	-	2	-	-	-	14	-
Level 6	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-
Level 7	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-
Level 8	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-

Table 95, continued

	Bo	Dl	Ec	Es	Gci	Gco	Gr	Gu	He	Ho	Hs	Pm	Pv	Rm	St
N1014/W976															
Surface	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
N1015/W971															
Level 1	-	-	-	-	-	1	-	-	2	3	1	4	-	-	12
Level 2	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-
Level 3	-	-	-	-	-	-	-	-	-	1	1	-	-	-	6
N1015/W974															
Level 1	-	-	-	-	-	-	-	-	1	-	-	-	-	3	1
Level 2	-	-	-	-	-	-	-	-	1	3	4	-	-	4	11
Level 3	-	-	-	-	-	-	-	-	-	1	-	-	-	13	1
Level 5	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-
Level 6	-	-	-	-	-	-	-	-	1	-	-	-	-	5	-
Level 7	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
N1015/W975															
Level 1	-	-	-	1	1	1	-	-	3	1	1	1	-	7	10
Level 2	-	-	-	-	-	-	-	-	2	7	3	-	-	2	8
Level 3	-	-	-	-	2	-	-	-	-	3	-	1	-	4	-
Level 4	-	-	-	-	-	-	-	1	1	2	1	1	-	11	-
Level 5	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
N1015/W976															
Surface	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Features															
Feature 5	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-
Feature 6	-	-	-	-	-	-	-	1	-	-	1	1	-	6	-
Feature 7	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-
Feature 8	-	-	-	-	-	-	-	-	1	-	-	-	-	4	-
Feature 9	-	-	-	1	-	-	-	-	-	1	-	-	-	4	-
Feature 9I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Feature 9II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Feature 9III	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Feature 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Feature 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Feature 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Feature 13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Feature 14	-	-	-	-	-	-	-	-	-	1	-	-	-	-	7

Table 95, continued

	Bo	Dl	Ec	Es	Gci	Gco	Gr	Gu	He	Ho	Hs	Pm	Pv	Rm	St
Feature 15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Feature 16	-	1	-	-	-	-	-	-	-	1	-	-	-	-	2
Feature 17, Level 7	-	-	-	-	-	-	-	-	1	-	2	-	-	1	-

All species represented are known to be living in Travis County today. Presence of substantial leaf litter is indicated by the occurrence of S. texasiana, G. umbilicata, G. contracta, E. chersinus, and D. laeve. A substantial seepage area is indicated by P. vitreum and, in particular, G. roemeri.

The number of snail species is generally highest in Levels 2 and 3 (5-15 cm) of various columns. This pattern may be due to the distribution of modern populations, however. The uppermost soil levels are subject to surface desiccation, while lower levels have reduced water infiltration. Long-term environmental variations were not detected. The reasons for the lack of indication include actual lack of significant variation in the environment or the amelioration of any environmental variations by the protective nature of the small canyon which contains 41TV742.

While both factors may be significant, the similarity among level samples outside the shelter indicates that the local environment surrounding 41TV742 has not changed significantly during the appropriate time scale (i.e., the last 2,000 years). Deciduous woodlands have been present in this unnamed canyon for a substantial period of time.

Much has been written concerning the existence of shells of various species of the large snails of the genus Rabdotus in archeological sites in Texas (e.g., Clark 1973; Hester 1975). Most discussion has involved the utilization of these snails as food items. The most common species in the samples recovered from 41TV742 is Rabdotus mooreanus. Known as the prairie snail, R. mooreanus is common in grassland and open woodland habitats of Central Texas. No indication of human consumption of R. mooreanus by the inhabitants of 41TV742 was detected. Substantial numbers of immature specimens indicate the occurrence of a suitable breeding habitat. No large concentrations of adult-sized shells were recovered. Incidental consumption of these snails cannot be denied, but R. mooreanus was not a major, or probably even a minor, source of protein in the diet of the inhabitants of this shelter. The lack of burned snail shells may be significant.

Proveniences with shells of R. mooreanus tend to have few or no other snail species. Associated shells are generally P. mooreana and H. eigenmanni. Proveniences with five or six species usually have few or no R. mooreanus. This rarity is not surprising as R. mooreanus is typical of open habitats, whereas the diverse faunas represented in some proveniences are characteristic of protected leaf litter pockets in closed woodlands. Note should be made of the possible washover origin of some specimens of R. mooreanus in this shelter. Heavy rainfall would produce runoff capable of transporting substantial numbers of R. mooreanus shells from slightly upslope areas over the roof shelter and onto colluvial deposits which were accumulating in this area.

The only aquatic snail recovered from 41TV742 is a single specimen of Biomphalaria obstructa. This specimen most likely is not the result of flooding of the shelter by rising water. The specimen could be a washover shell (as discussed above) or may have come in on a mussel shell.

METHODOLOGY COMPARISON

For many years, all snail faunas from archeological sites consisted only of shells which did not fall through a 1/4-inch screen. All specimens of small species and immature specimens of large species were never sampled in such studies. Recently, archeologists have begun to provide snail samples which contain the smaller shells. The larger data base obviously would provide a better reconstruction of past environments. Analysis of the origin of Rabdotus shells in archeological sites is impossible without such increased variety of shell sizes.

Tables 96 and 97 present a comparison of the data bases provided in the fine- and coarse-screen samples. The numbers of species and individuals of these species are increased by use of fine-screen techniques (see Table 97). A comparison of paired samples of fine and coarse techniques of the same levels shows a general increase in species numbers. Instances of larger species numbers in coarse fractions probably result from microscale variations in shell distributions and technique sampling error.

TABLE 96

NUMBER OF SPECIES AND INDIVIDUALS OF SNAILS
IN COARSE AND FINE SAMPLES, 41TV742

Fraction	No. of Proveniences	Species	Individuals
Coarse	54	4	168
Fine	96	15	1,044

SUMMARY

The analysis of modern and paleosamples of snails from the Kenyon Rockshelter reveals no indication of significant variation in the terrestrial environment. This stability existed on a scale equivalent to land snail microhabitats and concerned environmental parameters significant to land snails. Significant changes could be indicated in aquatic habitats, although the mussels recovered from the Kenyon Rockshelter may have come from substantially farther downstream. No indication of consumption of Rabdotus was noted, although occasional ingestion cannot be disallowed. Human consumption of mussel meat is assumed; the utilization of shell materials for unknown tool or ornament use is indicated.

TABLE 97

COMPARISON OF RELATIVE SPECIES NUMBERS IN PAIRED PROVENIENCES (COARSE AND FINE FRACTION) INSIDE AND OUTSIDE THE ROCKSHELTER, 41TV742

	Inside	Outside	Totals
Coarse < Fine	17	6	23
Coarse = Fine	6	0	6
Coarse > Fine	3	1	4
TOTALS:	26	7	33

The increased data base resulting from fine sampling as opposed to coarse sampling is documented for proveniences originating from the Kenyon Rockshelter.

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