Pollen Analysis of Sediments

from 4-ORA-64

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Four sediment samples from 4-ORA-64 were processed and analyzed during August, 1972. The site is characterized (Drover, pers. comm.) as Archaic, of the milling stone type, with possible affiliations to the Desert Tradition or Great Basin Archaic. Available age estimates (UCLA 1777 A,B,C) range from 4900 ± 80 to 6560 ± 80 radiocarbon years B.P. Both these ancient dates were obtained on shell from the culturally sterile deposit at 80 cm. depth underlying the midden. A C-14 date of 5580 ± 80 B.P. is from the shell of the midden deposit at 20-40 cm. depth below surface.

One of the submitted samples was collected from the sterile deposit at the 80-90 cm. level. This sample, and that from the 50-60 cm. level, were less polliniferous than the samples collected at the 30-40 cm. and the 0-10 cm. depths. For this reason, lower pollen sums were accepted for the lower samples. The pollen density of the samples is a somewhat complicating factor in the analysis of the data, but we feel it is not a significant one in the present instance.

The laboratory was requested to direct its concerns towards an attempt to portray the possible flora of the period prior to and during the occupation, and to the problem of possible dietary preferences. In this last regard, an additional series of pollen grains was observed (though not counted) from each sample in hopes of encountering pollen of the economic types recognized by Nevly and Hill (1970:114-15). No such economic pollen was observed, though some of the Compositae and Cheno-am pollen seen may

have been of economic character. Dietary preference, then, is not apparent from these pollen data.

The 0-10 cm. sample is the most polliniferous of the series, the sample contains the greatest variety of pollen types, and by virtue of its stratigraphic placement it incorporates surficial soil. This argues strongly that much of the pollen observed in this sample is more recent than the archaeological material with which it is associated. It thus is the closest available approximation of the pollen rain of the locality today, since no surface samples were submitted. Assuming that the pollen spectrum of this specimen is similar to that provided by the modern flora of the area, there is little evident floristic distinction from the pollen spectra representing the occupational and pre-occupational horizons. The amount of oak pollen is greater in the uppermost sample, but the distinction is not significantly great at the 95% level of confidence utilizing a bionomial confidence interval test. A chi-square test would probably allow no recognition of significant variation in the series as a whole.

The amount of grass pollen in the uppermost and lowermost samples is significantly greater than that in the other samples. This would appear to reflect a cultural impact on the pollen rain during the deposition of the midden, but probably not an impact of cultural importance. It need be nothing more than the disturbance of the local environment consequent upon the occupation itself. Thus the evidence available would indicate that the natural flora of the site locality today is essentially that which would have been encountered there both prior to and during the occupation of 4-ORA-64.

Although the samples were collected in stratigraphic sequence, there are too few specimens, and there is too little comparative material from

California, to allow development of a pollen chronology. The significant difference in arboreal pollen frequency in the uppermost sample may be indicative of a climatic fluctuation towards moister conditions today than were prevalent prior to and during the occupation. This interpretation would be consistent with the apparent altithermal age of the deposits. However, the palynological evidence is quite weak in this regard, and the conclusion cannot be drawn with confidence. This distinction in oak pollen frequency, the distinctions in the Gramineae pollen record through time, and the the distinction in the Cheno-am pollen record through time all may be taken as favorable indications that a pollen chronology based upon fluctuations in climatic and cultural effects upon the pollen rain may be developed in future. This would involve analysis of many samples from many sites, but it would appear such an investment would be profitable.

Depth	Total AP	P. edulis	P. ponderosa	Quercus	Salix	Total NAP	Cheno-Am	Lo-spine Comps	Hi-spine Comps	Liguliflorae	Gramineae	Ephedra N.	Malvaceae	Plumbaginaceae	Liliaceae	Unknown	Total
0-10	19	2	4	12	1	179	26	57	42	1	30			20	3	2	200
30-40	5		1	4		195	38	71	66	1	14	1		3		1	200
50-60	1			1		49	17	16	12		4		1	1			51
80-90	1			1		99	21	15	42		18		2	1			100
PERCENTAGE CALCULATION																	
0-10	9.5	1.0	2.0	6.0	0.5	89.5	13	28.5	21	0.5	15.0			10.0	1.5	1.0	
30-40	2.5		0.5	2.0		97.5	19	35.5	33	0.5	7.0	.5		1.5		0.5	
50-60	2.0			2.0		98.0	34	32	24		8.0		2.0	2.0			
80-90	1.0			1.0		99.0	21	15	42		18.0		2.0	1.0			

4-ORA-64 COLUMN 1

References

Hevly, Richard H. and James N. Hill
1970 Pollen from Archaeological Middens of Santa Cruz Island, California, Annual Report, Archaeological Survey, Dept. of Anthropology, U.C.L.A.