CONTEXT EVALUATION REPORT: POLLEN STUDIES

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Palynological research activities are not common aspects of archaeological studies in California, and they are almost totally ignored in Californian historical archaeology. Partly, this situation is a result of precedent, which can be summarized by the complaint "If the X Project got a good review without incorporating pollen research, why should any other report have to meet such a demand?" (I shall return to the issue this raises in the context of historic preservation activities before the end of this analysis.)

 Principally, though, the situation is a function of two significant factors: lack of concerned personnel and lack of archaeological awareness. There are relatively few people in the United States or Canada who have committed interest in any type of scientific efforts involving pollen study. The only professional society of palynologists in the region has fewer than 300 members. Less than 15 percent of the membership of the society has any training in, familiarity with, or interest in pollen analysis, which is the only palynological subdiscipline of demonstrated relevance to archaeology (most palynologists study the microfossils of sedimentary rocks). And only a small minority of pollen analysts has had any research experience in the recovery or interpretation of pollen from archaeological site-context sediment samples. Identification of people who have appropriate background experience — no less
expertise -- is therefore very difficult for the archaeological subcontractor who is obliged to fulfill commitments to undertake pollen study imposed by an agency contractor.

Beyond this, of the eight or ten people that have ever been actively involved in efforts to analyze the pollen of historic period archaeological sites, fewer than half consider it work with substantial priority, and probably no more than two depend on such work for their livelihood. Therefore, even when appropriate pollen analysis expertise can be identified it often is not possible to attract it to a particular effort.

Also, archaeologists traditionally receive no systematic education in pollen analysis, and are even generally unaware of secondary literature which discusses the range of potential applications of pollen study to archaeology (e.g. Bryant and Holloway, 1983). Few are cognizant of any of the technical, methodological or theoretical problems and issues of archaeological pollen analysis beyond those that pertain to the question "How and where should a site be sampled for pollen study?" Most archaeologists abjure responsibility to evaluate the archaeological quality or the archaeological relevance of pollen studies of site-context samples. They also abjure responsibility to integrate available interpretations of palynological research with the results of material culture analyses in their reportage of archaeological research. Thus archaeological pollen study is normally presented in the form of appendices in archaeological literature. The conventional perception of archaeologists is that pollen analysis produces a body of potentially useful archaeological information.
But it is the pollen analyst’s responsibility to identify and discuss that information, because the pollen analyst’s report is both arcane and tangential to “real archaeology.”

Pollen analyses of Quaternary Period deposits in California (Adams, 1985) have rarely, then, been concerned with any matters of archaeological relevance and, to my knowledge, not more than four or six reports exist that incorporate analyses of the pollen of samples collected from historic archaeology site contexts. Two of these are analyses of samples collected from Prado Basin historic properties (Gregory and Schoenwetter, 1987a; 1987b).

The study of samples from the Aros-Serano Adobe, however, was a pilot study designed to discern the variety of potential values to historical archaeology of analysis of the pollen of adobe bricks and mortar. The second study accompanied (and was an aspect of) archaeological tests of two historic properties, so it was only designed to allow identification of the sorts of culturally significant pollen records existing at the locations, which subsequent mitigative work would seek to recover as required by law. Thus though we presently know significantly more about the pollen of historic period deposits in the Prado Basin than almost any other part of California, and we know more about the pollen of clay-based construction materials from this area than any other single location in the world, none of this knowledge is truely substantive.

The amount of information presently available would seem impressive to a layman or an archaeologist unfamiliar with palynological research, for 92 individual samples have been subject to study and over 8,000 pollen grains have been identified and
are statistically similar to some pollen spectra representing modern...that is, to the horizon following construction of the Portland Dam...dates to the last 50 years.

(2) Some pollen spectra independently dated to the last 50 years represent statistically...a site, which are independently evidenced to be of similar antiquity. At what point...of different antiquity are recognizable as members of different...to the Portland Dam. Therefore, these sites at least a significant fraction of the types of deposits encountered in...can be recovered in analyzable quantities from at least a significant fraction of the types of deposits encountered in...recoverable.

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The Cretaceous Period. SubstantiFie...the Portland Dam. The data basin is a data gap, and such data as exists is...the research of the stratigraphic record of the historic period. Almost...interpretation. Seen in this light, it is clear that the concept of...to the Portland Dam. The data basin is a data gap, and such data as exists is...the research of the stratigraphic record of the historic period. Almost all data gaps is inappropriate to assess the existing stratigraphic record...for example, the analysis of surface pollen samples from an ethnographic context which may (but...Second, it stems from a third and the observation of the artifacts from a single location. In effect, the available information equivalent to the artifacts (or pollen) from a single location...or each analyzable sample is representative of the number...tabulated, but each analyzable sample is representative of the number...
pollen rain collected in 1986. Others are not. But the spectra that are not are sufficiently similar to modern pollen rain collections that arithmetic and statistical manipulations probably would reveal interpretable patterns. Such manipulation processes are well established in the methodology of modern pollen analysis (e.g. Birks and Birks, 1980; Turner and Hodgson, 1979 and 1983; Schoenwater and Smith, 1986), but cannot be applied to the Prado Basin spectra because they require statistically large populations of pollen spectra incorporating statistically large numbers of pollen grains.

Theories basic to the disciplines of pollen analysis and archaeology strongly suggest these empirical results allow prediction that further archaeological pollen analysis research is likely to prove productive as regards five major areas of archaeological study: determination of the relative and/or chronometric antiquity of directly or indirectly associated assemblages of material culture; determination of sequences of landuse practices; determination of sequences of ecosystem modifications; analysis of behavioral changes which constitute significant modifications of subsistence or economic adaptive strategies; and analysis of such site formation processes as construction events, material culture disposal events, geomorphological feature formation events, site component destruction events and post-abandonment decay and plant successional events.

The empirical evidence also, however, provides support for methodological argument that achievement of one or all such goals will probably be unusually labor-intensive and logistically demanding. In practical terms, generalized pursuit of any of these research interests through pollen analysis alone would effectively triple the cost of their pursuit through application of appropriate methods of historical study, material culture recovery and material culture analysis alone. Yet the effectiveness of existing historical archaeology methods for pursuit of one or all such goals is, except
in unusual site situations, less than adequate. The clear implication is that neither pollen analysis alone nor historical archaeology alone constitute cost-effective strategies for pursuit of such research interests. What seems required is a carefully justified research program that incorporates palynological study as an aspect of the historical archaeological research, not as an adjunct to it.

Given the lack of precedent for such research, and the difficulties that would be involved in implementing it, it is reasonable to ask why it should be required. Simply, it is because the pollen records trapped in the deposits of the archaeological sites of the Prado Basin constitute an irreplacable and non-renewable source of information of archaeological, and therefore cultural heritage, relevance. The expertise and technology to mitigate loss of this resource is not widely understood, appreciated or practised. But that does not make the information potential of the palynological data base a less significant resource, nor one less protected by law than other forms of information of such relevance — e.g. sites or artifacts. Loss of this resource occurs during the course of any archaeological work which demands exposure of any form of polleniferous deposit. Mitigation of such loss is not satisfied by the programmatic recovery and retention, nor even the programmatic analysis, of some pollen samples. Such actions curate and identify palynological data, but they do not act to create a palynological data base of demonstrable archaeological, thus cultural heritage, relevance. They create a data base analogous to a box-full of unprovenienced artifact fragments. One may interpret such data in
many ways, but is unable to demonstrate that any of the interpretations are either true or false.

Thus mitigation of loss of this data base is not best achieved by pursuit of the traditional research designs of Quaternary pollen analysis. Such research designs consider the depositional contexts of pollen records from geological and ecological perspectives, and they consider the comparability of pollen records of different locations. They even, under certain conditions, justify inductive arguments concerning behavioral patterns which have affected past pollen rains. But they do not consider matters of particular archaeological relevance, such as the directness or indirectness of association with artifact assemblages, the implications of site-specific behavioral reconstructions and historic information, the theory, methodology or site-specific rationales guiding archaeological data recovery and analytic strategies, etc. The traditional research designs of Quaternary pollen analysis achieve their intended purposes. What is required to mitigate loss of the significant qualities of this data base is the establishment of research designs which achieve archaeologically relevant purposes.

I suggest that research designs are required which are site-specific as well as program-specific, because each archaeological site presents unique logistical problems and unique opportunities for research. A relevant and cost-effective research program outline would proceed in six stages:
(1) Prioritization of generalized research objectives for a program of archaeological pollen analysis of Prado Basin sites, and identification of appropriate budgetary and labor investment parameters.

(2) On-site evaluation of research potentials throughout the course of any testing or mitigation effort, with attendant development and execution of a site-specific sampling strategy.

(3) Interruption until the analysis of archaeological observations made during the course of excavation, study of the evidence of historic documents and analysis of material remains has progressed to the point that judgements of the nature of the most culture heritage significant objectives of a pollen study can be well justified.

(4) Establishment of explicit hypotheses which may be tested unambiguously by the methods of pollen analysis that are problem-oriented, and program- and site-relevant. Also, development of a design for testing them.

(5) Joint agreement on the execution of the design by the analyst, the contracting archaeologist and the contractor agency.

(6) Implementation and reportage.

Stages 4–6 would take place subsequent to completion of any primary reportage of the results of archaeological testing or mitigation operations for a particular site. However, the contracting archaeologist and the analyst would be mutually responsible for the operationalization of the sixth stage, in order to effect a fully integrated effort.

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