DATING OF PRECOLUMBIAN MUSEUM OBJECTS

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Through accelerator mass spectrometry (AMS) dating, it has become possible to apply radiocarbon dating to precious museum objects. We are finding AMS to be very helpful in dating Precolumbian art. The origin of most of these objects is vague. They have been in museums and in private collections for many years. Most Precolumbian objects can only be placed in a general cultural context because no archaeological contextual information nor written documents exist. In this paper, AMS dates of different types of material will be discussed.

RADIOCARBON DATING OF LIME FRACTIONS AND ORGANIC MATERIAL FROM BUILDINGS

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AMS dating and proportional gas counting were used to analyze lime mortar. If separation was possible, lime nodules and mortar powder were dated. From each carbonate sample, the total amount of CO₂ and fractions were measured. In all but one case, the results from the isotopic fractionation provided information about the absorption of atmospheric CO₂. In some cases, the nodules produced better radiocarbon dates than the mortar powder; in other cases, it was the opposite. In some samples, organic material was found and dated separately. Working with AMS and looking for small samples, we found more organic material (charcoal, hair, wax) in the mortar and construction materials than we were expecting to find.

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DESIGN AND PERFORMANCE OF A THERMAL DIFFUSION MICRO-COLUMN FOR 14C ENHANCEMENT OF CARBON MONOXIDE

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Isotopic enrichment of carbon monoxide by thermal diffusion is well known and has been routinely used in radiocarbon laboratories to extend the range of 14C dating (Grootes & Stuiver 1979). In these systems, at least 150 g of CO is required to obtain 9 g of CO with a theoretical enrichment factor of about 16 for 14C. This 9 g quantity of CO, converted to CO₂, is required for precise low-level proportional gas counting (llc). At the time these systems were designed, llc was the only method available for precise radiocarbon analysis. To take advantage of the new direct atom counting techniques, a design was proposed for a small sample thermal diffusion system capable of concentrating the 14C contained in 1 g of CO into a 23 mg fraction (theoretical enrichments