Archaeological Investigations at the Salmon Beds

Radiocarbon Results

Three samples of bone fragments were submitted for radiocarbon dating to the Center for Accelerator Mass Spectrometry (CAMS), Lawrence Livermore National Laboratory. In addition, three carbon samples from the Salmon Beds were submitted for conventional radiocarbon assay to the Brock University Earth Sciences Radiocarbon Laboratory (BGS). The results are shown in Table 6.

The carbon samples were chosen as they were among the largest samples from the site, because they were all from adjacent units and because they provided a series from different depths L6 (Level 6, 25-30 cm), L8 (Level 8, 35-40 cm) and L11 (Level 11, 50-55 cm). All three resulting dates from Brock University overlap within one sigma range of one another. Two samples (BGS 2161, 2163) produced almost identical dates while BGS 2162 yielded a slightly later date.

Several different explanations can be offered for the dating anomalies:

1. All three dates were deposited within a short time span between approximately AD. 1000 and 1220 years.

2. Sample BGS 2161 may have been contaminated in its origin - for example, it could have been derived from an older tree or washed in wood that was burned at a later date.

3. Sample BGS 2162 may have been contaminated, possible during excavation or post excavation handling. The lab calculated AD date yielded 3 probable dates (1163, 1173, 1180) suggesting some uncertainty for this sample.

The three bone collagen dates were selected because they were derived from adjacent units and were from three upper levels at the site-Level 2 (5-10 cm), Level 4 (15-20 cm) and Level 6 (25-30 cm). In addition, the Level 6 date from the two laboratories could potentially verify one another. The dates provided by CAMS of 610 +/- 40, 400 +/- 40, and 710 +/- 40 yrs B.P. are all within a 300 year period. They are however, not in the expected sequence because the sample closest to the current surface should be the most recent and there should be a progression in ages from Level 2 through to Level 11.

Comments:

All three earlier dates were likely deposited within a short time between approximately AD 1000 and 1220 years. Because of the relative depths of the three samples, it is most probable that BGS 2161 is too early and should date younger that BGS 2162. Level 11 (Sample BGS 2163) is near the base of the cultural materials which indicates that deposition of this terrace began slightly earlier than 1000 years ago. The terrace has then built up gradually to its modern level.

Of the three more recent dates, Level 2 is near the surface and, as such, it should have the most recent date. The date provided by the Level 2 sample (CAMS 60322) of 610 +/- 40 could result from mixing, either as a result of river action, the excavation of a cultural pit or the action of an animal such as a beaver or a muskrat. Another possiblity is that some mixing could have occurred due to dredging of the river channel in the early twentieth century. River dredging was conducted along sections of the Columbia River to permit paddle wheelers to navigate the Columbia River.

TABLE 6: RADIOCARBON SAMPLE DETERMINATIONS

Sample Number	Provenience	Radiocarbon Age BP	Corrected and calibrated date (Struiver and Reimer 1993)	AD date (Struiver et al. 1998)	Maximum one sigma calculated age range
CAMS*[1] 60322	7n0 L2	610 +/- 40			570-650
CAMS* 60323	8n0 L4	400 +/- 40			360-440
CAMS* 60324	6n0 L6	710 +/- 40			670-750
BGS🔲 2161	5n0 L6	989 +/- 50	BP 930 +/- 50 yrs	1023	1000-1152
BGS🔲 2162	8n0 L8	880 +/- 50	BP 780 +/- 50 yrs	1163, 1173, 1180	1043-1219
BGS🔲 2163	7n0 L11	988 +/- 50	BP 930 +/- 50 yrs	1023	1000-1152

* Center for Accelerator Mass Spectrometry, Lawrence Livermore National Laboratory

🔲 Brock University Earth Sciences Radiocarbon Laboratory

A final conflict in the radiocarbon dates occurs between two dates from Level 6 (25-30 cm). These two samples were taken from adjacent units at this level. A date derived from a bone sample yielded 710 +/- 40 B.P. (CAMS 60324) while a carbon sample yielded a date of 989 +/- 50 years B.P. (BGS 2161). No explanation can be provided for this apparent difference except as suggested earlier that the date on charcoal may be derived from wood that died sometime earlier than when it was used.

If the date from Level 2 (CAMS 60322) and the date from carbon from Level 6 (BGS 2161) are eliminated, the remaining dates provide a logical progression from the base to the top of the site as follows: 988 +/- 50 (Level 11), 880 +/- 50 (Level 8), 710 +/- 40 (Level 6) and 400 +/- 40 (Level 4) years B.P. (Figure 30).

The inexactness of radiocarbon dating is a recognized phenomenon. All of the dates are plotted on Figure 30. These dates were used to determine a Pearson Product-Moment Correlation. If deposition had occurred at a consistent rate the correlation should have a value of 1.0. The Pearson Product Moment Correlation for the six dates yielded a value of 0.73 indicating that the correlation of these dates to depth is acceptable.

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