

## “QUICKIE” <sup>14</sup>C DATES

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The extension of the bristlecone pine chronology, which is, thus far, the only complete tree-ring-dated series that extends beyond 6000 BC and which is used for the calibration of radiocarbon dates, has been going on over the past 22 years, that is, ever since Schulman (1956; 1958) established the extremely old ages of the bristlecone pine. The few people in this world who search for very old wood samples to extend a dendrochronology may appreciate a method of establishing quickly the approximate ages of the samples.

Normally, in order to date a sample of bristlecone pine wood, one obtains a core or cross-section of it—usually a run of several hundred rings. In the laboratory the wood is polished, the widths of the rings are carefully measured and plotted (indexed). The plot of the samples is then compared (cross-indexed) with a master chart, and if it fits into the master chart, its age is established. This type of fitting can be attempted in the field, if one has the skills and space to work with a chart 15 meters long. C W Ferguson (1970) at the Laboratory of Tree-Ring Research, University of Arizona, who compiled the master chart, has been successful in dating precisely many samples in this manner.

Difficulties arise when the sample has an aberrant set of rings which cannot be readily fitted to the master chart, or when the rings of the sample reach beyond those of the master chart (*ie*, are older than 5500 BC).

Over the past seven years we, at the Radiocarbon Laboratory, University of Pennsylvania, have used the radiocarbon process to date quickly many of the samples picked up in the field just a few days before. The samples are sent by air mail from the White Mountains area in California to the laboratory in Philadelphia. They are processed immediately and counted. About 275 samples have been dated during the past seven years.

After a few dozen minutes the counter indicates whether the sample is “young” (up to, say, 3000 years) or has a promise of being old. Since we are interested in collecting bulk samples of wood more than 6000 years old, we stop the counting of young samples and discard the gas. We continue to count the older samples for about 100 to 150 minutes, after which time we can calculate the approximate age of the samples. Of course, the tolerance of such a date is large—typically  $\pm 200$  to 300 years. We have come to call these “quickie” dates. (The oldest samples are counted again for 1000 to 3000 minutes and, thus, the standard deviation is reduced). Fortunately, these samples do not contain radon.

The field worker is informed of the “quickie” dates that seem significant to extending the bristlecone pine dendrochronology, so that

he can pick up bulk wood and send it to the Laboratory of Tree-Ring Research for detailed analysis.

We feel that this coordination between field worker and laboratory, although 3000 miles apart, has saved valuable time and has accelerated the extension of the bristlecone pine chronology, which soon, we hope, will reach 10,000 years.

## REFERENCES

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