± 0.9‰ (1σ) depression of $\Delta^{14}C$ relative to the Olympic Peninsula. We find a 3.2‰ average depression of $\Delta^{14}C$ for single-year Douglas fir samples from the Olympic Peninsula relative to Douglas fir from the Santa Catalina Mountains near Tucson (32°26'N, 110°47'W; elev. 2740 m). This implies a *ca.* 5.8‰ average anomaly between the Tucson mountains and Grand View site areas. Expressed in years, this would result in a *ca.* 48-yr discrepancy in ages from the two sites.

We ascribed the relative suppression of $\Delta^{14}C$ near the Arctic Circle to the release of ^{14}C depleted CO_2 as thawing occurs during the May–August growing season. This is similar to the release of radon that occurs during spring thaws resulting in the tagging of air masses with anomalous amounts of radon.

In order to further study this regional effect, we extended our measurements back to AD 1861. The measured depression was a little greater than previously measured, 3.1 ± 1‰ (1σ) rather than 2.6 ± 0.9‰ (1σ), primarily resulting from an anomalous warming from AD 1867–1869 determined by dendroclimatology involving tree-ring density. The inverse correlation between $\Delta^{14}C$ and temperature is r = 0.63, implying that *ca.* 40% of the relationship can be explained by increased thawing during warmer growing seasons. If this is correct, measurement of $\Delta^{14}C$ in annual tree rings from Arctic regions may provide an additional paleoclimate technique.

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SUPERNOVA: PRIME PROBLEM OF PALEOASTROPHYSICS

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Galileo constructed his first telescope in 1609. Prior to that, astronomers had been limited to naked-eye observations of light reaching Earth from the cosmos. Instruments have evolved to record virtually the entire electromagnetic spectrum plus protons, electrons and other particles arriving at Earth from objects distant in time and space. However, until recently the instrumental record has been limited to radiation arriving at Earth since Galileo. Cosmogenic isotope research expands the astrophysical record into the distant past limited only by the half-lives of the cosmogenic isotopes.

Cosmogenic isotopes are produced by cosmic rays and cosmic rays are of primarily galactic origin, generated by supernova explosions. If a supernova explosion were to occur near enough to the Earth, it would be observed as an increase in the cosmic ray flux, leaving a record in increased concentration of cosmogenic isotopes in natural archives. Hard γ-rays would arrive after the visible light and produce ^{14}C. The 8‰ ^{14}C pulse recorded in tree rings in the third year after light arrived from SN 1006 AD probably signals the arrival of the hard γ-rays from that event. If so, the total γ-ray energy from SN 1006 AD is ~10^{50} ergs. No measurable increase in ^{14}C has been observed for the Tycho and Kepler supernovae and would not be expected because of their greater distance from Earth.

The ^{10}Be increase in the Vostok ice core at *ca.* 35 kyr is a candidate for arrival of a supernova shock wave at Earth. An event at approximately the same time has been observed in the GISP ice cores and in ocean sediment cores from the Gulf of California and Adriatic Sea. We believe the supernova hypothesis is correct because the increase in production rate is too great to be explained by zero geomagnetic field intensity. Geomagnetic field lines are almost vertical at Vostok and a Maunder type