linking Turkey, Mesopotamia and the general Levant. These radiocarbon dates provide, for the first time, a chronological correlation of this brand-new site with the surrounding Anatolian, Mesopotamian and Egyptian chronologies, using calibrated radiocarbon measurements.

LOW-LEVEL LIQUID SCINTILLATION COUNTING FOR RADIOCARBON DATING

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Recently, liquid scintillation counting (LSC) has become the method of choice for radiocarbon dating. In order to perform radiocarbon dating, it is essential to optimize the instrument performance ($E^2/B$). This can be accomplished by maximizing the counting efficiency and minimizing the instrument background. This maximum instrument performance can be achieved using the patented Time-Resolved LSC (TR-LSC) technique on a modern Packard liquid scintillation counter. The TR-LSC technique rejects most nonquenchable background pulses and accepts valid scintillation pulses which result from the $^{14}$C in the sample. The optimization of this technique, in regard to sample preparation, cocktail composition and counting regions will be discussed in detail, as well as the use of a new slow fluor plastic guard detector. This detector helps to further reduce background without substantially changing the counting efficiency of the sample. Data will be presented to support the use of the TR-LSC technique for radiocarbon dating.

DISTRIBUTION OF BOMB RADIOCARBON IN THE ANTARCTIC OCEAN: IMPLICATIONS REGARDING IRON FERTILIZATION

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The stimulation of plant production in the nutrient-rich surface waters of the Antarctic Ocean through the addition of dissolved iron was proposed as an effective way to partially compensate the rise in atmospheric CO$_2$ content generated by fossil-fuel burning and deforestation. A successful fertilization would drop the CO$_2$ partial pressure (pCO$_2$) in Antarctic surface waters, and CO$_2$ would flow from the atmosphere into the surface waters of the Antarctic. However, the atmospheric pCO$_2$ drop would be buffered by the CO$_2$ outflow from the non-Antarctic portion of the surface ocean. To draw down the atmospheric pCO$_2$ to that for the iron-fertilized Antarctic, it would be necessary also to draw down the $\Sigma$CO$_2$ content of the surface layer and part of the underlying thermocline for the entire non-Antarctic portion of the ocean. This CO$_2$ would all have to be crammed into the Antarctic water column. Inventories of bomb-produced $^{14}$C in the Antarctic Ocean, as measured during the GEOSECS surveys of the world ocean, show that the Antarctic waters contain far less bomb $^{14}$C than invaded this region from the atmosphere. By contrast, the temperate regions of the southern hemisphere ocean have inventories exceeding the amounts received by invasion. The explanation for these deficiencies in the Antarctic Ocean is upwelling coupled with lateral transport to adjacent temperate regions. If this is true, only a limited volume on top of the upwelling plume would be available for CO$_2$ storage. The CO$_2$ delivered to the Antarctic from the atmosphere and non-Antarctic surface ocean would drive the pCO$_2$ of Antarctic