

In ordinary strong alcoholic beverages that contain 57–60% alcohol, the mean  $^{14}\text{C}$  and  $^3\text{H}$  activities are  $60.3 \text{ Bq.dm}^{-3}$  and  $153.8 \text{ Bq.dm}^{-3}$ , respectively, but in spirits of lower alcoholic content (38–40%), the mean  $^{14}\text{C}$  activity is  $46.1 \text{ Bq.dm}^{-3}$ , that is, 23.5% less than ordinary spirits, and the mean  $^3\text{H}$  activity is  $114.6 \text{ Bq.dm}^{-3}$ , that is, 25.5% less than ordinary spirits.

We compared the  $^{14}\text{C}$  and  $^3\text{H}$  contents of five kinds of staple grains from both Sichuan and Guangdong provinces. We learned that the level of  $^{14}\text{C}$  activity in spirits is equivalent to that in grains, and the level of  $^3\text{H}$  activity in spirits is ten times higher than in grains and water. White spirits has fully concentrated  $^3\text{H}$  and  $^{14}\text{C}$  from both grain and water, and activities increase with increasing alcoholic content.  $^3\text{H}$  in white spirits probably is averaged from both water and grain, and  $^{14}\text{C}$  is averaged mostly from grain.

#### **ABSOLUTE RADIOCARBON CHRONOLOGY OF THE AUBREY CLOVIS SITE, TEXAS, BASED ON SOIL HUMATE STRATIGRAPHY**

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The Aubrey Clovis site was discovered in the outlet channel of Ray Roberts Lake, Denton County, Texas. The Clovis occupation surface, including two camp areas and a bison-kill-processing locus, was buried 8–9 m below the Trinity River floodplain. A radiocarbon chronology was developed to establish the geochronology of late Pleistocene lacustrine and spring deposits and a thick section of Holocene alluvium. A 12 m stratigraphic column was sampled at 17 horizons, with ages ranging from 14,200 to 1730 BP without reversals. Dated materials include peat residue, peat soluble fractions, alluvium and soil A-horizons. Procedures for the pretreatment of sediment samples include removal of carbonates, extraction of total humates, separation from clay minerals and concentration of humates to solid form. Despite exposure to the atmosphere for several years and seepage of bicarbonate-rich waters, excellent results were achieved. Stable isotope data from these organic-rich sediments clearly demarcate the shift from lacustrine to fluvial environments at the locality.

#### **RADIOCARBON DATING OF GROUNDWATER CONTAINING MICROBIAL METHANE**

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Many aquifers in glacial deposits contain microbial methane formed from decomposition of organic materials contained in the sediments. Microbial decomposition can have a significant effect on both the  $\delta^{13}\text{C}$  value and the  $^{14}\text{C}$  content of the dissolved inorganic carbon (DIC) and, thus, on the radiocarbon age of the water. This study addresses the problem of radiocarbon dating of groundwater containing microbial methane.

Groundwater samples were collected under pressure from several different depths in Illinoian glacial deposits and from the underlying bedrock at a site in east-central Illinois. The dissolved