A search for the glacial age ^{14}C depleted ocean reservoir

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The only viable explanation for the 190 per mil Mystery Interval decline in the ^{14}C to C ratio in surface ocean and atmosphere carbon appears to be the mixing into the remainder of the ocean of a large radiocarbon – depleted isolated abyssal ocean reservoir. While circumstantial evidence can be cited in support of the existence of such a reservoir, no convincing direct evidence based on the radiocarbon age differences between coexisting benthic and planktic foraminifera has been found. Nor have glacial – age ^{13}C depleted benthic foraminifera or anaerobic abyssal sediments been found. Down to 2.8 km, the radiocarbon age of Pacific deep water shows no significant change during the course of the last 20 kyrs.

Sedimentological evidence for the origin of Paleoproterozoic, Banded Iron Formations in the Hamersley Province of Western Australia

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Banded Iron Formations (BIF) are metamorphosed iron-rich sedimentary rocks. Detailed sedimentological and volcanological studies [1,2,3] indicate that the 2.5 to 2.45 Ga Brockman Supersequence contains BIF interlayered with bedded chert, limestone, mudrock, sandstone, breccia, tuffaceous mudstone, ashfall tuff, and a bimodal (basalt/dolerite and rhyolite) large igneous province deposited in a submarine environment. Density current rhythms are preserved in the sedimentary rocks with relicts of similar textures in the BIF implying a resedimented origin for the precursor to the BIF. Bedded cherts, chert nodules and the chert matrix of the BIF preserve evidence for diagenetic silica replacement before and during compaction close to the sediment water interface. The original sediments were resedimented from two sources: the non BIF components from a shelf during sea level lowstands; and the BIF from hydrothermal sources within the basin. The precursors to the BIF are interpreted to have been hydrothermal muds comprising ferrous iron-rich silicates (smectite), carbonates (siderite), and ferric hydroxides that were resedimented from a seamount type volcanic-hydrothermal system. The oxide-rich BIF is most likely the result of non-photochemical oxidation processes such as direct or indirect biological oxidation and a significant amount of the BIF could have originally been deposited as ferrous minerals [4].

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