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A NEW AND IMPROVED CLEANING PROCEDURE FOR THE DEAD SEA SCROLLS

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A large but unknown number of Dead Sea Scroll fragments have been contaminated by castor oil by the original team of readers. Castor oil was used by most members of the team for the purpose of cleaning and securing better readability in the time interval from ca. 1950 to ca. 1964. None of the team members realized at that time the consequences to the Scrolls.

Treatment with castor oil does not seem to have harmed the Scrolls in terms of changed appearance or state of conservation. The problem comes about when radiocarbon dating of a Scroll fragment is attempted. If “modern” carbon atoms (i.e. material with a relatively high ratio of $^{14}C/^{12}C$) from the castor oil are still present at the time of conversion of the sample to CO_2 and later reduction to elemental carbon used in the sample pellet for the input system in the AMS accelerator, then a falsely younger age is produced. The standard AAA pretreatment used by radiocarbon laboratories to prepare samples for dating was shown by us in previous publications ineffective in removing castor oil.

There are two ways in which to overcome this potential problem. One is to diagnose the presence of castor oil components or reaction products of castor oil components in a milligram size Scroll sample intended for radiocarbon dating, and then simply avoid dating such a sample. The other is to devise a chemical cleaning method to decontaminate the small sample prior to AAA pretreatment and radiocarbon dating. In the talk we present our latest work on understanding the nature of the contamination and of devising a decontamination procedure.