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Hugh is a cradle Catholic, and has been teaching general science continuously since 1974, first as a school-teacher, now as a private tutor. He became aware of the Shroud in 1972, and wrote his first article for the British Society for the Turin Shroud (BSTS) newsletter in 1995, of which he was editor from 2013-2017. He became persuaded of the medieval origin of the Shroud about ten years ago, and is now one of the most prominent advocates for this.

ABSTRACT

Converting radiocarbon decay to calendar dates. Why the Shroud may date from 1260 to 1280, but not from 1340

Although the radioactive decay of Carbon-14 is quite regular and unaffected by environmental conditions, it cannot be used as a simple clock relating a particular proportion of Carbon-14 to Carbon-12 to a calendar date. The ratio of Carbon-14 to Carbon-12 in a living organism has varied over the centuries, due to the effects of solar radiation and volcanic activity. An organism which died when the atmosphere had an unusually high proportion of Carbon-14 may appear to be younger than one that lived with an unusually low proportion, even when it is in fact older. The correct proportions of carbon isotopes in artefacts of any particular ages can be determined using tree rings, whose date can be determined by observation with great accuracy. Finding the current Carbon-14 to Carbon-12 proportion in samples from tree rings enables points of precise correlation to be determined, from which an accurate calibration line can be derived, the most recent being that of Reimer *et al.* (2013).

The fourteenth century was a period of particularly variable atmospheric carbon ratios, such that organisms which died in 1320, 1350, and 1390, all in fact have the same ratio now, appearing a little older than organisms which died in 1370, and younger than those which died in 1320. The radiocarbon dating of the Shroud demonstrates this anomaly. As a specific example, the youngest Arizona sample, with 93.1% of the present atmospheric Carbon-14 content, correlates to the years 1325, and 1345, and 1395, but cannot relate to the intermediate years 1335 or 1375. Of course, organic remains whose radiocarbon content has been changed by unknown processes cannot be dated at all.