

# Earthquake-Induced Piezonuclear Reactions And The Image On The Shroud Of Turin: Critical Remarks

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## Abstract:

Neutrons produced by hypothetical “piezonuclear” fission reactions have been proposed as causative for the formation of the image on the Shroud of Turin<sup>1</sup>. According to this hypothesis, compressing solids can provoke nucleus-splitting reactions without emitting  $\gamma$ -rays or producing nuclear waste. This involves an exponentially accelerated decay rate of a thorium isotope, according to results presented in 2. The decay rate of the isotope <sup>228</sup>Th in a water solution, compared with its natural decay rate, is said to be increased by a factor of 10<sup>4</sup> when exposed to cavitation, *i.e.*, sound waves at 20 kHz and 100W, as might be produced by a very high-magnitude earthquake. This claim has been disputed as not substantiated by the experimental evidence presented<sup>3</sup>.

The Shroud image is said to have been formed by a hypothetical flux of thermal neutrons directed into the Shroud, which in turn interacts with atmospheric nitrogen to generate both protons (which are absorbed by the linen cellulose, producing a superficial coloration) and additional isotopes of <sup>14</sup>C, captured by cellulose of the linen cloth, as proposed by Rinaudo<sup>4</sup>, thus skewing the radiocarbon dating of 1988.

However, Rinaudo posited the body as the source of the neutron-proton flux, producing the very superficial image on the inside of the cloth. On the contrary, in the piezonuclear fission hypothesis, the source of neutrons are rocks of the walls of the tomb. Therefore the flux of neutrons (and of secondary protons) is directed to the outside surface of the linen cloth. As a consequence, the image would be on the outside of the cloth, in contradiction with the detailed results of STURP studies.

The unique earthquakes in the *Gospel of Matthew* (27:51, 28:2), absent from the other Gospels, are subsumed into the piezonuclear hypothesis. But they are completely unattested by any known independent historical source. References to earthquakes at the time of the Crucifixion and/or the Resurrection, such as attributed to the unknown historian Thallos, *The Narrative of Joseph of Arimathea* and Dante’s *Divine Comedy* can scarcely be considered to support historical authenticity, as their source is none other than the *Gospel of Matthew*.

Moreover, image formation via the neutron flux-proton interaction hypothesis is said to have required an earthquake of 8 - 9 *ML* magnitude<sup>1</sup> “which “should have razed Jerusalem to the ground”<sup>5</sup>, and could not have gone unnoticed by contemporary or later historians – *i.e.*, Pliny, Josephus, Philo, Tacitus, not to mention the letters of Paul or *Acts*, which portrays the apostles openly teaching in the Temple (3:1 ff.) following the death of Jesus.

The premise that the earthquakes of Matthew may somehow have been involved in formation of the Shroud body image may be untenable, as neither occurred, according to the Evangelist, when the shroud could have been in contact with the body.