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A re-evaluation of the 5th October 1948 M7.3 Ashgabat earthquake (Turkmenistan)

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The 1948 M 7.3 Ashgabat earthquake, killing over 38,000 people, occurred in the dextral strike-slip Kopeh Dagh fault zone in the Iran-Turkmenistan border region. Previously, it has been debated which fault(s) it occurred on and whether this earthquake was a thrust/reverse, strike-slip, or multi-fault earthquake, as published focal mechanisms suggest it had a reverse mechanism. We relocated the hypocentre using historical seismograms and present a new strike-slip focal mechanism. We used Pleiades satellite stereo imagery to produce Digital Elevation Models of part of the ruptured area. These data reveal clear strike-slip faults where surface ruptures were mapped in 1948. The earthquake did not rupture the Main Kopeh Dagh fault, but instead these subsidiary faults, highlighting the importance of considering lesser faults in seismic hazard models.