

Ground Effects of the Baelo Claudia Earthquake (4th Century A.C.): Geomorphologic and Archaeological Data.

¹SILVA, P. G.; ²SAZ, C.; ¹GOY, J.L.; ²LUQUE, L.; ²LARIO, J.; ³DABRIO, C.J. and ⁴BARDAJI, T. 1. Depto. Geología Universidad Salamanca, Salamanca/Avila, Spain; 2 Depto. Geología, Museo Nacional CC. Naturales, CSIC, Spain; 3 Depto. Estratigrafía UCM, Madrid, Spain; 4 Depto. Geología, Universidad de Alcalá de Henares, Madrid, Spain.

The former Roman City of Baelo Claudia, located at the axial zone of the Gibraltar Strait (Cadiz, South Spain), contains an abundance of disrupted architectural relics probably related to historic earthquake damage. Main co-seismic structures are related to pop up-like deformations affecting flagstone couplets of the ancient roman pavement. In general, disrupted relics include: (1) Seven pop up-like alignments crossing the squared floor-stone pavement of the *forum* with consistent N110-116°E orientations. (2) Bended and refracted pop up-like arrays affecting the irregular-polygonal shaped flagstones of the *Decumanus maximus* (Main Street) showing main N130-125°E orientations. (3) Eastern walls of the forum and city walls tilted to the W. (4) E to W upthrust slabs in the main stairs of the *forum*.

The analyses of the disrupted relics seem to indicate that compressive stress acted in a main NE-SW/ENE-WSW orientation. Main disruptions and compressive features indicate an anomalous westward ground displacement orthogonal to the main gentle southwards slope of the topography. As suggested by previous authors, main disruption could be generated by ground shaking of a relatively far away earthquake, like those occurred in the Alboran Sea or in the San Vicente Cape in the years 365 A.D. and 382 A.D. respectively. Anyway, moderate earthquakes (mb 4-6), occur in near inland zones (Gibraltar Strait) and horizontal ground accelerations of 0.05g could be expected at this site. An assemblage of geomorphologic (fault scarps, shutter ridges) and paleoseismic (liquefaction, landslides) features in close zones indicate that this area holds a main transpressive Quaternary tectonics.

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