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# Imaging experimental bone tool micro-structure: towards an understanding of archaeological bone tool function

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Many experiments have sought to recreate the types of damage that would be expected in ancient stone and bone weapon tips. This damage is usually presented as visible fractures or microscopic surface modification. Fatigue tests conducted on bovine bones, however, show the development of internal micro-cracks that result from stress, prior to actual breakage. In this paper I present the results of an experimental investigation of bone points subjected to a variety of activities. I assess the presence of microdamage using micro-focus computed tomography. The results show that two patterns of micro-cracks develop in bone and are best viewed in longitudinal section. Micro-cracks are a cumulative feature dependent on the amount of load applied and the duration of activity. When subjected to high enough loading rates, micro-cracks will merge together to eventually form a fracture. Although further tests are needed to confirm the exact point at which these fatigue fractures begin to form, micro-focus computed tomography has the potential to reveal whether an individual bone point underwent multiple or prolonged impacts and thus to elucidate the probable function/s of ancient pointed bone tools where no visible damage is apparent. Micro-focus computed tomography is a non-destructive and non-invasive procedure and therefore safe to use on archaeological artefacts.

## Submit a paper<br>for peer review<br>(SA Journal of Science)?<br>(Yes / No / Maybe)

Maybe

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