Patience Cowie and the Inception of Modern Fault Mechanics: A Recollection

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Patience Cowie’s PhD thesis, conducted with me at Lamont, resulted in three papers, published in 1992, that laid the groundwork for the modern era of fault mechanics studies. In the first paper\(^1\) she reasoned that a cohesive zone model provided a plausible model of fault growth provided that the width of the cohesive zone scales linearly with fault length. In that case, the Griffith instability is avoided and faults grow self-similarly in quasistatic equilibrium. This model is consistent with the existence of faults of all sizes in which displacement scales linearly with length and the fault grows by the breakdown of a damage zone at the fault tip. In the second paper\(^2\) she showed that the then existing data for fault displacement and length were consistent with linear scaling for faults rupturing rock of similar strength. In the third paper\(^3\) she combined the earthquake slip/length scaling law with that fault scaling law to show how faults can grow by the accumulation of slip from earthquakes.

In the subsequent thirty years much more work has been done to expand on these themes pioneered by Patience. Here I share some memories of working with Patience in those formative years.

