

Earthquake theory stretched in Central Asia study

February 25 2008

The entrenched political instability in Pakistan and Afghanistan is of grave concern to many in the West – but now geologists at ANU have suggested a new cause for the seismic instability that regularly rocks the region.

Scientists from the Research School of Earth Sciences at ANU argue that the frequent and dramatic earthquakes in the Hindu Kush mountain range are likely to be the result of a slow, elastic stretching of a sub-surface feature called a boudin. Their findings, published in the journal *Nature Geoscience* today, run contrary to the theory that earthquakes usually result from the abrasive collisions between tectonic plates.

“We’ve always thought of earthquakes as being brittle, but our research that the slow, ductile stretching of certain geological features can build up energy that is then suddenly released, causing major seismic upheaval,” said lead author Professor Gordon Lister.

Using computer modelling, the researchers were able to show that the long, hard boudin that sits vertically beneath the Hindu Kush is being stretched as its lower parts are pulled into the Earth’s mantle. “It’s like a metal rod that is being pulled at both ends,” Professor Lister explained. “Eventually the stretching will suddenly accelerate, releasing energy in the process.”

The boudin is thought to be a remnant of the oceanic plate that was pushed into the Earth’s mantle when India collided with Asia. Professor

Lister said that eventually it too will eventually drop into the deeper mantle, but that is likely to take thousands, if not millions, of years.

“This is important work, as it suggests a new way of understanding how earthquakes happen. It feeds into the potential for us to eventually develop new and innovative long-range forecasting techniques” Professor Lister said.

“It’s no accident that nations like Afghanistan and Pakistan are places of unrest, because the people there are living in constant hardship, and this results in part from periodic catastrophe’s they must endure, for example related to earthquakes. If we don’t put more effort into understanding the how and why, and also into how we might eventually better forecast earthquakes, humankind is forever doomed to deal with the consequences.”

The researchers have developed a software program called eQuakes that allows them to model earthquake patterns against geological features.

Source: Australian National University

Citation: Earthquake theory stretched in Central Asia study (2008, February 25) retrieved 8 May 2024 from <https://phys.org/news/2008-02-earthquake-theory-central-asia.html>

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