waveform to the *Jason 1* profile. Earthquakes can be used as inputs to tsunami models, but working backward from tsunamis to earthquakes misses certain aspects about the slip on the fault. However, to match his synthetic waveform to the satellite's observation of a broad trough in the central Bay of Bengal, Ward had to presume much larger slip displacements in the northern end of the rupture over an hour's duration than seismic models alone would predict. In that respect, the tsunami serves as a window into intermediate-length processes not captured by shorter-period seismic signals. Still, uncertainty in a few parameters, most notably how steeply one plate dips under the other, continues to stir debate over the problem.

Where Next?

Long term, the slow accumulation of stress as tectonic plates converge makes earthquakes inevitable. But the rate at which that happens is nonuniform, and the strength of the crust is also not constant. The presence of water can weaken the crust significantly, and heterogeneities along the fault zone influence its frictional properties. So, predicting where and when the next big one is likely to strike largely boils down to checking the historical record. And the error bars can be decades or centuries. The last large tsunami to strike Indonesia occurred in 1861.

Seismologists are now concerned about the earthquake potential of the Cascadia fault-a subduction zone in which the Juan de Fuca plate is sinking under the US Pacific northwest. An important question is whether scientists can distill from the vast data now collected an improved understanding of what the expected seismic shaking is likely to do to high-rise buildings there. The matter is pressing. That fault zone has been accumulating stress for 300 years and is as close to Seattle as the Sumatran earthquake epicenter is to Banda Aceh.

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BOREWELL SAMPLES FROM INDUS BANKS

This note highlights the significance of finding pebbles of granite from Khardungla (representing the massive Ladakh batholith) located on the northern side of River Indus and sandstones from Stok glacier (representing the Tethyan Himalayan sedimentary sequence deposits on the southern banks of river Indus).

The pebbles of granite and sandstone found from the borewell samples drilled on the banks of river Indus at a depth of >100 feet below the ground level clearly show that the borewell in question represents the boundary between the two glaciers in the past (ice age). The granites representing the eroded material from the Khardungla batholith and sandstone represent the eroded material from the Stok-Kangri Zanskar range.

The most important physical characteristic of this find is the flatness of the pebbles.

The paleoenvironmental significance of these deposits is that the glaciers extended right up to the banks of River Indus in the past at an altitude of 11000 feet above the mean sea level. Today these glaciers are restricted to the peaks of the massive hills at an altitude of >16000 feet and 20000 feet respectively and are fast on the verge of extinction.

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