

worth living. As theologian Ronald Cole-Turner points out: “Technologies such as psychopharmacology and human genetic manipulation fit very well within the broad program of Western religions and philosophy”. In this context, philosopher Carl Elliott expresses concern that drugs such as Prozac could be used to ‘treat’ alienation or existential anxiety — or, as contributor Gerald McKenny puts it: “To relieve the human condition”. To Elliott, seeing this sort of unhappiness as a psychiatric issue represents a category error, “like seeing Holy Communion as a dietary issue”.

One way to see what is so disturbing about, say, a happy, smiling August Strindberg on Prozac is that he might no longer be Strindberg. Elliott refers to what the philosopher Charles Taylor has called an ethics of authenticity: the idea that our lives can only have meaning insofar as we are true to ourselves, and on this basis develop our own life project. Thus, altering one’s personality by means of Prozac may potentially be an act of self-betrayal resulting in a seemingly happy, yet phoney and pointless life.

This is a fascinating, challenging and important book, and a major achievement by Parens. Although the contributions are written by academics, by the style of most of them they are obviously meant for a broader audience, and use clear and accessible language — Dan Brock’s essay in particular. I predict that this book will open a debate that will play a significant role in shaping our culture in the years to come. □

David Gems is in the Galton Laboratory, Department of Biology, University College London, London NW1 2HE, UK.

## Destruction and deliberation

### The Earth in Turmoil: Earthquakes, Volcanoes, and Their Impact on Humankind

by Kerry Sieh and Simon LeVay

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Claudio Vita-Finzi

Just over a century ago, the pioneering seismologist John Milne, then at the Imperial College of Engineering in Tokyo, was trying to decide whether the apparent association between earthquakes and volcanoes was a coincidence. “It would seem,” he concluded, “that the two phenomena are without any direct connection, unless it be that both are different effects of a common cause.”

Geology has since supplied the requisite common cause: the collision between or splitting apart of two of the plates that make up the Earth’s outer shell. But the layman has never doubted that earthquakes and volcanoes go together, like plague and famine or



Awful sight: we know much about volcanoes, but are still often caught off guard when they erupt.

fire and brimstone. As Pliny and anyone else living under Mount Vesuvius knows, they often occur together and they epitomize the hostile side of nature.

Kerry Sieh and Simon LeVay in *The Earth in Turmoil* respect this fear — and its obverse, the desire to do something about the twin scourges. More than 1.5 million people have died in earthquakes this century and the 1985 eruption of the Nevado del Ruiz volcano in Colombia killed 25,000. But, with the detachment of neurologists confronted by a devastating cranial lesion, the authors also welcome eruptions and earthquakes as clues to the workings of the planet.

Their casebook is provided by the United States, which has its share of volcanoes, earthquakes and irresponsible planners, and, more to the point, superlative geoscientists and research organizations. In contrast with many of their European counterparts, these scientists and organizations make data, facilities and ideas available to the world at large with prodigal liberality.

It is not always a question of money. The geologist Brian Atwater, armed with little more than a shovel and a canoe, revealed to the complacent population of the north-western United States that it was at greater risk from major earthquakes, and the attendant sea waves and landslides, than the Californians down the coast. The local written history was too short to register a major event 300 years ago comparable in

severity to the earthquake that devastated south-central Chile in 1960 (the largest in recorded history), but sand and peat layers revealed a sequence of such events separated by between three and nine centuries.

Our knowledge of the much more notorious San Andreas fault has also benefited from historical analysis, and one of the 23 colour plates in the book could well have been swapped for a detailed trench section by Sieh. For here, too, an inadequate human chronicle has been remedied by the spade — and the mechanical digger — to reveal at least two nineteenth-century earthquakes on the scale of the 1906 San Francisco disaster.

Seismic zoning has not kept up with understanding, nor with the humility it brings. Once movement on faults was recognized as the cause rather than the result of earthquakes, the emphasis was put on mapping them and estimating the probability of when and how they would move. Sieh and LeVay have a fine time listing some of the major cities that lie within easy reach of a major active fault, among them Tokyo, Osaka, Xian, Beijing, Lima, Valparaiso, Algiers, Athens, Jerusalem, Tehran, Karachi and Kabul.

Yet many of the most destructive events have occurred on hidden structures whose existence was signalled only by the mayhem they caused. And the earthquakes of 1811–12 in New Madrid in the United States, like the 1993 Latur earthquake in India that killed 10,000 people, remain puzzling because their locations do not conform to the oversimplified versions of plate tectonics.

The situation is similar with volcanoes. We know a lot, but are caught off guard either because we ignore warnings or because eruptions are triggered by apparently unrelated events such as landslides. The forces involved are prodigious: during its 1980 eruption, Mount St Helens liberated as much energy as the Hiroshima bomb every second for nine hours. As in the study of earthquakes, there is much to be learnt from folk tales which may point to a prehistoric event for which the evidence is ephemeral. A piquant example is the eruption that is thought to have prompted two medicine men to throw themselves into Mount Mazama in Oregon, to placate the Chief of the Below World.

Scientists continue to die in their efforts to understand or predict eruptions. This book documents their achievements. It does so with eloquent pride and with greater incivility than many college textbooks. One quibble: the title speaks of the Earth in turmoil. When has it been at peace? □

Claudio Vita-Finzi is in the Department of Geological Sciences, University College London, London WC1E 6BT, UK.