

NOTE

## *Abrupt Climate Change*

**A Correspondent writes :**

Glaciologist Lonnie Thompson has spent more time above 20,000 feet than any other human being. In collecting a vast library of ice samples from mountain peaks, he has developed a unique view of past and present-day climate change.

Understanding the mechanisms of abrupt climate change would be important in any period of time. But in today's world, it's especially important given that the planet earth never had 6.7 billion people before, and that the potential impacts of changes on social and economic systems could be substantial.

To understand the mechanisms of abrupt changes in the present and future, it is essential to know what has occurred in the past. Fortunately the planet earth has recorded very detailed histories, often annually, of how the climate system worked in the past.

Glaciers are like sentinels, and they're telling people that the system is changing. The first thing one looks for in the ice is radioactivity from thermonuclear bomb tests in 1962–1963 and 1951–1952. Back in 2006, three cores were drilled in the southwestern Himalayas. At 6,050 metres, where those glaciers reach their highest elevation, it was found that neither of these radioactive layers was preserved. The glaciers are being decapitated. Not only are they retreating up the mountain slopes, but they are thinning from the top down.

This same scenario is playing out on Mount Kilimanjaro in Africa. The test drilling in 2000 showed that the 1951 atomic test was preserved but not the 1962 test.

What does that mean for climate science?

Once a glacier melts, the history it contained is gone forever, so there's an urgency in trying to collect the records before they are lost.

*The loss of tropical glaciers is very telling because they're in such sensitive places. Half of the surface of the planet lies between 30° N and 30° S. That's where the heat that drives the climate system is received. It's also where 70 percent of the 6.7 billion people on the planet live. In the twenty-first century human beings face two major problems: how do they get along with each other, and how do they get along with the planet? □□□*