

## Panel 10: Cold War/Long Peace (1945 to 2000 AD)

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In this panel, for the first time, individual years are resolved on the time axis, so the tick marks are labeled as January 1 of the relevant year **(A)**. Compare this with Panel 2, showing all of Earth history, where each tick mark represents 100 million years! The start of this panel is January 1, 1945, a few months before the end of World War II, when the global human situation changed from all-out warfare to the uneasy, armed peace that lasted until and beyond the year 2000.

Even in this short time interval, there were a number of major natural disasters. The greatest earthquakes **(B)** recorded in North America (Alaska, 1964,  $M_w = 9.2$ ) and globally (Chile, 1960,  $M_w = 9.5$ ) took place during the 1960s, along with the Mexico City earthquake of 1985, which was particularly destructive because of instability of the soft sediment of former Lake Texcoco, on which much of the city is built. All three of these events, and in fact, most of the earthquakes with  $M_w \geq 8$  since 1900 have occurred on subduction zones either surrounding the Pacific Ocean or around Indonesia.<sup>1</sup>

The decade of the 1980s saw three devastating volcanic events **(C)**, with another in 1991. The worst of these was the eruption of the stratovolcano, Nevado del Ruíz, in the Colombian Andes, on November 13, 1985. Although only  $5^\circ$  north of the equator, this mountain is 5,300 m (17,500 ft) high, and was covered with snow at the time of the

eruption. During the event, large amounts of hot volcanic ash fell onto the snow, melting it and generating lahars, or volcanic mudflows, which swept down valleys on the east side of the volcano. One lahar overwhelmed the town of Armero, killing 2/3 of its nearly 30,000 inhabitants.<sup>2</sup> This event, known as the Tragedy of Armero, was greatly worsened by the paralysis of the Colombian government, then facing the height of an armed insurgency, and by the fact that the Mexico City earthquake had taken place just two months earlier, so that much of the global emergency response capability was already deployed in Mexico. Major volcanic events with fewer fatalities took place at El Chichón in Mexico, Mount Pinatubo in the Philippines, and Mount Saint Helens in the Cascades of Washington State — the latter being first eruption in the lower United States since Mount Lassen in 1915.

Beginning in 1981 and continuing to the present day, the global HIV/AIDS pandemic **(D)** has killed more than 30 million people, and is only slowly being brought under control.<sup>3</sup>

The growth of the human population **(E)**, reaching 6 billion just before the year 2000, looks less steep than it does on Panel 9, but this is because of the expansion of the time scale by a factor of  $\sim 10$ . Human beings are now so numerous and health care so advanced that the population curve shown here

does not reflect even great natural disasters. However, this situation is not necessarily permanent. Much greater disasters are certainly possible. Impact of a 10-km asteroid or comet 66 million years ago caused a mass extinction throughout the plant and animal worlds. Full-scale nuclear war nearly took place at least twice during the time of this panel, and many such weapons remain, with new nuclear powers emerging. Collapse of the economic system or of agricultural production and distribution are not impossible. The current economic system depends on continual growth, but unrestrained growth is clearly not sustainable indefinitely on a finite Earth. It is hard to avoid the conclusion that we must voluntarily transition to a non-growing population and a sustainable economy, or Nature will do it for us.

A major human milestone was passed, for good or ill, on July 16, 1945, with the explosion of the first ever atomic (fission) bomb at Alamogordo, New Mexico **(F)**. Within a month, two such weapons destroyed Hiroshima and Nagasaki, the Japanese surrendered, and World War II was over. Within a decade the Soviet Union tested its own atomic bomb, the U.S. tested a much more powerful hydrogen (fusion) bomb, the Soviet Union matched it, and the world entered a new era, living constantly under the threat of nuclear annihilation.