10-1-2002


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Available at: https://scholarsarchive.byu.edu/ccr/vol47/iss47/14
In the middle of the sixth century AD, something happened that was the natural equivalent of what scientists fear would befall the world's climate in the event of nuclear war: the so-called "nuclear winter."

According to David Keys: "In that appalling potential future disaster, hydrogen bomb explosions would force vast quantities of pulverized debris, dust, and temporarily vaporized earth up into the atmosphere. There, this nuclear pollution would form a barrier which would prevent much of the sun's light and heat from reaching the ground. Temperatures would fall, the world's climate system would be thrown into chaos, and famine followed by epidemics would begin to rage.

The mid-sixth-century climatic catastrophe displayed all the hallmarks of nuclear winter. But obviously there were no H--bombs in the first millennium A.D. So what was the culprit?"

With this opening, Keys lays out a historic mystery story that uses the tools of good modern historians: government records, journals, epidemiology, climatology, and makes this all relevant to the global changes that we are undergoing today. Taking the mysterious global event that affected climate, animal and insect life, and human behavior as the trigger for a catastrophe, Keys shows how the ancient world died and the modern world began.

He begins with the first Black Death, the plague that came out of Yemen and swept Europe in the 6th century. We are generally more familiar with the second round of this plague in the 13th century that came out of China, but the first round was just as devastating. It brought with it the demise of old Roman rule and ushered in the barbarian tide that replaced it.

When one human governing system collapses, there is a rush to fill the gap. The Avars from Central Asia pushed other barbarians before them and entire European populations were replaced. Keys describes how the movement of barbarian peoples works like dominoes. As they move west, they encounter others who either fight, join, or flee. "Although the Avars themselves have long vanished into the mists of history, it is to them that the modern world owes much of the ethnic and political geography of modern eastern Europe," he says. "They were, to a large extent, a violent and catalytic phenomenon--a sort of bulldozer that often forced those in front to move on (to become someone else's
tormentors) and enabled those to its rear to benefit as allied subject colonists of new lands.

Barbarian invasions came in part because of dramatic ecological changes during the 6th century--not only out of Eurasia, which we have come to expect, but also in North Africa (the Arabs) and in the New World as well, where old civilizations collapsed and new barbarians moved in.

The event (whatever it was) launched another powerful tribe, the Turks, who eventually brought to an end the ancient Roman Empire in its Byzantine form. In Western Europe, climate disasters and plague transformed Britain, Ireland, France, and Spain. The effects of the Black Death of 542 on Visigothic Spain gives us a new analysis of why the Arab invasion succeeded. The Black Death caused substantial social, economic, and political destruction. It also seems to have upset the balance of power between the Visigothic ruling class and their Romano-Spanish subjects.

Tax revenue crashed because of the death of both taxpayers and tax collectors. Individuals of great personal, political, and military power were wiped out. "In history," Keys notes, "the creation of an abnormally large number of vacancies at the top most frequently creates a large bout of competitive--and often violent--activity to fill them." This is the period that laid the foundation for the arrival of the Muslims.

The best written records of the strange event comes from the Chinese documents that clearly describe the beginning of a terrible and fateful sequence that began some time between mid-November and early December 535. Yellow dust (ashes) fell that could be swept up by the handfuls. "The mysterious ch'en or hui falling from the sky in late 535 and the winter of 536-7 must have been either volcanic ash or a totally extraordinary and unseasonable series of very severe dust storms caused by massive climatic disruption," said Keys. This ushered in a long period of climatic dislocations.

Another document to verify this event was the Nihon Shoki, a chronicle of early Japan. The chronicle states that in 536: "Food is the basis of the empire. Yellow gold and ten thousand strings of cash cannot cure hunger. What avails a thousand boxes of pearls to him who is starving of cold?"

Keys tells us: "...climatic catastrophe was translated into massive political and religious change through four key interrelated factors: climate, migration, disease, and religion." Just as in Europe, the Middle East, and the Orient had experienced massive geopolitical change in the
century following the climatic disasters of the 530s, so too did the Americas. Both in Mesoamerica and the Andes, there was a total geopolitical realignment, driven ultimately by the engine of climatic change, which is the most reasonable explanation I have heard for the desertion of the huge Mesoamerican city of Teotihuacan.

An analysis of more than 150 skeletons from Teotihuacan by a forensic anthropologist shows that in the years prior to the collapse of the city-state, people began to die at an earlier age—probably because of the great drought and agricultural failure. "Indeed the death rates for those under twenty-five virtually doubled--68.3 percent of the working-class population were dying before the age of twenty-five, compared to 38.5 percent in more normal times."

The last section of the book explores what may have happened. Was it a collision with a comet? Siberia had such an event (apparently a piece of a comet) in 1908 that set off hundreds of miles of forest fires. Also, there is evidence that one enormous collision off Yucatan may have triggered the extinction of the dinosaurs. But this 6th century event does not seem to have been from outer space.

There is evidence for a huge volcanic eruption on Java, one so huge that it split the island in two. The sound of it was heard a thousand miles away in China (and duly recorded) and there was a rain of ash that traveled even further. This was followed by months of little sunlight globally, untoward climatic events such as snow in August in southern China, droughts and floods in areas not expecting them, a perfect environment for gestating plagues and barbarian invasions.

According to Keys, "The 535 eruption was, as near as can be determined, one of the largest volcanic events of the past fifty thousand years. Whether looked at in terms of short- and medium-term climatic effects, caldera size (assuming proto-Krakatoa was the culprit), or ice-core evidence, the eruption was of truly mammoth proportions. Climatologically, the tree-ring evidence shows that it was the worst worldwide event in tree-ring record. Looking at the ice cores, we see that it may well have been the largest event to show up in both northern and southern ice caps for the past two thousand years."

Keys ends his book with a speculation on potential global catastrophes tomorrow and what we may need to know to protect ourselves. There is evidence that we are entering a new era of geothermal activity, even one of which could create massive dislocations as we have seen before. Third World overpopulation, malnutrition, and new diseases, as we can see in Africa and India today, are already positioning such peo-
The developed world is in a much better condition to handle such a catastrophe, but we will have to deal with a desperate Third World exodus.

I remember a paper by Stedman Noble in which he discussed a comparable—or much larger—eruption of this same Mt. Tuba in Indonesia at the dawn of man that created a human bottleneck. Apparently it wiped out 90 percent of not only primeval mankind but also other animals, and those humans who survived the event were a couple of thousand beings who filtered out of Africa and repopulated the world. These are the ancestors of us all.

I rank this work with Jared Diamond’s *Guns, Germs and Steel* as a brilliant new way to look at historic events from a global standpoint. This is a marvelous piece of historic detective work and provides plenty of food for thought.

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