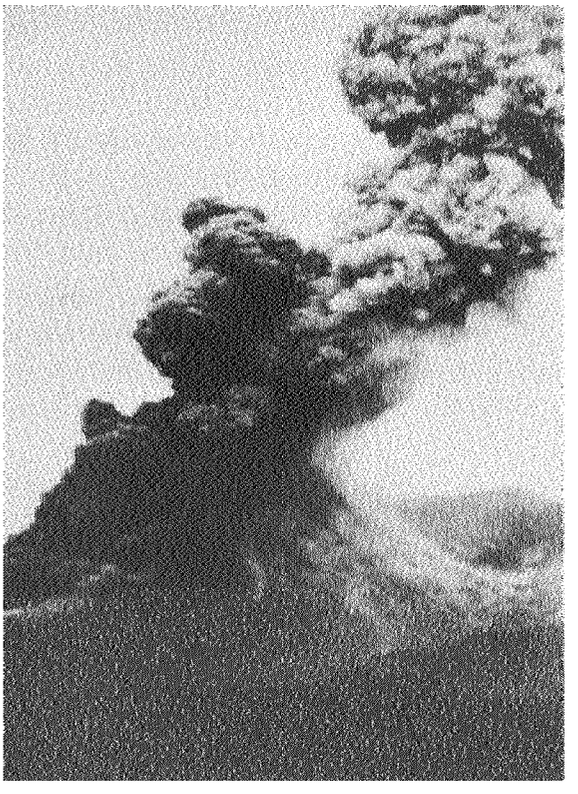
Volcanoes



The Rabaul volcano eruption in Papua New Guinea.

Volcanic eruptions are among the most awesome and most feared of natural phenomena. Myths, legends and recorded history abound in testimonies to their destructive power, and the geological record shows that volcanic processes have been important throughout the earth's history. These processes continue at the present time, often with profound effects on human life and activity.

More than 500 volcanoes have been active in historical times. There are also many hundreds of others now dormant which show evidence of eruptive in the recent pre-historic past. Some of these will undoubtedly erupt again; eruptions have also occurred at volcanoes previously thought to be extinct. In addition, entirely new volcanoes are formed time to time within volcanic zones.

Eruptions vary widely in magnitude and duration, not only from one volcano to another but even at the same volcano. The frequency of eruptions also varies, from volcanoes which are in almost continual eruption to those which erupt only at intervals of hundreds or even thousands of years.

Volcanoes affect the lives of people in both negative and positive ways. Any volcanic eruption, whatever its degree of violence, can be dangerous to people in its neighbourhood. Yet, during their periods of inactivity, volcanoes attract human settlement because of the fertility of volcanic soils and the often spectacular beauty of volcanic landscapes. Large numbers of lives and large economic investments may therefore be at risk when an eruption occurs.

Most eruptions are preceded by premonitory signs which, if recognized and heeded, can give timely warning of the impending events. However, these signs may be subtle or complex, and may demand careful and detailed study before they can be interpreted correctly. Some of history's greatest catastrophes have been caused by eruptions whose early signs were unrecognized, misunderstood or ignored.

One cannot abandon or prevent all settlement of the areas where volcanic hazards exist; what is important is to learn to live with them as safely as possible. For this, it is essential to know each volcano's history, the frequency and character of its eruptions, and to understand the process which leads up to them.

Source: Volcanic Emergency Management (UNDRO/UNESCO Publication, 1985).

Sociologically, a disaster is an event, located in time and space, that produces the conditions whereby the continuity of the structure and processes of social units becomes problematic. Disaster agents may differ as to their cause, frequence, speed of onset, length of forewarning, duration, scope of impact, and destructive potential.

The term "disaster" continues to be used in a variety of ways. In general usage, a "disaster" implies a misfortune or calamity, hard luck, or anything of a ruinous or distressing nature and an "emergency" implies a sudden or unexpected event requiring immediate action. However, the words "disaster" and "emergency" are used so diversely as to provide no universally accepted understanding of particular characteristics, or necessary actions. In part, the different conceptions of disaster stem from different uses by users. Thus a seismologist will define a disaster in relation to tectonic movements, relief administrators in relation to relief needs and political officials in relation to political consequences.

The concept and definition of a "disaster" has altered over time, in accordance with changing ideas concerning cause and effect. Prior to AD 1700 for example, infectious diseases were considered inevitable natural disasters and in many societies what were once seen as unavoidable "acts of God" are now understood to be controllable physical phenomena.

Even since the 1950s conceptions of "natural disaster" have changed. Earlier conceptions were based largely on the characteristics of the physical forces and the resulting impact or damage. For example, most disaster preparedness efforts were then concerned with improving warning equipment and with scientific study of physical phenomena. With the increasing attention given to the social science study of emergency situations, the perception of "natural disaster" has shifted from consideration of the technical aspects of the physical phenomenon as the primary focus, to a perception that the extent of deleterious effects is predominantly a social issue based on whether the people are aware of the potential threat and take the necessary actions to minimize physical destruction and social disruption. The definitions of "disaster" have reflected this change, with increasing attention being given to the social aspects of disaster situations.

First, disasters are social phenomena (rather than mere physical events) and, secondly, while the physical event may cause social disruption it is not likely to cause social disintegration. Individuals and groups within a community can be expected to continue to function after a disaster in approximately the same way they functioned prior to a disaster. This rather positive perception of social processes in emergency situations differs from what is commonly assumed to occur, and has significant programme and policy implications in all aspects of disaster planning, preparedness and reconstruction.

Source: Social and Sociological Aspects, Disaster Prevention and Mitigation, Vol. 12, DHA/UNDRO publication.

■ CUBA
Evacuation of 7,000 people following floods and quake

Sea waves with up to 90 km per hour winds which flooded the north-western coast on 6 February, damaged housing, factories, schools, in Havana and Matanzas. In some buildings, water reached the height of 1.5 m. 2,000 people were evacuated. Rains and waves were due to a side effect of the warm El Niño Ocean current. *(see "El Niño Phenomenon".)*

A strong earthquake occurred on 25 May at 12:56 hrs (local time) near the coast of Southeastern Cuba in Granma province. Over 300 aftershocks were registered. Over 50 persons were injured and 5,000 evacuated.

■ ECUADOR
El Niño Floods

In early March, 10 provinces, victims of the "El Niño" Phenomenon, were flooded. The most damaged cities were Milagro and El Triunfo. Hundreds of kms of roads were completely destroyed, rendering the traffic between the coastal region and the *sierra* very difficult. 100,000 families were affected by the floods which lasted until early May, due to continuous rains. 22 people died. Many schools being used as emergency shelters when not flooded, the opening of the school year was seriously hindered. 25,000 ha of agricultural land were devastated. Health measures had to be taken to prevent risks of epidemic due to stagnant waters (many cases of cholera.)

El Niño Phenomenon

Each year, from December to about the end of March, a weak southward-flowing warm ocean current develops in the Pacific, along the coast of Ecuador, Peru and northern Chile where it causes sea surface temperatures to rise. Because it begins around the Christmas season, the local residents named the current "El Niño de la Natividad", "The Christ Child". A sudden shift in the normal weather pattern between summer 1982 and spring 1983, intrigued scientists and weather experts alike. Severe floods in many countries in South America, prolonged droughts in parts of Australia and most of Indonesia, the mysterious appearance of large shoals of dead fish off the Peruvian coast, the unusually low level of the shrimp catch off Colombia and the discovery that mackerel were surviving by eating their own eggs, are all believed to be due to the El Niño Phenomenon. The term now refers to periods where extensive warming takes place, on average once every five years, although these events are far from regular. During these exaggerated warmings, the disruption to the local environment is enormous.

Tsunami

The tsunami, a Japanese word meaning harbour wave, is a tidal wave created in the ocean by a powerful movement of the sea-bed such as an earthquake or volcanic eruption. The waves spread in all directions with several hundred kilometres between their crests. Out in the Ocean the wave is no more than a metre high and is scarcely noticeable, whereas by the time it approaches the costs it has grown enormously and may be 20 metres high. Tsunamis, which occur frequently around the Pacific, travel very rapidly and cause major damage. In May 1960, for example, the very violent earthquake in Chile gave rise to a tsunami which caused a hundred deaths in Japan and some 40 in the Hawaiian Islands and demolished the largest statue site on Easter Island.