Shake, Rattle, and Roll

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(Part 1)

Listen! The rumble sounds like a train going by, but then . . . the chair you are sitting in begins to rock like a rocking chair, but you are not in a rocking chair. The noise increases to a dull roar and objects around you begin to rattle and move. The motion increases and throughout your home, books, dishes and other objects begin to fall to the floor.

The sideways motion becomes so great that you are thrown from your chair onto the floor. Walking becomes impossible, so you crawl to the nearest doorway and pray that the shaking will end. Some readers may have experienced this first hand, while others have only received information from the media. Regardless, an earthquake is a frightening experience.

If you happened to be standing outside when an earthquake occurs, you would be able to see what looks like a wave of water coming toward you. The only difference is that the wave is a "land wave" rather than a wave of water. Sometimes there is no warning, but simply a strong jolt that may be one and one-half times the force of gravity.

The force created by this jolt is strong enough to throw a person to the ground. Only people who have actually experienced an earthquake of this magnitude can understand the fear that accompanies such an earth-shaking event. This article provides a brief scientific explanation about earthquakes, as well as Bible texts to demonstrate how earthquakes contribute to the end-time story.

No one knows for sure how many people have died as a result of earthquakes, but conservative estimates taken from historical records calculate the number to be more that 13 million people. In fact, earthquakes affect more people worldwide than any other natural phenomenon. Every thirty seconds, on the average, a tremor occurs somewhere on the Earth’s surface. This is a total of more than one million tremors each year. Fortunately, people only feel about 3,000 of these tremors.

Many students of Bible prophecy, as well as other concerned people, believe that during the twentieth century a significant increase in the frequency of earthquakes has occurred. However, even though the data does reveal an increase in *large* earthquakes during this century, the total number of recorded earthquakes has not increased proportionately. This should not discourage you, since there is no Bible evidence to substantiate that the number of earthquakes will increase prior to Christ’s second coming.

Carefully read Matthew 24:7, **"Nation will rise against nation, and kingdom against kingdom. There will be famines and earthquakes in various places."** While this text states there will be earthquakes in various places, it does not say the frequency will increase.

Earthquakes, however, are a significant part of the end-time story. In fact, if you read the previous article in this *Day Star,* you are well aware that the next prophetic event will be a global earthquake that occurs when the censer is cast down. (Revelation 8:5) Three other times in Revelation, as the prophetic picture unfolds, earthquakes mark the progression of prophetic events.

These earthquakes occur at the special resurrection (Revelation 11:13), shortly thereafter at the seventh trumpet (Revelation 11:19) and at the second coming (Revelation 6:12; 16:18). In a manner that no one can mistake, these earthquakes, accompanied by numerous other physical manifestations, mark Earthly and Heavenly events occurring prior to the Second Coming.

Although earthquakes are common occurrences, there has been no historical evidence of a global earthquake. In fact, many geologists do not believe an earthquake that affects the entire world is possible. There is a striking similarity between the thoughts of today's scientists and the people in Noah's day who believed that rain was impossible. However, their belief did not prevent the flood from happening.

To understand the scientific perspective, it would be useful to review what the world currently knows about earthquakes. All earthquakes are caused by tectonic plate movement. Why do the tectonic plates move? The tectonic plates cover the hot molten core of the Earth. This molten material slowly rises toward the surface of the Earth, either exhibiting itself in areas of significant geologic activity, such as Yellowstone Park in the United States or expelling through volcanoes in the form of lava.

Unfortunately, in most areas of the Earth, the molten mass has no where to move upward, so it moves horizontally. The tectonic plates resting on the molten material also shifts along with the molten material.

Most earthquakes occur in a level of the tectonic plates called the lithospheric plate. The lithosphere extends from the surface of the Earth to about 35 miles underground. The magma that erupts from within volcanoes though, comes from a level below the lithosphere called the asthenosphere. The magma rising from the asthenosphere into the lithosphere is the root cause of earthquakes. The earthquakes in the lithosphere level occur along fault lines. The fault lines are located at points where the stress between different portions of the lithospheric plates is strongest. Tectonic plate stress grows at "fault lines" in several ways.

The first type of stress which causes almost continuous earthquakes is called a mid-ocean tremor. Faults of this type are called "extensional faults" and are typically located on ocean floors at various points around the world. Pressurized magma from the Earth's core flows up through cracks in the Earth's plates and forces its way up to the bottom of the ocean.

This magma pushes up a ridge on the ocean floor and also expands outward. This outward expansion causes weak zones in the Earth's plate to fracture, thereby producing an earthquake. Although this type of earthquake is quite common, it does not currently pose a threat to civilization. The earthquakes caused by extensional faults usually register below a magnitude of eight on the Richter scale.

Another type of stress that causes an earthquake is called a "transform fault." In a transform fault, two portions of bedrock move in opposite directions by each other. Often one portion or segment of the subterranean rock snags another portion. Stress builds up at that point until the force becomes too great, then an earthquake occurs which relieves the stress. These types of earthquakes usually occur in the top fifteen miles of the lithosphere and affect only a small geographic area.

The San Andreas fault in California is an example transform fault. One side of the land mass is moving northwest and the other side is moving southeast. As the Pacific Plate moves in an opposite direction from the North American Plate, the stress continues to build until an earthquake relieves the stress. Earthquakes caused by transform faults usually register as a magnitude of 8.5 or less on the Richter scale.

A third type of stress occurs when two portions of the plate collide against each other (called a "collision or compression fault"). The long-term result of a compression fault is mountain ranges, such as the Alps or the Himalayas. This type of compression causes earthquakes to occur in the spot where the two plates collide and enormous pressure builds between the two land masses. A fault develops where the two plates meet and both vertical (up and down) and horizontal (back and forth) earthquakes occur when the stress becomes too great.

The pressure can also extend for many miles on either side of the major fault and earthquakes may occur at weaker spots where the pressure can be relieved. Examples of this type of earthquake have occurred in Iran, Turkey and Italy where the African Plate has impacted the Eurasian Plate.

Another type of compression fault is called a "subduction trench." This stress is similar to a collision fault because two plates compress against each other. However, in a subduction trench, one land mass actually is forced underneath the other mass. One side of the plate is lifted up and the other side is forced down into the Earth. Most of the world’s largest earthquakes are caused by subduction trenches and the centers of these earthquakes range anywhere from the surface to as deep as 400 miles.

Typically, these stresses occur where the plate underneath an ocean is forced under a continent. Earthquakes having the greatest seismic energy occur in subduction zones and are the most powerful recorded to date. For example, the 1964 Alaska earthquake is estimated to have released 25 times more seismic energy than the Richter reading of 8.5 would indicate. The country of Chile is also located over a subduction zone.

The majority of earthquakes that have occurred throughout the world have fallen into one of these three categories. Every earthquake ever recorded has been of critical importance to the area in which the earthquake occurred, however, the impact of those quakes in other parts of the world has been insignificant.

So, is a global earthquake possible when all the recorded events to date have been localized? If there is such a thing as a global earthquake, then we know it must occur in a different manner than the earthquakes scientists have observed thus far. I believe a global earthquake is

possible, but to understand how this event could occur, a further explanation of the subduction trench concept is necessary.

With the subduction trench, a plate is forced under a continent to a level as deep as 400 miles below the surface of the Earth. The plate actually pokes down into the molten material of the asthenosphere. This brittle surface material experiences the same stresses that other plates on the surface experience. As the surface material heats because of the magma that surrounds it, faults develop and the magma forces its way through cracks in the brittle material.

The compressional forces in this plate cause what are called deep focus earthquakes. On June 9, 1994, an earthquake measuring 8.3 on the Richter scale was centered in Bolivia at a depth of nearly 400 miles. While this earthquake was felt all over South America and as far away as Canada, people near the epicenter of this deep fault quake did not feel it.

Currently, faults throughout the world are identified in one of two ways. First, by identifying earthquake locations and noting the frequency of the earthquakes. Second, geologists evaluate the formations in a particular area and determine the type of tectonic plate movement that has caused the formation. From this analysis, potential locations for faults can be identified without observing the actual earthquakes.

If a subduction trench is not identified because no significant earthquakes in that location have occurred, the stress levels may cause a deep focus earthquake. Scientists have observed ocean trench earthquakes that register as high as 8.9 on the Richter scale. Although a deep focus earthquake of this type has never been observed, it has the potential to impact an entire hemisphere. An earthquake, potentially as deep as 500 miles below the surface, could set off an earthquake chain reaction around the world.

An "earth-shaking" event of this magnitude would be an immediate call to action for those who have an "ear to hear."

Hopefully, this article has given you a basic scientific overview reviewing the causes of earthquakes. In the July *Day Star,* more information will be provided on previous earthquakes that have impacted civilization.