

The 26 minute Earthquake cycle
By Ray Tomes

Whole earth quake reverberation

The author was inquiring into the possibility that subsequent earthquakes might be stimulated by the shock wave from an earlier earthquake. There are two places where the energy from one earthquake are concentrated into a small area, the first is the point directly opposite on the earth, and the second is the original location after the shock wave has travelled to the far side of the earth and returned.

Because there are multiple different modes by which energy from earthquakes are transmitted, the time for these events might be stretched out over a window from 44 to 54 minutes for a full trip to the far side of the earth and back.

Data and analysis

A period of 35 days earthquakes from California in 1995 was used as a sample, and in this time 806 earthquakes were recorded and reported by the U S Geological Survey and posted to usenet weekly.

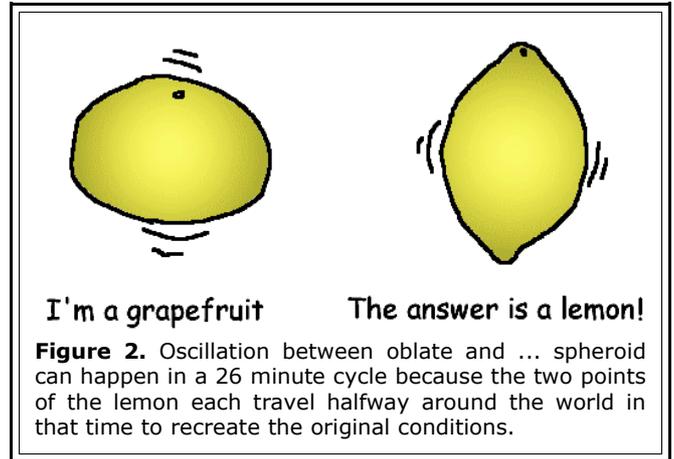
A histogram was built by the use on bins at one minute intervals. For each earthquake that was in the sample, all subsequent earthquakes were added to the appropriate bin of 240 bins at 1 minute intervals.

Results of analysis

The author was expecting some sort of increase in the number of subsequent earthquakes at multiples of 44 to 54 minutes after a previous earthquake. The result as shown in figure 1 was quite different to this, with regular peaks at 26 minute intervals, only half the expected period. This would

be the time to get to the far side of the earth, but not back again. This was not the expected result but interesting all the same.

The 26 minute period being just half the expected period cannot easily be explained by causes within the earth. If earthquakes have their cause entirely within the earth, then the minimum period for a related effect should be 44 minutes. However if earthquakes are caused by factors outside the earth then it is possible to explain the 26 minute periodicity.



If there are causes outside the earth that make the earth deform with dipole terms then two opposite points on the earth would be similarly stressed at the same time. The waves from these would then naturally swap places in 26 minutes leading to a repeat of the same conditions. The earth might be oscillating between oblate and ... spheroid with a 26 minute periodicity. These terms simply mean that the shape oscillates between that of a grapefruit and a lemon, as shown in figure 2.

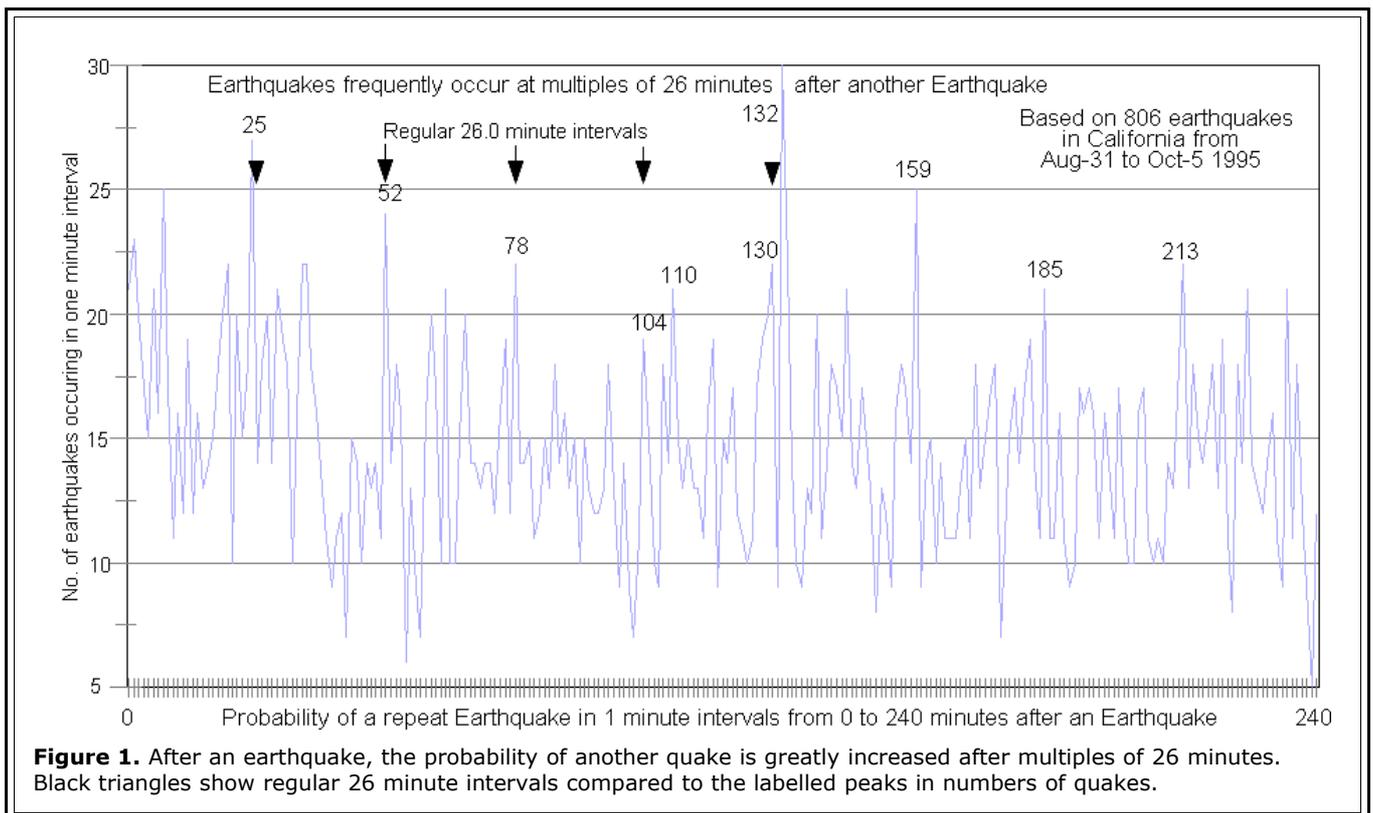


Figure 1. After an earthquake, the probability of another quake is greatly increased after multiples of 26 minutes. Black triangles show regular 26 minute intervals compared to the labelled peaks in numbers of quakes.

The histogram in figure 1 was subjected to a spectral analysis to ascertain if periods other than about 26 minutes were present. The results of this are shown in figure 3 and a series of harmonically related periods of 12, 6 and 3 minutes were also detected along with a period of 128 minutes. The 26 minute period was split into two periods of 25.6 minutes and 27.7 minutes. The 3 and 6 minute periods are common cycles found in a variety of different series.

Origin of the 26 minute period

It appears that the period of the 26 minute cycle in earthquake repetitions is related to the time for an earthquake wave to travel half way around the world and is therefore a dipole whole earth oscillation. The possibility that the earth was being stimulated by gravitational waves of about this period was investigated, and experts in GR agree that gravitational waves of this magnitude are extremely unlikely to exist in our part of the universe.

One other gravitationally related quirk seems worthy of further investigation. The time for a body to orbit the earth at about ground level is 84 minutes if we had no atmosphere. If this is taken as a circular gravitational disturbance, then a radial one might have a period that is a factor of π less, or 26.7 minutes. This is in the right area, and right in the middle of the 25.6 and 27.7 minute periods observed in the spectral analysis. Furthermore, these two periods make beats in 0.47 day, which might be related to the tidal deformation period of the earth which is 0.50 day for the Sun and 0.52 day for the Moon. These suggestions are quite speculative, but as there is no reasonable explanation we can consider speculation.

reflections from centre ???

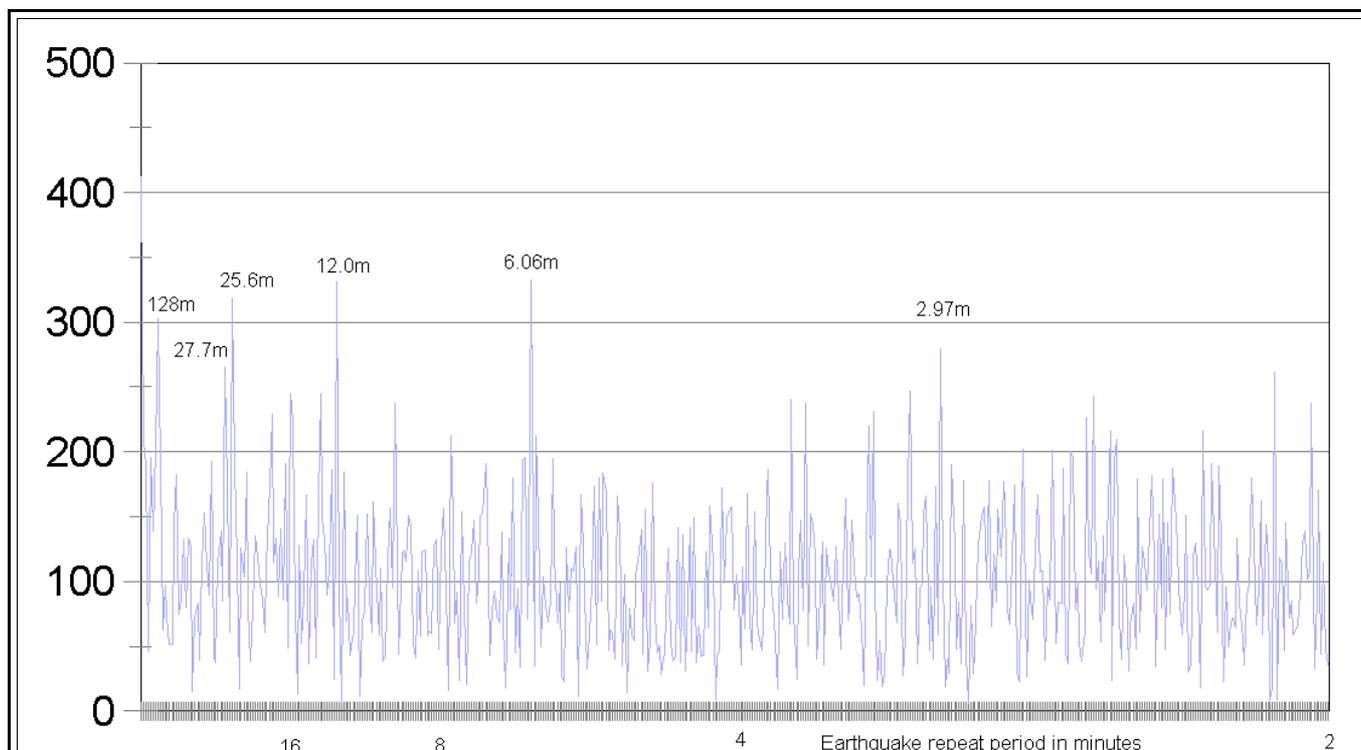


Figure 3. The repetition times of earthquakes show a number of strong lines in the spectrum. The 12, 6 and 3 minute waves are observed in other time series with 6 and 3 minutes being very common. The pair of periods at 25.6 and 27.7 minutes are centred at 26.7 minutes. The earth surface orbital period is 84 minutes which is π times 26.7 minutes, suggesting a possible relationship to gravity. The beat time of these periods is 0.5 day suggesting a tidal relationship.