

Living in the shadow of Italy's volcanoes

The margin of the African and Eurasian tectonic plates runs through the centre of Italy and then forms an arc through the Ionian Sea and on to Sicily (Figure 1). Essentially it is a convergent (destructive) plate margin which, along most of its length, is a collision margin responsible for mountains and earthquakes but with no volcanoes.

However, in southern Italy the Calabrian Arc (the name given to the plate margin as it curves around Calabria and on to Sicily) is a subduction zone. This is the last remaining segment where oceanic subduction (of the African plate) occurs along the plate boundary and it is Italy's most active seismic belt. In 1908 the Messina earthquake killed some 100,000 people. It is also the zone responsible for Italy's active volcanoes. Several damaging earthquakes have occurred in recent years in central Italy including the Accumoli earthquake (M6.2) which killed 300 people in August 2016. A further earthquake occurred in the same region in January 2017.

The old oceanic crust of the Ionian Sea has been subducting, or plunging, beneath Calabria to depths of over 400 km. The volcanoes of the Aeolian Islands mark where this descending plate begins to melt. To the north, along the Apennines, and to the west, in Sicily, all of the ocean crust has been subducted, and mountain chains now mark the collision of continental landmasses.

Over the last 25 million years, this subduction zone has advanced south-eastwards across the Western Mediterranean. Tearing has occurred at the edges and Mount Etna appears along one of these 'tears' in Sicily. At the northern end of the subduction zone, rising magma has formed Mount Vesuvius.

Figure 1

Italy's tectonic setting



Italy's tectonic setting

Figure 2

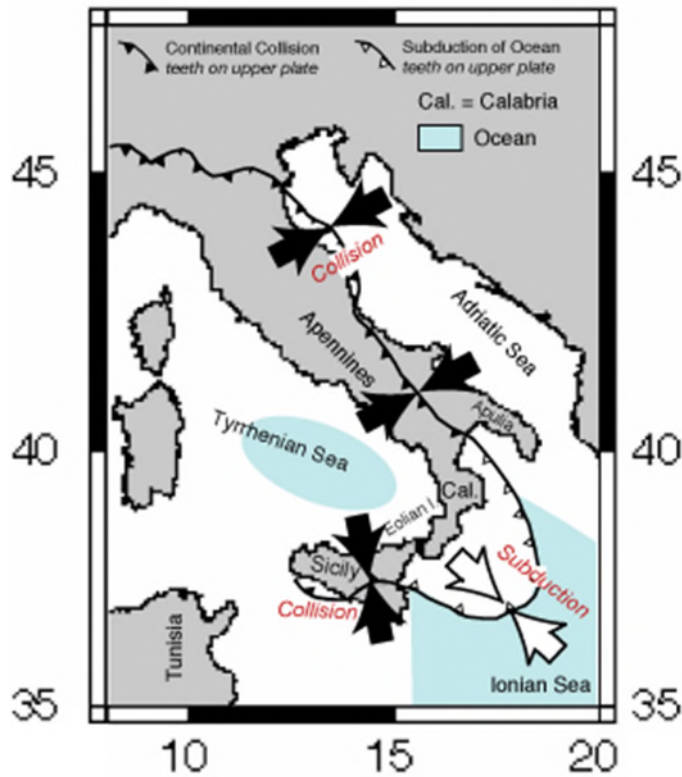


Image source: http://www.ldeo.columbia.edu/news/reports/2004/CATSCAN/story_catscan01.htm

Questions

1. Describe the location of the subduction margin.
2. Explain why volcanoes such as Mount Etna and Mount Vesuvius have been formed in southern Italy.
3. Draw simple diagrams to show what is happening at the collision margin to form the Apennines.
4. Why are there no volcanoes in central and northern Italy despite the presence of a plate margin?
5. Find out more about the 2016 Accumoli earthquake. How strong was the earthquake and what were its impacts?