

(as microbes are supposed to have evolved into molecular biologists)? Vitamin B12 absorption is testimony to the Creator's design!

### References

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## How does andesite lava originate in the earth?

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Andesite is a type of lava intermediate between rhyolite, typically associated with explosive volcanism, and basalt, which flows like honey along the earth's surface. Andesite is very common and forms volcanic cones or stratovolcanoes. It is especially abundant along what is called the 'ring of fire' around the Pacific Ocean. With the advent of plate tectonic theory, it had been assumed that andesite represents the formation of new continental crust since about the Precambrian.<sup>1</sup> Precambrian continental crust is another issue and it is difficult to understand how it would originate naturalistically. Some authors assume that 30% of the crust formed after 450 million years ago,<sup>2</sup> and a significant proportion of this is presumably by the addition of andesite. Andesite is thought to form when one tectonic plate, generally an

oceanic plate, moves beneath another plate at a subduction zone. In early plate tectonics models, andesite was thought to form directly from the melting of the ocean crust, but in later models, it is considered to result from the injection of water into the hot mantle above; this lowers the melting point and creates andesite lava from the partial melt:

"Andesite volcanic rocks were identified early in the development of plate tectonic theory to represent new additions to continental crust. They are abundant in subduction zones and resemble continental crust in composition. When one tectonic plate dives beneath another in a subduction zone, the magnesium- and iron-rich (mafic) oceanic crust it is carrying might partially melt to yield andesite. Or, in a later theory, water from that crust escapes and causes hot mantle above it to partially melt. When formed from a solid source and collected into a body, such magma is called primary. Continents grow inexorably by andesite addition, it has been argued ..."<sup>3</sup>



Figure 1. Mount Hood, Oregon, USA, reflected in Mirror Lake.

But this rather simple plate tectonics explanation has been challenged by recent data from Mount Hood in Oregon, USA.<sup>4</sup>

### Andesite from the lower crust?

Eruptions from Mount Hood, a volcano associated with the ‘Cascadia subduction zone’, are predominantly andesitic. The andesite is believed to have originated from the mixing of two separate types of magma, one more like a basalt and the other more rhyolitic in character. As hot basaltic magma is injected upward into the cooler rhyolite magma chamber, it triggers the eruption. This idea is deduced from the two distinct crystal populations with different geochemistry found in the mountain.

Since the mixing created marked geochemical differences in the crystals that should have diffused quickly (if not erupted rapidly), the researchers deduced that the andesite that formed Mount Hood must have originated at shallow depths in the *continental crust* just a *few* days before the volcano erupted. This is a radical departure from the current accepted theory for the origin of andesite, since the researchers believe the andesite did *not* originate deep in a subduction zone.

This phenomenon of magma mixing to create a volcanic eruption has also been reported in previous studies. For instance, it was deduced seismically from the recent eruption of Mount Pinatubo in the Philippines, another ring of fire volcano. Seismic activity, possibly indicating the movement of basaltic magma, was followed 12 days later by the eruption of mixed andesite.<sup>3</sup>

### Uniformitarian conundrums

There are several uniformitarian conundrums that result from this new idea on the origin of andesites. For example, what is the origin of the rhyolitic magma, and why is it not either solidified or slowly

contaminated by basaltic magma leaking upward?<sup>3</sup>

A more significant puzzle is the origin of continental crust in the evolutionary/uniformitarian scheme if andesite eruptions originate from within the crust itself. If no new crust forms then subduction *alone* did not produce continental crust of andesitic composition in the Phanerozoic, since it presumably produced only the basalt.<sup>1</sup> So, the origin of continental crust in the Phanerozoic by subduction is now questionable and apparently contrary to uniformitarianism, since continents are likely *not* growing:

“There is no compelling reason to believe that the continents are still growing either. ... All this casts doubt on the pleasant uniformitarian picture of subduction today, integrated over eons, slowly building the continents.”<sup>5</sup>

Subduction has been relegated to simply assembling and breaking apart continents through continental collision or splitting, or plastering exotic terranes onto continents. Because of what is called ‘subduction erosion’, which grinds away the underside of a continental edge by subduction, and the subduction of sediments eroded from continents, it is even possible that the continents are losing ground.<sup>5</sup>

The result is that the origin of all the continental crust has been ‘pushed back’ to early Earth history in the scheme of geological evolution. Some of the ideas include catastrophic pulses of crustal production from the mantle and crustal differentiation by asteroid bombardment during earlier heavy bombardment.<sup>5</sup> It is interesting how uniformitarian scientists are going back to catastrophism—without God:

“Uniformitarianism, which overcame old catastrophist thinking more than a century ago, is now being tempered by a new catastrophism.”<sup>5</sup>

There are several implications from this new research on andesites for mainstream scientists.<sup>6</sup> Firstly, current thinking in geology and geophysics is tending toward neocatastrophism. Secondly, that new data often casts doubt on theoretical understandings, often quoted as fact, that are entrenched in the disciplines.

### Creationists implications

For creationists, the research results caution us to be careful of accepting uniformitarian interpretations. It also indicates that the origin of andesites may have nothing to do with plate tectonics or subduction.

Because of the current difficulty geologic theories have in explaining the origin of continents, the creation of the continents on Day 3, or very early during the Flood, is a far more realistic explanation.

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