

Communicating the Geologic History of Aruba: Contextualizing Gold and Incorporating Human Activity

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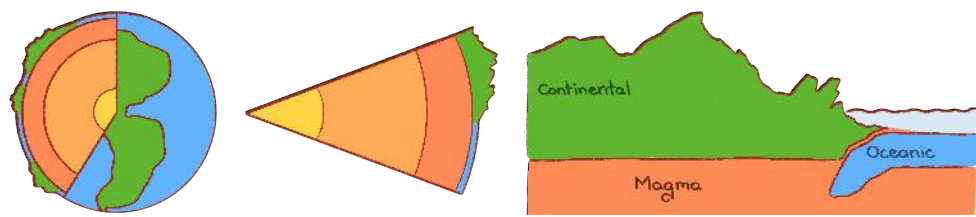


Introduction

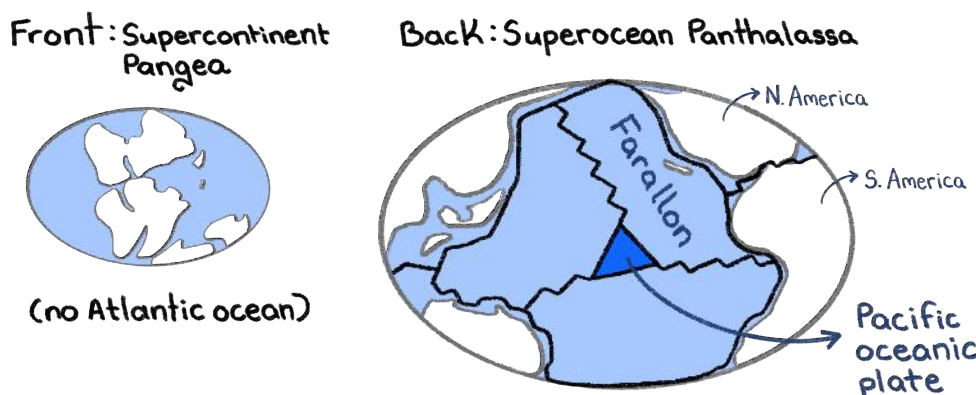
Aruba is well-known for its beautiful beaches fueling a prominent tourist industry, however it was not always so. The oil refinery is in recent memory for the island but what has faded is its predecessor, the nearly 100-year gold industry, running from 1824, when Willem Rasmijn is said to have found the first gold nugget, until 1916, when the Great War made gold processing a waste of resources.

Tectonics

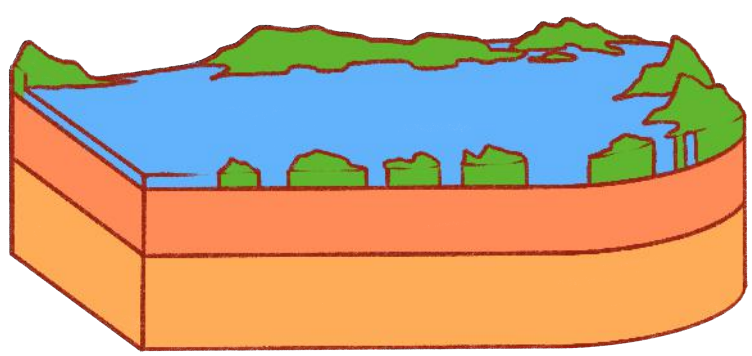
To understand the geology of gold, the bigger picture must be captured.



The Earth is made of layers, a central core wrapped by the mantle and an outer crust. The crust is divided between light, thick continental crust and dense, thin oceanic crust.



250Ma: There was no Atlantic ocean, only the supercontinent, Pangea, and superocean, Panthalassa, which rifted to make the Pacific Ocean. The rifted Panthalassa split into three plates. Most relevant is the Farallon plate.



The Caribbean plate is part of the oceanic Farallon plate that was pushed between North and South America.¹ It is made up of both continental and oceanic crust.

Stratigraphy



Aruba is made up of two layers of lava with a layer of limestone on top.² These layers are called formations.



The youngest formation, the Limestone Shelves, sits on top the second-oldest formation, the Batholith. The oldest is not visible, it is the Aruba Lava Formation (ALF).



Some magma rose up, cutting through through the formations and hardened to create quartz veins. These veins are younger than the formations that hold them. The magma carried up minerals other than quartz, like gold.



Veins can be a single centimeter thin or over a meter wide. It is these quartz veins that were mined for the gold they carry. The process to harvest the ore was straightforward, standard mining excavation, but milling/processing the ore was another story.

Gold: Mines and Mills



There were over 20 veins that were reported for mining, one famous mine is the Miralamar mine, and there were two mills on the island: Bushiribana and Balashi.

Gold

In the late 1800s, a new method for gold processing was developed. By mixing crushed gold ore into a cyanide solution, a higher percent of gold could be extracted. Both Balashi and Bushiribana mills were used for this process: cyanidation.



The National Archives of Aruba maintain documents, some of which depict the mills and their surroundings, such as a photo of Balashi mill (above) in the years after it was abandoned in the early 1900s. In 1998, Dr. Morin and Ms. Hutt traveled to Aruba to study the consequences of cyanidation.³ The waste products from cyanidation have been known to cause damage to health and environment.⁴ As seen below, little plant life grew between the time the archival photo was taken and the time they took their field photo.

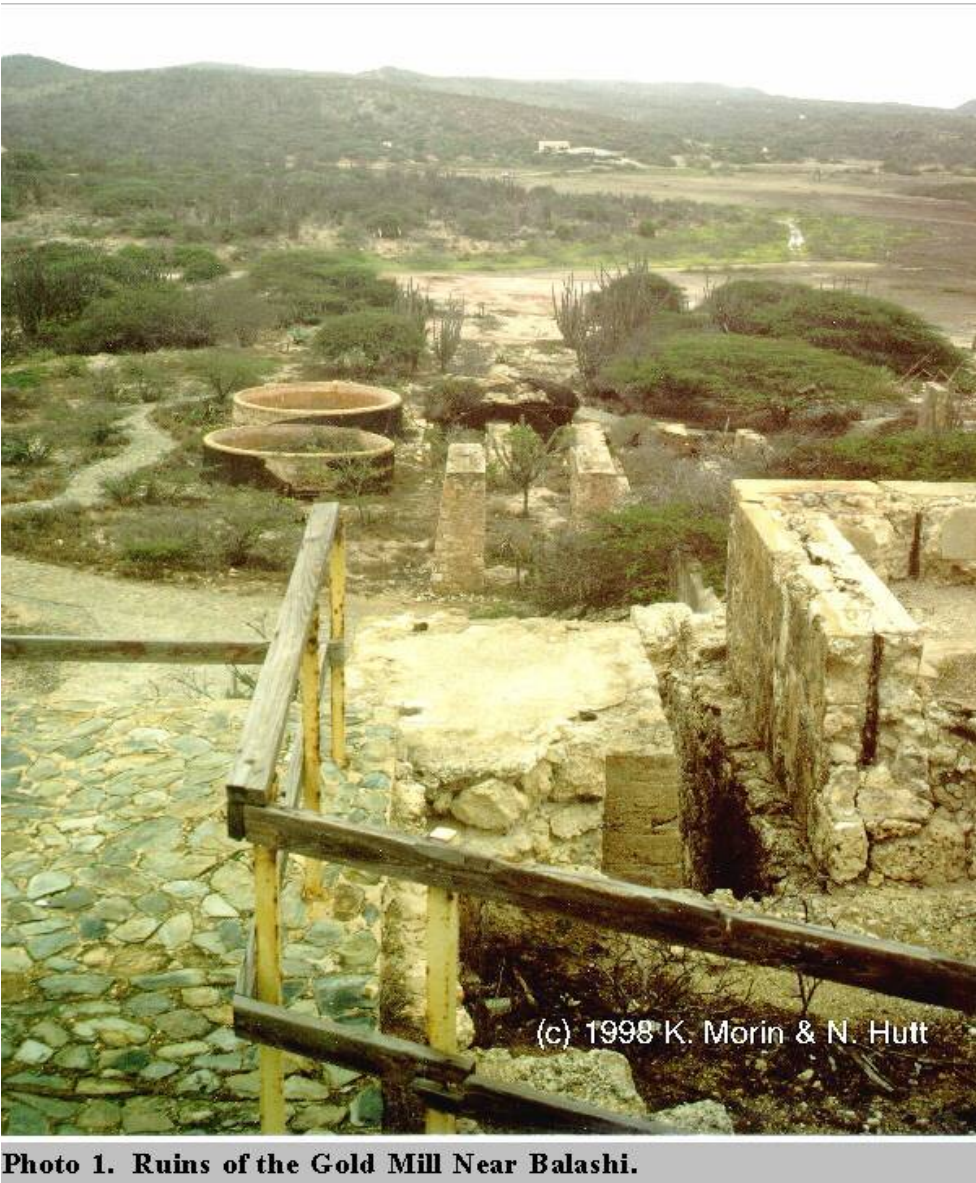


Photo 1. Ruins of the Gold Mill Near Balashi.

The photo below taken on the 3rd of March 2022 shows the state of Balashi mill. Notice the flora development between the above and below photos.



Is Gold Worth It?

The quartz vein intrusions that ran for various lengths across the island were recorded by Rule in his 1872 report.⁵ Using his proposed length and width of the veins, it can be estimated that the gold mine owners were informed of 1,151,399 tons of gold-bearing quartz present. Below, the right map shows the formations. It is the Batholith and ALF that carry the veins which cross through both urban development (left map) and Arikok National Park.



Which begs the moral and economic question, was mining Aruba worth it and will it ever be again? Given that its small attempts to revive the industry led to nothing of substance, it can be extrapolated that Aruba's value is not in its gold anymore, but its golden beaches. Gold mining and milling is expensive and invasive. Destroying an entire ecosystem and excavating millions of years' worth of geologic history morally cannot equate to the gold that may or may not be there based on an 1872 report.

References

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- ² Jean-Claude et. al. Hippolyte. Neogene-quaternary tectonic evolution of the leeward antilles islands (aruba, bonaire, curaçao) from fault kinematic analysis. *Marine and Petroleum Geology*, 28(1):259-277, 2011.
- ³ Kevin A. Morin and Nora M. Hutt. Internet case study 8: Remnant environmental effects from gold mining in aruba after a century. MDAG, blog, 1998 [Online].
- ⁴ Facts about cyanide. CDC, blog, 2018 [Online].
- ⁵ B. F. Rule. Report of benjamin f. rule, 1872.