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GOLD IN PETRIFIED WOOD  
By WALTER S. PALMER.\*

A very interesting occurrence of gold was recently discovered in the Aspen District of Churchill County, Nevada, by Edward and Frank Eugent, Clayton Kreh and William Johnson. The occurrence consists of gold deposited in petrified wood, which in turn is buried in a volcanic tuff.

The Aspen District is in the extreme southeastern corner of Churchill County at the eastern end of the Broken Hills range and northwest of the Bruner or Phenolite District in northern Nye County. The Broken Hills range is a group of low hills lying between the Fairview and Kilworth ranges in Churchill and Nye Counties and consist chiefly of volcanic tuffs, basalt, andesite and obsidian.

The gold bearing petrified wood is found about one quarter mile southwest of the camp known as Nigger or Tucker Wells, in the northern part of the Aspen District. In this part of the district the formation is chiefly volcanic tuff cut by dikes of andesite and overlain by basalt, in certain parts. There are some zones that are highly silicified due to hot water action.

The petrified wood has been found at present over an area of about five hundred yards and were but only a small part of this area contains logs carrying gold. The logs are found practically at the surface and are lying in all positions from upright to prone. They are found by tracing float pieces of the petrified wood and then looking for discoloration at the surface, the tuff being quite light colored while the freshly exposed wood is very black due to the carbon which it contains. In size the logs seen were up to two feet in diameter and had been followed to a depth of not over fifteen feet in the tuff. It was said that some logs four feet in diameter had been found and mined. About ten to fifteen gold bearing logs have been found to date and only parts of two are now exposed, which carry gold. The others have been mined and either milled or screened and sacked for shipment.

An examination of the logs show that they now consist of crystalline and chalcedonic silica, carbon and calcite. The quartz crystals in some specimens are very small and rather loosely held together but they have preserved very plainly the annual ring growth of the original trees. Other specimens are very dense, black and hard and contain veinlets of chalcedony. No cell structure of the original wood could be observed in any of the specimens examined and therefore the species of the original trees cannot be determined, according to Professor P. A. Lehenbauer of the Department of Botany.

The specimens richest in gold are easily crushed and on washing off the black carbon, the material then has a light gray color. Under the microscope some of the crystals are seen to include black particles, probably carbon, and many of these are doubly terminated. The gold, which has been observed in the original material, occurs as both irregular and crystalline grains in the spaces between the quartz crystals. Carbon in finely divided form also helps to fill the spaces between the quartz crystals.

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On examining gold, that had been separated by panning, under the microscope it was found that most of the gold consists of individual crystals although some intergrowth of crystals was noted. The most common forms noted were octahedron, cube, dodecahedron and combinations of these forms. The largest crystal noted was 0.40 mm in diameter. Some of the crystals were attached to quartz and some had cavities which appeared to be filled with carbon.

It is probable that the carbon has been a contributing factor in producing the reducing action which has precipitated the gold from circulating solutions which have come in contact with the logs. The gold bearing solutions could have come from a zone about seventy five feet west of the hole containing the richest log, where there is found an altered zone of quartz and kaolin with very indistinct walls, which on sampling and assaying was found to carry 0.56 ounces of gold and 0.50 ounces of silver per ton.

In the hole where the richest log was found, the log had been followed to a depth of about fifteen feet and portions of the log were still to be found in the side wall of the shaft near the bottom of the hole. Along the line close to where the log had been removed, a dense chert was noted, indicating hot water action. The chert and also the tuff from this hole showed traces of gold and silver on assaying. A sample was taken of the log still remaining and showed on assaying 18.26 ounces of gold and 10.8 ounces of silver per ton, and was the richest material sampled. Gold is readily observed under the microscope, in some of the original material from this log.

From the samples assayed it is evident that the logs differ widely in their gold content and that the average material carries only moderate values. The assay on a grab sample from fifteen sacks of fine screened material showed 0.39 ounces of gold and 0.30 ounces of silver per ton and the coarse screenings assayed 0.17 ounces of gold and 0.10 ounces of silver per ton. Some of the logs showed very low values under 0.02 ounces per ton in gold and traces of silver.

Undoubtedly the carbon now found in the petrified material is a result of charring of the original wood but it is impossible to tell whether the wood was charred before or after being buried in the tuff. It could have been charred by being buried in hot tuff and it may have been charred by the action of the nearby igneous intrusions which have cut the tuff. There is also the possibility of charring by acid fumes from the volcanic vapors which could have accompanied the igneous intrusions.

No evidence was noted to indicate that the tuff was deposited in water, specimens examined do not show signs of stratification.

There does not appear to be enough of the material to be of commercial value to work for its gold content. It would be like mining very narrow veins with very small lenses of ore and a large amount of dead work would have to be done to secure a very limited tonnage. The owners do not feel that sufficient tonnage could be secured to warrant development for the gold in the material but they may be worth further development for their value as specimens of an unusual gold occurrence.

The assays reported in this article were made by Professor William I. Smyth on samples collected by Professors Palmer and Smyth on April 27, 1935.