MEDIA RELEASE

NEWS FROM THE UNIVERSITY OF TASMANIA

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ATTENTION: Chiefs of Staff, News Directors

UTAS geologists discover an ancient river of gold

Two University of Tasmania geologists have challenged orthodox thinking around the formation of the fabulously rich reefs that inspired the famous gold rushes of the 19th century.

Most scientists currently agree that the majority of gold deposits are generated from hot fluids that move from very deep in the crust upwards to low-pressure sites in the rock structures to deposit gold reefs similar to those in the Victorian Goldfield and Kalgoorlie Goldfield in Western Australia.

The University of Tasmania geologists have developed a totally different theory that has just been published by the Geological Society in London.

Over the last seven years Dr Stuart Bull and Professor Ross Large have been studying the geology and chemistry of the rocks that surround the Bendigo gold reefs in Victoria, using the most up-to-date technology.

They have found that rather than the gold-rich fluids coming from great depth - between 10 and 15 kilometres - the gold was more likely sourced by erosion of adjacent mountain ranges at the time of sedimentation of the rock sequence.

Stuart Bull has studied the sedimentary rocks at Bendigo, which are a small part of the floor of an ancient (450 million-year-old) ocean, the remnants of which extend from southern NSW through most of Victoria to SE Tasmania. He has found evidence that sediments in the area of the mine were deposited in a marine channel-levee complex, somewhat similar to a giant underwater version of the large rivers such as the Amazon that cut the continents today.

Recent work on modern ocean basins has revealed that these channel systems cut across the ocean floor and are the main avenues of delivery of sediment and organic material from continental river systems, via canyons cut into continental shelves and into the deep marine environments in which they occur.

It is the coincidence of the gold deposits and ancient examples of these deep marine channel features that suggests that gold, along with other sediment components sourced from an eroding mountain belt on the ancient Australian landmass to the west, was delivered to the area of the present-day mines as part of this sediment supply chain.

Ross Large, who has researched the chemistry of the sedimentary rocks, has shown that the gold carried by the giant river system segregated into the finer grained silt fraction and become adsorbed onto clay minerals and organic matter during river transport. This finer fraction was then deposited as black organic-rich muds in overbank deposits on the margins of the giant canyon-levee system.

The result is that the mudstones that form a major component of the rock strata at Bendigo are enriched in gold up to 10 to 100 times more that of normal sedimentary rocks.

Later tectonic and structural events have released the gold from the mudstones and concentrated it in the very rich gold reefs, making Bendigo one of the “gold wonders of the world”.

“Without new ideas and theories science stagnates and we all start believing the current dogma as if it was fact,” Prof Large notes. “In the field of geology, less than 30 per cent of published theories prove to be correct, so my advice to my students is the same as my professor gave me – ‘disbelieve if you can’.”

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