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M. J. Oard

Could BIFs Be Caused by the Fountains of the Great Deep?

Banded-iron formations (BIFs) are thin rhythmites of iron-oxide and chert that are found in many areas of the world and dated as late Archaean and early Proterozoic according to the geological timescale. The origin of BIFs is a mystery with no modern analogue. Therefore, they must be explained by non-uniformitarian mechanisms. Two general theories have been suggested: from below or from above.[1] The 'from below' theory suggests BIFs were related to magmatic extrusions. The 'from above' theory is a typical uniformitarian model of very slow chemical deposition from upwelling ocean water over long periods of time. The alternations of iron-oxide and chert are presumably chemical varves, deposited seasonally in one year. The deposition rate supposedly would be around 3-4 m/Ma. The second theory has been favoured for its gradualistic appeal during a supposedly quiescent period of geologic time. BIFs have also been used as evidence for the slow build-up of oxygen in the Earth's early atmosphere.

It now appears that the 'from below' theory is the better explanation for BIFs. A recent analysis of the large Hamersley Province BIFs from central Western Australia indicates that BIFs were deposited during a major tectono-magmatic event, probably during the accompanying hydrothermal activity (see Figure 1).[2] These BIFs cover an area greater than 50,000 km^2 and can be thicker than 500 m (see Figure 2). They are now intimately associated with the submarine igneous province in the area that extruded a volume of rocks greater than 30,000 km^3.

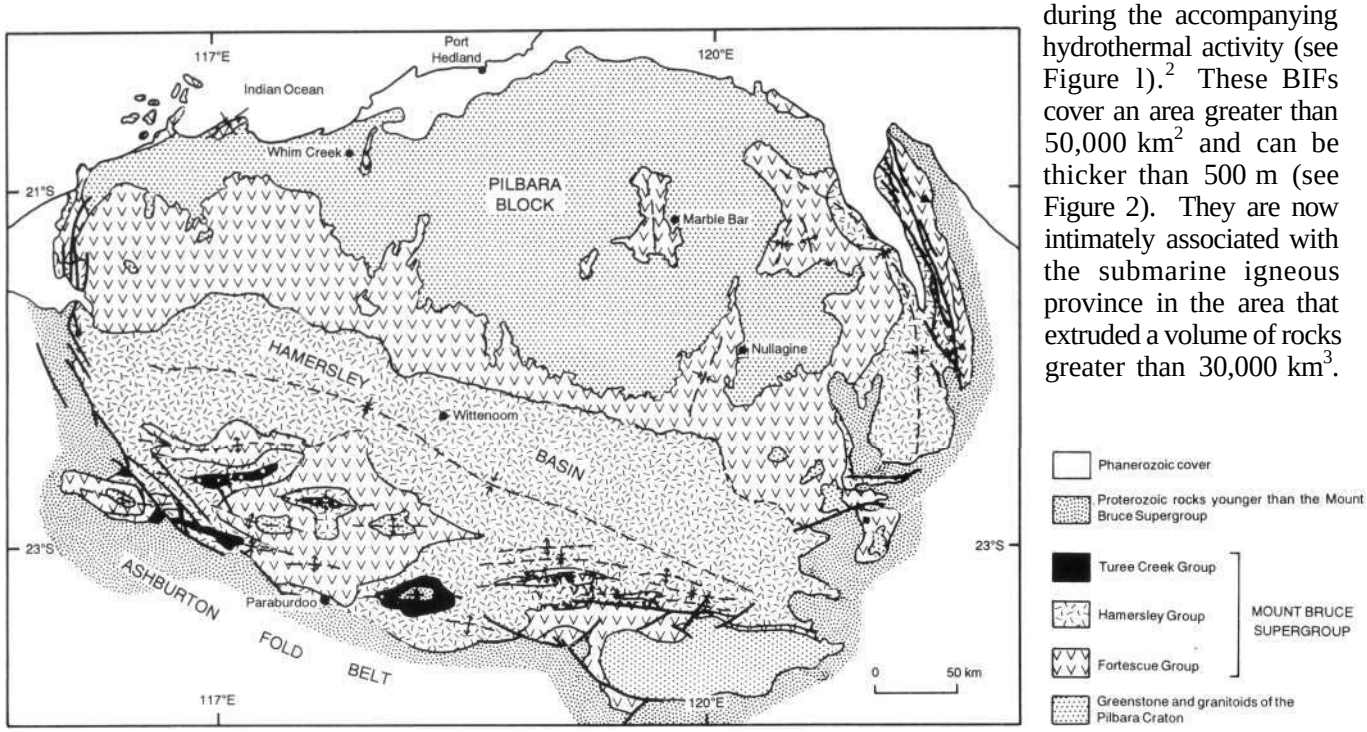

Figure 1. *Geological map of the Hamersley Basin (based on Geological Survey of Western Australia mapping).*

Several stratigraphic relationships outlined by the most recent research demonstrate the close relationship between undersea volcanism and BIFs. Since the igneous rocks were extruded rapidly within the uniformitarian paradigm, the BIFs must also have formed fairly rapidly due to the magmatic activity. New radiometric dates also confirmed in the minds of the investigators that the BIFs formed relatively quickly. The authors state:

> *'Thus, there is mounting evidence that pulses of enhanced igneous and hydrothermal activity, related to a large igneous province (or provinces), may have accompanied both Brockman and Woongarra supersequence BIF deposition.'*[3]

Including periods of non-deposition, the authors propose a possible deposition rate of 100 to 1000 m/Ma. This compares to a modern ocean pelagic sedimentation rate of 40 m/Ma. They also suggest that these much faster rates of BIF deposition also apply to the large BIF province in South Africa.

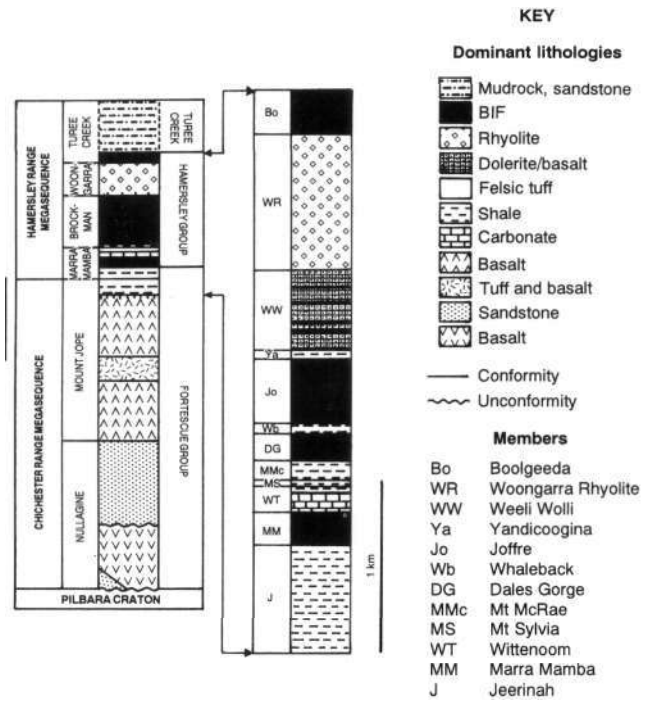

Figure 2. *Stratigraphic column of the Hamersley Basin showing the association of banded iron formations (BIFs) with outpourings of volcanics.*

Of course, the authors' analysis was still carried out within the uniformitarian paradigm. Now switch their results to a catastrophic paradigm. If BIFs are among the first sedimentary rocks deposited on the Earth, could they be caused by the 'fountains of the great deep' that initiated the Genesis Flood? Although the exact meaning of the 'fountains of the great deep' is rather controversial, creationists still regard the fountains as the primary source of the water that covered the Earth during the Flood.[4] Such an event would surely be accompanied by massive magmatic and hydrothermal eruptions. Thus BIFs could have formed rapidly from the hot hydrothermal fluids and rapid currents spreading out from such eruptions. This conclusion supports the suggestion by Max Hunter that Archaean sediments were derived from magmatic fluids rich in iron and quartz.[5]

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M. J. Oard

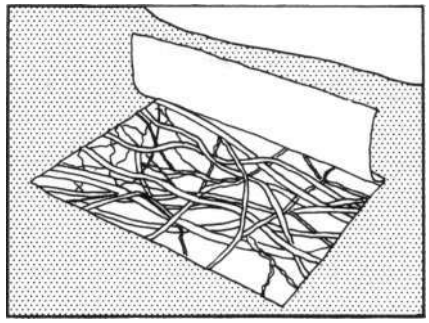
Mechanical Biology?

For 30 years biochemists have held centre stage with developing our understanding of the living cell. So pervasive has the chemical approach been that many have come to view the cell as little more than a (very) complex bag of chemicals interacting together.

When the cell's cytoskeleton was discovered, it did not impinge on the chemical view — it was considered merely a passive structural support for the cell.

All this has changed. In some really clever work, Andrew Maniotis, Donald Ingber and Christopher Chen at Harvard Medical School and the Children's Hospital in Boston, used a combination of micro-manipulation, recently-available proteins that bind to specific cell-surface receptors, and video microscopy, to show that mechanical tugging on particular receptors on the surface of living cells caused almost instantaneous rearrangements in the nucleus.[1]

Their procedure was as follows: they coated 4.5 µm beads with fibronectin protein, which binds specifically to cell surface receptors, called integrin receptors, which are



A force-carrying network extends from the cell membrane into the nucleus.