

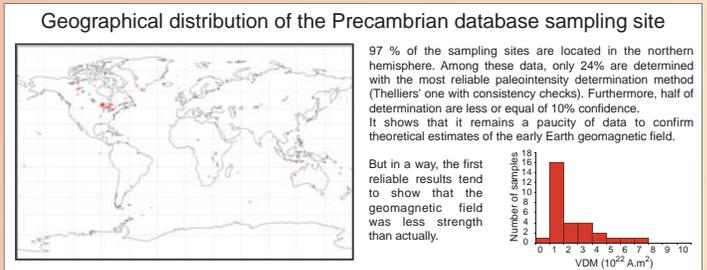
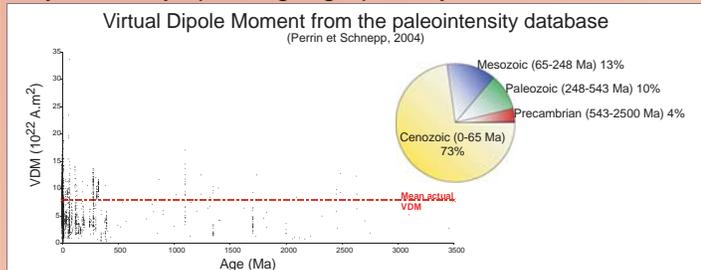


# Preliminary magnetic studies of the Pilbara Archean drill core Western Australia

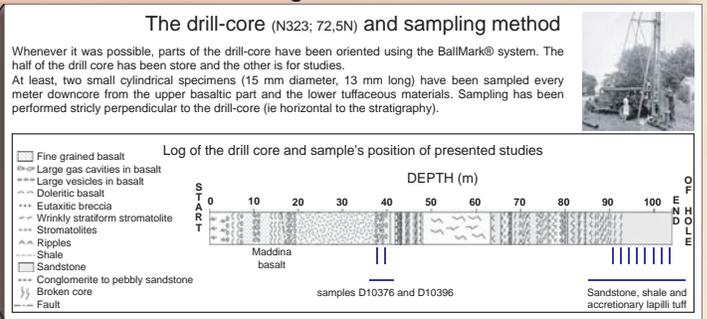
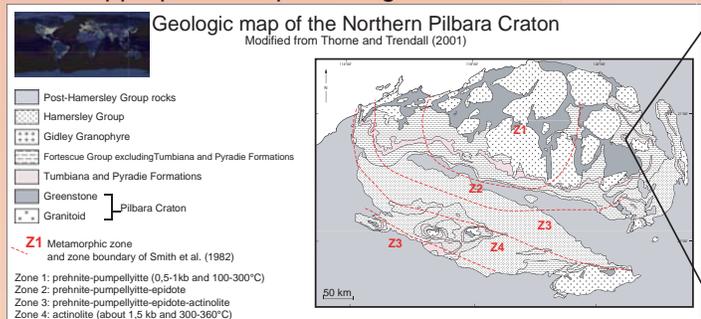
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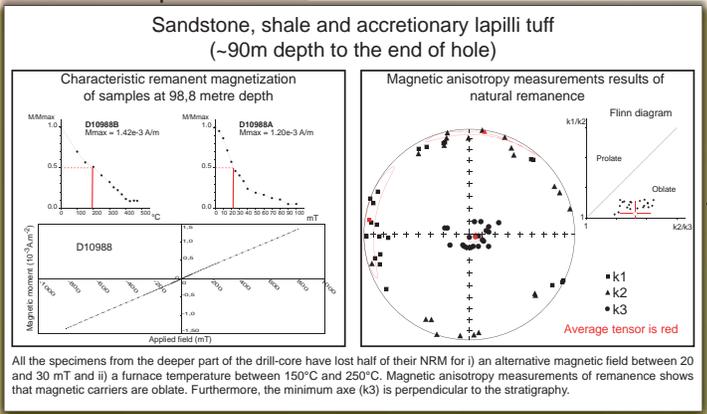
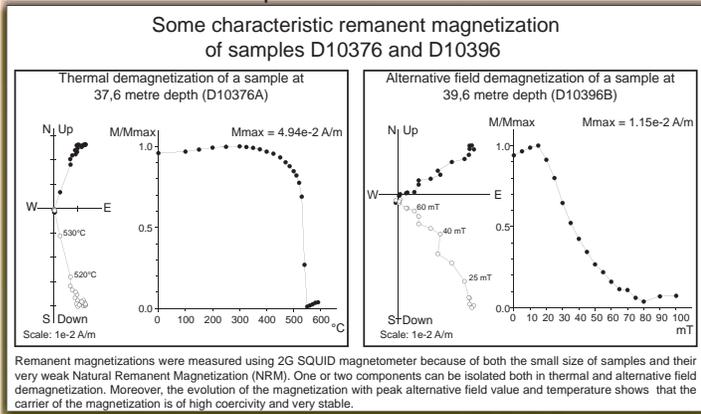
**Introduction:** Paleomagnetic studies of Precambrian rocks provide important information on the early development of the geomagnetic field. But as well as being sparse in time, the Precambrian paleointensity data are very unevenly spread geographically. It is thus critical to extend the database.



**Geology:** The Tumbiana formation of the Fortescue group in northwestern Australia is composed of unaltered and relatively undeformed Late Archean material (2,7 Ga). Moreover the drill-core give us exceptional fresh rocks, hence appropriate for paleomagnetic studies. Attention has been focused on drilling orientation.



**Experimental results:** Both thermal and alternating field demagnetization have been conducted in order to check for the consistency of the paleodirections and also to provide some preliminary clues on the magnetic properties of the samples and their adequacy for future studies of absolute paleointensity. Magnetic anisotropy measurements were performed in order to determine orientation of samples and the tilt of the drill-core.



**Discussion and conclusions:** In one hand, because of their low coercivity spectrum the deepest material are not adequate for future absolute paleointensity determination. It is confirmed with hysteresis experiment results under room temperature and a maximum field of 800mT. A paramagnetic linear component dominates. But finally, magnetic anisotropy results confirmed the right orientation of the drill core at one hundred metre depth (ie still right perpendicular to the stratigraphy). In the other hand, some basaltic material from the upper part of the drill-core shows very good magnetic characteristics in the perspective to conduct absolute paleointensity experiments. It will soon be confirmed with i) hysteresis experiments and ii) susceptibility vs temperature experiments. Finally, all these results will also give supplementary informations on Australian plate tectonic regime at Precambrian time. To be continued...

## References:

Perrin, M., Schnepf, E., 2004. IAGA paleointensity database : distribution and quality of the data set. Phys. Earth Planet. Interiors, 147, 255-267.

Thorne, A. M., Trendall, A. F., 2001. Geology of the Fortescue Group, Pilbara Craton, Western Australia. Western Australia Geological Survey Bulletin 144. 249pp.

Smith, R. E., Perdrix, J. L., Parks, T. C., 1982. Burial metamorphism in the Hamersley Basin, Western Australia. Journal of Petrology, 23, 75-102.