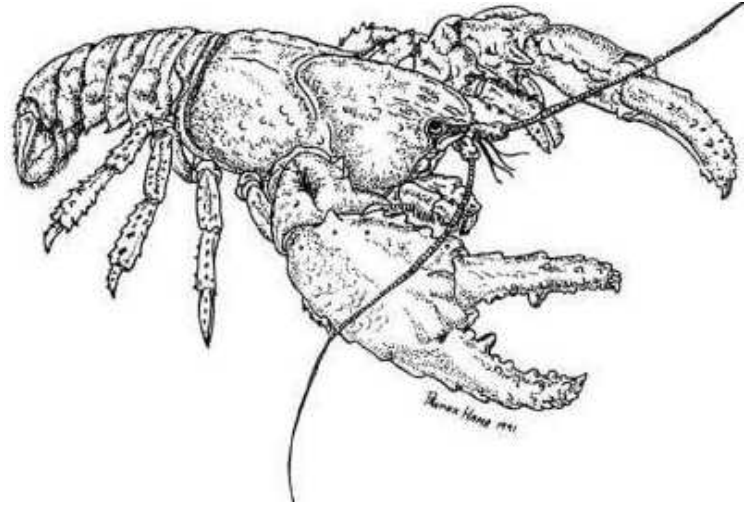


Disjunct Naturalists

WEBSITE OF THE CENTRAL NORTH FIELD NATURALISTS



Hard Rock

by **Ron Nagorcka** - 21 September 2009



Not long after Sarah and I moved to Black Sugarloaf, we came across a specially designed rock-splitting sledge-hammer in a hardware store. While my immediate vision was of all those images of hard labour in photos of prison camps in America, I also surmised that this object might be the very thing to assist in the creation of a smoother track to our new property. Those who have visited us will no doubt be grinning broadly – this was obviously not my most successful enterprise. Indeed, I made only one attempt to split the rock on our track. Either the hammer simply bounced off violently jarring my hands, or chips of rock flew dangerously hither and thither and the resultant sharp edges on the rock looked considerably more hazardous to car tyres than before. I decided that this rock-splitting business was not for me! The sledge-hammer has been useful, but it has split no rock since!

This was not our only unsuccessful purchase however. Equally useless to our situation was the nice compass we picked up at Allgoods in order to stop getting lost in the considerable areas of bush that surrounded us, and that we were determined to explore. It turns out that our little mountain had very strange magnetic properties (see below) – we had to use other means to find our way home.

We had encountered Dolerite, the rock that has been known as 'curse of

Tasmania'. Since then Sarah and I have done many things with this rock – the house has dolerite walls, the garden beds are edged with it, there are steps of dolerite, floors of dolerite, immovable large bits of it remain in the centre of Sarah's studio and the bathroom. It holds down bits of roof and stops the trailer rolling away. Recently I have even made music with it – its hardness and qualities of fracture are such that thin pieces of it ring loudly when hit. So I have recorded it and turned those ringing sounds into an electronic instrument.

The Rock which makes Tasmania

This article is a combination of my own observations of dolerite and information from the most authoritative book on the subject with the above title by Tasmanian geologist David Leaman, who has spent a lifetime exploring the nature of this rock for which he has a passionate affection. It is a personal, somewhat idiosyncratic book – a strange mixture of personal accounts, science, and the demolition of previous misconceptions. It could have been a great deal more readable with better editing and the employment of a good illustrator. However I'd recommend it highly to anyone interested in learning about dolerite – it is full of fascinating information and the index is very comprehensive and helpful.

(There is also a fascinating chapter ('Up from below' page 105) which discusses Prof. S.W. Carey's theory that the earth has expanded markedly since the Jurassic and that the oceans have only appeared in that time. This is not as crazy as you might think. For instance 'no part of any ocean is older than Jurassic', and it does provide a credible theory as to how the continents drifted apart. But I digress ...)

What is dolerite?

'Dolerite is an igneous rock (meaning it has cooled and crystallized from high temperature magma) which is wholly crystalline and whose mineral crystals are less than 1 – 2 mm across or long.... The rock may look like dark lava (basalt) but it has an unusual texture (ophitic) in which well-formed feldspar crystals are surrounded by a later formed crystal mush of pyroxene and trace minerals. The rock crystallized at a moderate depth below the surface (500 to 3000 metres, hence 'hypabyssal') in masses of limited size which were injected (intruded) into pre-existing rocks.' (Leaman, page 13) When it was first described in Europe, it was difficult to describe its constituents and the greek and latin roots of the name mean 'deceptive' or 'deceitful'.

Dolerite appears on the earth's surface only well after the intrusive event, due to further uplifting activity and as the layers above it are weathered away.

Where does it occur?

Most intrusions of dolerite around the world are small. There are large ones in Antarctica and South Africa, but Tasmania has the honour of containing the largest areas of exposed, accessible dolerite in the world. It does not occur on mainland Australia. While there are outcrops of Precambrian (750 million years BP) dolerite in northwest Tasmania, and some Devonian (350 million years BP) in the northeast, the vast bulk of it – from Black Sugarloaf to Ben Lomond, Quamby Bluff and the Great Western Tiers, Cradle Mountain, Mt Wellington and many other wonderful places – is Jurassic (175 million years BP). It gives the island a special link to this era of great drama in the great southern continent of Gondwana. At this time Tasmania was at the centre of important global goings-on as Gondwana began to split apart. The crust of the earth thinned and magma swelled up from below.

Hydrology

One of the main attractions of the block of land we bought was the presence of a permanent spring – and this despite the fact that we were only 100 metres

from the top of a small mountain. It was maybe just as well that we did not know that historically dolerite has been known as a dry rock as it is hard and virtually impervious to water. However it turns out that dolerite can store water quite well in its many joints and fractures. (See Leaman chapter 18 – page 135) On the slopes of Black Sugarloaf there are a few springs and many soak areas with a rich growth of swamp and scented paperbark (*Melaleuca ericifolia* & *M. squarrosa*) and Swamp Gum (*Euclayptus ovata*). The water table in these areas is high enough to provide habitat for populations of 2 burrowing crayfish *Engaeus disjuncticus* and *E. nullaporius*. Even in our recent dry summers, our spring has not stopped trickling. (But with global warming upon us who knows if this will continue?)

Magnetic properties

Botanist Robert Brown found dolerite to be magnetic in 1804, and Charles Darwin commented on it during his visit to Tasmania in 1836. A compass needle will often fluctuate wildly in its presence as we found to our dismay. Leaman explains (page 101) how through a complicated process in the cooling of the rock from magma, sections of dolerite become a permanent magnet, and retain a magnetic memory. The explanation of these complex processes in Leaman's book are well worth the read. One thing the magnetic property of dolerite makes really clear is that at the time of intrusion Tasmania was very close the South Pole.

Dolerite as habitat

Leaman makes mention (p 134) that Jack-jumper ants & scorpions particularly like dolerite. They certainly aren't the only beneficiaries of such a landscape! Our dolerite provides perfect habitat for many reptiles (all 3 Tasmanian snakes, skinks, blotched bluetongues and mountain dragons), frogs, ants, millipedes, snails, and of course beetles etc. Dolerite dug from the garden or cleared from tracks is piled around the place ready for various building projects. Such piles of rock are shaded and retain quite a lot of moisture through the summer, so it is often difficult to bring oneself to use it because of the resulting habitat destruction!

A curse?

Dolerite is hard, inscrutable, and unpredictable in its structure. You never know where it might turn up – especially if you are mining coal. It is difficult to drill, shape or quarry. To quote a government report from 1937:

'... in the central plateau and the higher portions of the State all the overlying sedimentaries have been denuded away and the diabase [i.e. dolerite] forms the surface. It destroyed the coal measures and itself is barren of all mineral wealth and use, except as road metal. It is so dense and hard that the soil washes away as rapidly as the rock decays. It is Tasmania's curse.'

Well, I can confirm that it is a good building material and easy to form walls from without being cut or split. And the soil in our garden has produced a great deal of food – especially brassicas. It may have been hated by miners and bureaucrats, but broccoli seems to like it! Potter Neil Hoffmann (a C.N.F.N. member) has melted it into his recent work. It has its good points.

In short, dolerite is a fascinating aspect of Tasmania which is a place of generally complex geology and has produced some highly regarded geological scholars. This article has merely scratched its surface – and as Leaman points out there is a great deal more to know about this enigmatic part of our landscape.

References

- Leaman, D. (2002) *The rock which makes Tasmania*, Leaman Geophysics, Hobart.

Page URL: <https://www.disjunctnaturalists.com/articles1/hard-rock.htm>

[Back to top](#)

[Home](#)

[Why 'disjunct'?](#)

[Membership](#)

[CDs & Books](#)

[Contact Us](#)

[Articles](#)

[Acoustic Bird Monitoring](#)

[Walks & events](#)

[Links](#)