Dolomite as an Indicator

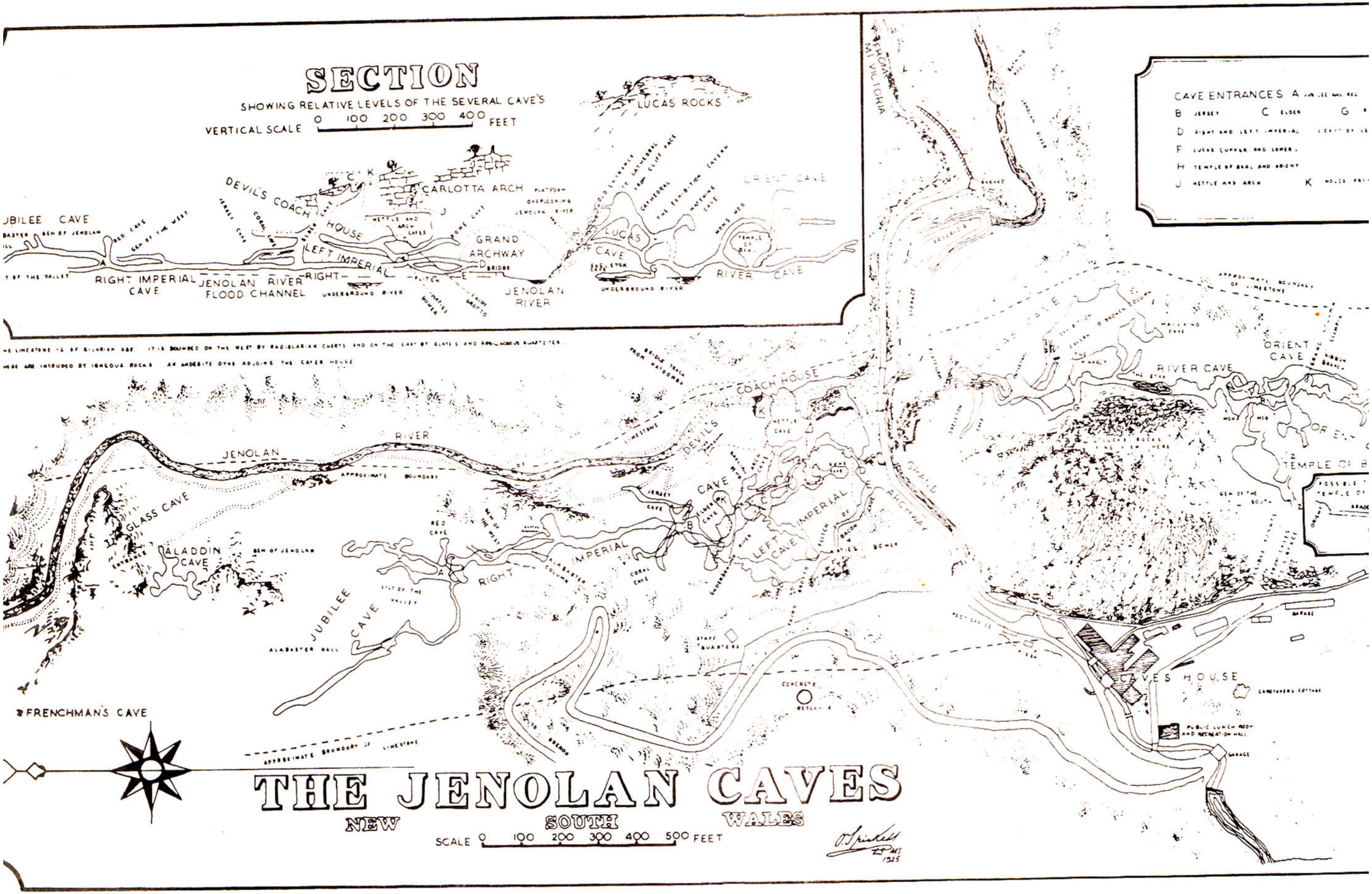
Ted Matthews

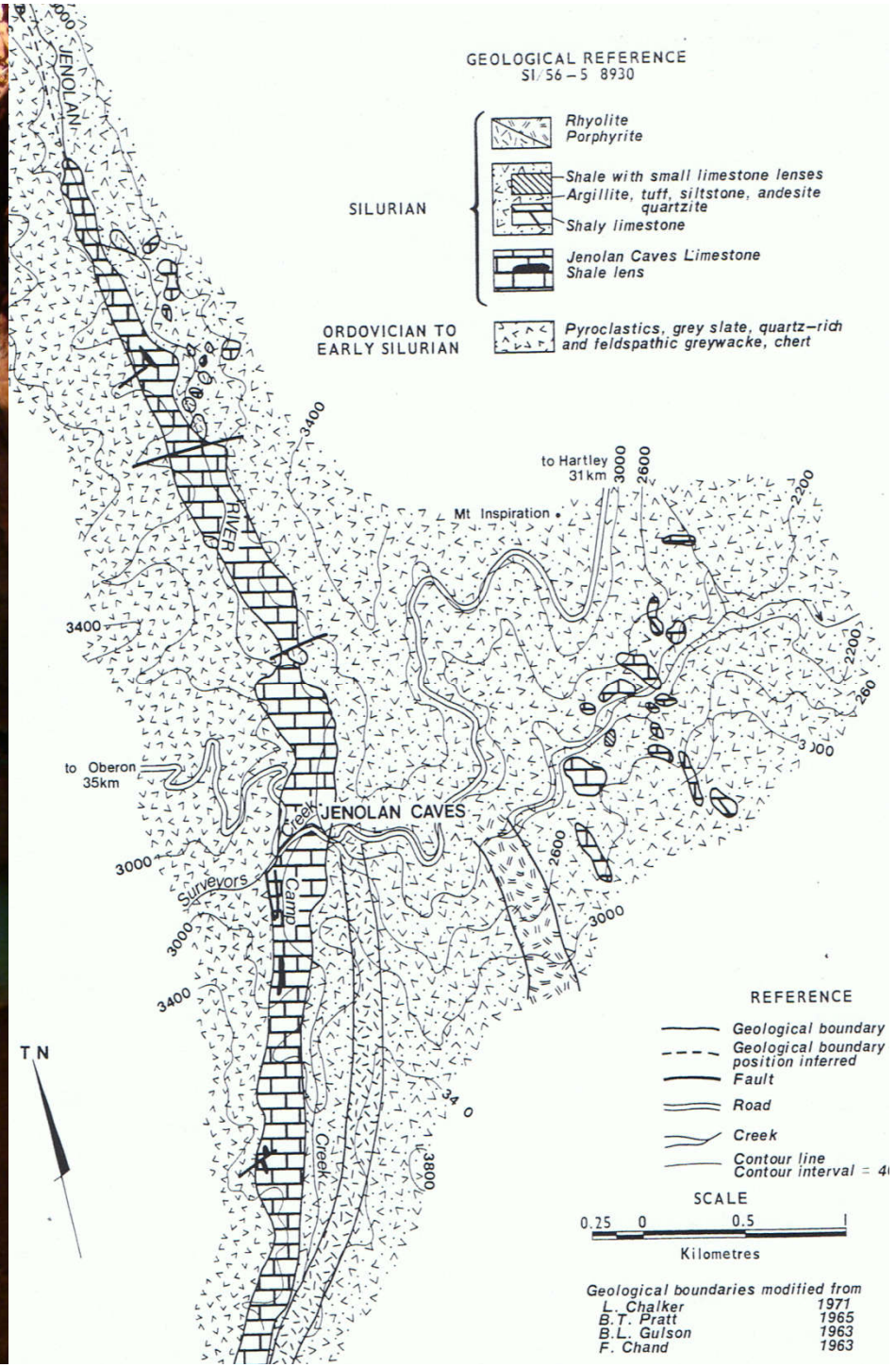
Jenolan Caves NSW

I thought this paper was going to be about river sediments in caves !!

- ***You know, conglomerates and stuff***
  - ***sand***
  - ***clay***
  - ***gravel***
  - ***boulders, stones ,cobbles, pebbles***
  - ***and stuff !!***


JLim


SECTION
SHOWING RELATIVE LEVELS OF THE SEVERAL CAVE'S
VERTICAL SCALE 0 100 200 300 400 FEET
LUCAS ROCKS
DEVIL'S COACH HOUSE
CARLOTTA ARCH
JUBILEE CAVE
GRAND ARCHWAY
LEFT IMPERIAL
RIGHT IMPERIAL CAVE
JENOLAN RIVER FLOOD CHANNEL
JENOLAN RIVER
LUCAS CAVE
RIVER CAVE
ORIENT CAVE
CAVE ENTRANCES
JENOLAN RIVER
GLASS CAVE
ALADDIN CAVE
JUBILEE CAVE
RIGHT IMPERIAL
LEFT CAVE IMPERIAL
DEVIL'S COACH HOUSE
GRAND ARCHWAY
LUCAS CAVE
RIVER CAVE
ORIENT CAVE
TEMPLE OF B
CAVES HOUSE
FRENCHMAN'S CAVE
FROM MT VICTORIA
THE JENOLAN CAVES
NEW SOUTH WALES
SCALE 0 100 200 300 400 500 FEET


GEOLOGICAL REFERENCE
SI/56-5 8930
SILURIAN
Rhyolite
Porphyrite
Shale with small limestone lenses
Argillite, tuff, siltstone, andesite
quartzite
Shaly limestone
Jenolan Caves Limestone
Shale lens
ORDOVICIAN TO
EARLY SILURIAN
Pyroclastics, grey slate, quartz-rich
and feldspathic greywacke, chert
JENOLAN
RIVER
to Hartley
31km
Mt Inspiration
to Oberon
35km
JENOLAN CAVES
Surveyors
Creek
Camp
Creek
Creek
3400
3000
2600
2200
3800
T N
REFERENCE
Geological boundary
Geological boundary
position inferred
Fault
Road
Creek
Contour line
Contour interval = 4
SCALE
0.25 0 0.5 1
Kilometres
Geological boundaries modified from
L. Chalker 1971
B.T. Pratt 1965
B.L. Gulson 1963
F. Chand 1963


IMPERIAL CAVE
Jenolan Caves N.S.W.

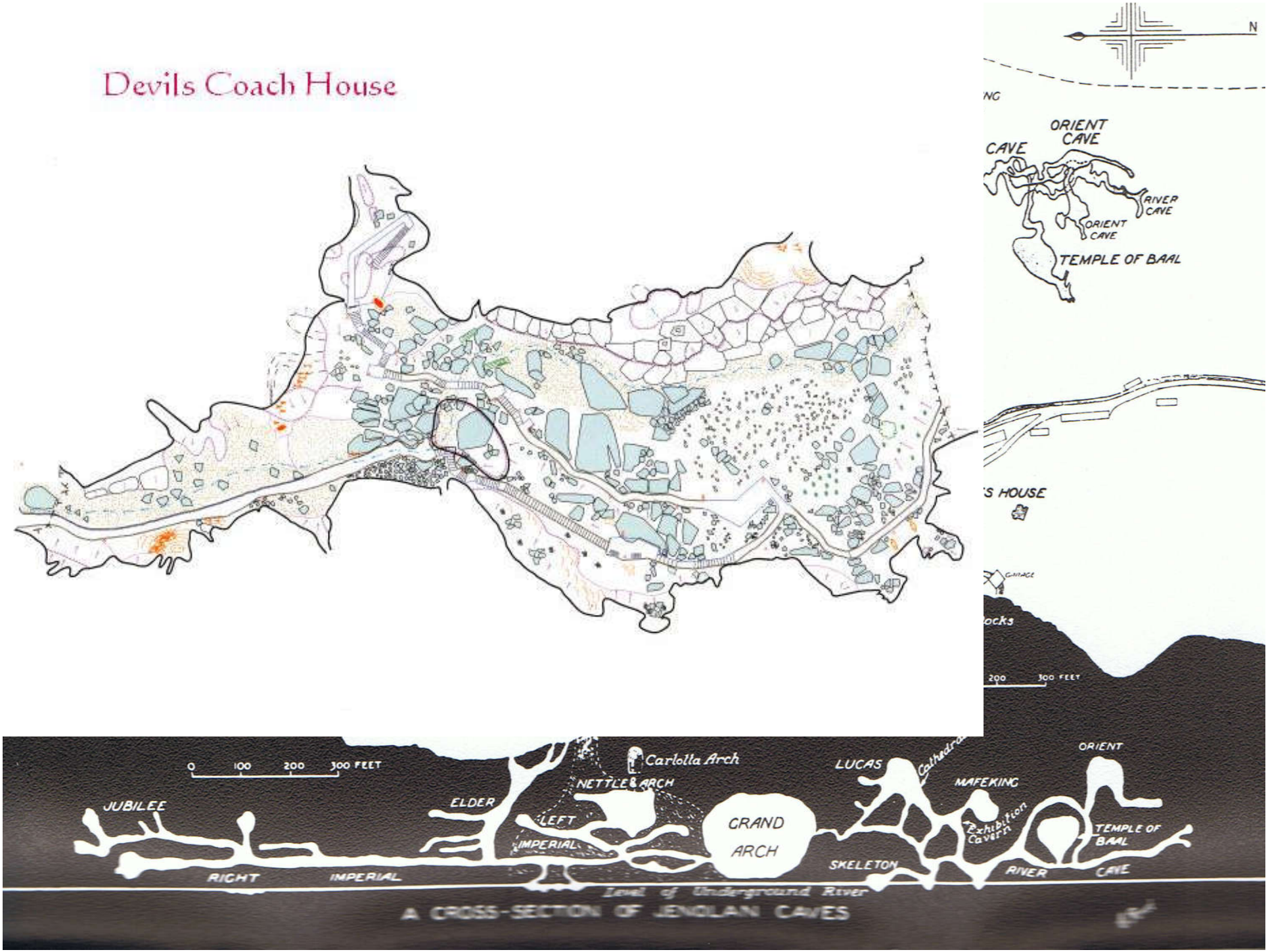

River Cave
Jenolan Caves N.S.W.

River-Formed Valleys

- ***Do not start at the top, they are worked back to the top, so the upper reaches will, in general, be the youngest***
- ***Serve to drain the land to the lowest point available***
- ***Are shaped by gravity using, for example***
  - ***its effect on water mass***
  - ***its effect in collapsing masses of rock and associated mineral debris***
- ***Are a significant response to the interaction of that river with the underlying rock type being worked on by the various agents of weathering and erosion***

So ,how old are these river/creek valleys?

- ***Not as old as the caves..but close -***
- ***The valley of Camp and McKeown's Creeks is there because the limestone has control…***
- ***The creeks have taken the more direct path, their passage being directed by the underground opening up below them…***
- ***Given time, the roof of the cave passage may collapse, in this way lowering the valley floor…***


Devils Coach House
N
ORIENT CAVE
CAVE
RIVER CAVE
ORIENT CAVE
TEMPLE OF BAAL
S HOUSE
0 100 200 300 FEET
Carlotta Arch
NETTLE ARCH
LUCAS
Cathedral
ORIENT
MAFEKING
JUBILEE
ELDER
LEFT IMPERIAL
GRAND ARCH
Exhibition Cavern
TEMPLE OF BAAL
SKELETON
RIGHT IMPERIAL
RIVER CAVE
Level of Underground River
A CROSS-SECTION OF JENOLAN CAVES

So, how do stones become part of a cave wall ?

Well, they could be washed in !!

They could fall in.!!

Or they could have been already in the parent rock…

What we have here is evidence of the relocation of sediment from an unknown, older cave down to the present younger cave

...


..with
thanks to
members of
SUSS for
the next
sets of pix


23 4 2006


..along with
the fossils of
course

So what is it indicating ?

- ***The occurrence of dolomite associated with calcium carbonate reef deposits shows that the original structures have experienced an alternation in pH conditions that can be found in natural settings at different frequencies…***
- ***…in other words, the dolomite forms in situ, as, for example, on the reef itself…. And of necessity, <u>during the times</u> of the reef deposit***

Ted Matthews 080127

.. additional photography by Russ Commins, Paul Lewis,
Jimmy Lim, Paul McKendry and Alan Pryke

...further reading

- ***J.C.Deelman "Low temperature nucleation of magnesite and dolomite"..N Jb. Miner.Mh.,1999 (7)pp289-302,Stuttgart 1999***

- ***..also, perhaps more readable to some 'Observations Re Dolomite as Limestone Interbeds' ..Ted Matthews Jenolan Caves 30 Nov. 2007***