

Abstract:

Long basaltic lava flows and lava tubes and channels - Is there a relationship?

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Long basaltic lava flows are found in the young volcanic provinces of Queensland and Victoria, in the southern USA, and in recent eruptions in Hawaii. Flows which are young enough to retain 'stony rise' surfaces can be readily traced, and flow length, width, gradient and volume determined. Older flows are more difficult to trace continuously, but there is no reason to suppose that the earliest flows in the Newer Volcanics of Victoria were not also long 'stony rise' flows.

Lava tubes are relatively common in both Queensland (Stephenson and Griffin 1976) and Southeastern Australian provinces (Webb, Joyce and Stevens 1993). Most lava tubes are in flows which have been dated as or are obviously young. An age range of 2 Ma to present, and in most cases considerably less than 1 Ma, is most common. These are the Rouse and Eccles Regolith Terrain Units of Ollier and Joyce (1986). Amongst the older lava tubes in Victoria are Parwan Cave (perhaps 2Ma) and Panmure Cave at 0.57 Ma, and the youngest include the Byaduk Caves in the Harman Valley flow of Mt Napier at about 8000 BP and small tubes at Mt Gambier at 4,400 BP.

Tubes occur in a variety of topographic settings (Webb, Joyce and Stevens 1993) including at the foot of scoria cone complexes (Mt Napier), in the flanks of lava shields (Mt Hamilton), at the distal edge of a flow (Panmure) and at varying positions within a flow (Mt Napier and Mt Eccles).

An obvious suggestion is that confinement of a flow in a channel or tube is necessary to allow a long flow to develop, and tubes are sometimes closely associated with lava channels as at Mt Eccles and Mt Napier (Joyce 1987) but sometimes are not, as at Mt Porndon and Mt Hamilton.

So do all long basaltic flows have tubes or channels or both? And do such tubes and channels differ in any significant way from tubes and channels in different settings, eg. are long tube systems only found on long basaltic flows?

References

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