Subsurface hydrogeological processes related to the formation and evolution of the Shalbatana complex and related areas on Mars

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Complex networks of underground conduits and cavities has been identified using Viking imagery at 256 per degree and Mars Global Surveyor 32 pixels per degree digital elevation models.

These networks seem to be present in a diversity of terrains and locations and appear to have played a major role in the surface landscaping as well as in the Martian hydrological cycle. The role these networks have played in the Martian geological history is partly illustrated by the Shalbatana Chaos and Vallis complex. The Shalbatana Chaos is interpreted in this work as the result of the modification of a 110 km diameter crater by the development of a ring valley and undermining of the south eastern flank by an underground conduit complex. The source water which, flooded and carved the Shalbatana Vallis is here interpreted to have been released from the conduits, which undermined the south eastern flank, possibly due to collapse of the conduits.