

Geomythology: Zimbabwean Examples

Forbes Mugumbate

Ministry of Mines and Mining Development, Bindura

Fmugumbate@mines.gov.zw / fmugumbate@gmail.com

Introduction

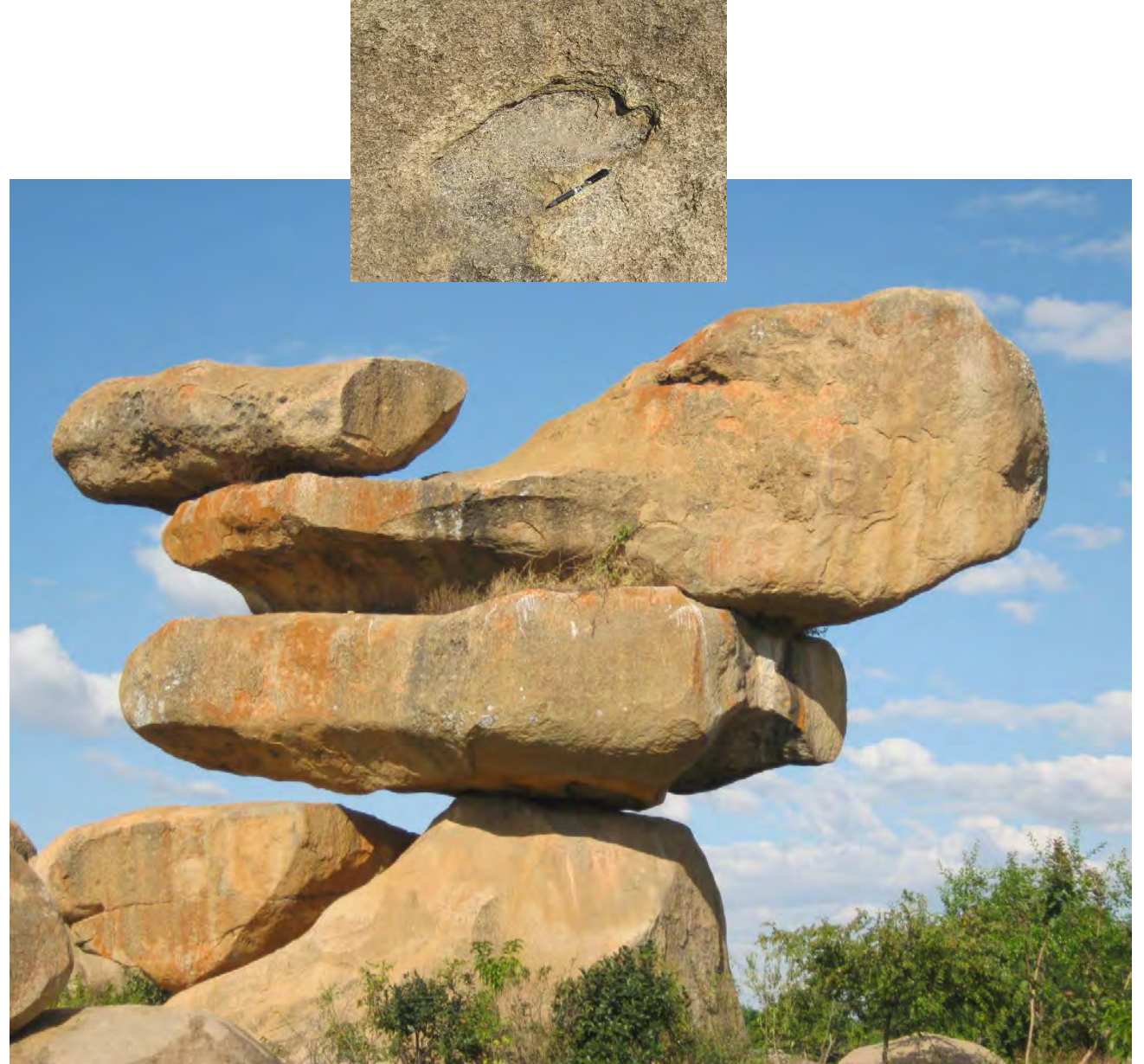


Introduction



Introduction

- Prescientific communities are puzzled by simple phenomena such as geomorphological features
- In some cases they have invoked traditional stories to explain the evolution of some poorly understood characters of the natural world.
- Some of these mythical accounts have been handed down generations through oral history
- The Epworth balancing rocks and weathering etch marks are attributed to God hence the name (Domboramwari) God's rock



Introduction

- Geomythology is the study of myths concerning the development of certain geological elements such as volcanoes, earthquakes, fossils and certain landscapes.
- Two kinds can be identified;
 - a distorted explanation of some actual geologic event; and
 - a geologic feature or phenomenon which has inspired a legendary explanation.
- In the case of geologic events that occurred in the pre-human past, observation and imagination led to mythic explanations that were handed down over millennia
- In the case of natural cataclysms within human history, descriptions were transmitted over generations, often accruing supernatural details

Introduction

- Most of these myths can now be explained by science
- There is however a need to document them,
 - For preservation of heritage
 - also because scientists and historians have often missed truths and rational concepts embedded in geomythological narratives owing to the legendary language of oral traditional beliefs. A few geomyths observed in the pre-scientific past are being found to have roots in real geological events.

Examples of the two types of
geomorphology

1. Noah's Flood

- Christian, Jew and Muslim literature tell of God destroying the Earth with a great flood but spared Noah, and his family.
- Noah built a huge boat and filled it with two of every animal.
- God covered the Earth with water, drowning everything.
- Noah, his family and the animals on the boat survived and repopulated the planet.



Noah's Ark on Mount Ararat, by Simon de Myle



Science

- How it was possible to accommodate Noah's animals in a boat measuring 135m x 22.5m x 13.5m;
- The source of water that flooded the earth
- **But** Believers have faith that everything is possible with God's command

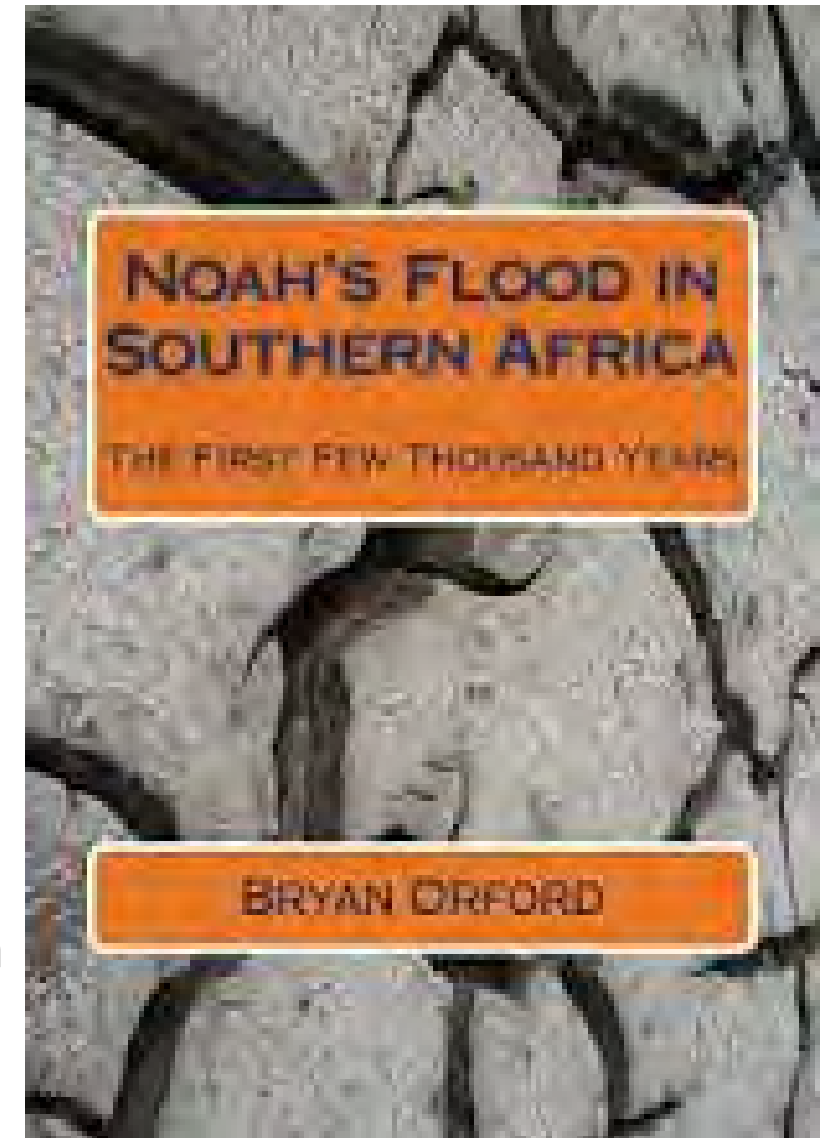
Science

- Some geologists believe that the Noah story may have been influenced by a localised catastrophic flooding event in the Black Sea around 5,000 B.C.
- The story of floods is told differently in many cultures, e.g. Hindu and Mesopotamian mythologies
- There's a natural tendency for people to exaggerate their memories, to turn a bad event into a far worse one



Noah's Flood in Southern Africa: by Bryan Orford, 2015

- Argues that Earth not as old as indicated by radiometric age dating' hence most geological features from 'so-called Archaean to Recent' resulted from the effects of Noah's floods
 - Deposition of coal, etc point to global flooding during Noah's floods – occasional finds of remnants of human culture embedded in coal – humans were present much earlier than shown by geological record
 - Widespread evidence of volcanism under water – pillow lavas
 - Evidence of rapid sedimentation throughout the region
- The tremendous forces unleashed by the floods, caused ruptures in the earth's crust
- **BUT where are the fossils of the drowned sinners?**



2. Legend of the Devil's Tower, Wyoming, USA

Once upon a time, a travelling Red Indian tribe had several little girls cornered by bears. No one was near enough to save them. Suddenly a voice from the ordered the girls to climb a hill.

The girls huddled together on the hill with the bears climbing after them



The situation appeared hopeless, but a strange voice from heaven commanded the knoll to rise out of the ground, carrying the children high into the air.

Higher and higher the mound rose, as the frustrated bears growled and clawed at its sides. Sharp pieces of rock broke away from the rising spire and crashed down upon the angry bears



The strange voice said, “Do not cry; you will not fall. I have many pretty birds with me. Make friends with them, for soon you will ride upon a pretty bird, away and away down to the ground.”

Birds appeared and carried the children to their mothers.

Molten rocks poured down the sides of the mound, burying the hungry bears.

That was how Devil's Tower came to be according to legend. To prove it, the Indians point to the deep crevices along the walls of the tower and the claw marks made by the huge bears of long ago.



Scientific explanation

The fluting of the columns, a classic example of columnar jointing, is explained as the claw marks made by the bear as it tried to reach the children.

Columnar joints result when a rock cools rapidly from the outside towards the centre causing shrinkage cracks just like in drying mud.



3. Domboshawa Rainmaking ceremony

- Domboshawa part of the Chinamhora batholith located about 30 km north of Harare
- Exhibits magnificent geomorphological features with cultural and historical sites associated with supernatural phenomena and myths



Polygonal cracks that resemble mud cracks. The cracks are superficial and are assumed to be the result of temperature changes that caused differential rates of expansion and contraction and fracturing of the outer layer of the rock.



Pseudo-ripple marks resembling sedimentary structures on rock pavement.
These are formed by weathering along planes of closely spaced joints



Drainage channels on solid rock resembling patterns of normal drainage basins. They are clearly the result of weathering and erosion although local people believe they are the result of lightening strikes (GEOMYTH). Have well-formed levees



Varieties of lichen groups impart strong effects on appearances of the hills. The yellow and orange colouring of major lichen species can be seen from a distance as a reddish hue. The name Domboshava 'red rock' (*Dombo* = Rock; *shava* = red in Shona language) was derived from the red colouration caused by lichens.



Domboshava exhibits caves with fascinating paintings and Stone Age artefacts portraying the lifestyle of different people who lived in the area over thousands of years.



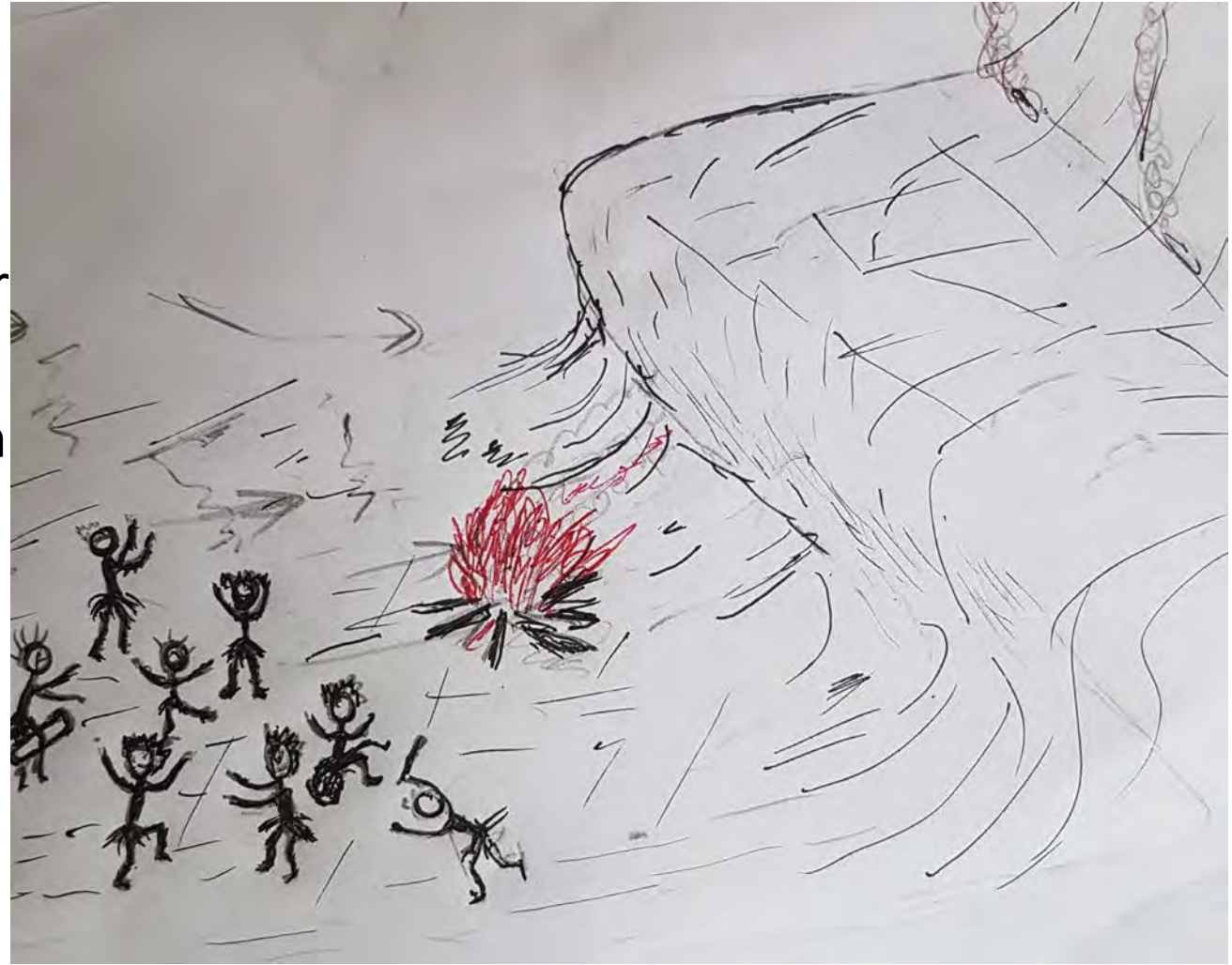
- One of the caves was used for rain making rituals
- sacrificial sheep would be burnt in the cave
- depending on wind direction, smoke would pass through a fissure that leads to a hole at the top of the hill.
- If the smoke billowed out of the hole, observers waiting below would scream in happiness believing ancestral spirits would have accepted their prayers for good rains





Science

- Coincidental observation of actual weather phenomenon
- The cave is facing north, the direction from where winds that bring rain to this part of the country come from
- Thus a normal year will have wind blowing in the 'right' direction to force smoke into the hole at the bottom and out at the top
- Also wind will blow towards the fire as the air around the fire expands and rises creating some sort of a vortex



4. Lake Kariba seismicity, the angry Nyaminyami

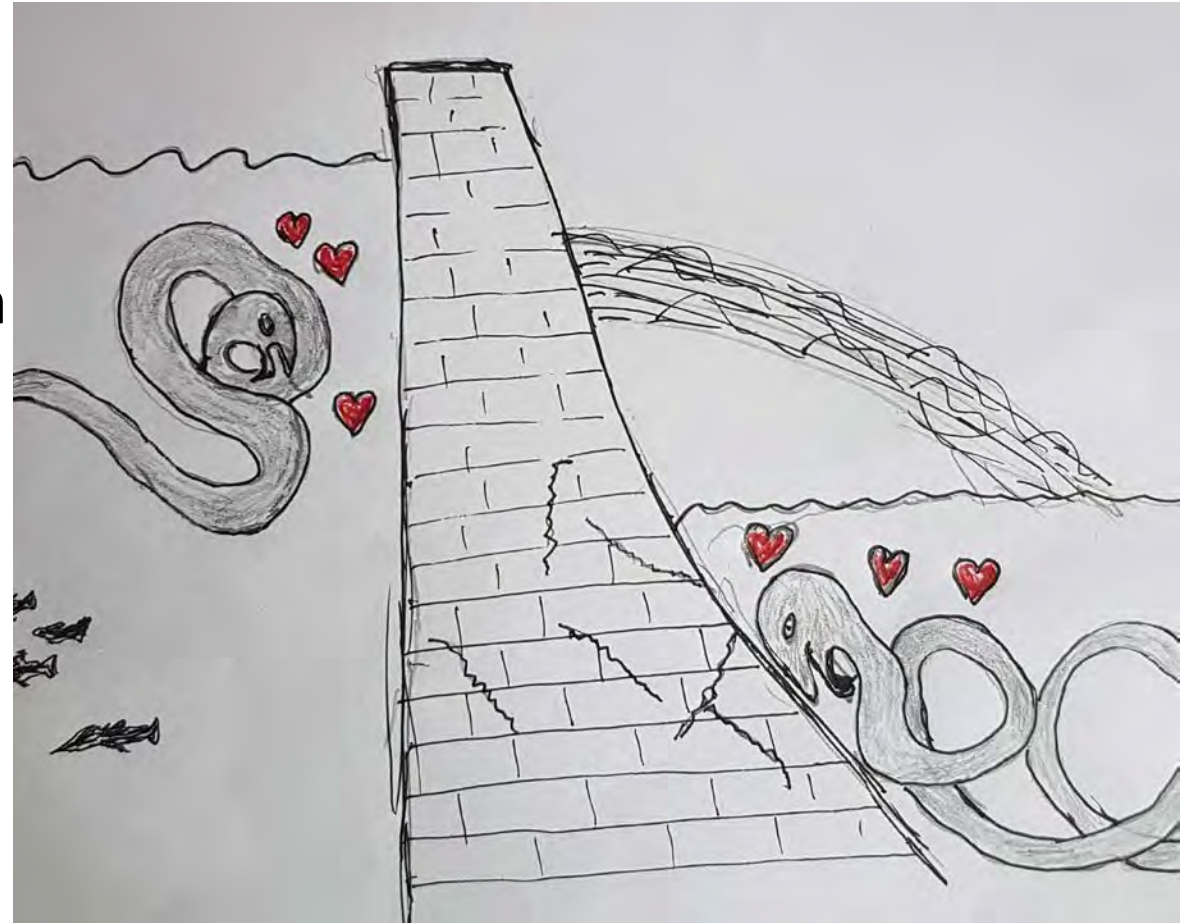


- Kariba Dam 1955 – 1960
- It is believed Nyaminyami, River God of the local Tonga people, a snake with a head of fish, lives in the Zambezi River.
- Looks after the welfare of the Tonga people, and gives sustenance in times of difficulties.
- Nyaminyami was against building of the dam
- Lots of mysterious things attributed to the wrath of Nyaminyami happened during construction of the dam



- 1957 worst floods ever known on the Zambezi – washed away partially completed wall and equipment. Many people killed
- Bodies of people killed disappeared mysteriously
 - Tonga elders advised that rituals should be conducted
 - Although not taken seriously, desperate relatives of missing people agreed – a black calf was slaughtered and floated in the river
 - Next morning the calf had gone and the missing bodies of workers were in its place
- Nyaminyami struck again with more vigour in the following year – floods and more deaths
- Damwall eventually completed in 1960.

- The Tonga believe that the dam wall separated Nyaminyami from His wife.
- He occasionally tries to break through the wall to get to the wife – this manifests in tremors prevalent in this part of the country
- The area is affected by earthquakes more than any area in Zimbabwe – over 20 earthquakes with >5 magnitude on the Richter scale



“A hydroelectric dam bordering Zambia and Zimbabwe threatens the lives of 3.5 million people in the southern African region as it is on the verge of collapsing, local newspaper Zambia Daily Mail reported Tuesday.

The wall of Kariba Dam, ... has developed weaknesses and may collapse if nothing is done to repair it in the next three years, the report said.....”

- Source: Xinhua, March 19, 2014

The Tonga are convinced that Nyaminyami will one day succeed in breaking the dam wall



Science

The world's largest man made water reservoir contains 200 billion tonnes of water

- the loading and unloading of water induce seismicity in this pervasively faulted area.

**BUT the floods and disappearances during dam construction?
Coincidences?**

5. The colossal fighting of mountains of Murehwa

Part of the Murehwa batholith comprising several bornharts



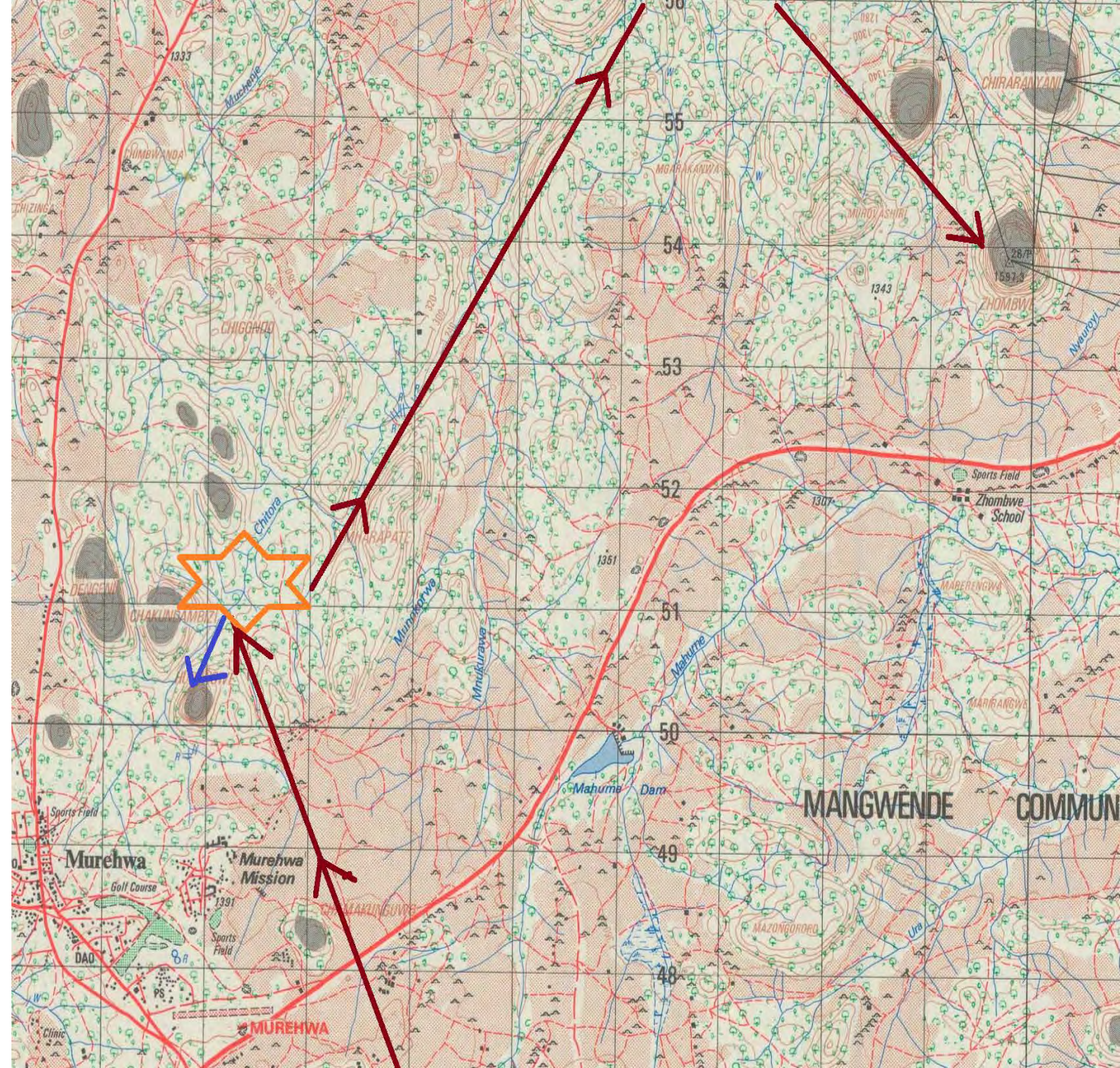
Zhombwe and Hurungwe imposing bornhardts adjacent to each other near Murehwa Growth Point

The nature of the structure of the mountains and their surroundings has caused legendary stories of how they ended being where they are.



The Legend

- Once upon a time, Zhombwe mountain came from Buhera in the south along a track manifesting today as a valley.
- Hurungwe mountain of Murehwa then engaged Zhombwe in a titanic fight
- After being beaten thoroughly, Zhombwe moved to a new area the path of which is marked by another valley.



While the general outlook of bornharts in this area is that of smooth outlines 'whalebacks', Hurungwe and Zhombwe are shattered.

Hurungwe that travelled from Buhera shows the highest degree of fracturing showing the extent of the suffering during the fight.



Science

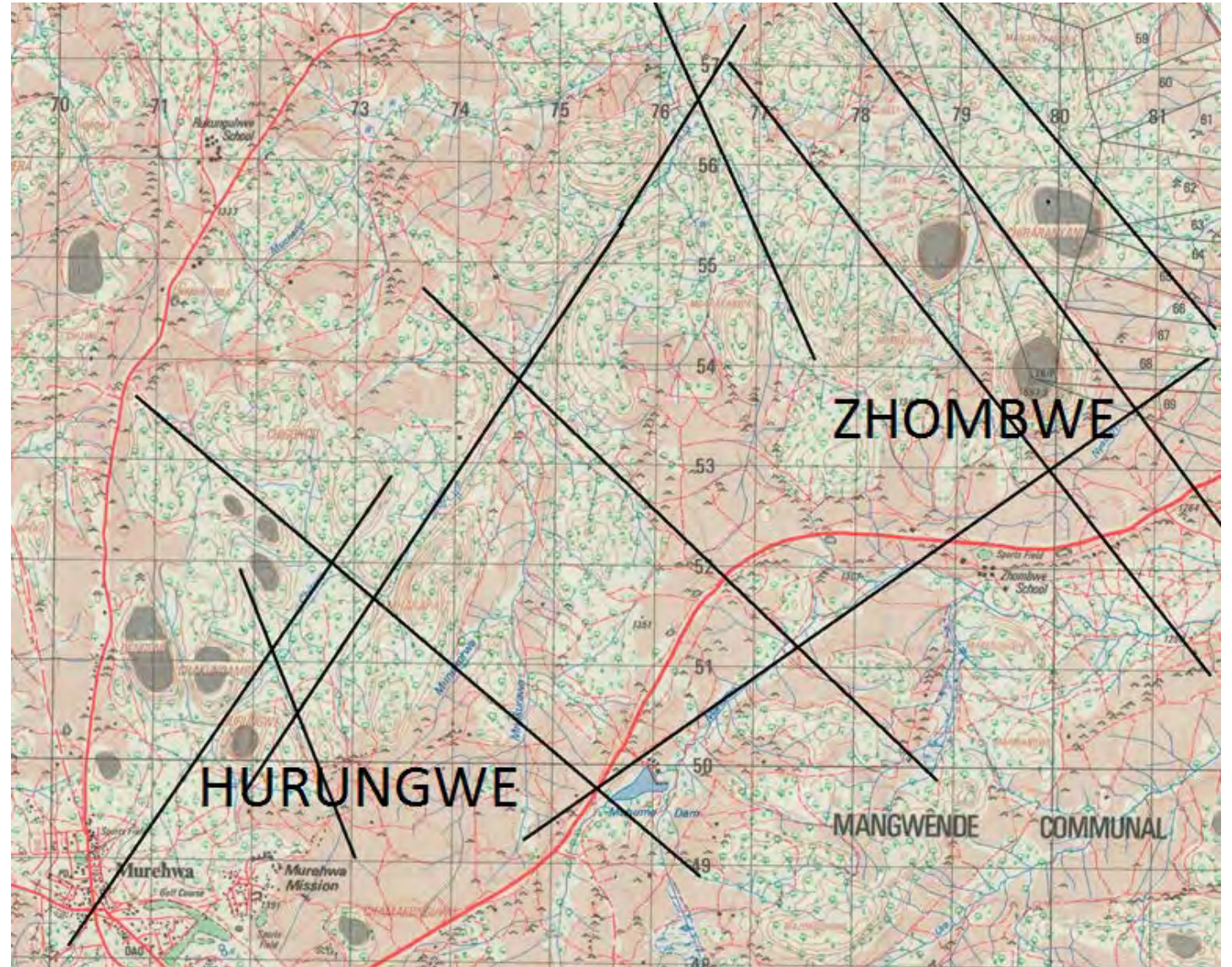
The mountains have always been there since Archaean times, exhumed by weathering and erosion

The valleys are tracing faults and dykes many of which trend NW-SE.

The jagged structure of the two bornharts is the result of faulting with Zhombwe having been fractured more than Hurungwe by the faulting

COMMENT

Although mythical explanation for the evolution of the structures, the observations were spot on



6. Chinhoyi Caves

- Karst structures with an open sinkhole 'Sleeping Pool' known as "Chirorodziva" the " Pool of the Fallen".
- Name derived from an incident which took place in the 1830s when Ngunis who were moving northwards surprised local people and threw the dead into the pool.
- Prior to that the Caves were used as a stronghold by an outlaw called Nyamakwere who murdered many victims by throwing them into the "Silent Pool"
- Thus the pool is believed to be haunted by the spirits of the dead



- The water of the Sleeping Pool is extraordinarily blue in colour and unusually clear.
- It appears the colour is not due to any unusual chemical content and is merely the natural colour of clean water, assisted by the natural diffusion by water of the blue-violet end of the spectrum.
- The clarity is attributed to a deficiency of sunlight, limiting the growth of algae and plankton, and a lack of pollution by argillaceous sediment.
- The absence of waves allows any sediment entering the pool to settle rapidly.



Chirorodziva

Legend

- Any one who has attempted to throw a stone across the length of the Sleeping Pool would have discovered that it is not possible
- The stone drops into the water.
- The belief is that the spirits catch the stone intending to throw it back to the thrower. No reported incidences of this ever happening



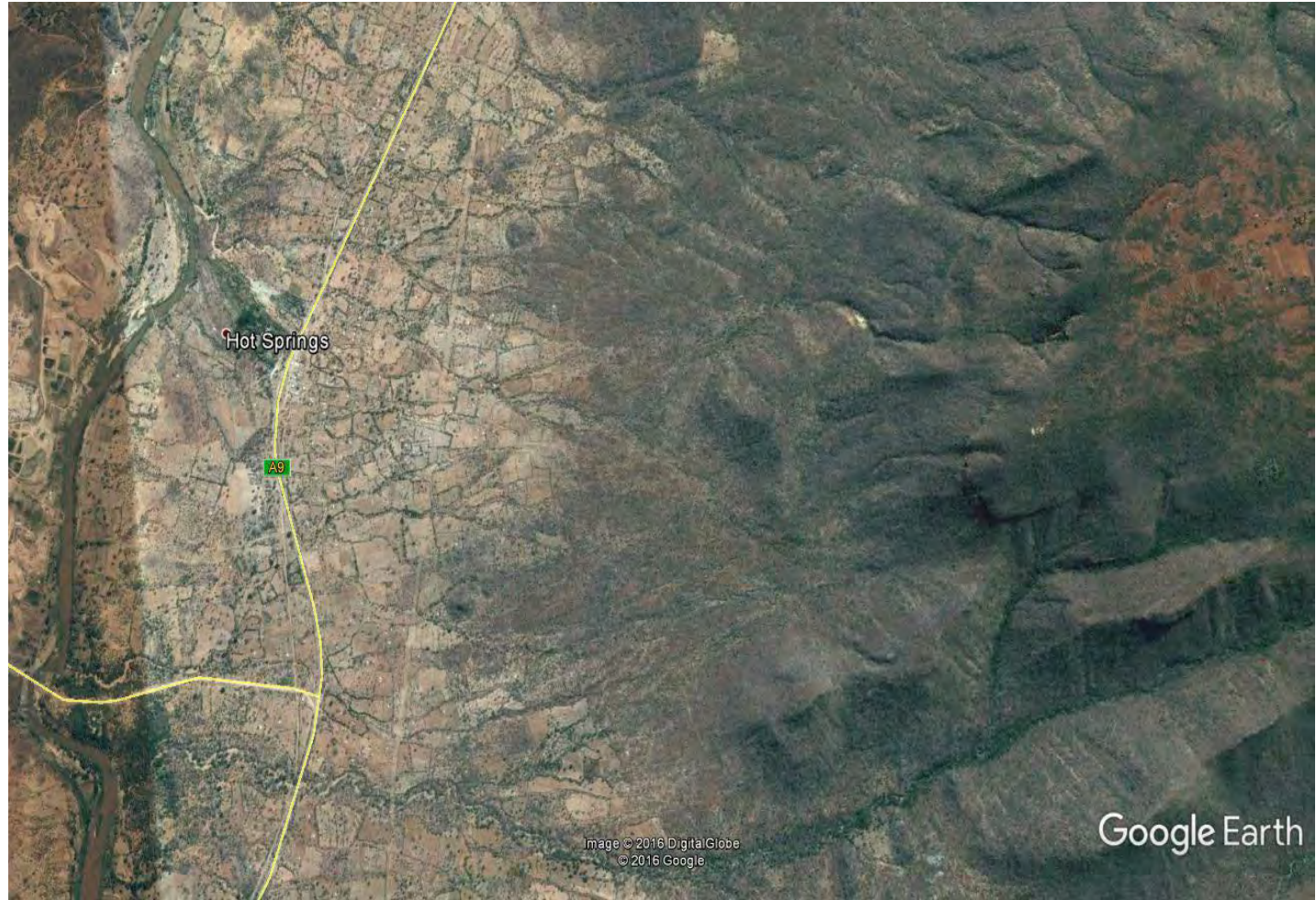
Science

The angle of view of the pool, being sub-horizontal, gives an illusion of a short length when in fact the length is huge, beyond a normal person's throw.



7. The legend of the Nyanyadzi Hot Springs

- The Rupise hotsprings are located about 90km from Mutare and 20km from the Birchenough Bridge.
- The area is within the vicinity of breathtaking geomorphology dominated by the Chimanimani mountains



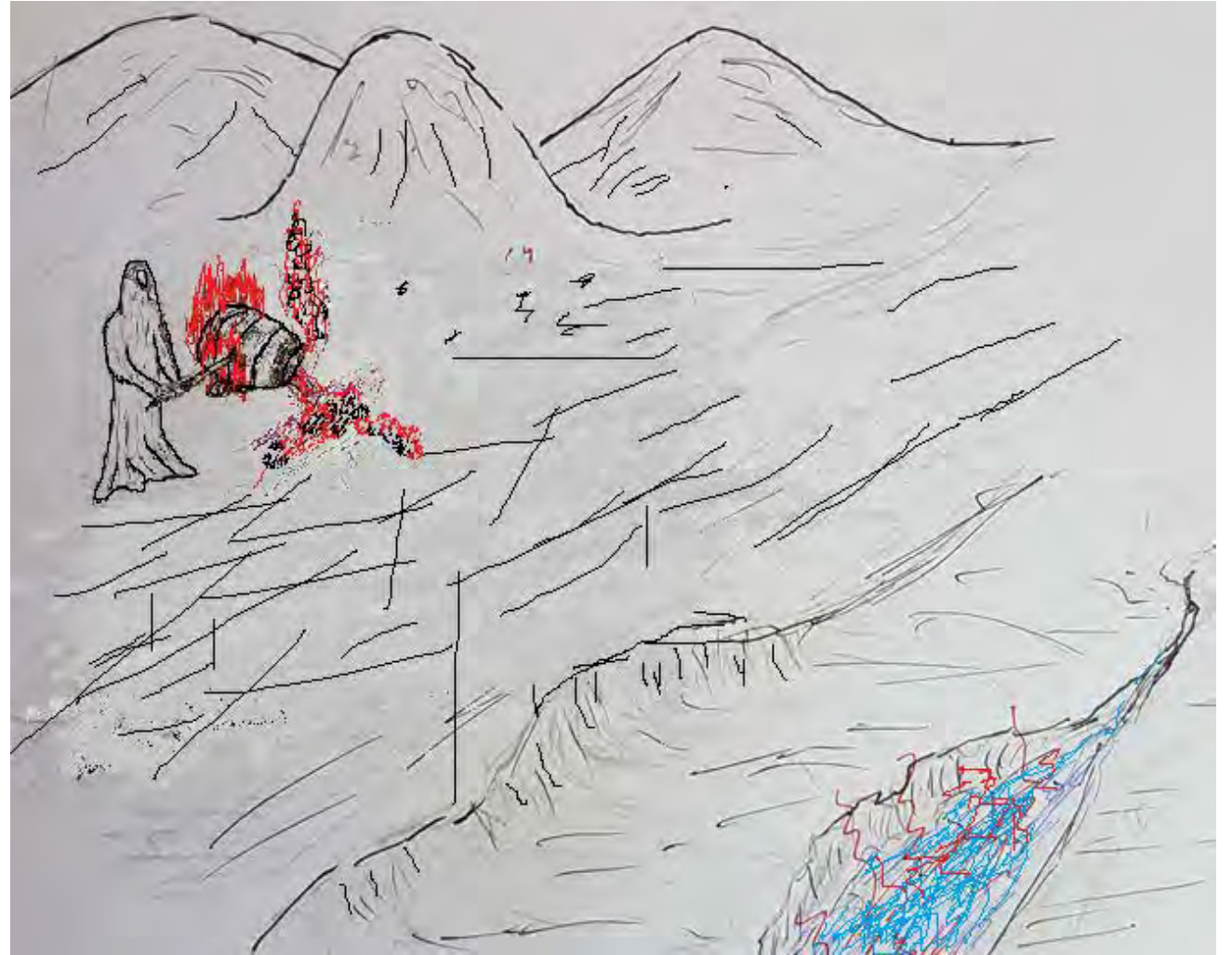
- Hot water at close to boiling point oozes naturally from the ground
- The area that used to be a foremost tourist destination became derelict as a result of the 1970s war of independence.
- The resort had a Hotel, lodges and a swimming pool where tourists enjoyed naturally warmed water
- There have been efforts to revive the resort following discoveries of diamonds nearby



- The legend of hot springs is that hot water can hold more dissolved solids than cold water, and often have very high mineral content.
- Some of these minerals have high therapeutic properties
- Myth is that the water can remove wrinkles and also cures skin diseases and rheumatism
- Because of the myth of hot water coming from the ground naturally, the springs are believed to bring luck – people throw coins to attract luck
- Because of both the folklore and the claimed medical value, some of these springs are often popular tourist destinations, and locations for rehabilitation clinics especially for disabled.

- Many years centuries ago some local people who were climbing the Chimanimani Mountains, heard chopping sound as if one was cutting down wood.
- On investigating the place, they saw a cauldron of bubbling water. Thus they believed that the cutting sound was made from spirits cutting down wood to boil the water

For many generations locals believed the hot springs were the outlet of hot water boiled by mermaids at their sacred cauldron further up the Chimanimani mountains



Science

- Geothermally heated ground water that rises from the Earth's crust.
- In general, the temperature of rocks within the earth increases with depth – geothermal gradient
- If water percolates deeply enough into the crust, it will be heated as it comes into contact with hot rocks.
- The water from hot springs in non volcanic areas is heated in this manner.

Conclusions

- Although the term geomythology was coined by geologist Dorothy Vitaliano in 1968, the concept was known and applied since antiquity.
- Geomythology is part of our heritage, which is now considered a new field of study.
- Zimbabwe is probably rich in these heritages, but remain embedded in some people's mines.
- Given the nature of the modern way of living where oral story telling is fading away, there is danger of losing these heritages
- There is therefore need to gather as much information on geomythology as possible, and to systematically match the insights contained in the myths to modern scientific knowledge

Thank You