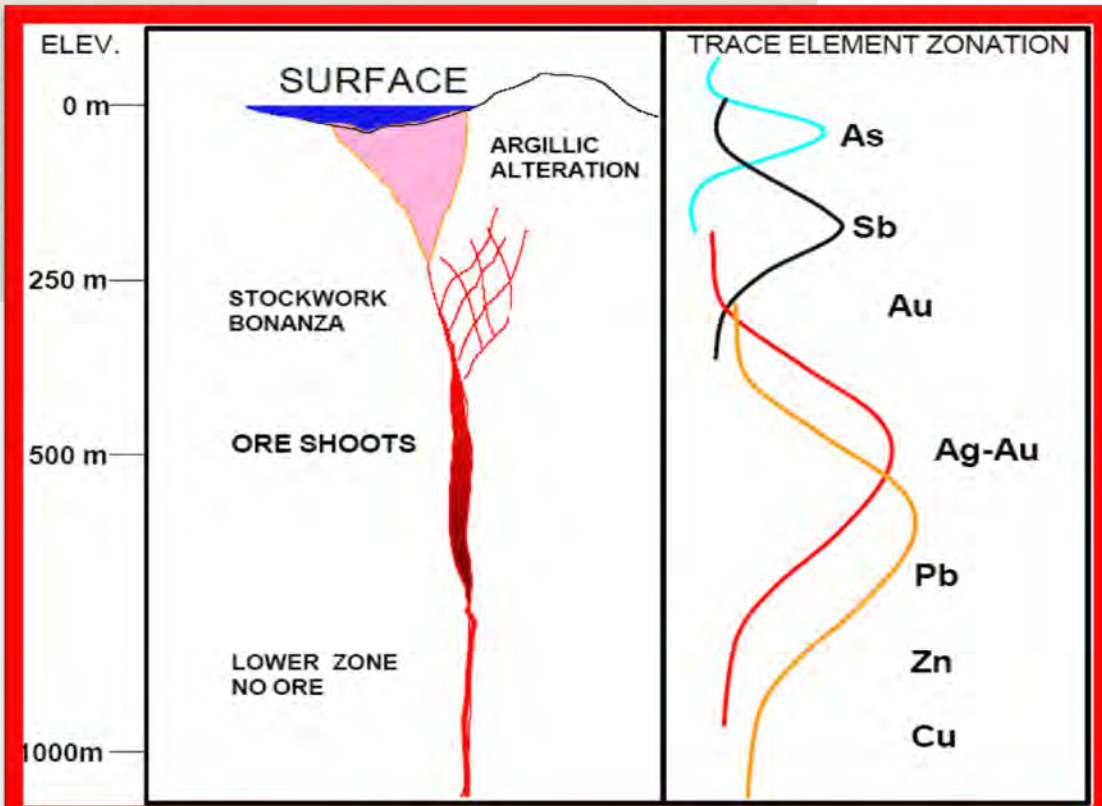
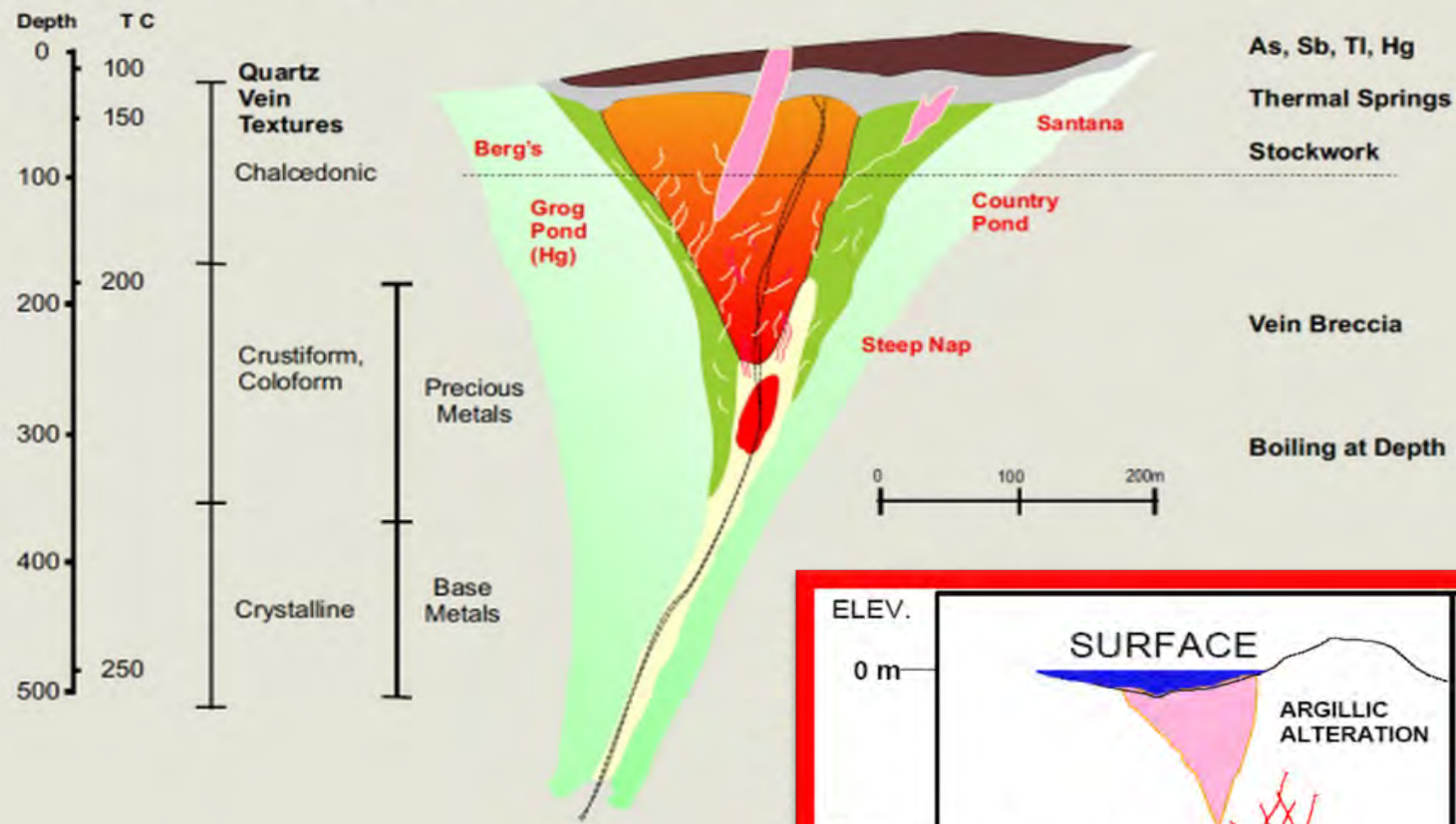
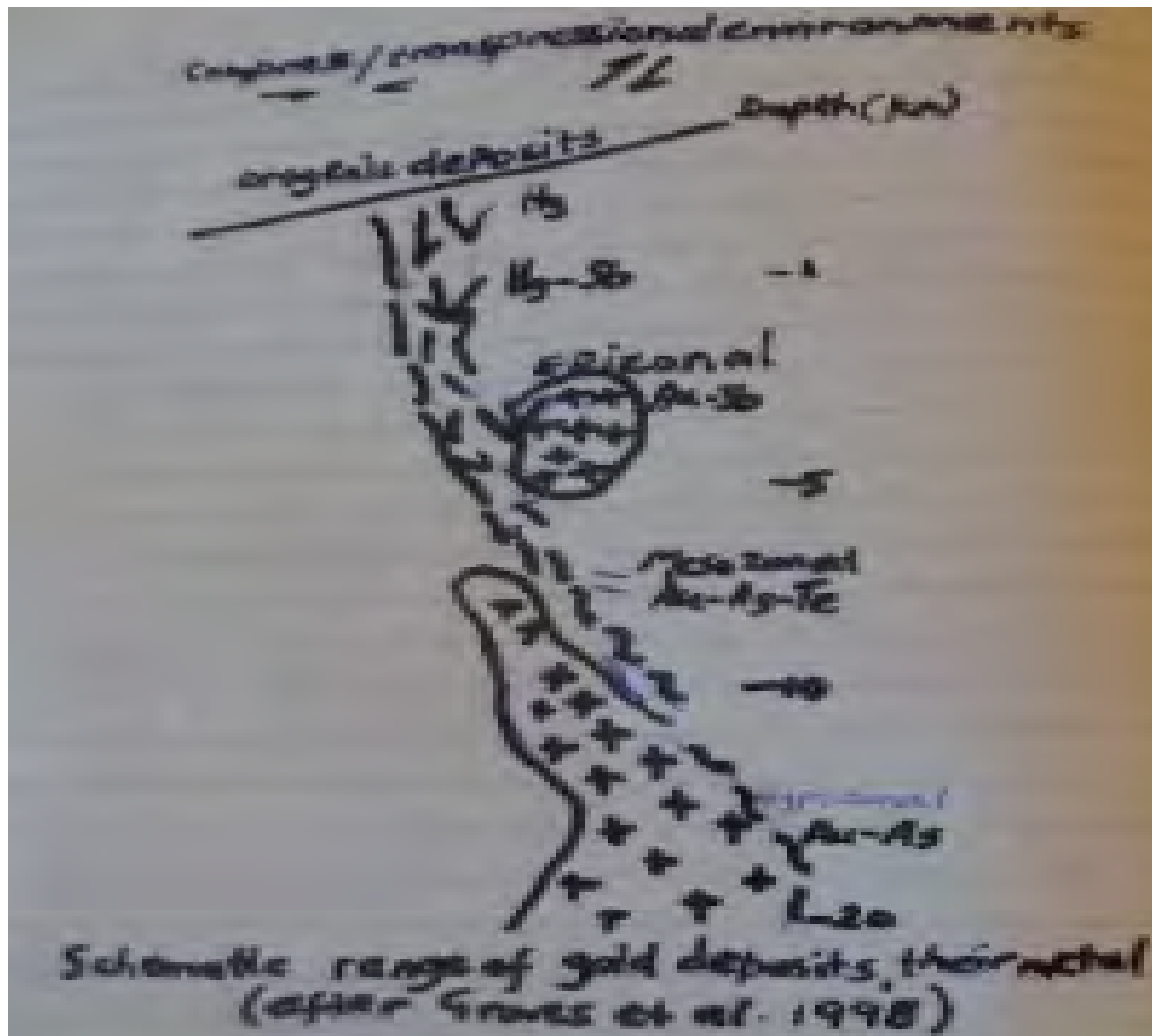


Epithermal Model: Epithermal Au Occurrences



Compressional/transpressional environments for Au genesis



Hypothermal environment- the case thereof

-Au occurs at the contact between clastic Kibarian metasediments (conglomeratic unit) and older Palaeozoic schists.

- Au in Palaeozoic units remobilized during (i) Lomanian orogeny of 1Ga and (ii) Pan African orogeny (650 Ma)

- Largely brittle - ductile regime, here auriferous quartz veins and breccias formed (Sarah Hebert, 2012)

Geological team



Team work



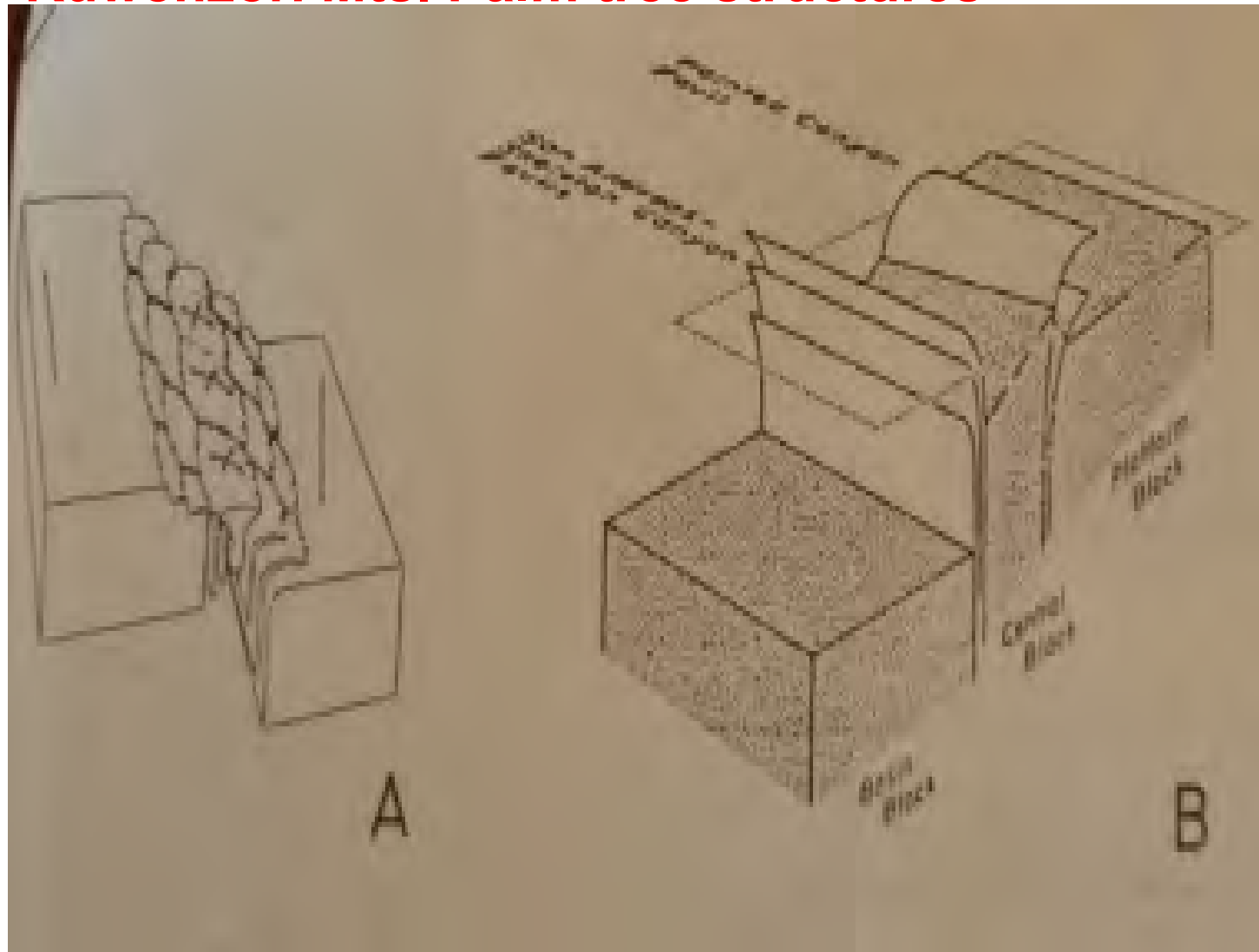
**Quartzite hills. V and U shaped valleys ,
rugged terrain- Rukunjiri**



The rift map



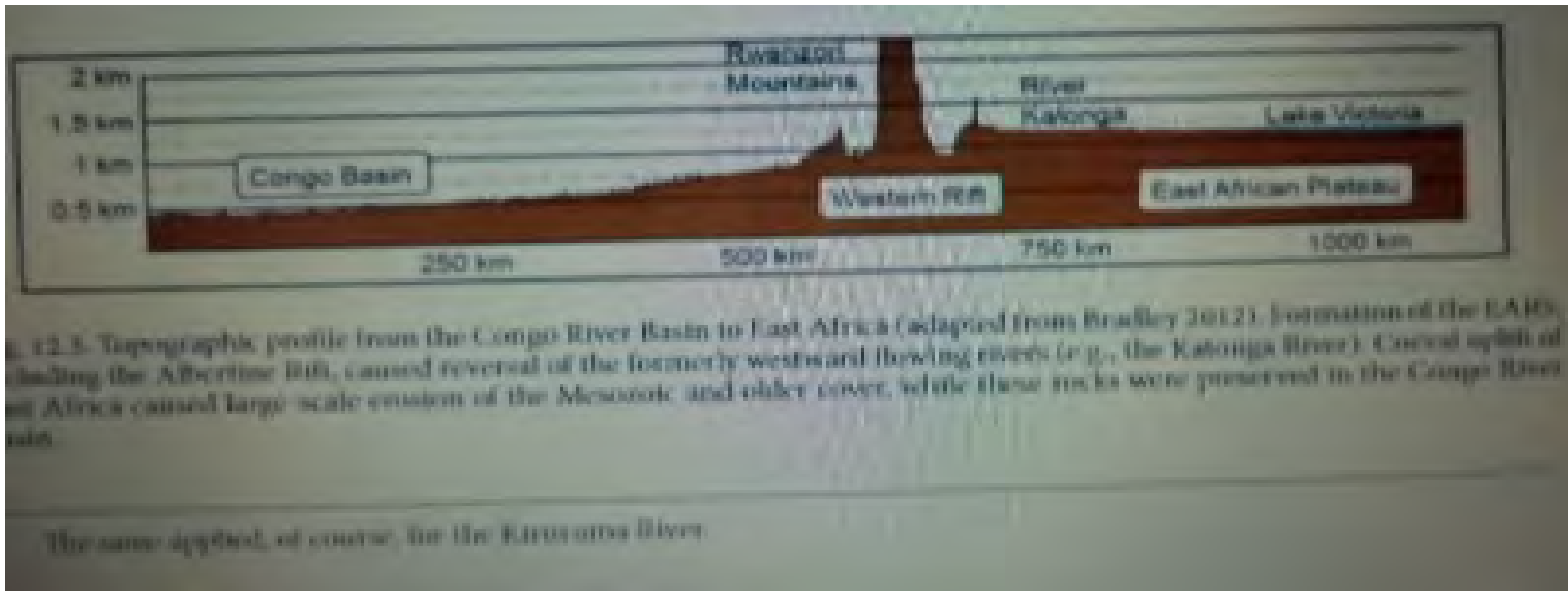
Orogenesis of Mt Margarita – Ruwenzori Mts. Palm tree structures



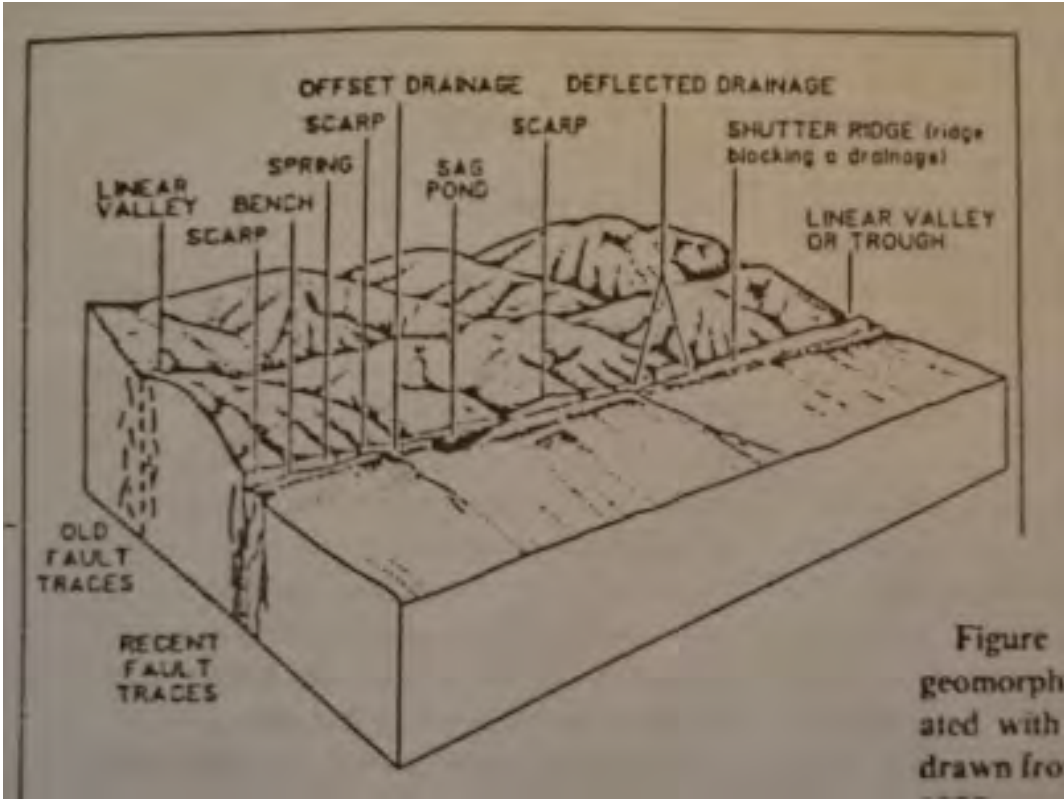
The Rowenzori Block



Drainage reversal - Palae current W, now S



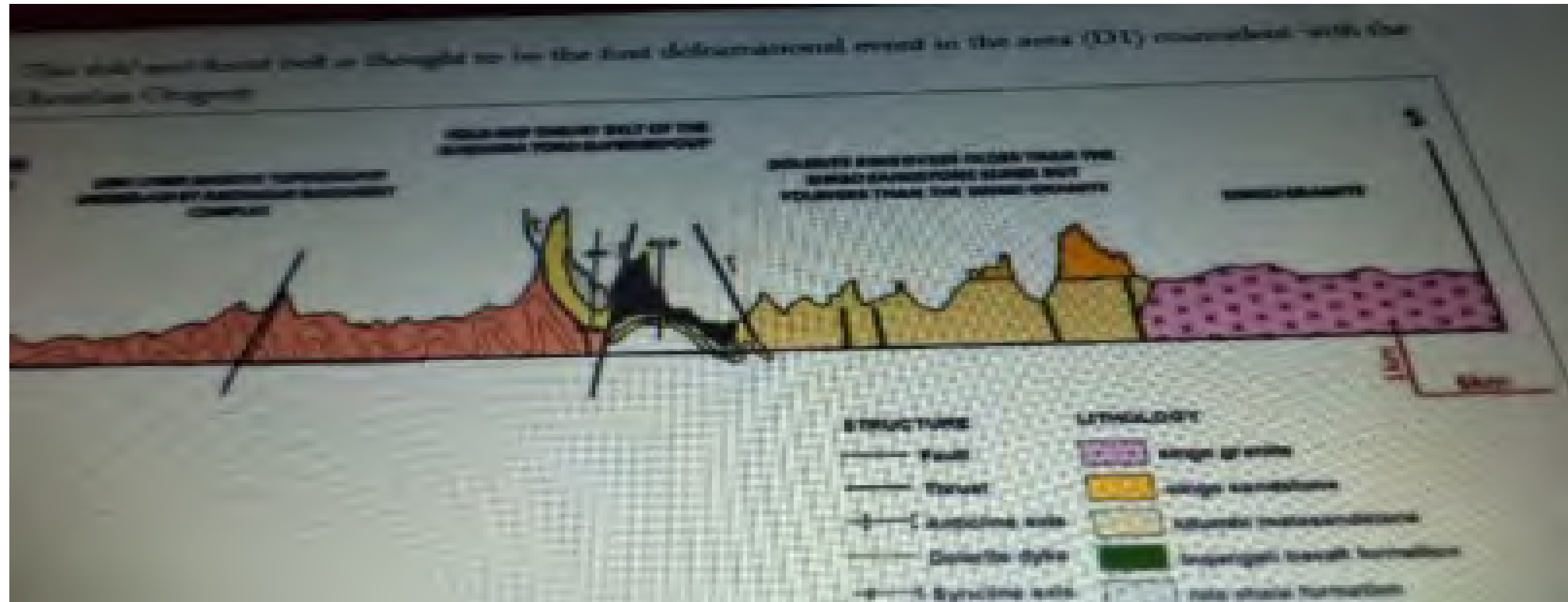
Mts produced in strike - slip environments

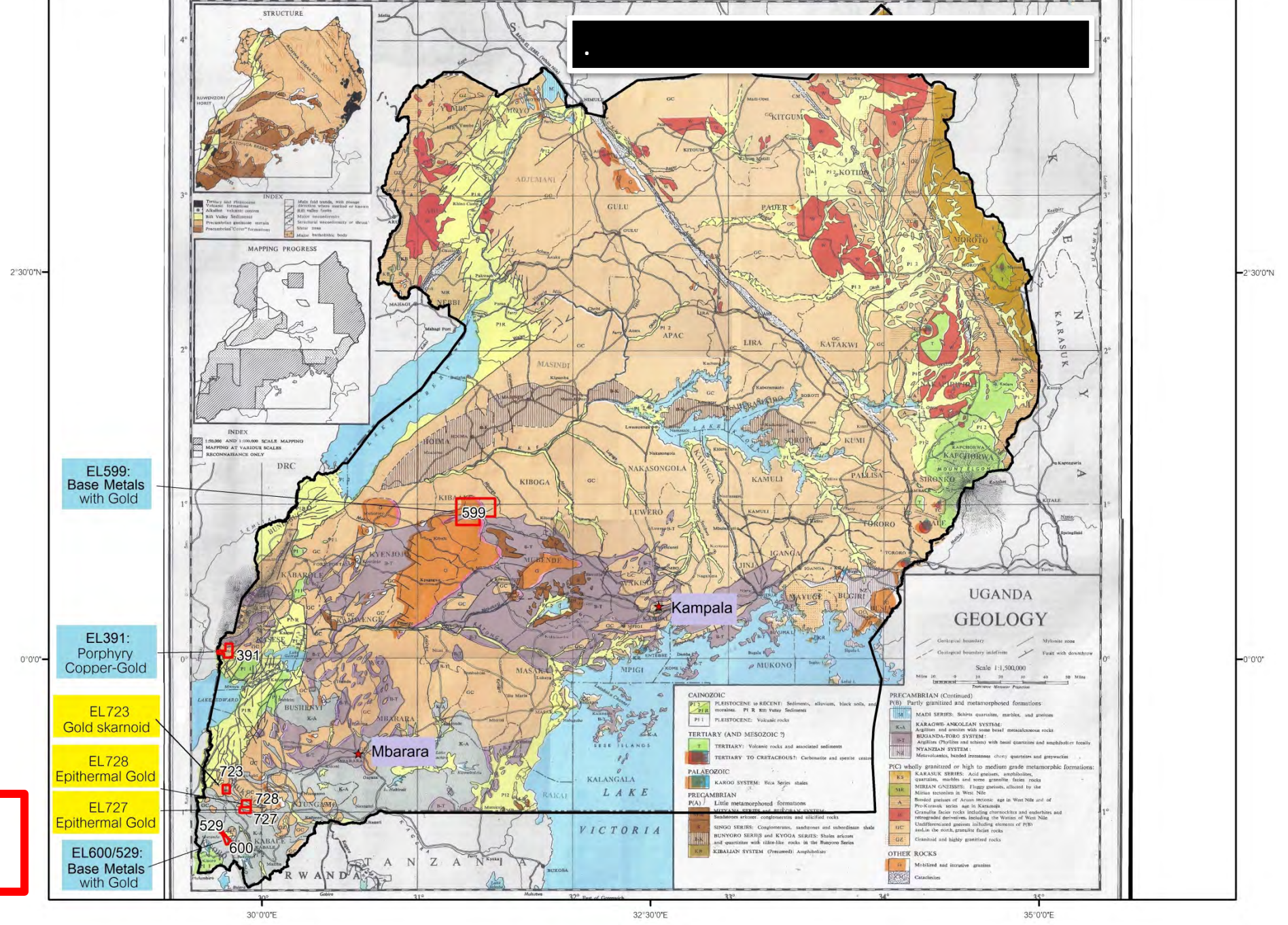


Rukunjiri Mountains- geomorphic features from strike –slip faulting



Section facing NE , showing thrust and strike –slip faults and folds- Deformational event is D₁- Ubendian orogeny





EL599:
Base Metals
with Gold

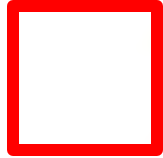
EL391:
Porphyry
Copper-Gold

EL723
Gold skarnoid

EL728
Epithermal Gold

EL727
Epithermal Gold

EL600/529:
Base Metals
with Gold



Crustal Evolution In Proterozoic

80% of present continental crust had formed by end of Palaeoproterozoic.

Only 25-40% is preserved the rest is buried, recycled , overprinted (Goodwin1991)

Palaeoproterozoic- BIFs, Layered Complexes, global orogenesis, stabilization-cratonization (Tanzanian etc,)

2 deformational phases termed the Ubendian orogeny.

2100-2025Ma characterized by E-W to WNW –ESE foliation and granulite facies.

The 2nd phase occurred between 1950-1850Ma-and the so called Ubendian belt, was formed.

Mesoproterozoic: Platform covers, continued expansion of platform covers, Rodinia amalgamation (1000 Ma), Narrow belts of intense deformation. tectonics S-type granites (compression syntectonic). Later A –type (S/Slip tensional)

Kibaran (1.4-0.9Ma) Orogeny. Rift tectonics recorded here.

1375Ga the Kibaran event was coined. Here bimodal volcanism under intra-cratonic, regional scale extension stress regime took place.

Neoproterozoic: Global rifting, Collision of E and W Gondwana(700 Ma), Cooling event of 500 Ma, Glaciation

2 phases –The early phase of oblique collision between E and W Gondwana.

At the end of the Pre Cambrian there was a collision of East Gondwana and West Gondwana. Then subsequently the Mozambique mobile belt was formed. In Uganda it is recognised as the Karasuk group of metasedimentary rocks over-thrust onto the Aruan.

Cenozoic-Recent Tectonic

- The East African Rift System (“EARS”) runs from the Afar triangle of Ethiopia to the Zambezi River in Mozambique, part of the Afro-Arabian Rift that extends north into Turkey (35 Ma). The eastern branch of the EARS, sometimes known as the Gregory Rift, lies to the east of Lake Victoria and strikes northeast. The Western or Albertine Rift strikes south along the western borders of Uganda, Rwanda, Burundi and into Tanzania. The structure is that of a graben bounded by fault zones around 40-50 km apart. **Branches contemporaneous. E thought to be 15 Ma than W.**

- Steep fault scarps mark the flanks of the graben structures; Mt. Margherita in the Ruwenzori Mountains at 5,110 m rises. **This is the example of shoulder uplift of a block of crystalline basement in an extensional setting in the world.** Most of the faults defining the rifts are steep normal, or dip-slip faults, frequently offset in en-echelon arrangement.

The graben are usually asymmetric, with a single large fault on one side and sets of smaller step faults or a monoclinial flexure on the other side. Grid faulting with an average spacing of 1.5 km is common on the graben floor.

- Much of the present land surface of Uganda has suffered deep and intense weathering over geological time that has led to the **accumulation of residual concentrations of resistant minerals.** Deposits formed in this way include those containing **tin, apatite (phosphate), gold, pyrochlore and gemstones**, all of which occur in Uganda. Deposits formed by chemical action during deep weathering include **uranium in calcrete and sandstones as well as nickel in laterite.** Nickel deposits of this type occur in Burundi. No uranium deposits of commercial significance are known.

Pleistocene

Western branch of EARS with grabens bordered by high angle normal faults.

- After glaciation, in the Palaeozoic, warmer and more humid conditions prevailed in the Mesozoic, this in turn led to weathering of Jurassic/mid-Cretaceous terrains during a period of tectonic quiescence.
- Opening of the South Atlantic Ocean terminated the weathering cycle above and instigated a cycle of stripping between mid-Cretaceous and early Miocene. This gave rise to the “African” surface which has persisted from the Miocene to the present day.
- Rifting in S. Uganda separated the Tanzanian craton from the rest of Uganda.
Rifting induced sedimentation and volcanism, then convergence of the Kasai and Tanzanian cratons

Trachyte plug- Bufumbira field



Modifying factors

- **Stripping** and **deep weathering**

Being a function of:

- **Climatic conditions**
- **Recharge rates, sea levels**
- **Bacterial activity**

- **Stripping during tectonism**
- **Deep weathering during period of quiescence**

Parallel drainage in fine grained sediments and pelite



Carbonatite tuff cones in western rift- Fort Portal



Quartzite capped hills – Rukunjiri (African surface)



Katwe-Kikorongo caldera



Crater lake — Katwe Kikorongo



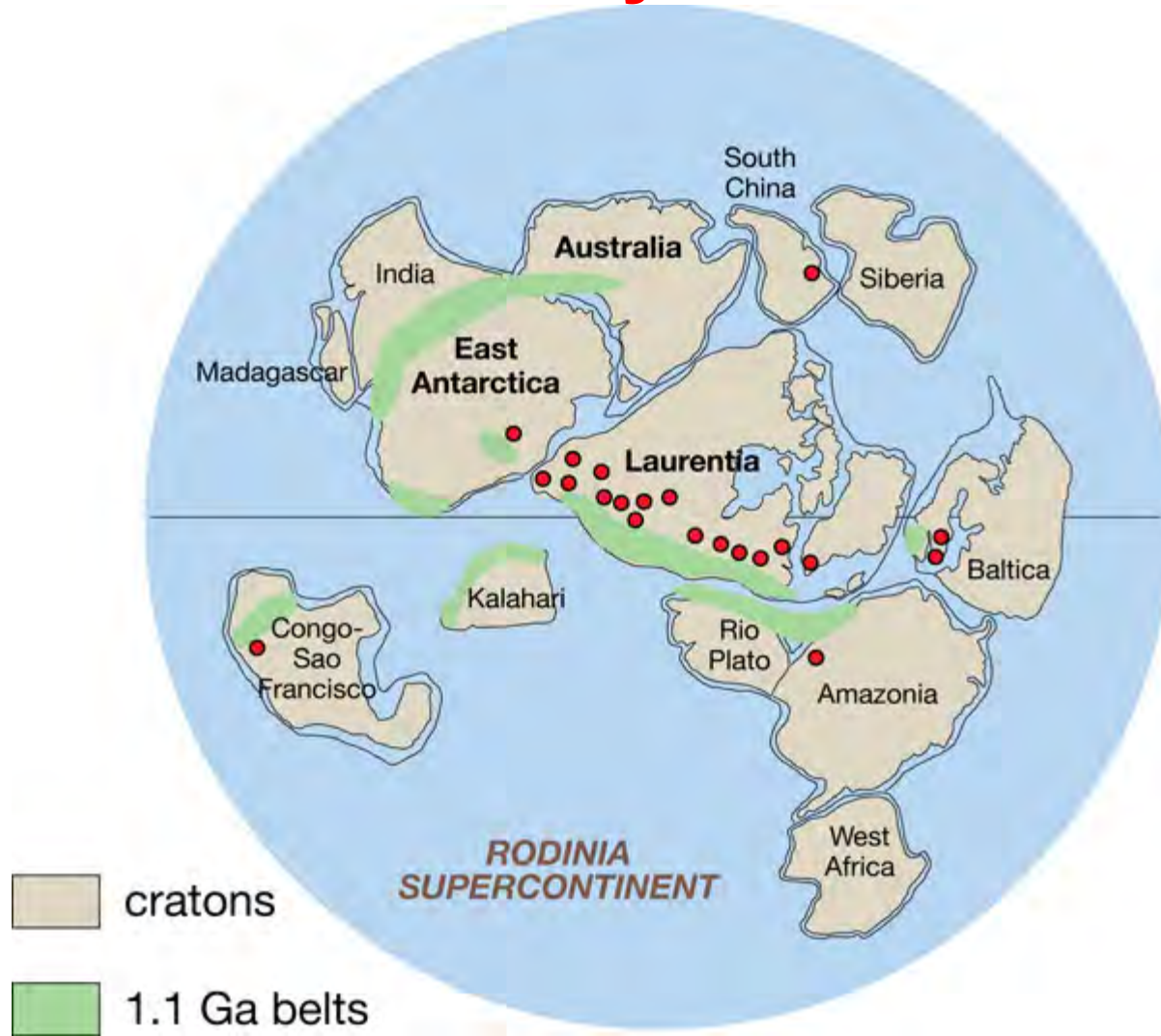
III – sorted unconsolidated sediments from conglomerates, quartzites and mafic intrusives – Kanungu district



African Surface – with both mature U shaped valleys & V shaped valleys.



Rodinia (Li et alia, 1995) Modified by Waedal, 2005



Geomorphology of SW Uganda

Classification on basis of:

- **Tectonism – Folds, faults, upwarping & volcanicity**
 - **Morphology**
 - **Relief**
 - **Climate**
 - **Sedimentological aspects**

Summary

3 Major orogenies

- **D₁ & D₂ Collision of Tanzanian and Congo cratons.**
- **D₃ orogenic event leading to tin metallogenic province and formation of supercontinent Rodinia at 1Ga.**
- **D₄ Pan African orogeny and collision of E & W Gondwana.**
- **EARS**

Equator in Uganda

