

DAY MEDAL LECTURE

Mark Harrison

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Is he stupid or just lazy?

- Born and raised in Kerrisdale, B.C.
- Chronic underachiever
- Career goal: Jet pilot
- High school grad & flyboy June '70
- Flunk out of community college & learn airline career not on
- Off to Oz!

The image is a composite. At the top is a school report card with a legend for progress symbols: O (Outstanding), G (Good), N (Normal), S (Slow), and U (Unsatisfactory). Below the legend is a table for 'GENERAL DEVELOPMENT' with columns for 'First Report', 'Second Report', and 'Third Report'. The table contains handwritten 'X' marks for 'Health Habits' and 'General Behavior', and 'U' marks for 'Work Habits'. A thought bubble containing a yellow biplane with 'SE' on the fuselage and 'NAVY 16895' on the tail is positioned over the report card. A circular inset shows a black and white portrait of a young boy. A white oval highlights a 'U' mark in the 'Third Report' column of the 'Work Habits' row.

	First Report	Second Report	Third Report	Fourth Report
Health Habits	X	X	X	X
General Behavior	X	X	X	X
Work Habits	U	S	S	U

REMARKS*

First Report: Mark is inattentive in class. He does not do his work if he is not interested.

Second Report: Mark is inattentive from lack of interest.

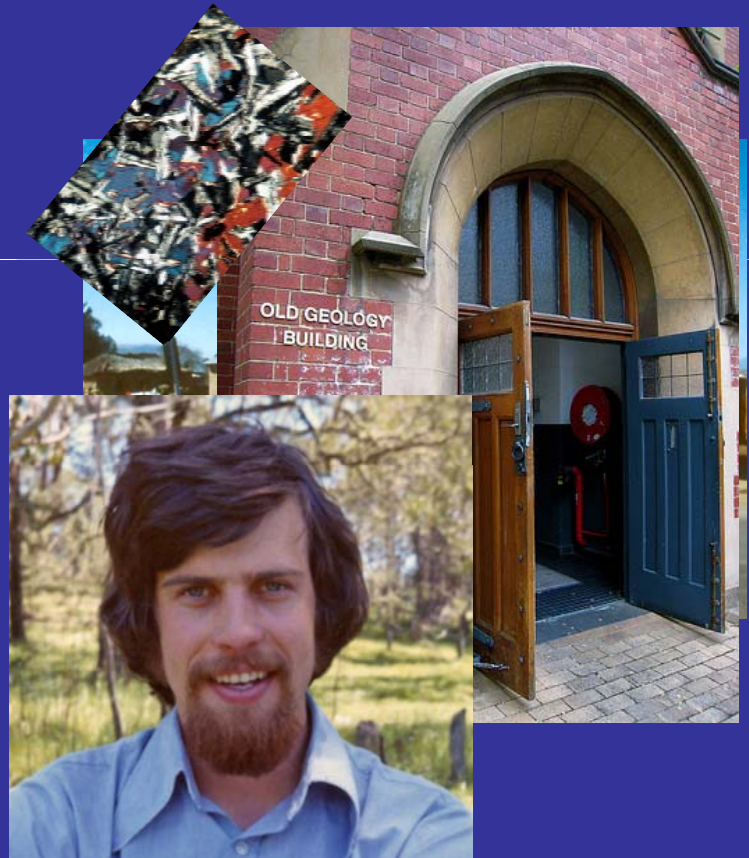
Third Report: Mark is inconsistent in his work and finds it difficult to keep up the pace of this class.

Fourth Report: Mark needs extra practice in Arithmetic. He seems to understand his work but works slowly.

* Ratings by the Teacher are required for each report. It is strongly recommended that written comments be given by the Teacher whenever necessary.

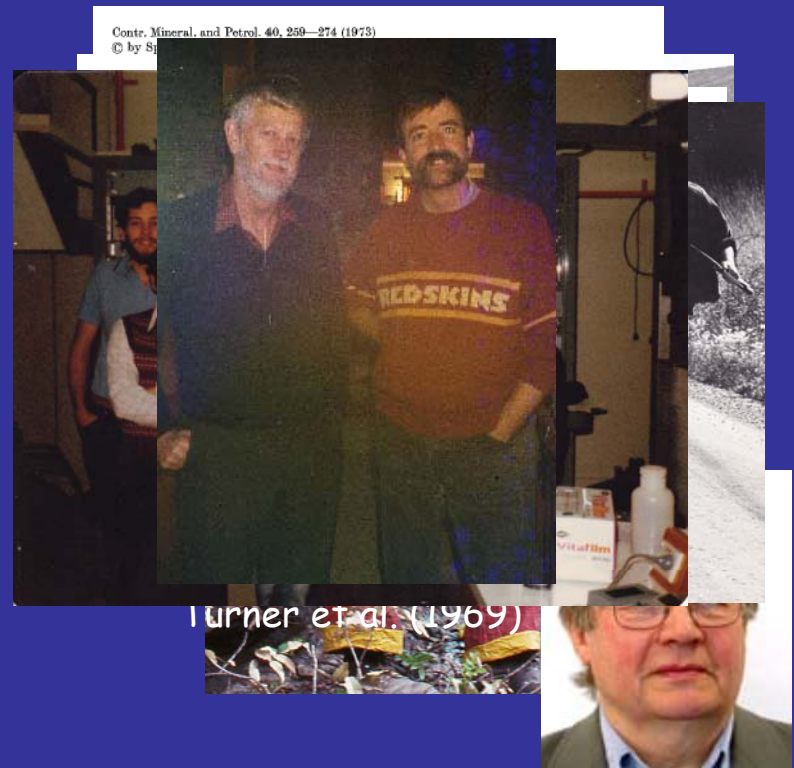
Maybe better luck in southern hemisphere?

- Made thin sections at Melbourne Uni & hung with grad students
- Show up in South Africa & meet cute Aussie redhead at Jo'burg youth hostel
- Worked at Anglo American's research lab running e-probe
- Geology is for me!



Early days of thermochronometry

- Back to Vancouver to attend UBC
- Dick Armstrong advises honors thesis; leads me to Dodson (1973)
- Take geophysics from Garry Clarke & pester him about thermal modeling
- Create first geochron cooling curve & model simulation
- Saw Turner's $^{40}\text{Ar}/^{39}\text{Ar}$ lunar age spectra & my future
- Dick orders me to ANU for Ph.D. with Ian McDougall



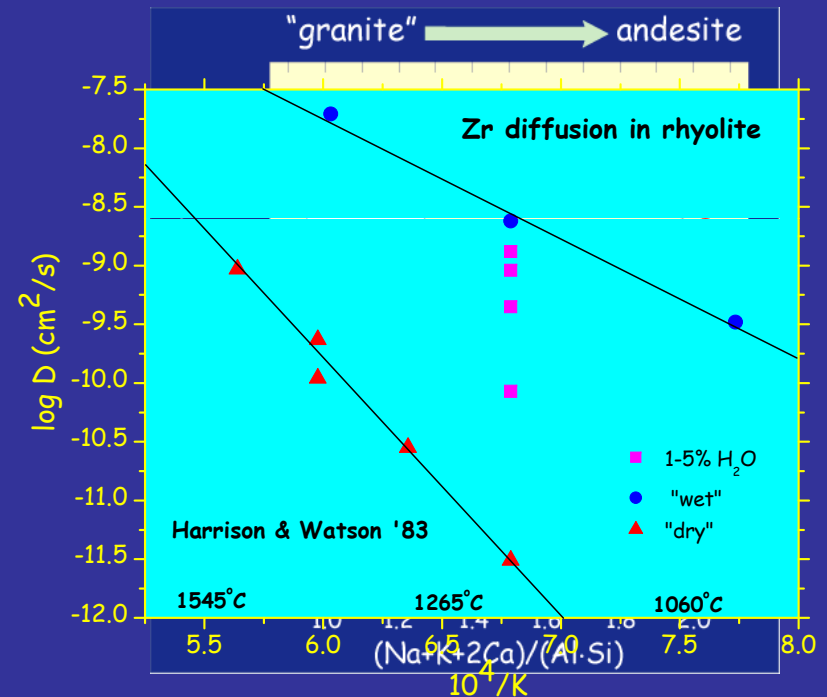
Accessory mineral systematics

- I watch SHRIMP being built at ANU
- Kevin Burke gives me job at SUNYA; I connect with Bruce Watson at RPI
- Inherited zircon cores with magmatic overgrowths not understood
- Zircon solubility a function of T & magma composition & zircons dissolve quickly via diffusion
- Saturation thermometry born



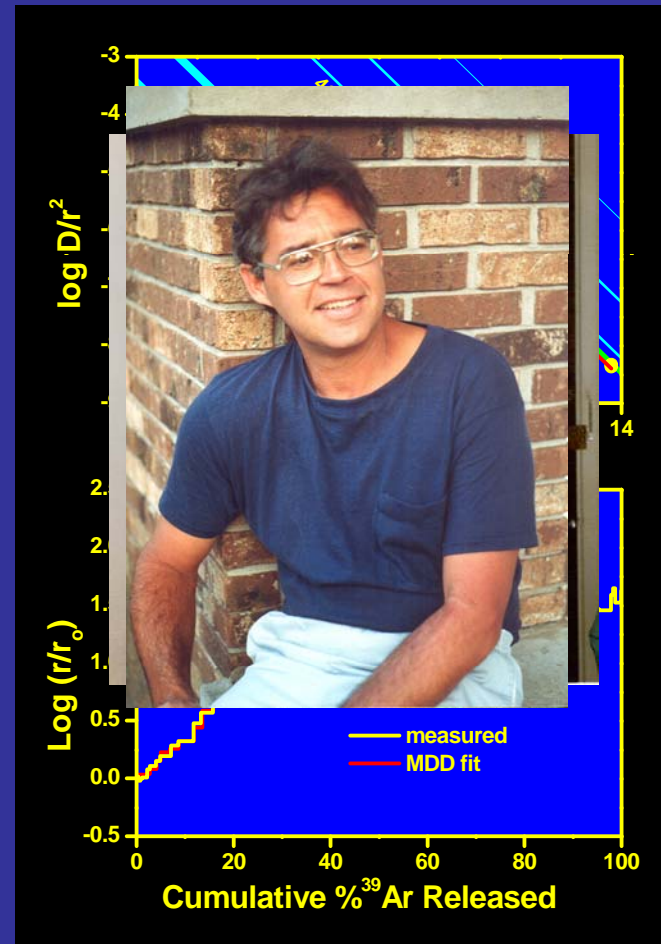
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Multi-diffusion domain model

- A critical comment on Richter's '86 paper
- With Lovera the MMD model is born
- MDD explains behavior of K-spar $^{40}\text{Ar}/^{39}\text{Ar}$ age spectra and ushers in continuous thermochronology
- Off to UCLA

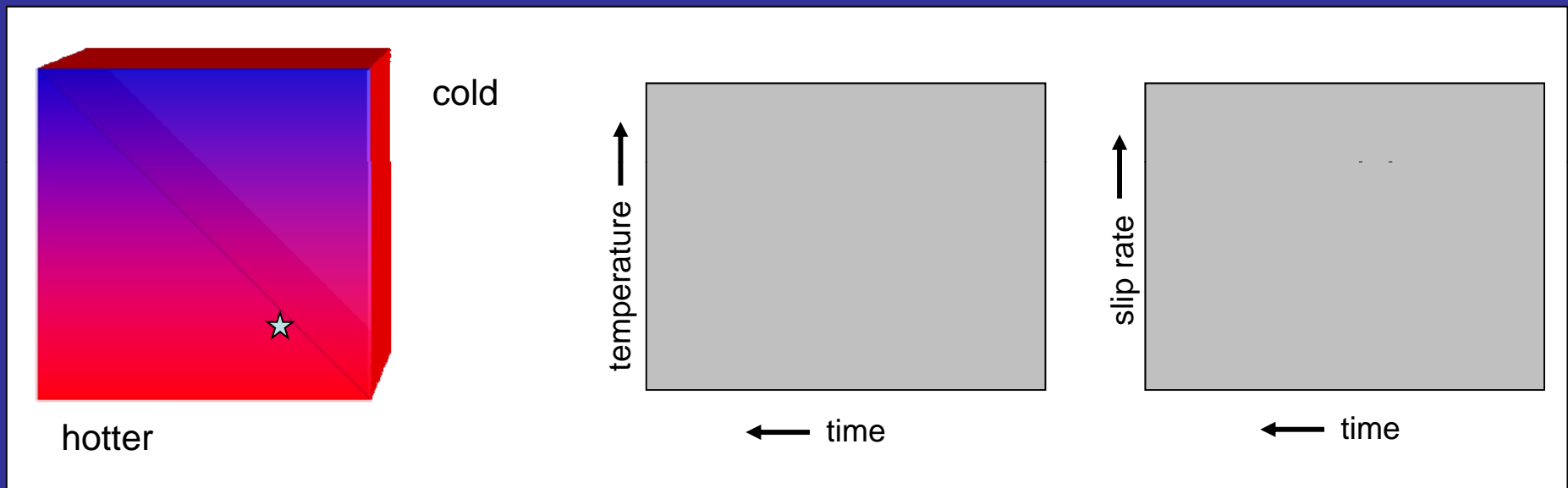


Tibet and the Himalaya

- At SUNYA, Bill Kidd volunteers me as Tibetan geochron 'wallah'
- Arrive at UCLA & meet Mandarin speaking structural geologist...Hmmm
- 'Golden era' for grad students
- Working in Yunnan with Rick Ryerson, we encounter Paul Tapponnier



Slip on a fault ramp juxtaposes cool block against hotter rock causing rapid cooling (and heating)...

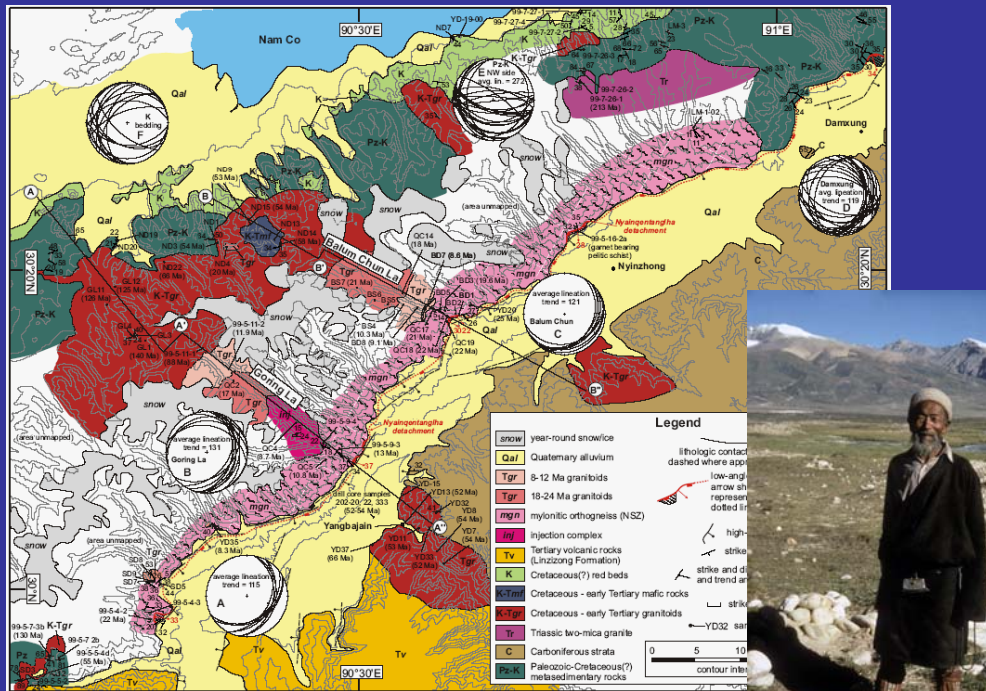
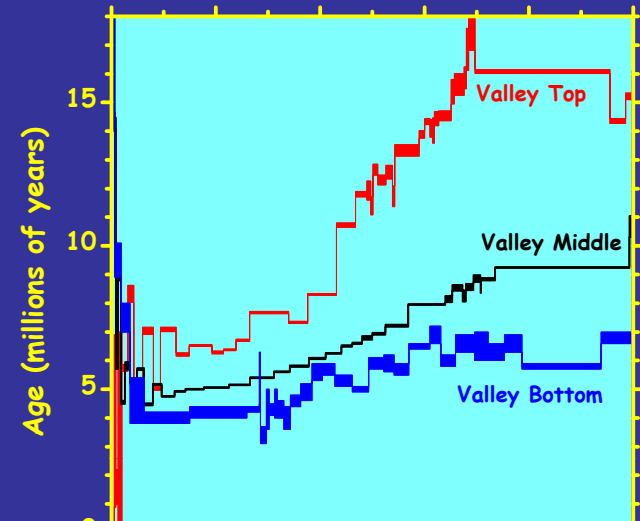


If temperature history adjacent major fault is known, we can reconstruct its **slip history** using thermo-kinematic modeling

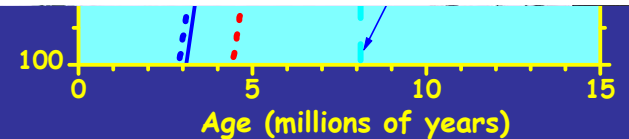
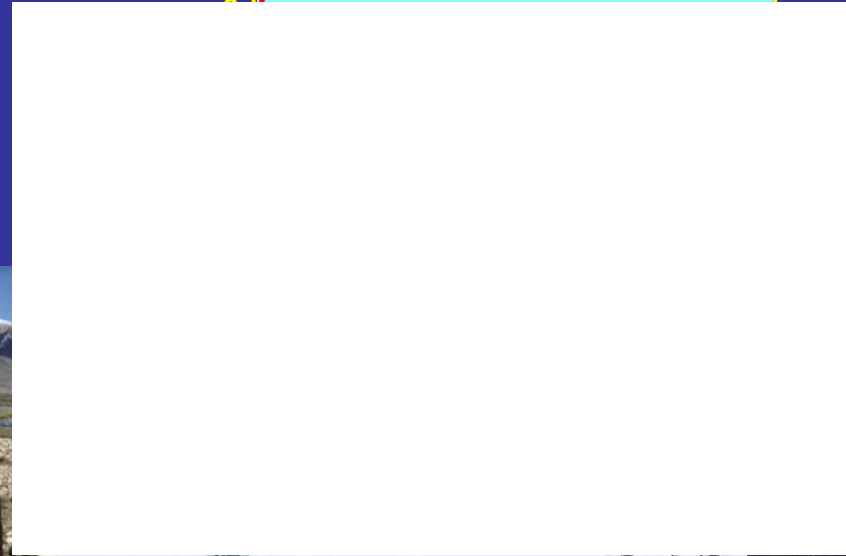
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Map the geology & take samples along the glacially incised valley adjacent the fault

Numerical simulation of the cooling history indicates that rifting began at 8 Ma at 3 mm/yr



Kapp et al. (2005)



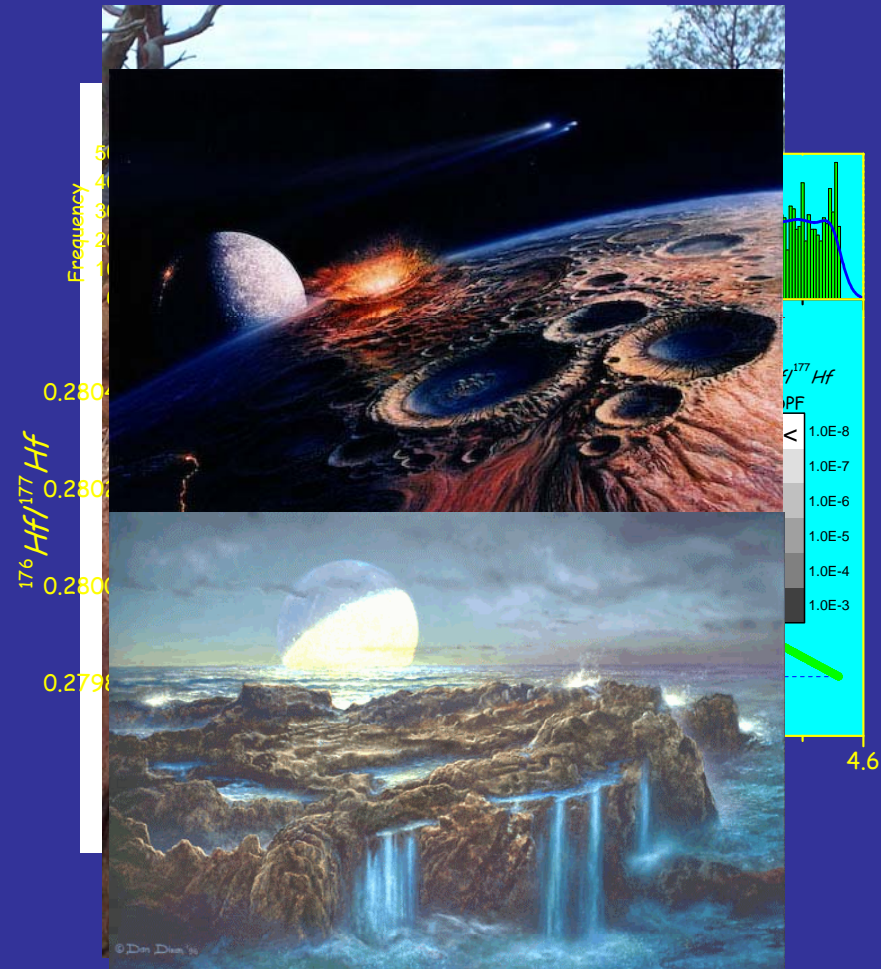
UCLA ion microprobe

- In '90, team up with Kevin McKeegan to specify new generation SIMS
- Numerous discoveries & new methods:
 - isotopic evidence of >3.83 Ga life
 - Th-Pb prograde thermochronology
 - SIMS U-Th series dating
 - $\delta^{13}\text{C}$ of fossil taxa
 - FISH-SIMS
 - solar oxygen isotope composition
 - U-Th-Pb depth profiling
 - nuclear irradiation in solar nebula
 - ultrahigh resolution climate records
 - evidence of early terrestrial ocean
 - age of lunar KREEP
- Hosted >300 visiting scientists



Early Earth

- Dick Armstrong noted for 'crackpot' ideas about early Earth
- Hadean zircons underused in providing clues to early Earth
- Initiated 'Mission to Really Early Earth'
- >150,000 Jack Hills zircons dated!
- Results consistent with Dick's vision of early Earth



In parting

- Be kind to late bloomers
- Work with smart, visionary people
- Suspect that much of what you're told is wrong
- Thanks to family, mentors, students, collaborators,...& Australia

