

The illusive Final Solution

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**Nuclear waste
calls for a long-term isolation
under strict safety**

**Geology is the key
to a meaningful long-term assessment
of adequate safety for any type of sub-surface storage
of high-level nuclear waste**

The Ever Lasting Waste

**We can never get rid of the waste,
just place it out of sight
and, what is worse, place it out of our control.**

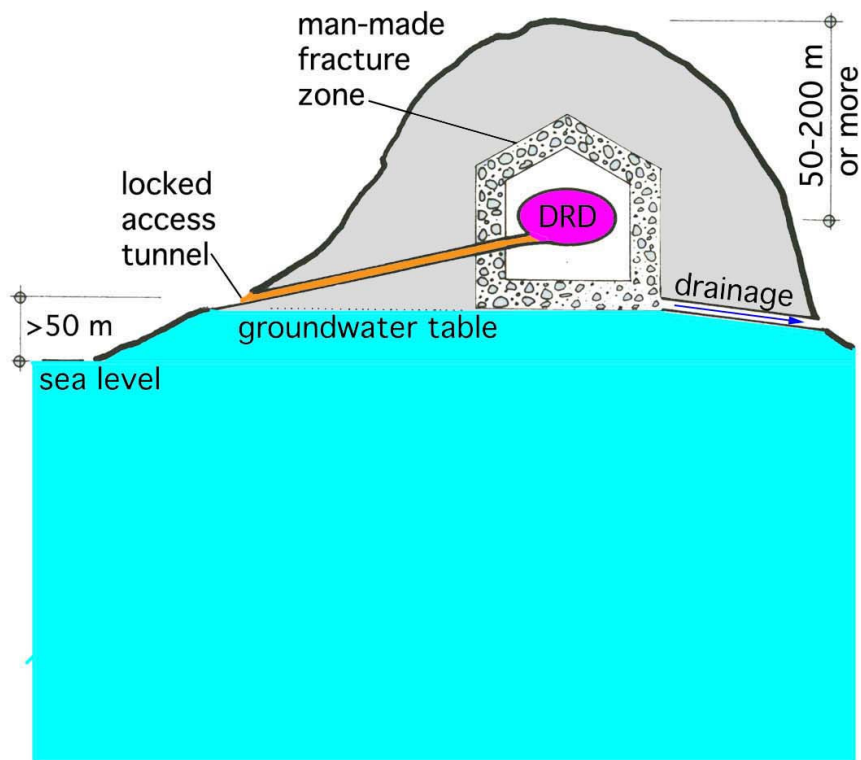
**As long as uncertainties remain,
we must **keep the control** of the waste.**

**Besides, the toxicity of the waste will remain,
at least, for 100,000 years.**

So, what can we do?

Dry Rock Deposit (DRD)

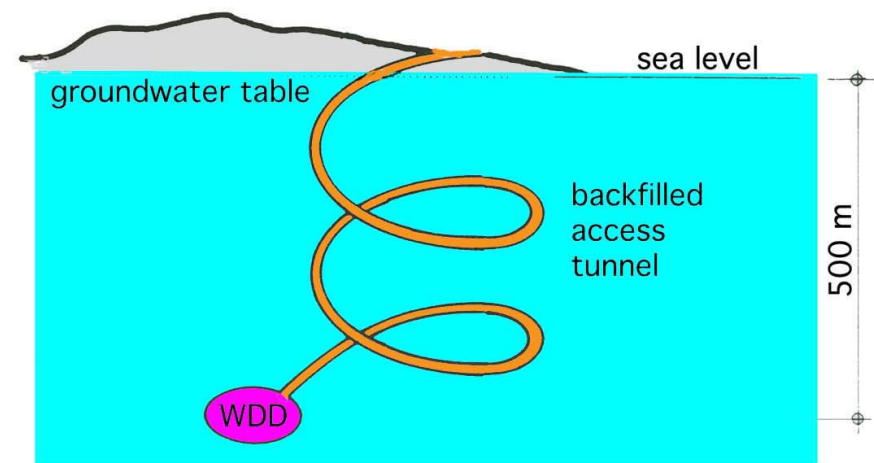
high relief area
far above sea level



Accessible and Controllable

Wet Deep Disposal (WDD) of KBS-3 type

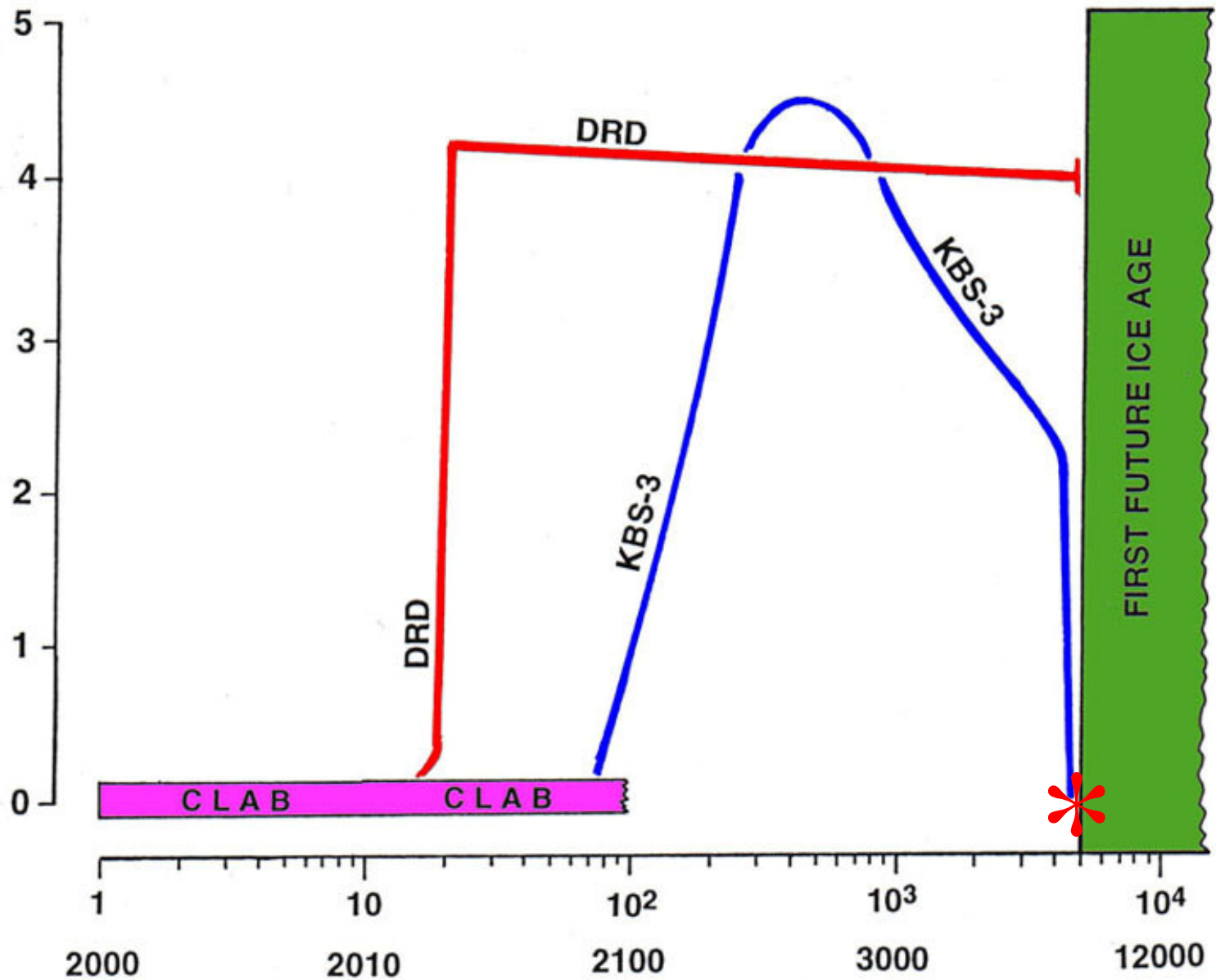
low relief area
close to sea level



Closed and Final

Relative safety-scale from 0 to 5

"SAFETY"



Logarithmic time-scale up to First Future Ice Age

UP

Old claims by SKB & Posiva

full stability

max. 0.1 M7 earthquake

only old fault reactivation

stable bedrock “plinths”

50-100 m respect distance

(issue not known)

many additional aspects

steady state treatment

New Observational Facts

no stability

100M7, 10M8, some M9

new faults & fractures

no such things

deform distance 10–50 km

methane ice explosion

many other factors

highly dynamic systems

DOWN

The KBS-3 method and the 100,000 years of required safety

DURING 100,000 YEARS	Assumptions and Models by SKB and POSIVA	Assumptions & Models COLLAPSED stability concept seismic concept respect distance methane explosion lots of other things
TODAY	CLAIMS by SKB and POSIVA	MUCH REMAINS to solve to show to improve
	RELIABLE	UNRELIABLE

A total of 58
paleoseismic events
recorded by 2007

ICE COVER

32 30 28

ICE COVER

13

10

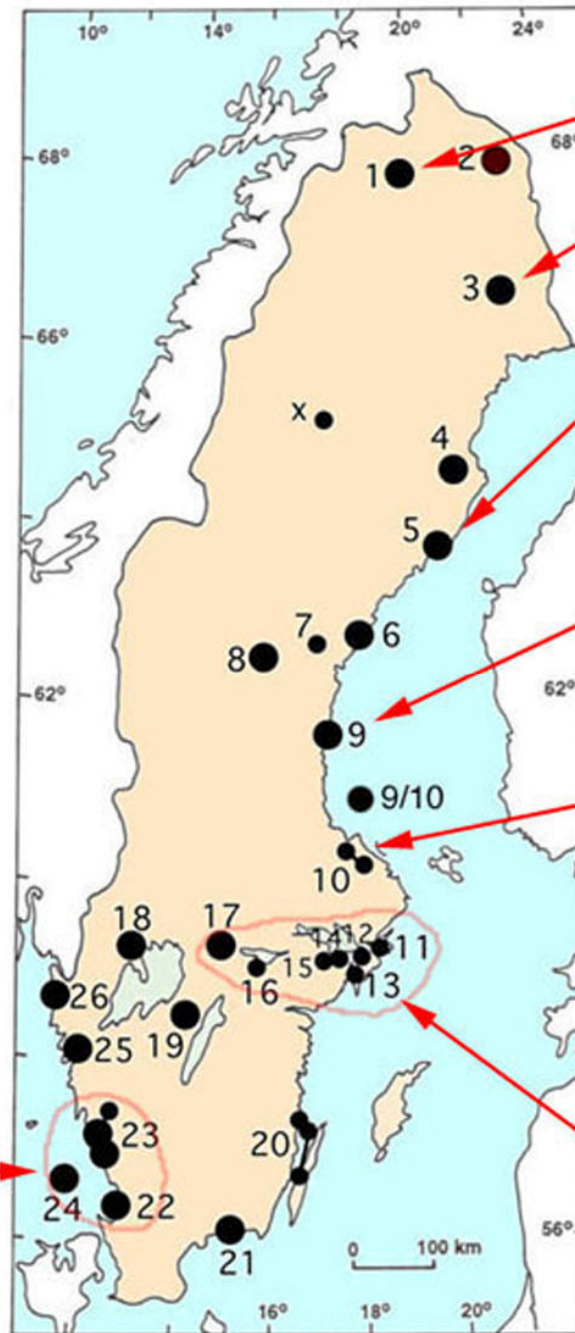
5

0

15
10
5
0

13 KA

13



Pärve

Lansjärv

5

9

7

10

5

10

14

11 KA

0

Seismic Hazard Prediction for the next 100,000 years

A: Blue box – based on seismic data only (SKB)

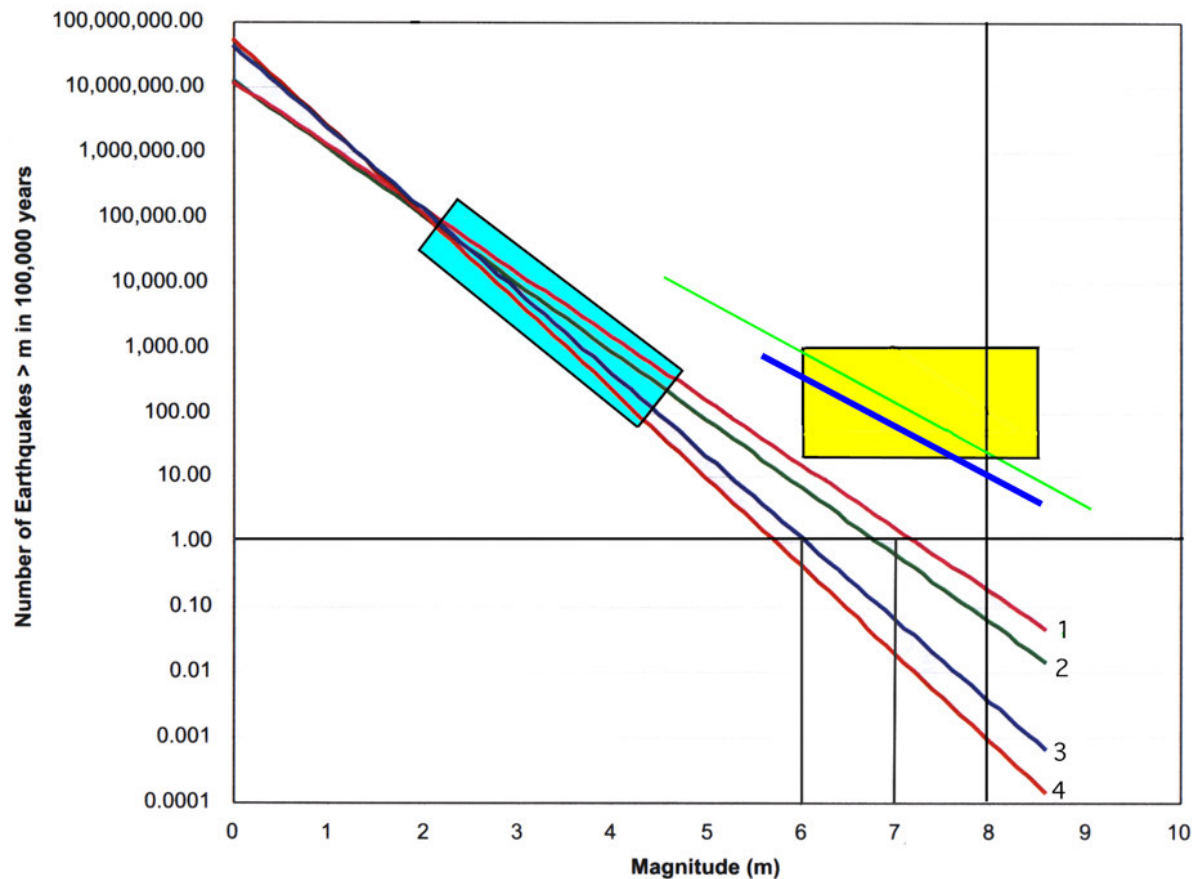
max 1 M 7 event in 100,000 years

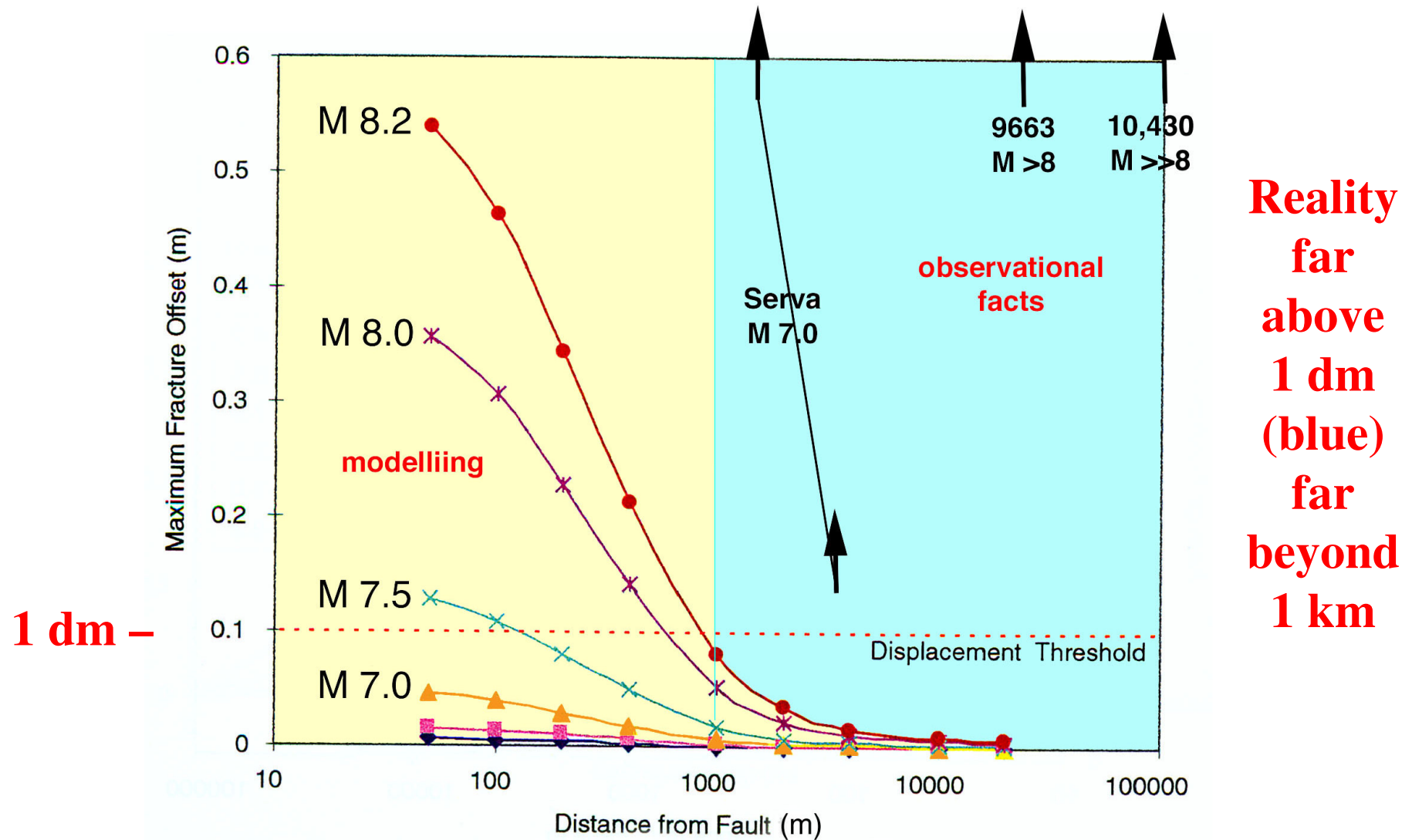
B: Yellow box – based on paleoseismic data (Mörner)

100–1000 M 7 events

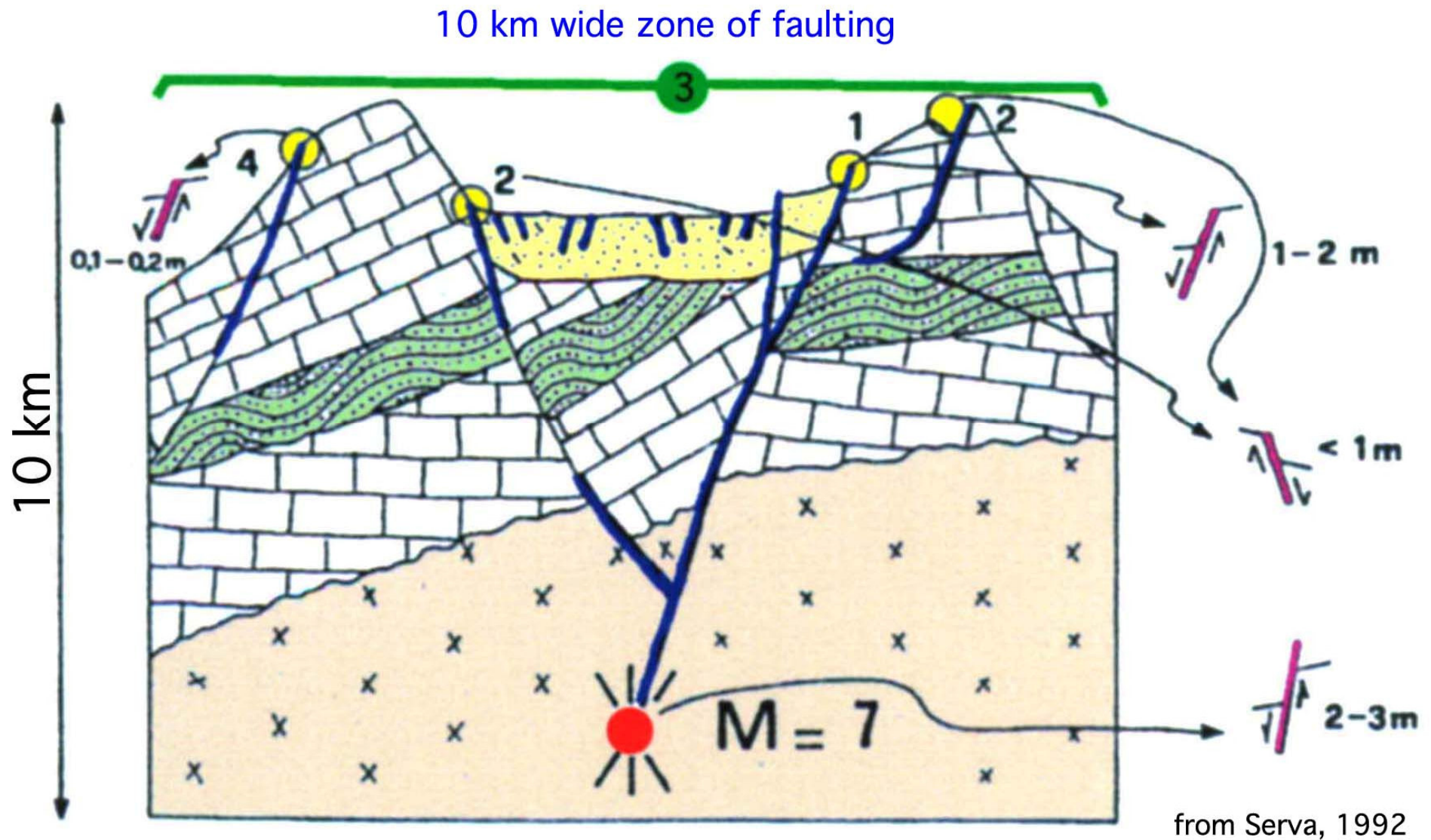
>10 M 8 events

even some M ~9 events

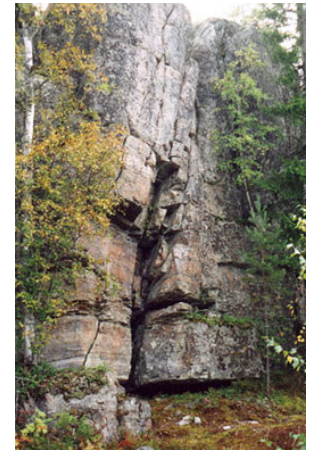
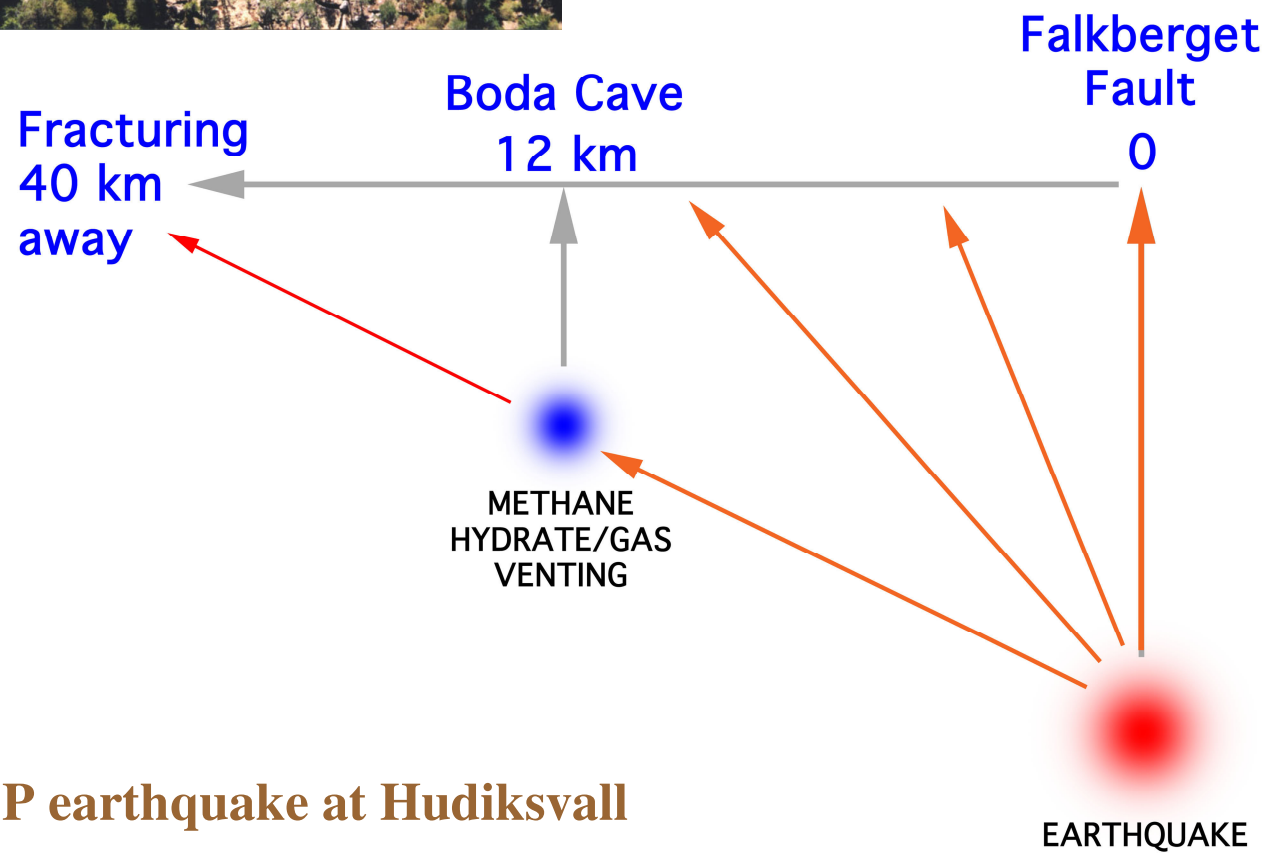
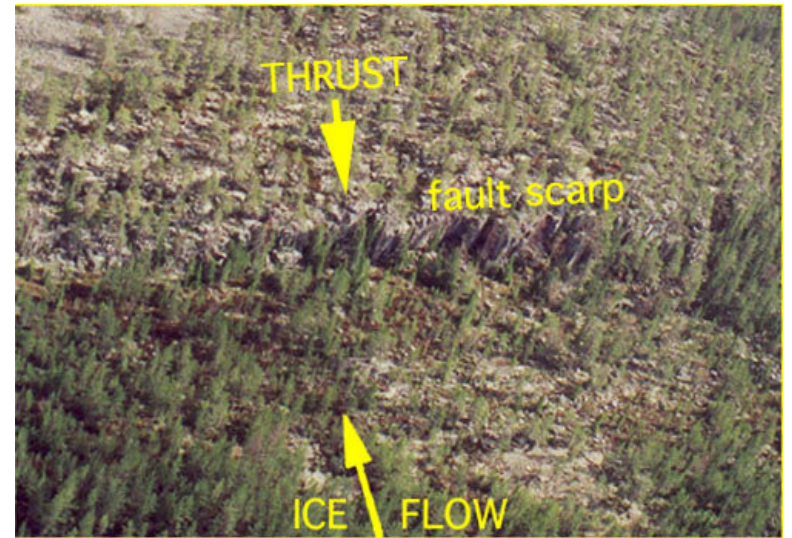




In order to obtain room enough in the bedrock, SKB and Posiva claim that the waste can be placed **only 50-100 m** from regional faults (yellow field above). This a "geological insult" and we must talk about **10-50 km** (blue field above). By that it is no longer room enough in the bedrock for the KBS-3 method.

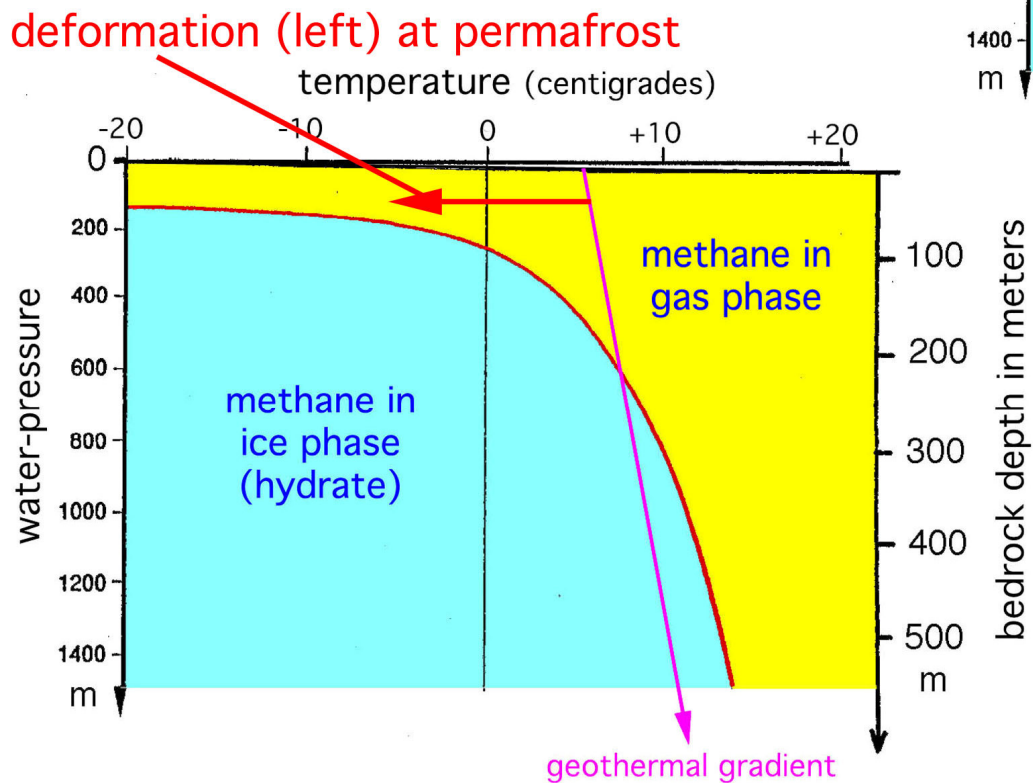
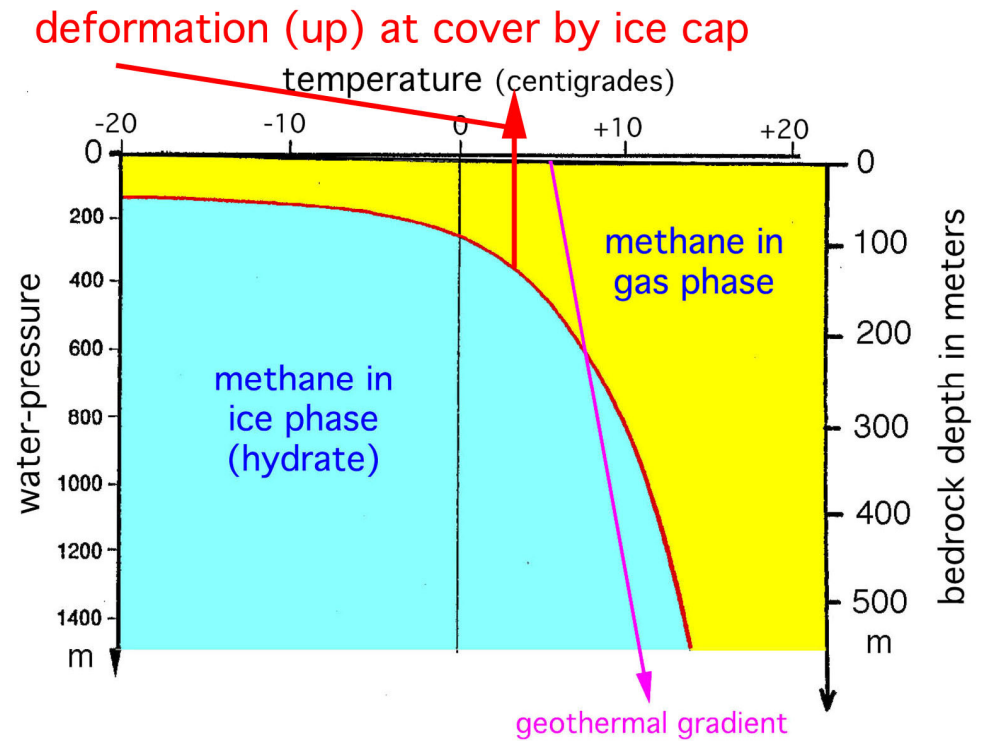


Repository at 500 m for 100,000 years: The claim of a "safe zone" only 50-100 m from a regional fault is, of course, sheer nonsense.



The 9663 vBP earthquake at Hudiksvall

**Phase boundary moves up
at glacial ice cover
(right)**



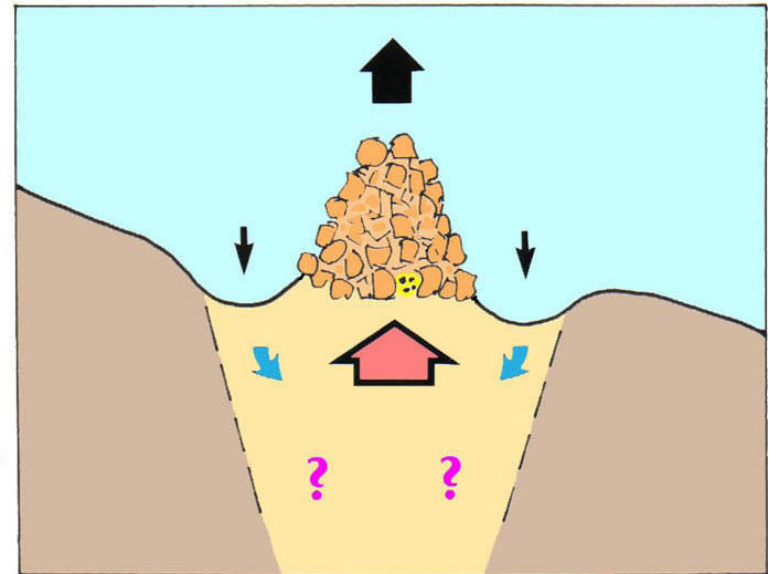
**Geothermal gradient
moves left at permafrost
(left)**

Explosive Methane Venting 2000 years ago

A 25 m high **cone of huge blocks** (of sizes of up to ~2000 tons) partly rests on beach material younger than 3200 BP.

The causation event **set up a tsunami** recorded in many lakes and bogs up to 20 m above the corresponding sea level position at +18 m from 2000 BP.

The most likely driving mechanism is **a subsurface explosive venting of methane gas** from a sudden phase-transition from methane hydrate to gas.



There is no solution just a gradation of lies

**The best thing to do must be
to keep the freedom of action and
to keep the control over the waste**

**SKB continues to claim that they have the ultimate solution,
which will guarantee full safety for 100,000 years**

This is nothing but unscientific nonsense, of course

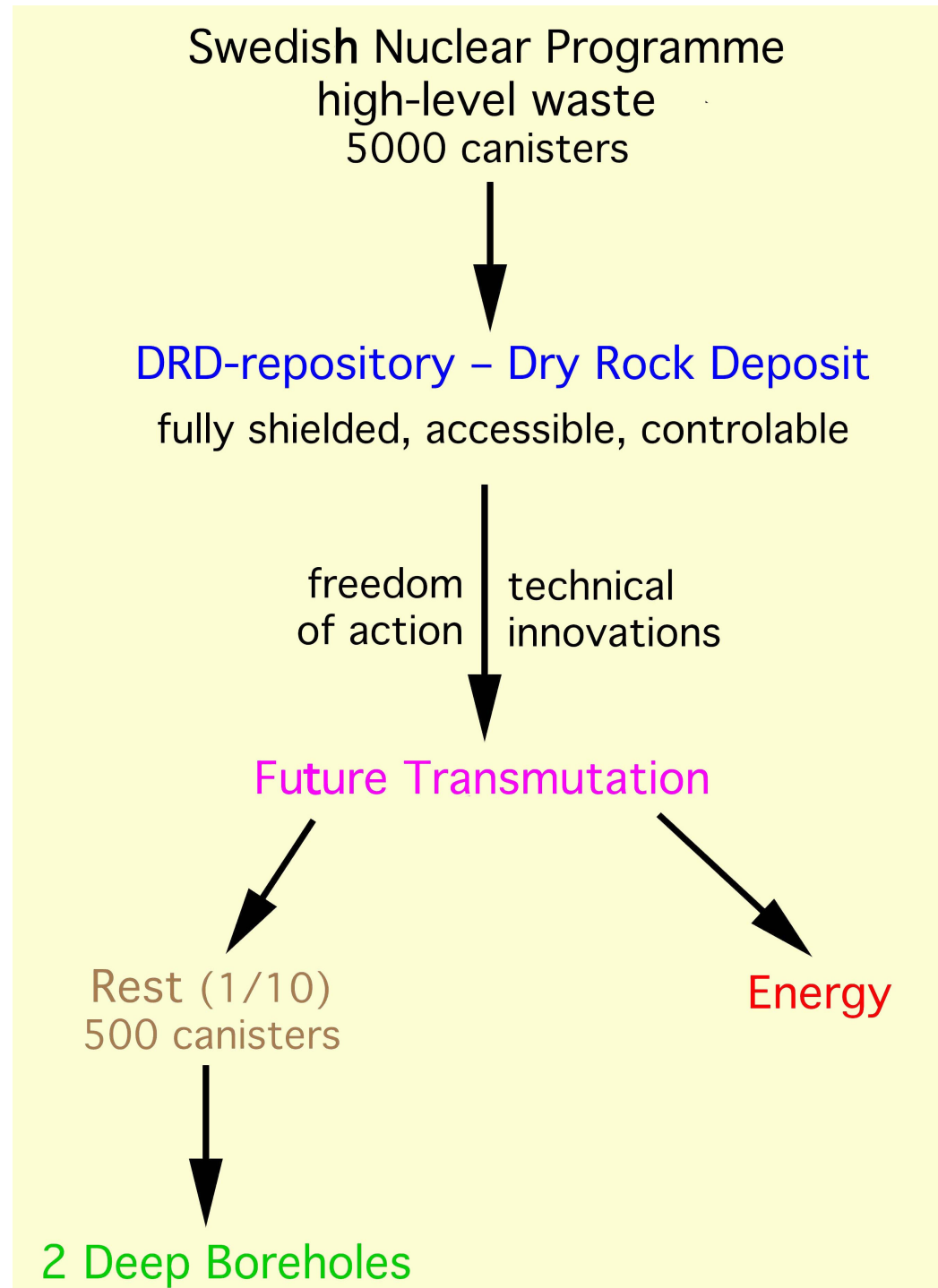
**and their seminar on September 25 on
“From Politics to Solution”
will be another day of
desinformation
and lies**

Let us admit that we cannot guarantee an adequate safety for 100,000 years.

and see how we should handle in the best possible way with the freedom of action kept like the possibility of control.

We have a proposal that harmonizes with:

- modern scientific knowledge
- environmental concern
- energy concern
- technology & innovation



CONCLUSIONS

”Final Solution” is a Big Bluff

Truly it is nothing but

a Dead End

as a serious way of handling the waste

as a long-term destiny for life on Earth

References

- Mörner, N.-A., 2008. Paleoseismicity and Uplift of Sweden. Guide-book: **33 IGC excursion No 11**, p. 1-107, The Nordic IGC foundation.
- Mörner, N.-A., 2005. An interpretation and catalogue of paleoseismicity in Sweden. *Tectonophysics*, 408, 265-307.
- Mörner, N.-A., 2004. Active faults and paleoseismicity in Fennoscandia, especially Sweden. Primary structures and secondary effects. *Tectonophysics*, 380, 139-157.
- Mörner, N.-A., 2003. *Paleoseismicity of Sweden – a novel paradigm*. Contribution to the INQUA XVI Congress, Reno, Nevada, 2003. Printed by the P&G unit of Stockholm University, Sweden, 320 pp.

**The 2003 book (320 pp, A4, hard cover, in colour)
is sold here at 30 Euro (= 25% reduction)**