



# Kas vetsufy.com ongi lahendus?

Erik Puura, Tartu Ülikooli areendusprorektor

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# Sa ei ole oma häädas üksi.

Saa tuttavaks innovaatilise teenusega, mis  
muudab sanitaarmaailma täielikult.

[vetsufy.com](https://vetsufy.com) – mobiiliäpp, mille kaudu saab tellida endale järelkäruul käimla

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/NALI/

Lihtsusta avaldis!

$$6) \left( \frac{x^2(x+y)^2}{y^4(2x-y)^3} \right)^4 \div \left( \frac{x^4(x+y)^3}{y^7(2x-y)^6} \right)$$

Sõnum: matemaatika ja ettevõtlikkus on seotud palju rohkem, kui me tunnetame

Sama moodi inseneeria ja juhtimine



Ettevõtlikud noored:

- sageli 4-3-sed, mitte 5-sed
- organisaatorid
- küsivad tüütuid küsimusi

Miks me seda õpime?

0 – istu vaikselt ja ära sega tundi

1 – sest see on õpikus kirjas

2 – seda lihtsalt peab oskama

3 – kui saad matemaatikuks, saad aru

9 – selgitan seoseid reaalse eluga

10 – õpetan nii, et seda küsimust ei peakski küsima

Lihtsustamise selgitamisel mina kui keematehnika doktor jään pisut jänni, sest teatud piirist EI TOHI edasi lihtsustada

Kristo Käärman  
 Haplotype inference using overlapping segments  
 Master's Thesis

Supervisor: Jaak Vilo, *PhD*  
 Instructor: Sven Laur, *MSc*

and by our assumptions all haplotype pairs are sampled independently. Next, we have to express  $\Pr[\mathbf{p}, H|G]$ . Due to the Bayes formula

$$p(\mathbf{p}, H|G) = \frac{\Pr[G|\mathbf{p}, H] \cdot \Pr[H|\mathbf{p}] \cdot p(\mathbf{p})}{\Pr[G]} = \prod_{g \in G} \frac{\Pr[g|\mathbf{p}, H] \cdot \Pr[H|\mathbf{p}] \cdot p(\mathbf{p})}{\Pr[g]} \quad (3.4)$$

As haplotype resolution uniquely determines genotype, hence for consistent haplotype resolutions  $H = (h_{11} \oplus h_{21}, \dots, h_{1n} \oplus h_{2n})$ ,

$$p(\mathbf{p}, H|G) = \prod_{k=1}^n \frac{\Pr[h_{1k} \oplus h_{2k}|\mathbf{p}] \cdot p(\mathbf{p})}{\int_{\mathbf{p}} \Pr[g_k|\mathbf{p}] p(\mathbf{p}) d\mathbf{p}} = \prod_{k=1}^n \frac{\Pr[h_{1k} \oplus h_{2k}|\mathbf{p}]}{\int_{\mathbf{p}} \Pr[g_k|\mathbf{p}] d\mathbf{p}}$$

if one assumes constant non-informative prior  $p(\mathbf{p}) = 1$  for  $\mathbf{p} \in [0, 1]^n$ . In other words, a priori no parameters are favored. Note that the denominator is independent from  $\mathbf{p}$  and thus

$$p(\mathbf{p}, H|G) \propto \prod_{k=1}^n p_{1k} p_{2k}$$

where the constant is independent from  $\mathbf{p}$ . Hence, the corresponding  $Q(\mathbf{p}|\mathbf{p}_t)$  is equal up to additive constant

$$\begin{aligned} Q_0(\mathbf{p}|\mathbf{p}_t) &= \sum_{H \rightarrow G} \Pr[H|\mathbf{p}_t, G] \sum_{k=1}^n (\log p_{1k} + \log p_{2k}) \\ &= \sum_{H \rightarrow G} \sum_{k=1}^n \Pr[h_{1k} \oplus h_{2k} = g_k|\mathbf{p}_t] (\log p_{1k} + \log p_{2k}) . \end{aligned}$$

In the maximisation step we need to maximize  $Q(\mathbf{p}|\mathbf{p}_t)$  w.r.t. constraint  $p_1 + \dots + p_m = 1$  where  $m$  is the possible number of haplotypes. The method of Lagrange' multipliers lead to a functional

$$Q^* = Q_0(\mathbf{p}|\mathbf{p}_t) + \lambda(p_1 + \dots + p_m - 1) . \quad (3.5)$$

The corresponding partial derivatives are

$$\begin{aligned} \frac{\partial Q^*}{\partial p_a} &= \sum_{H \rightarrow G} \sum_{k=1}^n \Pr[h_{1k} \oplus h_{2k} = g_k|\mathbf{p}_t] \cdot \frac{\partial}{\partial p_a} (\log p_{1k} + \log p_{2k}) + \lambda \\ &= \sum_{H \rightarrow G} \sum_{k=1}^n \Pr[h_{1k} \oplus h_{2k} = g_k|\mathbf{p}_t] \left( \frac{\delta_{1k=a}}{p_{1k}} + \frac{\delta_{2k=a}}{p_{2k}} \right) + \lambda \\ &= \frac{1}{p_a} \cdot E(n_a|\mathbf{p}_t, G) + \lambda \end{aligned}$$

where  $\delta_{i=j}$  is a Kroneker symbol and  $E(n_a|\mathbf{p}_t, G)$  is the expected number haplotypes  $h_a$  in  $G$  w.r.t. haplotype frequencies  $\mathbf{p}_t$ . Now, taking  $\frac{\partial Q^*}{\partial p_a} = 0$ , we get



Mis on innovatsioon?



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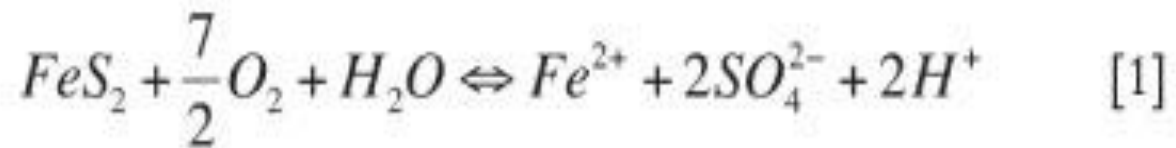
Nimetage üks Eesti ettevõtte,  
millel on Teie silmis positiivne maine

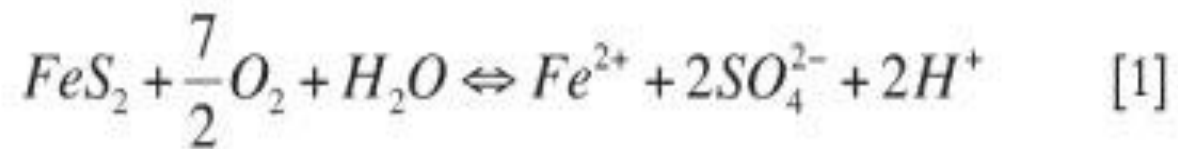


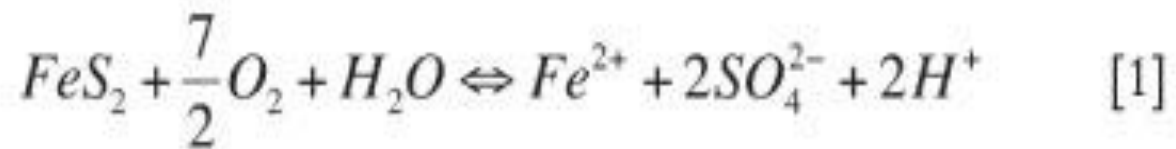
## Mis kujundab meie väärtushinnanguid? Kas minevik, meedia ja Õnne 13?

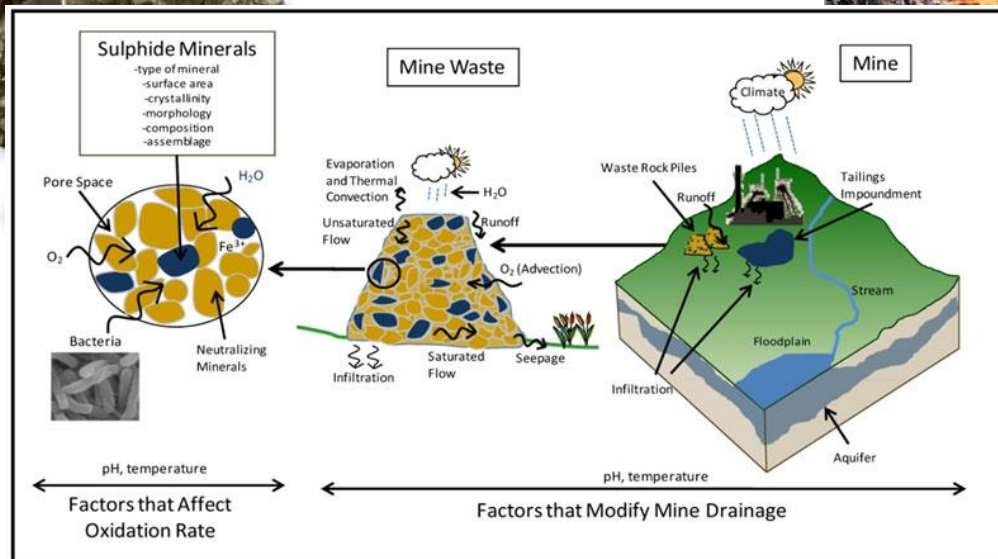
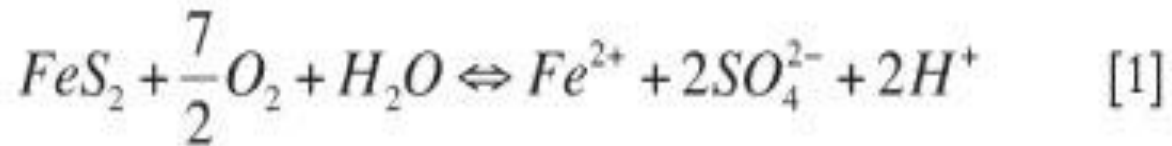


Õnne 13 ettevõtja-rollide (eriti perekondlikud) väärtushinnangud on väga paigast ära

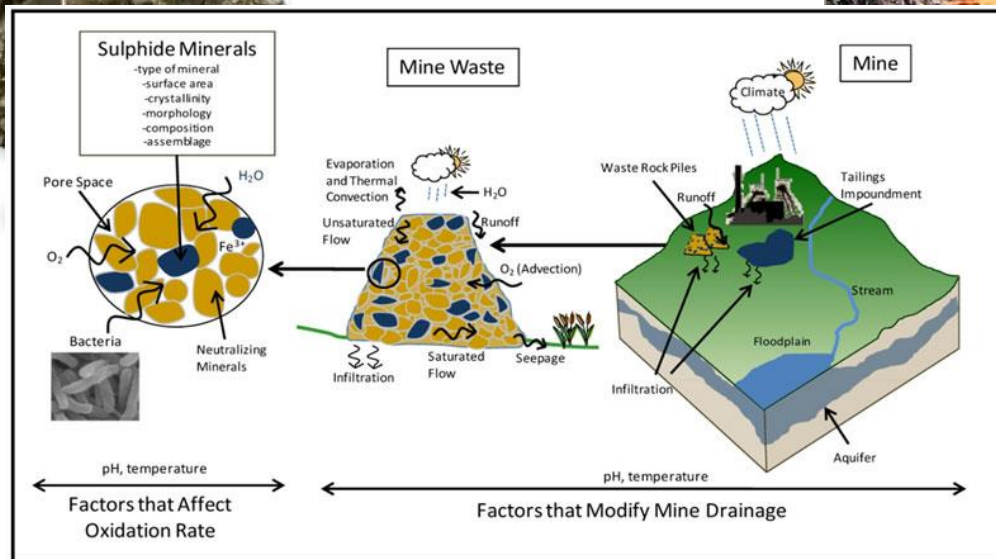
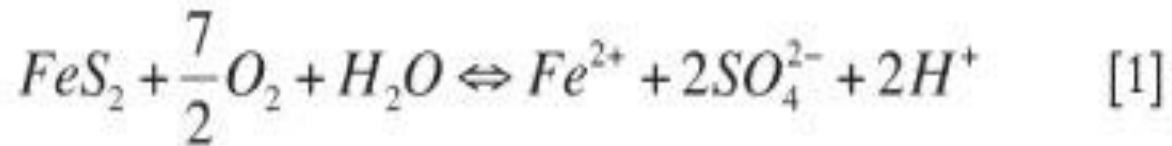




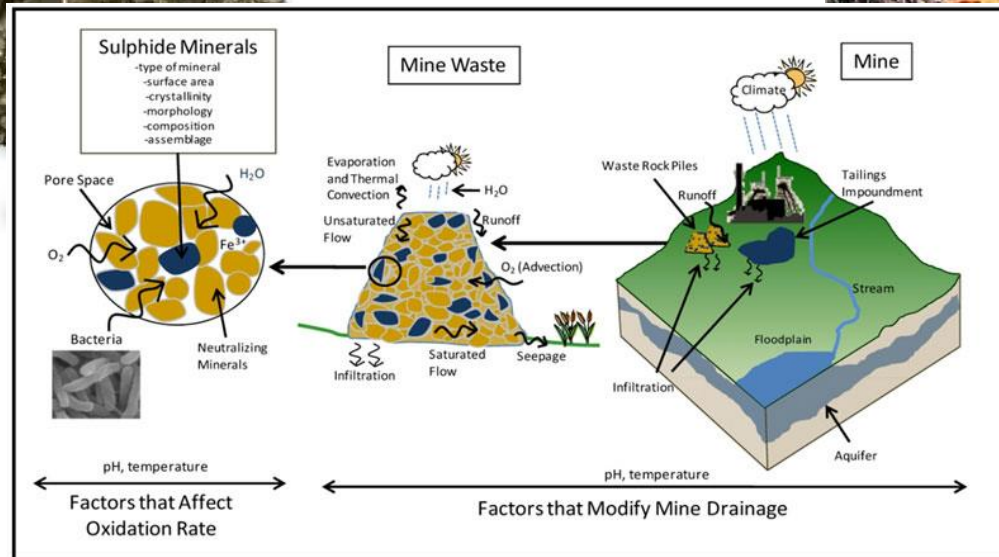
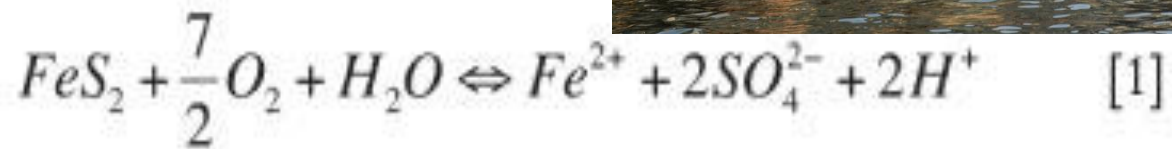




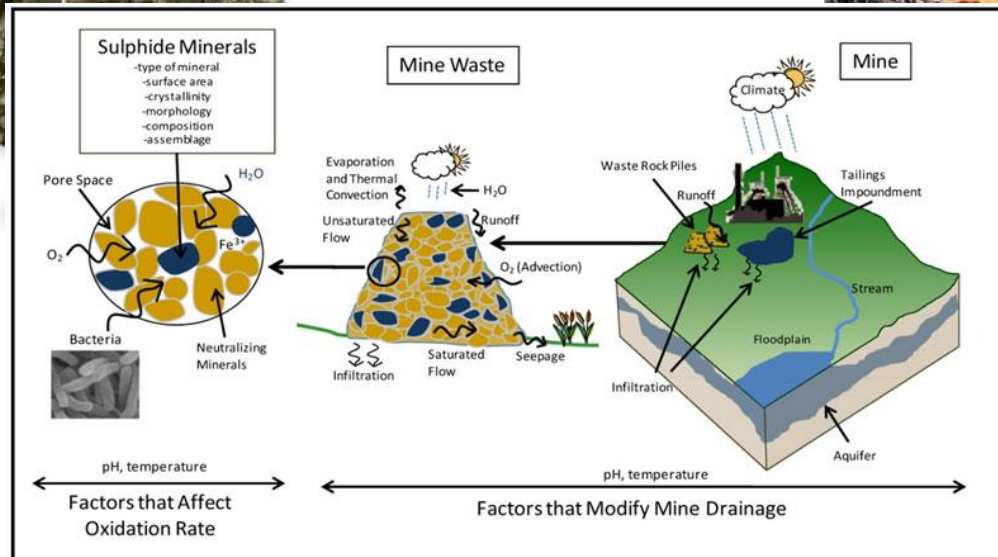
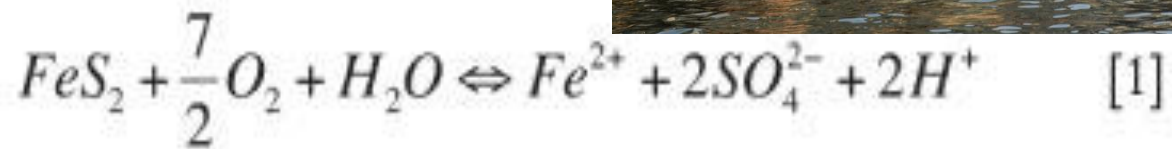








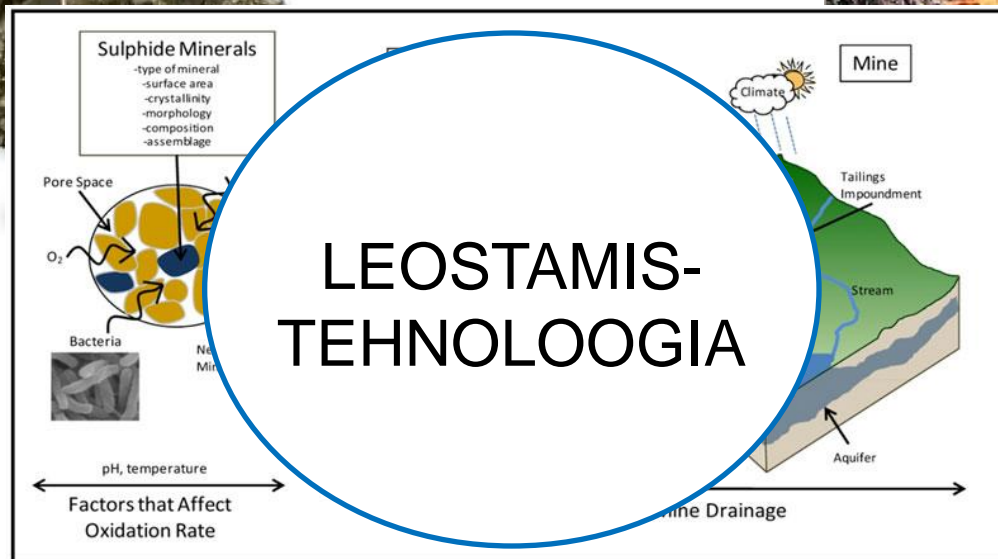
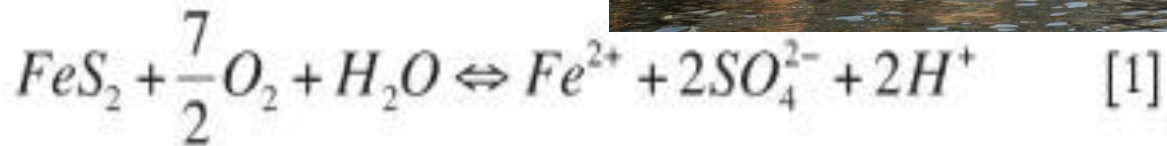




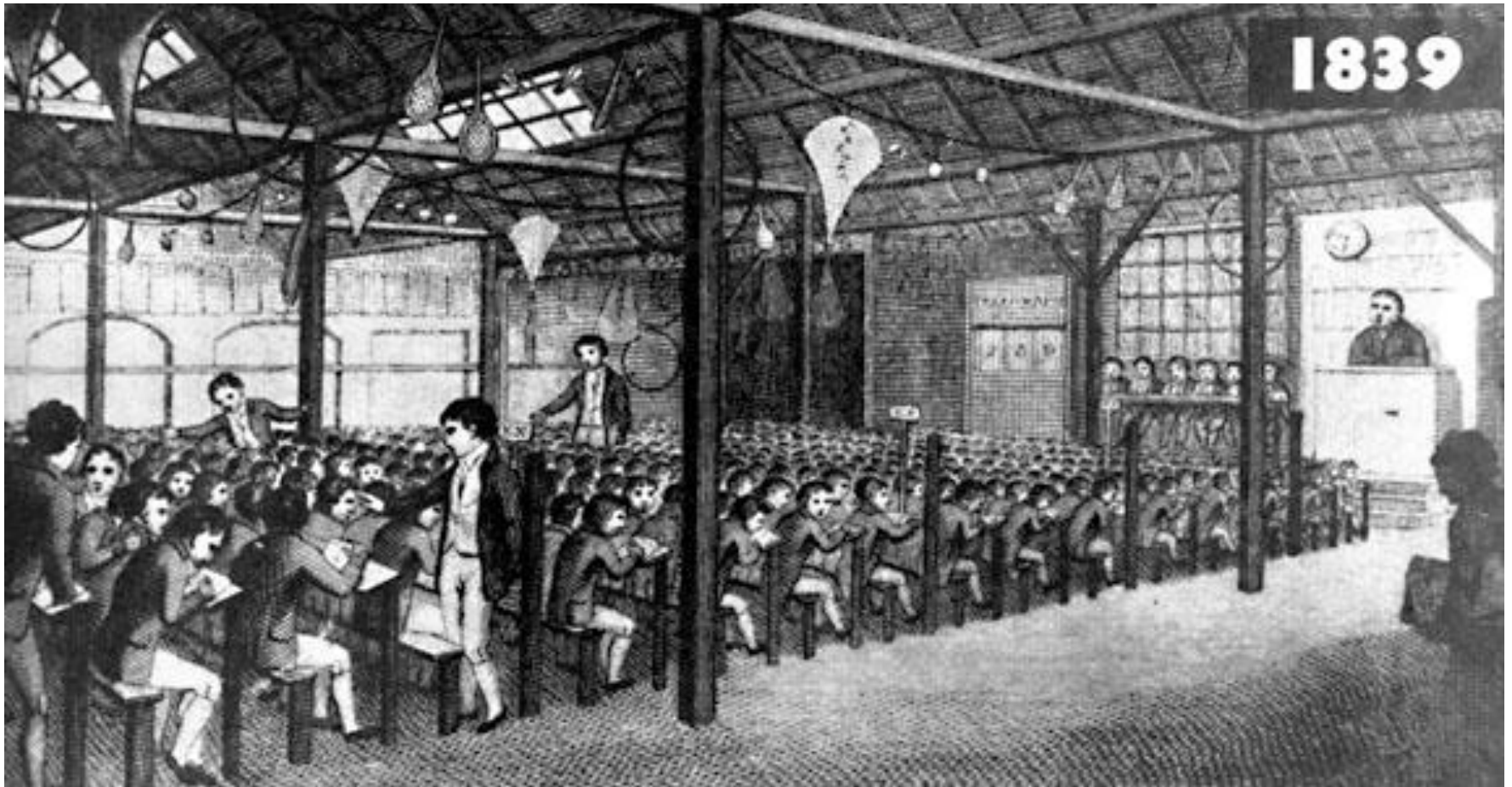


# KESKKONNA-TEHNOLOOGIA

# GEOLOOGILISED UURINGUD



# LEOSTAMIS-TEHNOLOOGIA



Joseph Lancaster (1778-1838) 'monitorial system'



vetsufy.com ei ole lahendus

me seisame väga pika tee alguses

sinna suunduvad kõik, meil on võimalus olla esimeste seas