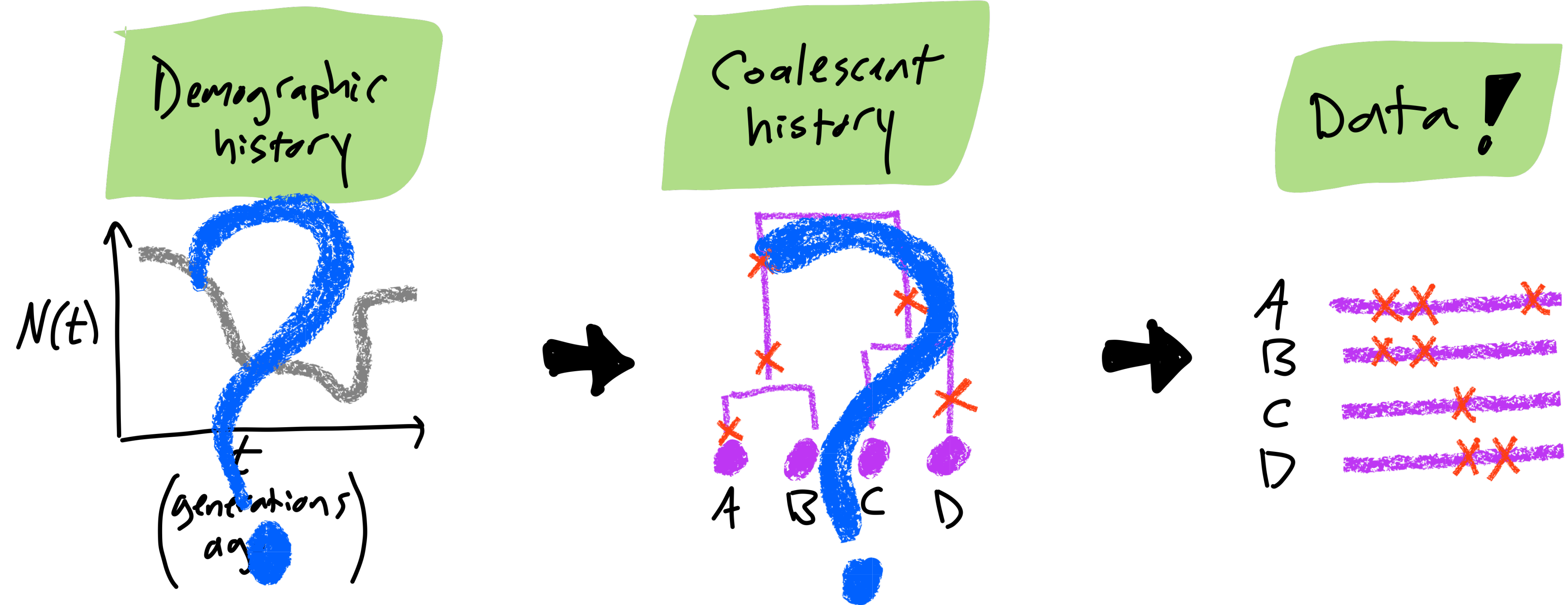


Coalescent theory

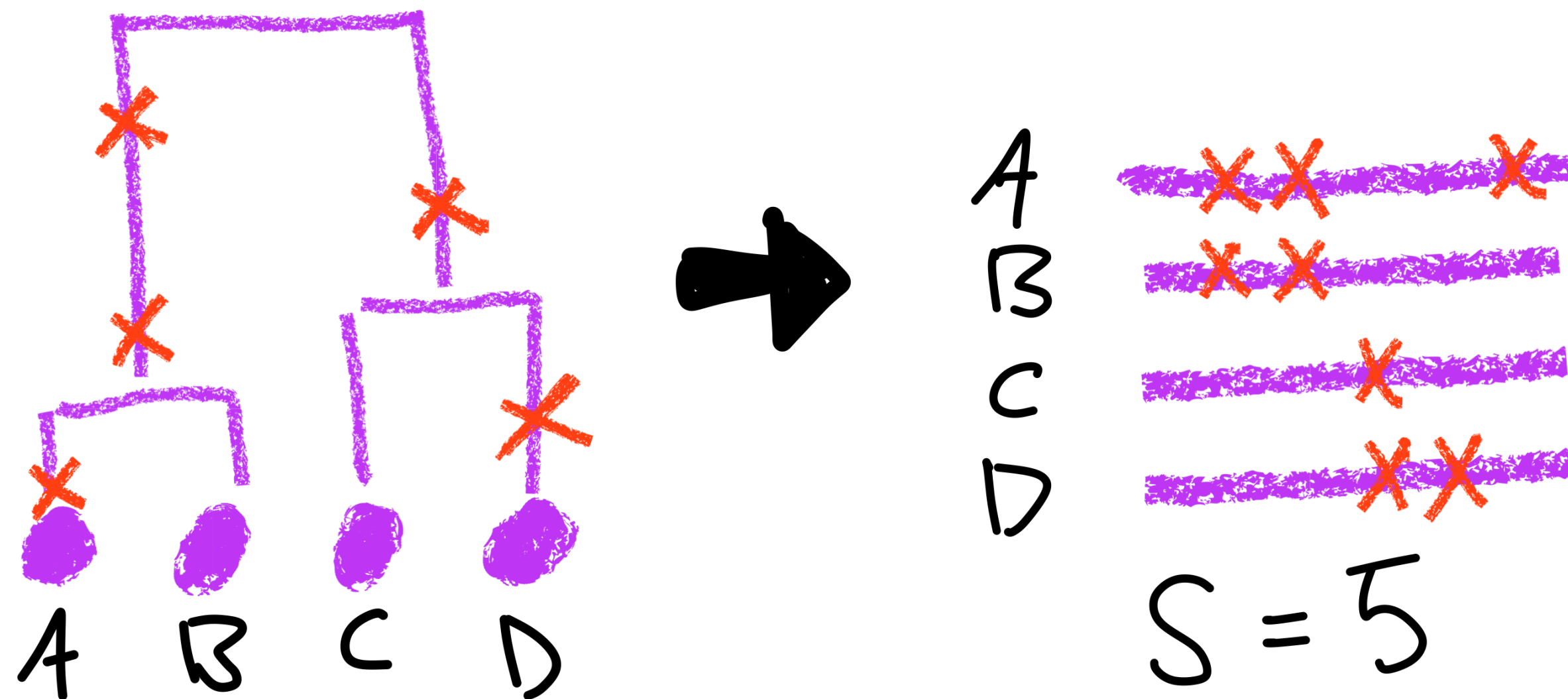
Genetic diversity



Coalescent theory

Genetic diversity

segregating sites, S , equals # mutations in the sample's history (infinite sites approximation)



Constant N case :

$$E[S] = \mu E[T_{\text{total}}]$$

$$= \mu \sum_{i=2}^n i E[T_i]$$

$$= \mu \sum_{i=2}^n i \frac{2N}{\binom{n}{2}}$$

$$= 4\mu N \sum_{i=1}^{n-1} \frac{1}{i}$$

total branch length