$$C_p = \frac{SSE(M)}{\hat{\sigma}^2} - n + 2|M| \quad \text{(8)}$$

$|M| \rightarrow$ # pred.

n: number of observations

$\hat{\sigma}^2$: residual error variance for the full model

- Model selection is used to determine meaningful set of fixed predictors
- $y = Xb + Zu + e$

Why is u random?
→ Because the structure of variation of breeding values has to be taken into account.

Xb: determined by model selection

- For random parts: important to have detectable variation in the data
- In Livestock breeding estimates of variance components are done only rarely and in separate evaluation.