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- How does this depend on  $t$ ,  $N$  and other factors?
- How can we use this knowledge to learn about the evolutionary history of the allele, or of the population

Neutral models: some history

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## Contrast:

### Neutral models of allele frequency change

describes how allele frequencies evolve within a population in the absence of natural selection

narrow

### "The neutral theory"

- proposes that most molecular variation within and between species is neutral.
- Deleterious mutations occur, but are quickly removed.
- Adaptive mutations are rare.

broad

## Applications of neutral/genetic drift models:

- Inference of population histories / population structure
- estimating recombination rates from population data
- phasing / imputation
- null models in tests for evidence of selection
- controlling for stratification in GWAS