

## Genes

Genetics is the study of two contradictory aspects of nature:

- offsprings resemble their parents, yet
- they are not identical to their parents

Examples:

Look at your own family

Even “identical” twins show subtle differences

But humans always produce humans

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**Heredity** = the similarity of offspring to parents

**Variation** = the difference between parents and offspring, and between offsprings themselves

**Genetics**



## Genes

Humans began domesticating plant and animals over 10,000 years ago

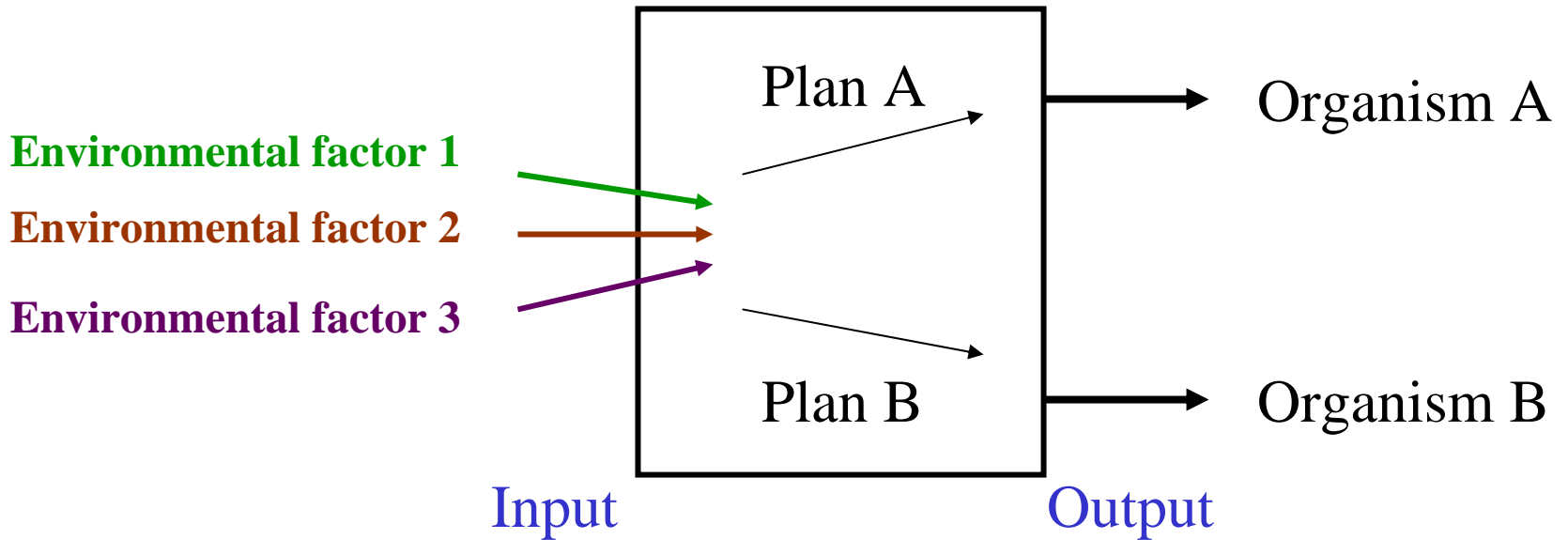
They had to choose advantageous characters and seek to propagate those characters in the future generations



Evidence for such conscious selection is found in Egyptian tomb inscriptions and in the Bible

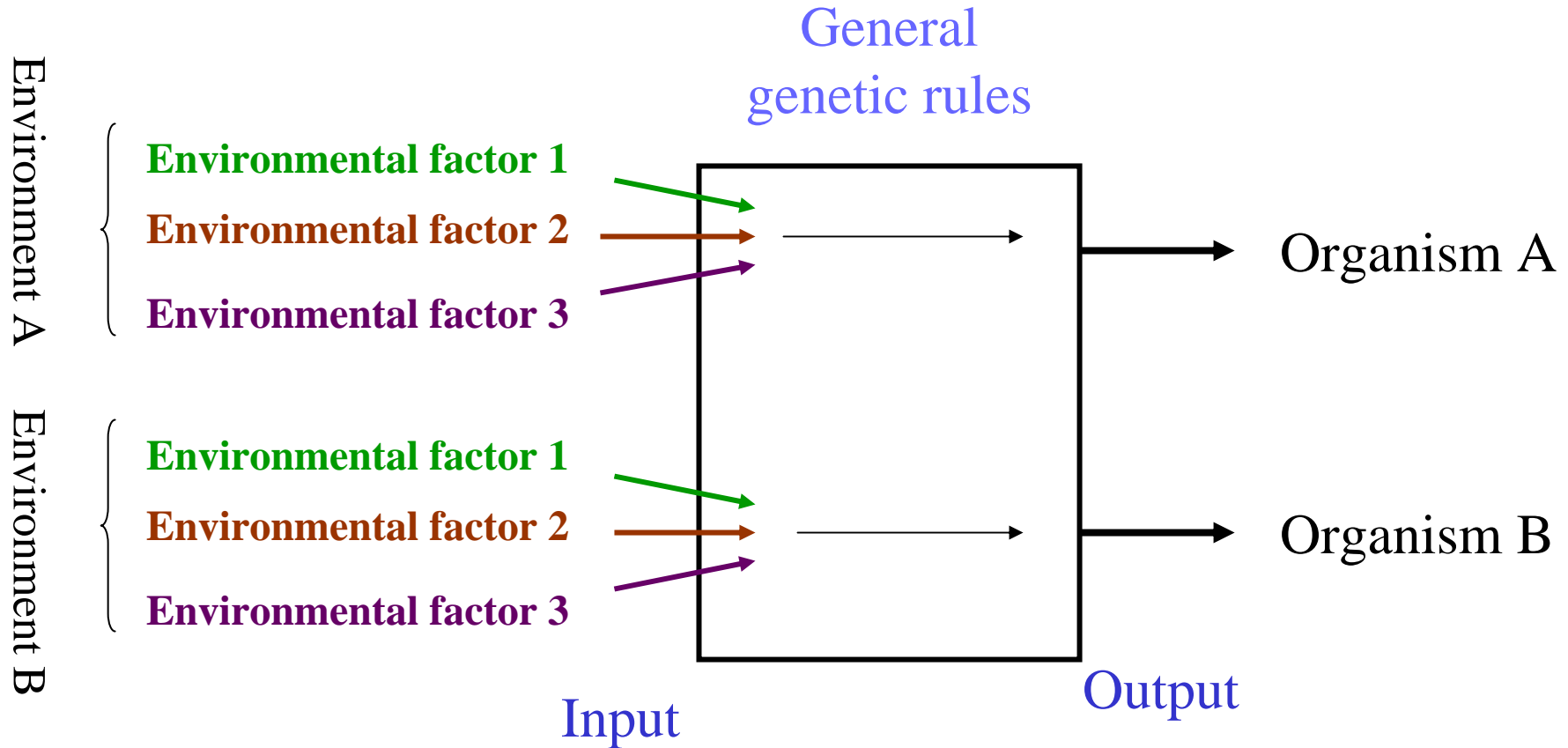
# Genes

Genetic  
“blueprint”



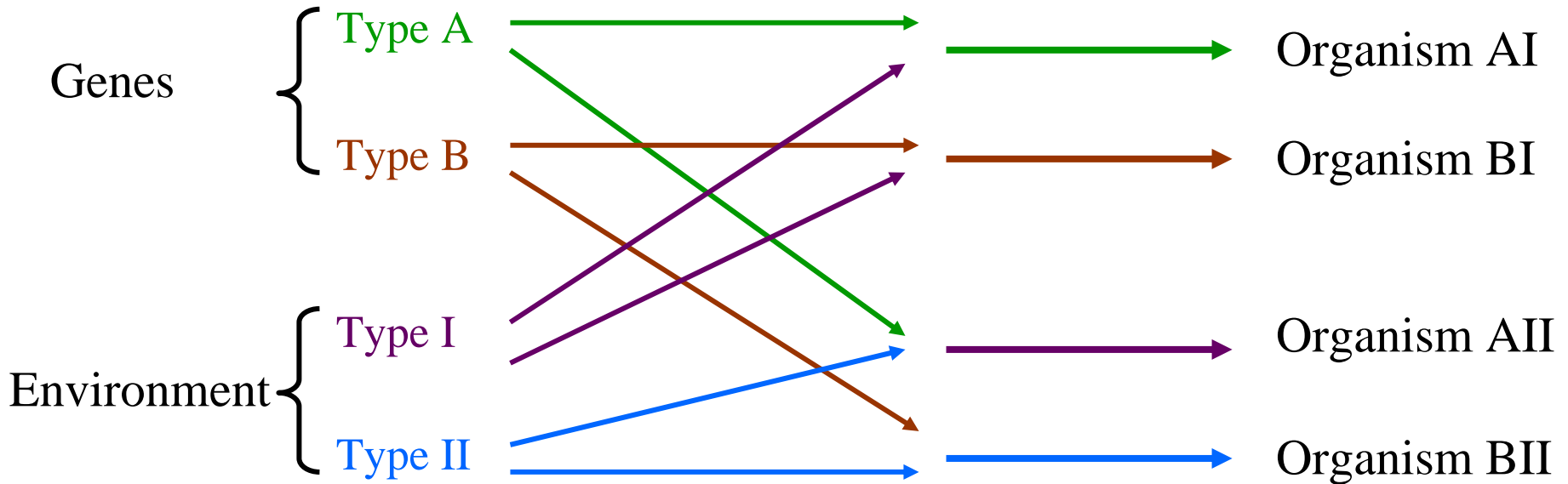
A model of determination that emphasizes the role of genes

# Genes



A model of determination that emphasizes the role of the environment

# Genes



A more realistic model of determination that emphasizes the interaction of genes and environment

## Genes

The developmental transformation of an organism from one stage of its life to another is a result of the unique interaction of its genes and its environment at each moment of its life history.



**Organisms** are determined neither by their genes nor by their environment - they **are the consequence of the interaction of genes and environment.**

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In general, the relationship between genotype and phenotype cannot be extrapolated from one species to another or even between phenotypic traits that seem superficially similar within a species. A genetic analysis must be carried out for each particular case.