### THE STRUGGLE FOR DX SINDINCID

The Revolutionary idea of Evolution in determining species diversification

#### History of Evolution

- Lamarck published a theory of evolution in 1809
- Lamarck thought that species arose continually from nonliving sources. These species were initially very primitive, but increased in complexity over time due to some inherent tendency.
- This type of evolution is called orthogenesis.

## Orthogenesis continued

- longer necks.
- **characteristics**

### Darwin Observed

- Variability exists within a given species
- Variant traits may be passed on/inherited
- In this "struggle for existence", variants that were slightly better suited to the environment would be more likely to survive

• This does \*NOT\* mean "Survival of the Fittest"

an organism's acclimation to the environment could be passed on to its offspring; <u>species never go extinct</u>

for example, he thought proto-giraffes stretched their necks to reach higher twigs. This caused their offspring to be born with

This proposed mechanism of evolution is called the inheritance of acquired

Who might like this idea for structuring society?

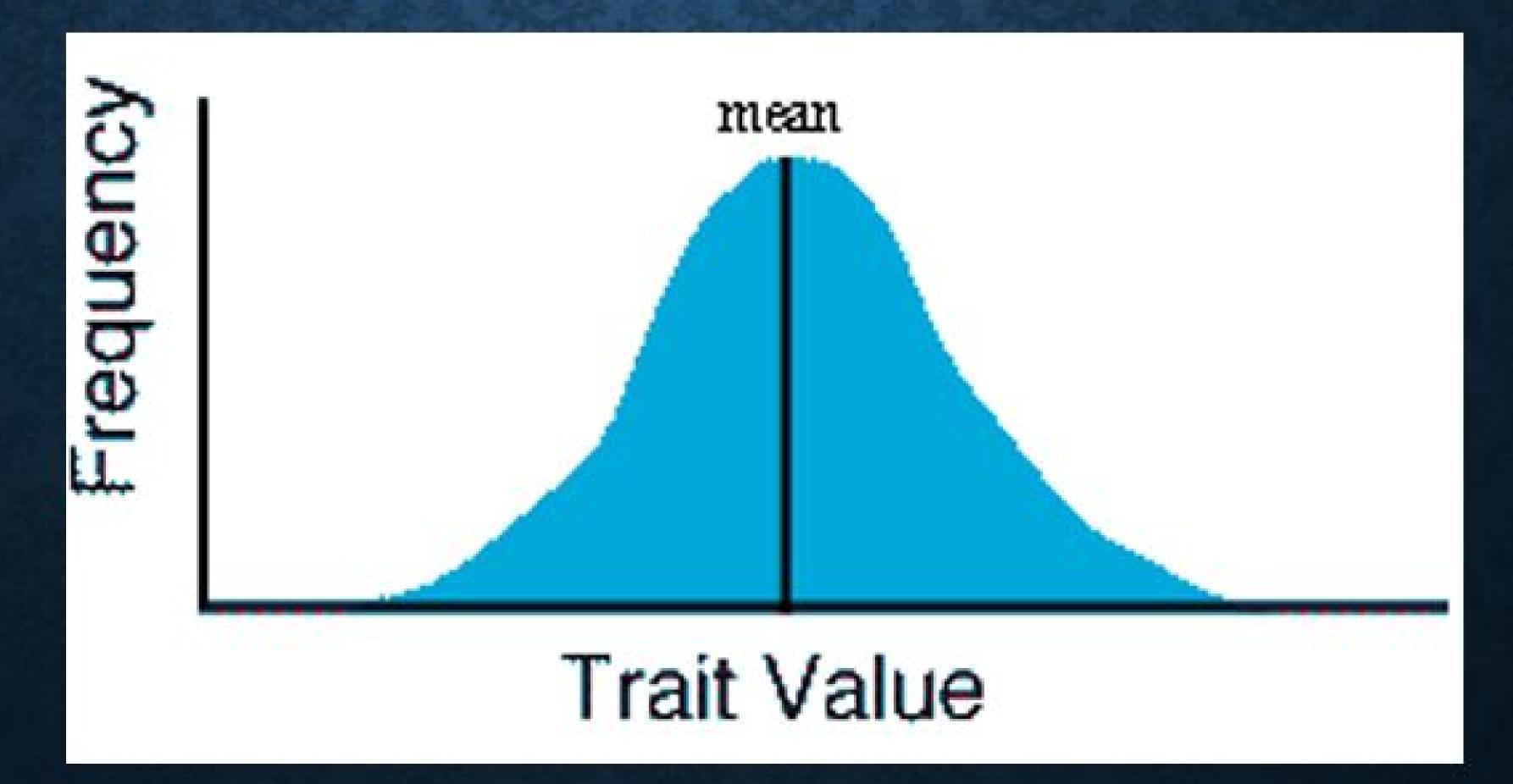
# Big Damn Digital Post It Note

# Darwin Never Said

## Survival of the Fittest

### VARIATION OF TRAITS $\rightarrow$ PASSED ON TO POPULATION

- Populations Evolve; Not Individuals
- A population is a collection of individuals which have some distribution of traits:





- "I have called this principle, by which each slight variation, if useful, is preserved, by the term Natural Selection
- It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change
- Intelligence is based on how efficient a species became at doing the things they need to survive
- In the survival of individuals and species, during the constantly-recurring struggle for existence, we see a powerful and ever-acting form of selection."

 I think it inevitably follows, that as new species in the course of time are formed through natural selection, others will become rarer and rarer, and finally extinct. The forms which stand in closest competition with those undergoing modification and improvement will naturally suffer most.

# What Would Descartes Say?

### OND MORD

### Darwin – Origin of Species -1859

- Mechanism for Evolution is Natural Selection
- New variants continually arose within populations -> Darwin observes this but does not understand what mechanism causes this
- Numerous instances of selecting the variant (due to higher survival probability) slowly leads to species modification/diversification

### Favorable Variations Drive Evolution

- change over time in their natural selection.

## The Fittest Survive

- This is the OUTCOME of natural selection the organism that is the most adaptable to their environment (e.g. the fittest) has the highest survival probability
- This takes thousands of generations to manifest
- Nature does not know A PRIORI who is fit and who is not.

Darwin: If certain variants will be preserved over time over other variants then that population will composition. This is evolution by

But Darwin does not understand how the variations of traits are generated in the first place



## Survival of the Fittest

- This implies (both explicitly and implicitly) that the fittest can be IDENTIFIED a priori.
- Nature can't do that
- Social Engineering (Spencer) posits, because it's a "scientific fact" that the FIT can be can flourish.

identified and they need to be protected so they

# Natural Selection

- Random pairings of Gene Pool/traits (Darwin) does not know this)
- Each pairing has a different survival probability within some Ecosystem
- fast rabbits)
- This statistical process takes a large number of generations to manifest itself
- If ecosystem is stable the end results is a
- distribution of most probable values (slow vs