As the century turned, Africa began to emerge from a Dark Age stretching as far back as life on earth, into all the years that lay ahead—years of Renaissance, Enlightenment, Industry, and, if you will, Anxiety. It is fitting that Grogan made his symbolic trek (across Africa—1891-92) as a survey for a railroad, the means through which foreign capital, the paraphernalia of technology, and foreigners themselves would enter. But because an incision is also a wound, the railroad was also the means through which the old life suppurated and poured out of Africa. This, then, is the tragic paradox of the white man’s encroachment. The deeper he went into Africa, the faster the life flowed out of it, off the plains and out of the bush and into the cities, vanishing in acres of trophies and hides and carcasses. The coming of the white man, who imposed his steel tracks, his brains and his will, on the great continent was attended by glory and courage, ennobled by sacrifice, enriched by science and medicine and law. But it marked the beginning of the end in a land where nature herself had always been sovereign.
What Would Descartes Say?

ONE MORE

- 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.

VARIATION OF TRAITS → PASSED ON TO POPULATION

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

![Frequency vs. Trait Value Graph]

Darwin’s Says

- “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.”
**Favorable Variations Drive Evolution**

- Darwin: If certain variants will be preserved over time over other variants then that population will change over time in their composition. This is evolution by natural selection.
- But Darwin does not understand how the variations of traits are generated in the first place.

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**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.

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**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 identified and they need to be protected so they can flourish.

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**Natural Selection**

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