



# Responses to criticisms of evolutionary theory

Mohamed Noor



Examples of natural selection  
in “real time”

Fossil record

Vestigial organs

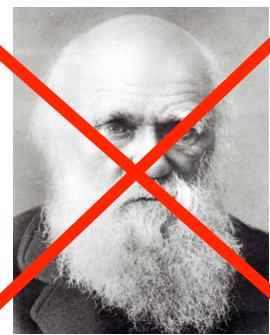
Vestigial genes

Biogeography

Inefficient design

TRUE!!!

# Observations that would falsify evolution



Fossils in the wrong place (e.g. mammals in the Devonian)

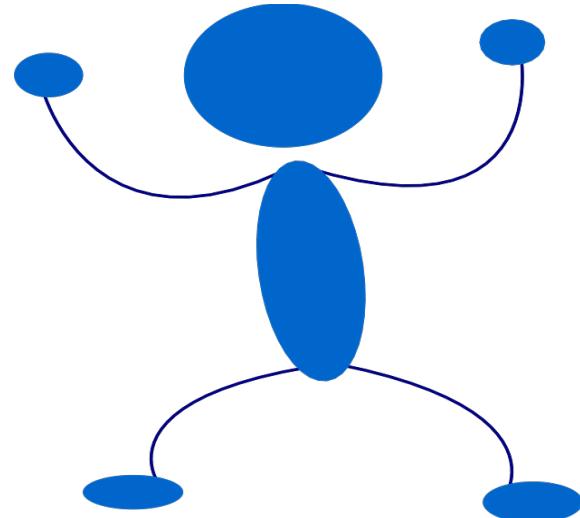
Adaptations in one species good *only* for a second species

Adaptations that could not have evolved by a step-by-step process

Evolved altruistic behavior among non-relatives in non-social animals

Unexplainable discordance between phylogenies based on morphology/ fossils and on DNA

# Other common criticisms



- Too much change for evolution to explain
  - Man from a bacteria??? Yeah right...
- Can't explain the complexity we see
  - Half an eye doesn't work.
- Why isn't it still happening?
  - Christine O'Donnell: “Why aren't monkeys still evolving into humans?”
- Doesn't explain life's origin- denies existence of God



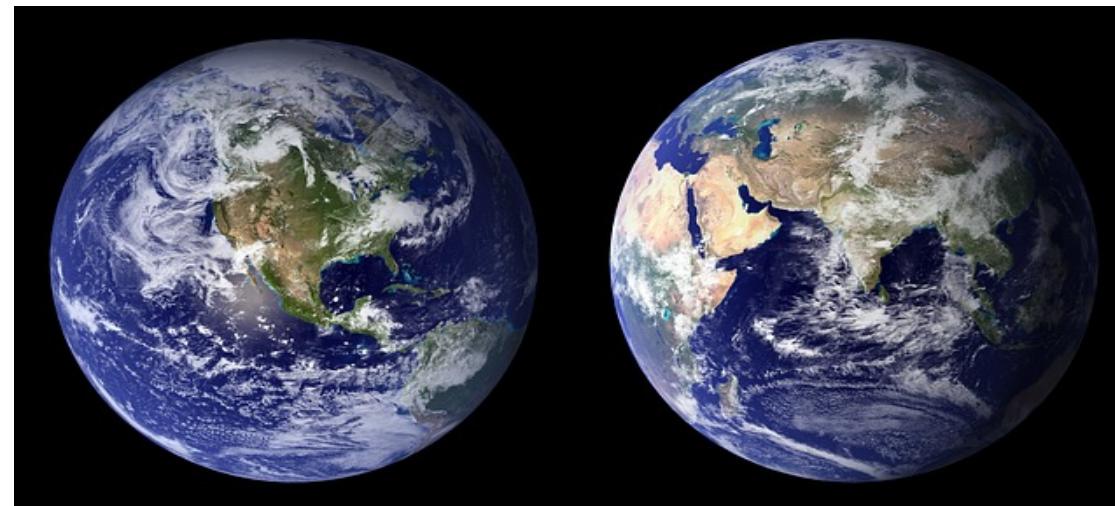
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  - Breeds we see are only a few hundred years old.
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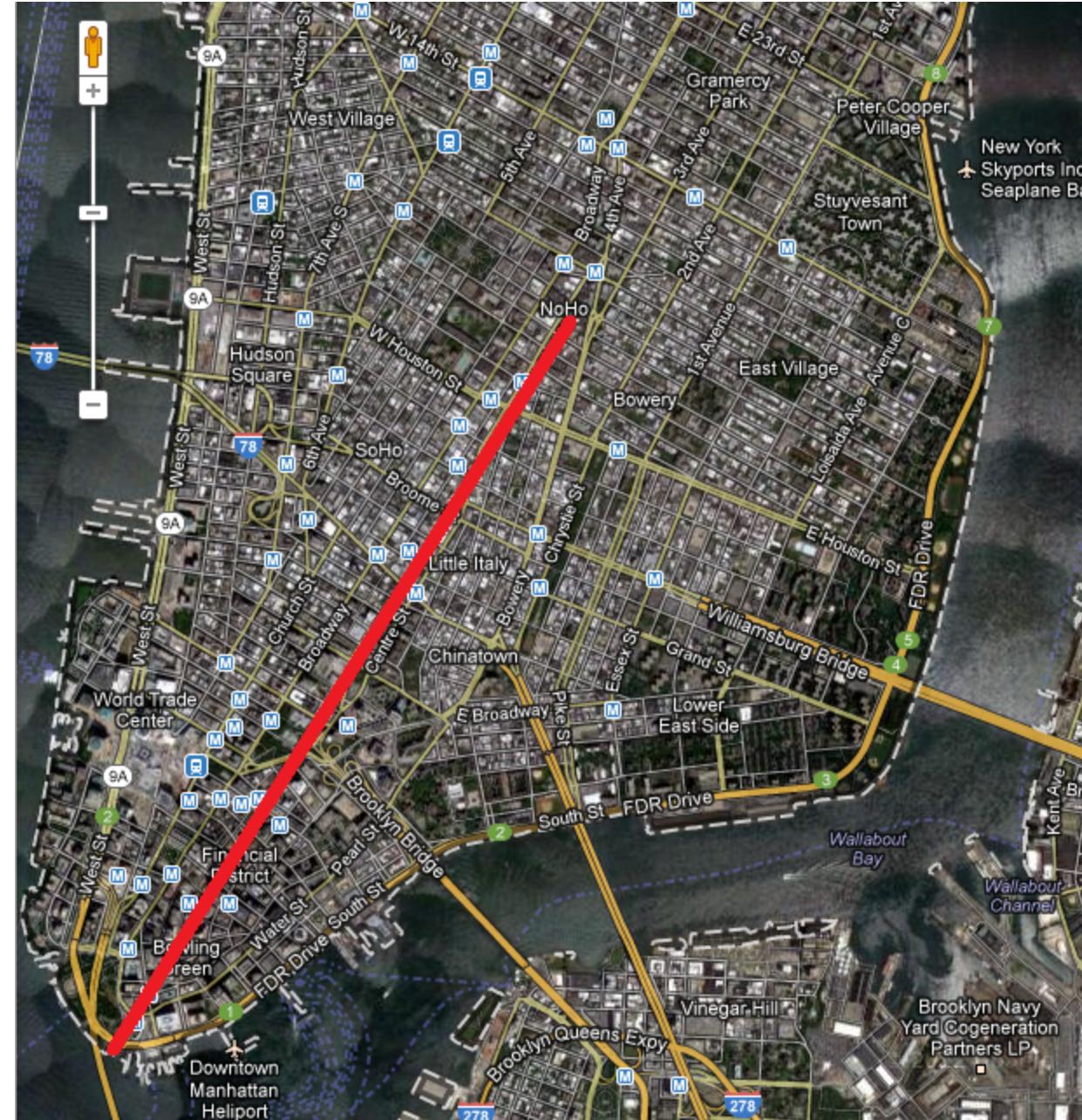
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- **Difference**- how many times over could dog breeds have evolved?
  - If 1000 years were a millimeter... 3.5 billion is 3.5 km!!!

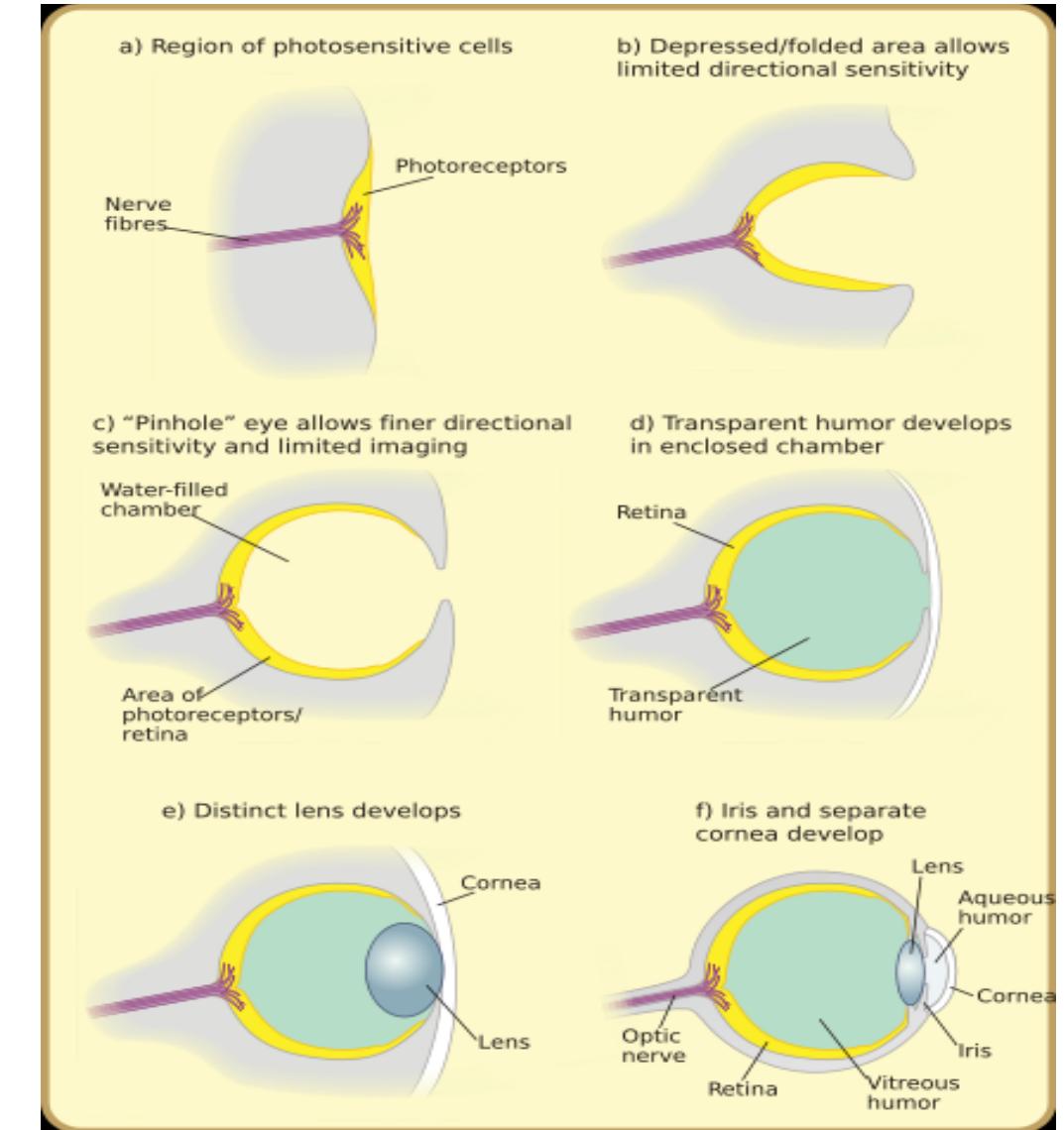
# 3.5 kilometers (Manhattan)

Imagine walking that far, 1 mm at a time...



# Too much complexity

- Intermediates DO exist, even in extant species
- Even single-celled Euglena has the eyespot photoreceptor

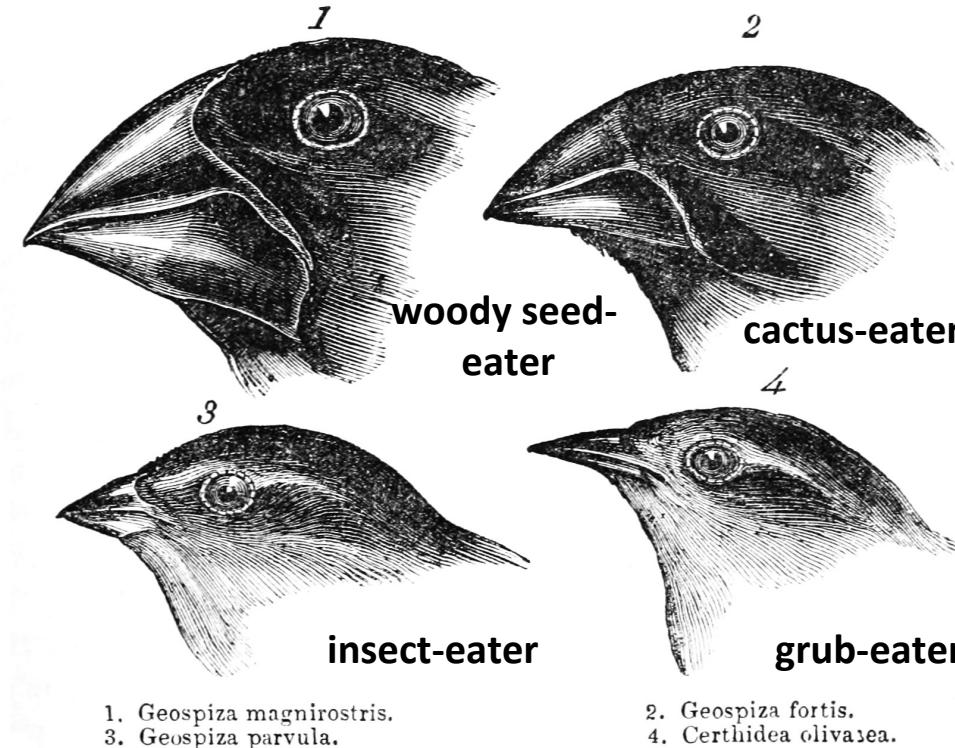


# Why isn't still happening?

- Many incorrect assumptions with argument
  - Formation of new species means demise of old
  - Presumed “directionality” of evolution

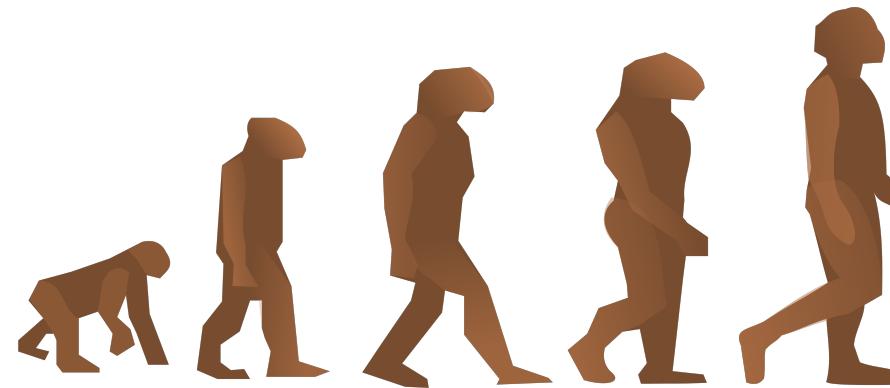
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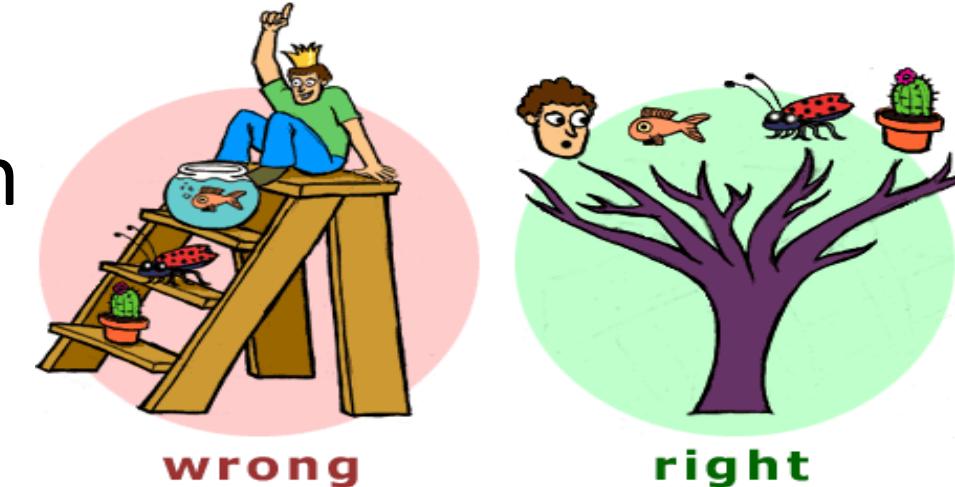
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- New forms may be advantageous because exploit different resources
- No “direction” of evolution
  - History may not repeat itself



# CRUCIAL POINT

- Humans did not evolve from amoebae or chimpanzees or anything else that is currently alive.
- Humans and all these other species “share a common ancestor”
- All species (including humans) have changed relative to the ancestral forms.
  - No “higher beings”: Even single-celled animals have evolved over time!





# Doesn't explain life's origin- denies existence of God



- **First part true:** Most evolutionary theory does not attempt to address why or how life arose
- **Second part untrue:** There's no intrinsic theism or atheism in what we've discussed
  - Some biologists who support evolution are also devout in faith (e.g., Francis Collins, NIH director)
  - Some are devout atheists (e.g., Richard Dawkins)

# Other Materials

- Interview with Jerry Coyne
  - Author of “*Why Evolution Is True*”



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