Theory of Evolution

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Before Darwin

• Genesis 1
  — 1 In the beginning, God created the heavens and the earth
  — 12 The land produced plants. Each kind of plant had its own kind of seeds. The land produced trees that bore fruit with seeds in it. Each kind of tree had its own kind of seeds
  — 21 So God created the great creatures of the ocean. He created every living and moving thing that fills the waters. He created all kinds of them. He created every kind of bird that flies. And God saw that it was good.
  — 25 God made all kinds of wild animals. He made all kinds of livestock. He made all kinds of creatures that move along the ground. And God saw that it was good.
Before Darwin

• Book of Genesis
  – Some Jews, Christians and Muslims believe it as the literal absolute truth.
  – It tells of God creating the world.
  – Worldwide flood and Noah’s Ark

• Bible does not state the date of when the creation accorded.
  – Estimated at around 4000 bc
Science began with Greeks

Philosophy began with the Greeks.

- Greeks had their own religious creation myth story.
- Plato’s “Timeaus” stated creation could be explained with physical matter and natural law moving away from Greek myth.
- Intelligently designed species implies a creator.
  - Aristotle critique 300 bc.
    - Defined a species as a breeding group created.
Power of Church

• As the Catholic Church maintained power the Biblical version held.

• The Church’s power weaned as the Protestant Reformation broke the choke hold of Vatican power.

• The French Enlightenment as a movement to reason, allowed many new theories to flourish.
Before Darwin
New Knowledge

• By late 1700’s  Industrial mining began to grow
  – Spurring interests in Geology
  – As geological record showed rich fossil history
  – Also showed Earth was much older than 6000 yrs

• Theories of Multiple Creations from Multiple Floods to explain fossil record.
  – Noah’s being the last of these floods.

• Newer Fossil Records showed some species lived through catastrophes, debunking theories.

• Dinosaurs skeleton’s first put together
Before Darwin
Evolution in the Air

Chevalier de Lamarck ‘s Giraffes

• Outlined first theory of organic evolution
• Electrical Life force spontaneously generated micro-organisms
• A species would evolve based on what the species exercised and then would pass that along to next generation.
• Giraffe needed a longer neck, it would stretch its neck telling the electric-life-force to grow the neck, making it longer, then pass this along to next generation. Overtime we get long neck giraffe’s.
  – Human’s worked their brains and became smarter.
Charles Darwin
Charles Darwin

• Born Feb 12\textsuperscript{th} 1809 (died in 1882)
  – Same birthday as Abraham Lincoln
• Knew of previous theories before he arrived on the scene.
• Also knew of tremendous amount of criticism others had received especially Lamarck
• 1831 set sail on the HMS Beagle to the Galapagos islands
Charles Darwin

• Returned in 1836 did not announce his new ideas.
• 1844 Chamber’s popularized evolutionary ideas anonymously writing evolutionary theory largely based on Lamarck’s theories.
• Darwin published about his voyage but not of his theories.
• 1858 Alfred Wallace published his work outlining natural selection.
Charles Darwin

• 1859 Darwin Published his book “On the Origin of the Species”
  – Presented his evidence from his voyage.
  – Wallace’s work lacked empirical evidence

• This book revolutionized biological thought.
Intellectual Revolution

• Darwin’s theory dealt a body blow to traditional Western religious thought.
  – It differed from the Genesis account

• Even with Darwin’s book most scientists in 18th and 19th Centuries accepted theistic or a deistic God and continued to posit the need for a creator as the prime evidence of God.
Intellectual Revolution

• Darwin’s theory undermined natural theology, which had become a mainstay of Protestant Christianity.
  – Natural theology sought objective evidence of God’s existence, rejecting Roman Catholic Church authority and elevated individual interpretation of scripture.

• Princeton theologian, Charles Hodge wrote a tightly reasoned book concluding Darwin’s theory (rejecting design) denies God.
Intellectual Revolution

• Debate swirled in scientific, religious, and popular culture.
• The central issue became the origin of human being’s mental and moral attributes – not whether the physical body evolved
• Traditional Christianity had ascribed these attributes to the divinely created soul
• Scientists generally accepted Aristotle’s theory of the rational soul found only in humans
Intellectual Revolution

• 1871 Darwin published the “Descent of Man”
• Argued for common ancestor with apes.
• Darwin argued moral feelings had survival value.
  – Appealed to Lamarck’s views through life-force of habits could develop human moral attributes.
  – Many broke from Darwin because of this book.
  – The book did anticipate many developments in social sciences and evolutionary psychology.
Intellectual Revolution

• By 1875 most biologist in Europe and America adopted an evolutionary view of origin.

• Many rejected random evolutionary process.
  – Lamarck’s view was changed to see God as guiding evolution.
  – Orthogenesis created variations from an internal force
  – Theistic evolution saw God as source and guide of variations along lines beneficial to species.

• These alternatives potentially fit the scientific evidence for the occurrence of evolution without spiritual and philosophical consequences of natural selection.

• By 1875 most everyone had already accepted species evolve.
Missing Links

• Fossils for a long time have been the principle basis for arguments against evolution.
  – Early works suggested species stayed constant and were replaced suddenly
  – Multiple creations explained layers of fossils
• Darwin remained confident missing links would be found.
  – 1880’s the horse was tracked back through fossils
  – Bird hips and dinosaur hips were linked in theory
• Human Evolution in 1890’s still faced broad skepticism
  – the absence of hominid fossils became the stumbling block for any popular acceptance of human evolution.
Missing Links

• Dutch born Eugene Dubois set out to prove human evolution.
  – 1887 started search in the Dutch East Indies
  – 1892 discovered a skull cap on Java
    • “Java Man” was sensational and controversial but many paleontologist dismissed his ape-like fossil
    • Dubois became reclusive, refusing to show his fossil

• 1912 “Piltdown Man” was discovered and discredited 1953 as a hoax (confusing the debate)
Missing Links

- Fossils of South Africa
  - 1925 *Australopithecus africanus*, walked upright with humanlike teeth
  - 1936 another fossil linked 1925 discovery to fit linear pattern of human evolution.
- 1929 in China and Java more “Java men”
- 1950’s East Africa
  - various fossils overlapping 1925 discovery
- 1961 – *Homo habilis* fossil found
  - 1.8 million years ago as close ancestor of 1925 fossil
- 1990’s more discoveries closed fossil gaps

Today most agree evolutionary fossil tree for humans shown through fossil records
Genetics

• Most biologist believed evolution happened but disagreed how it operated.
  – Continuous variation would lead to a norm that would not lead to evolution

• Lamarckian theories allowed for variations during life to be passed on to offspring
  – Failed to produce experimental evidence

• Genetic mutations through radiation could be passed on and tested.
  – Became Neo-Darwinism
Social Darwinism

Evolutionary thinking spilled over to social thought

• Social Darwinism was promoted by those adopting utilitarian philosophies.
  – Human progress attributed to unfettered competition.
  – Competition was the great good of society and mankind.
  – Even before Darwin, Herbert Spencer coined the phrase “survival of the fittest” as how people progress

• Encouraged Laissez-faire capitalism and discouraged helping the weak
  – The rich were fit and the poor were weak
  – Industrialists promoted speech against any social welfare
  – All regulation or taxation hurt the strong
Eugenics

Eugenics looked to promote more children from genetically “fit” parents and less from “unfit”.

- Many American States enacted eugenics in laws
  - Criminals were unfit and sterilized after three strikes
  - Poor were less fit (Appalachian sterilizations)
  - Rich were most fit
  - Intelligent were more fit
  - Beauty was seen as fit
  - Racism: White race was stronger than all other races
  - Nazi’s adopted this view as master race over weaker races

- This was all justified under Social Darwinism principles
Crusades against Evolution
Crusades against Evolution

• 1920’s Protestant Fundamentalism
  – Characterized as a group of believers within mainline denominations.
• Concerned of the Bible’s Interpretations
• Liberals saw an evolution of God in the Bible from Old Testament to New Testament
• Fundamentalist fervently rejected the evolution of God in the Bible, thus starting a movement
Crusades against Evolution

• 1920’s Evolution was being taught in High Schools
  – Average parents became alarmed
  – Fundamentalist gained membership

• Evolutionary thinking in the public’s mind was associated with:
  – Laissez-Faire capitalism, against social welfare
  – Eugenics (sterilization of the weak and vulnerable)
  – German Militarism (after WWI)
  – Re-interpreting of the Bible main concern for Fundamentalists

  – Jazz Age at this time also added fuel to anti-evolutionary opinion through a “back to normalcy” campaign by conservatives
Crusades against Evolution

1920’s Fundamentalists began targeting the theory of evolution for public condemnation

• Leading the attacks:
  – Baptist Ministers:
    • William Bell Riley, Minneapolis;
    • John Roach Stratton, NY;
    • J. Frank Norris, Dallas
  – World’s Christian Fundamentalists Association
  – Moody Bible Institute, in Chicago
  – Bible Institute of Los Angeles
Crusades against Evolution

• Mainline Protestant denomination became embroiled in bitter disputes
  – Fundamentalists demanded an orthodoxy with respect to the special creation of humans in God’s image.
  – Began to emphasize literalistic interpretations of Genesis as foundational to Christian belief
Crusades against Evolution

1920’s Religious Liberals fought back

• Leading the counter arguments:
  – Shailer Mathews, University of Chicago theologian
  – Harry Emerson Fosdick, NY Baptist Minister (Pres)

• Leading Scientists and Politicians countered
  – Herbert Hoover outspoken against anti-evolution
    • Against Social Welfare, Regulation of businesses, etc.

• Most mainline protestant denominations ultimately sided with the liberals.
Crusades against Evolution

William Jennings Bryan
• Talented orator
• Scarcely lost two presidential elections
• Progressive political thinker
  – Spoke for social welfare programs, against big business
• Against concepts of Human Evolution
  – Concerned of what this might mean for societal morality and religious faith
  – Worked to pass a law in Tennessee banning the teaching of Darwin’s evolution in schools. Law was seen as a symbolic.
  – 6 weeks after law was passed John Scope’s agreed to be indicted for violating it. Done for local publicity of town.
Crusades against Evolution

“The Trial of the Century” (promoted by media)

- Clarence Darrow, a famous litigator, led a crack team of ACLU lawyers to Dayton, TN to defend Scopes.
  - William Jennings Bryan joined prosecution.
    - Scopes convicted, to get him out of mallei, charged $100 fine
    - Appealed to the upper court.
- Darrow asked Bryan to take the stand and asked about biblical literalism to made him look foolish.
- Darrow won the appeal
- The entire trial was heard on radio across the country
- Trial left a bitter legacy over the of teaching evolution
Triumphant Evolution?
Neo-Darwinian Synthesis

• Field Naturalists stressed role of geographic isolation and environmental adaptation and favored Lamarkian theistic theories.
• Paleontologists used fossils to show linear evolution and favored a Lamarkian theistic evolution.
• Geneticists favored random mutations and selection of the fittest
Neo-Darwinian Synthesis

• 1940’s most agreed on merger of three theories.
  – Gene variability encountered environmental variables.
  – Genes variations suited for environment variables lasted
  – Isolated populations created greater variations through inbreeding
  – Theistic role lost ground
  • In UK study showed: peppered moth in industrial soot, darker moths survived birds
Triumphant Evolution?

• 1959 Scientists hailed the Neo-Darwinian Synthesis consensus on the 100 year anniversary of Darwin’s book.
  – All over the media as Triumphant
  – New public high school text books, federally funded, contained evolution for first time

• Public teaching of Neo-Darwinian Synthesis triggered strong Christian fundamentalist backlash
The Protestant Church Shifted

Mainline
Presbyterians, Methodists, Lutherans, Episcopalians...
  • Became more liberal
  • Opened to evolutionary theory in religion

Fundamentalists
  • Pentecostal, Evangelicals, and Southern Baptists
    – Untrained ministers
    – Biblical Literalism - didn’t have much need for theologians
    – Grew Larger
  • Conservatives moved out of mainline and into fundamentalism
  • Fundamentalism Popular in the South
    – Southern cultural influences grew throughout USA
The Protestant Church Shifted

Scientists Step Out of Churches

• Early 20\textsuperscript{th} Century most scientist had church affiliations and were involved in reconciling Science to Religion.

• Over the 20\textsuperscript{th} Century fewer and fewer scientists had church affiliation.

• Today Scientist are mostly secular and are not interested in religion.
  – Reconciliation with science is not happening

• Increasing the shift of American Protestantism toward biblical literalism
Evolution v. Creation in Textbooks

• 1960’s Fundamentalists demanded equal time to their views against evolution in text books

• Constitutional problems of separation of church and state prevented conservative protestants their equal time in text books.
  – Creating anti-government regulation sentiment
Institute for Creation Research (ICR)

• Henry M. Morris, hydraulic engineering professor at Virginia Tech
  – Became absolutely convinced if Bible was not literally true than none of it could be trusted.
• 1961 - Morris and literalist minister Whitcomb published “The Genesis Flood”
  – The book gained enormous following amongst fundamentalists
  – Published many follow up books
• Founded Institute for Creation Research (ICR)
Institute for Creation Research (ICR)

• Since 1972 promoted Scientific Creationism
  – Created many books, pamphlets & films

• ICR text books
  – Dominant in Christian academy high schools
  – Dominant in home school markets
  – Stripped of reference to “creator” sold into and adopted by conservative public school board markets
  – This raised new lawsuits
  – Eventually led to legal case whereby ICR textbooks and creation science were ruled as simply religious dogma
Religious Right Political Activism

• Late 1970’s and early 1980’s
• Three states and many school districts adopted “balanced treatment” laws or policies
• One by one they were struck down in courts as unconstitutional
  – 1987 Louisiana’s Balanced Treatment Act law was enacted to teach scientific evidence for/or against evolution. Supreme Court ruled this law must have been passed to promote religion.
  – Excluded creationism from public schools
• Fundamentalists’ backlash toward ruling fed Christian academies and home school programs.
Evolutionary Details for Debate?

Evolutionary Biologist

• Species evolved from pre-existing life forms

• Disagreements are in the details
  – Fossils show long periods of stability punctuated by rapid replacement of related types.
    • This doesn’t support Darwinism gradual branching pattern of replacement
    • God could impact mutations in survival in isolated groups (orthogenesis)
Altruism?

Evolutionary Biologist debate Altruism

• How could altruism exist in Darwinian evolution? It would be weeded out.

• Why would any individual organism sacrifice itself for its species? Selfishness should triumph and survive.

• Social Insects (ants, bees) sacrificing themselves for the group. Sterile workers sacrifice themselves but they should never exist in a Darwinian world.

• Neo-Lamarckian biologists posed these acquired instincts were given through the divine to help groups selection explained this.

• Theistic Evolutionist: God could have put in altruistic behavior into insects animals and humans
Selfish Genes?

- Genes survival of like genes. Self interested genes will help another with same genes, so the gene survive even in sacrifice of an individual organism.
- This explains altruism?
- Sterile insects helping fertile sisters, sharing common genes.
  - Did God give altruism to insects?
  - Or is it all selfish genes helping like genes?
Selfish Genes?

• Genes are simply chemical compounds
• Are organisms just robotic vehicles for the genes?
  – Richard Dawkins says YES.
• But organisms, not genes interact within environment, genes are simply traits of organisms, who ultimately survive or do not survive.
• The selfish gene debate continues
Human Genes or Environment?

Biologists (gene theory)
- Males gain by aggression of spreading sperm
- Females gain from protection of precious eggs
  - As seen in Chimpanzees reproduction
- Sociobiology thus explains human behavior.

Social Scientists
- Disagreed as they saw social environment as main cause of human behavior, thus sought to reform society by changing social environment. Education, self control, and individual choice

Does social environment and/or biology drive humans?
American’s Opinions

• Most American’s reject naturalism that underlines biological theories.
• 90 % American’s continue to believe in God
• Tension between Science v Society
  – What do Americans believe:
    • 50% believe God created man in our existing form
    • 40% believe God guided evolution of man
    • 10% purely genetic naturalistic evolution
  – What do Scientists believe:
    • Close to 0% believe God created man in our existing form
    • Many believe God guided evolution of man
    • Most believe purely genetic naturalistic evolution
Theistic Evolution

Between the extremes

• Asa Gray’s classic theory: God channeled evolution by guiding the process of variation

• Francis Collins, director of Human Genome Project, calls himself a theistic evolutionist
  – Believes in God uses mechanism of evolution to create humans, but human traits of altruism and a longing for God were divinely gifted.

• Darwinists Alfred Russell Wallace and David Lack also believed in certain human traits like love and consciousness, were specially created in evolved hominids to form humans.
  – Roman Catholic Church accepts this position.
The word “KIND” in Genesis

• Half of all Americans do not accept any significant role for evolution in generating different KINDS of plants and animals.

• Some can accept different KINDS evolving
  – Many Jews, Christians, and Muslims accept the written word from their scriptures as reason
  – Some posed arguments species and molecules were just too complex to evolve, pushing a concept of “intelligent design”
  – “Intelligent Design” became another term for creationism as written in scripture.
Scientists

• Scientists largely use Darwinian theory to explain the biological world.
  – Some see Divine intervention guiding variations and evolutionary processes
  – Some see only chemical genes and biological mechanics
  – Almost none accept scriptural accounts as rationale for what empirical evidence shows
150 Years

• Nearly 150 Years after Darwin published his theory we still debate its applications and implications

• What do you think?
Appreciation?

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