

Darwinism on Everything #1

In November 1859, a British biologist Charles Darwin published “On the Origin of Species”, which proposed that species _____ and _____ without any plan or designer _____.

He knew that his theory would face harsh criticism because the idea challenged traditional _____ about the origin and diversity of life presented by _____. At the time, most people believed that all creatures, including human beings, were created by God, so any idea that _____ does not _____ God to be explained _____ strong opposition. So _____ extremely careful to bring his idea to the public. He _____ his _____ for 17 years, _____ working hard to _____ reputation as a great scientist.

However, Darwin _____ the potential impact of his theory. To _____, the essence of Darwinian evolution is that beautiful and _____ systems can be made _____ anybody knowing how to make them. Evolution does not _____ living organisms. This _____ can potentially provide explanation to all of human culture; _____ to technology, _____ to religion. How does evolution explain the development of human society?

In November 1859, a British biologist Charles Darwin published “On the Origin of Species”, which proposed that species evolve over time through random mutations and natural selection without any plan or designer in charge.

He knew that his theory would face harsh criticism because the idea challenged traditional views about the origin and diversity of life presented by Christianity. At the time, most people believed that all creatures, including human beings, were created by God, so any idea that existence does not require God to be explained provoked strong opposition. So he had been extremely careful to bring his idea to the public. He kept his theory secret for 17 years, while working hard to establish his reputation as a great scientist.

However, Darwin himself might have underestimated the potential impact of his theory. To generalize, the essence of Darwinian evolution is that beautiful and intricate systems can be made without anybody knowing how to make them. Evolution does not have to be only about living organisms. This theory can potentially provide explanation to all of human culture; from morality to technology, from the economy to religion. How does evolution explain the development of human society?

mutation	変異	provoke	刺激する、挑発する
evolve	進化する	reputation	評判
origin	起源	underestimate	損なう、むしばむ
Christianity	キリスト教	intricate	込み入った、複雑な
existence	存在、万物	morality	道徳観

Darwinism on Everything #2

Human body is a _____ of 40 trillion cells that _____ and _____ without any master cell that directs and controls the _____ the cells. _____ is that this sophisticated system _____ the simple structure of _____ - _____ organisms without any top-down designer or _____. It is a gradual, _____, and bottom-up _____.

Similarly, the global economy today is working in a bottom-up, _____ way. Billions of consumers and millions of companies are making trillions of decisions everyday, but _____.

No central direction is _____ the economy how many slices of bread, cups of coffee or _____ are needed. Free market _____ by distributing information and power to make decisions among individuals because even the _____ mind can never process such huge data. Indeed, when somebody tries to make central directions, the result is often a _____, such as the _____ economy of the Soviet Union. Whether it is the structure of living organisms or social structures, distributed systems work _____ centralized systems.

_____, the _____ of the global economy today _____ from simple and basic exchanges in _____ - _____ era. Early hunter-gatherers recognized the _____ exchange and _____, which _____ individuals to _____ more specialized _____ and communities to _____ trading networks. The global economy in the 21st Century is the result of this _____ and _____ process. Much like biological evolution, nobody has _____ directed this thousands of years of economic progress.

Human body is a collection of 40 trillion cells that work collaboratively and autonomously without any master cell that directs and controls the function of all the cells. What is equally remarkable is that this sophisticated system has evolved from the simple structure of single-celled organisms without any top-down designer or planner. It is a gradual, incremental, and bottom-up process.

Similarly, the global economy today is working in a bottom-up, decentralized way. Billions of consumers and millions of companies are making trillions of decisions everyday, but there is no one in command. No central direction is required to tell the economy how many slices of bread, cups of coffee or laptops are needed. Free market works by distributing information and power to make decisions among individuals because even the best and brightest mind can never process such huge data. Indeed, when somebody tries to make central directions, the result is often a miserable mess, such as the socialist economy of the Soviet Union. _____ the structure of living organisms or social structures, distributed systems work better than centralized systems.

Furthermore, the intricacy of the global economy today has evolved from simple and basic exchanges in hunter-gatherer era. Early hunter-gatherers recognized the advantages of exchange and division of labor, which led individuals to engage in more specialized roles and communities to expand the scale of trading networks. The global economy in the 21st Century is the result of this spontaneous and accumulated process. Much like biological evolution, nobody has ever planned or directed this thousands of years of economic progress.

autonomous	自律的な	mess	窮状、乱雑
incremental	累積的な、漸進的な	hunter-gatherer	狩猟採集民
decentralize	分散的な、分権的な	division of labor	分業
command	指揮権、管理	spontaneous	自然発生的・自発的な
distribute	分配する	accumulate	蓄積する

Darwinism on Everything #3

We humans are unique animals _____ we can _____ strangers _____ sincerity and fairness. This moral sense was not created top down by God or _____, _____ _____ to _____ the environment. It is _____ trade and exchange that _____ the evolution of morality. In market societies, if you get a reputation for unfairness or _____, people will not _____ you, and you will _____. Trading with neighboring communities is more beneficial than _____, so people increasingly began to think of neighbors as potential trade partners rather than potential _____. _____ people to _____ the opportunity to _____ by a stranger. The point is that this change was not directed by some _____ leader or god. Rather, daily interactions _____ ordinary people gradually changed the common views in society, and religious leaders just _____ the _____ - _____ to us.

Morality is evolving even today. In the _____ global issues such as climate change, pandemic diseases and financial _____, a _____ individuals are _____ the _____ of considering the entire human race as a _____ community, displacing _____ nationalism. With increasing popularity of _____, humanity is now facing a new environment where we interact electronically _____ individuals, _____ and backgrounds _____. Since we Homo Sapiens are still _____ new style of communication, we are _____ our moral _____. On _____, for example, we see people both _____ strangers and criticizing those _____, _____ as a process of _____ our morality to _____ the newly invented way of interaction.

We humans are unique animals in that we can treat strangers with sincerity and fairness. This moral sense was not created top down by God or philosophers, but rather evolved spontaneously to fit the environment. It is probably trade and exchange that significantly drove the evolution of morality. In market societies, if you get a reputation for unfairness or violence, people will not deal with you, and you will lose in the long run. Trading with neighboring communities is more beneficial than killing them, so people increasingly began to think of neighbors as potential trade partners rather than potential prey. Commerce led people to value the opportunity to be trusted by a stranger. The point is that this change was not directed by some moral leader or god. Rather, daily interactions among ordinary people gradually changed the common views in society, and religious leaders just reflected the bottom-up decision back to us.

Morality is evolving even today. In the face of global issues such as climate change, pandemic diseases and financial crises, a growing number of individuals are adopting the perspective of considering the entire human race as a unified community, displacing intolerant nationalism.

With increasing popularity of social media, humanity is now facing a new environment where we interact electronically with anonymous individuals, whose faces and backgrounds remain unknown. Since we Homo Sapiens are still unfamiliar with this new style of communication, we are struggling to update our moral codes. On Twitter, for example, we see people both slandering strangers and criticizing those slanders, which can be seen as a process of calibrating our morality to fit the newly invented way of interaction.

sincerity	誠実さ	intorelant	不寛容な
prey	獲物、餌食	anonymous	匿名の
commerce	商業	slander	誹謗中傷
adopt	採用する、取り入れる	calibrate	調整する
displace	取って代わる		

Darwinism on Everything #4

The light bulb is often used as a _____ for invention. It is indeed one of the greatest inventions in human history. _____ cheap light for billions of people and _____ the _____. We love to read the story of how Thomas Edison finally invented _____ and _____. We _____ for changing our lives. _____ Thomas Edison hadn't been born, would history _____? Of course not. Somebody else _____ come _____ the idea of a light bulb. In fact there were 23 people who _____ for inventing some _____ electric light in the same _____. The light bulb was just _____ to be invented in the 1870s for the _____ two reasons. First, technology proceeds, like evolution, to the _____. Each invention is necessary for the next invention. _____ the invention of the light bulb, _____ significant advancements in power generation technology and _____ systems, resulting in the development of infrastructure to deliver electricity to ordinary _____. Second, inventions are _____ by _____. Due to industrialization and _____ in the 1870s, population density increased in cities and more people _____ night. Naturally they wanted safe and convenient _____ free from the smoke and fire risk. In short, there was a technical background and growing demand for inventing the light bulb. _____ invented in the 1870s and _____ who invented it. The same is true for other inventions. For instance, _____ like Google were _____ for discovery in the 1990s when the _____ became popular and the number of websites _____. People _____ something that _____ the page they were looking for. By the time Google came along in 1996, there were already many other _____ and Google was just among one of them. Once the necessary conditions are _____, new technologies will _____ to their own _____, in the places and at the times most _____ to them.

The light bulb is often used as a metaphor for invention. It is indeed one of the greatest inventions in human history. It brought cheap light for billions of people and lessened the chances of fire. We love to read the story of how Thomas Edison finally invented it through trial and error. We give him credit for changing our lives. Suppose Thomas Edison hadn't been born, would history have been different? Of course not. Somebody else would have come up with the idea of a light bulb. In fact there were 23 people who deserve the credit for inventing some version of electric light in the same decade. The light bulb was just ripe to be invented in the 1870s for the following two reasons. First, technology proceeds, like evolution, to the adjacent possible. Each invention is necessary for the next invention. Prior to the invention of the light bulb, there were significant advancements in power generation technology and distribution systems, resulting in the development of infrastructure to deliver electricity to ordinary households. Second, inventions are fueled by demand. Due to industrialization and urbanization in the 1870s, population density increased in cities and more people stayed up late at night. Naturally they wanted safe and convenient lighting free from the smoke and fire risk. In short, there was a technical background and growing demand for inventing the light bulb. It had to be invented in the 1870s and it didn't really matter who invented it. The same is true for other inventions. For instance, search engines like Google were ripe for discovery in the 1990s when the Internet became popular and the number of websites skyrocketed. People wanted something that helped them get to the page they were looking for. By the time Google came along in 1996, there were already many other search engines and Google was just among one of them. Once the necessary conditions are met, new technologies will emerge to their own rhythm, in the places and at the times most suited to them.

credit	名声、称賛	power generation	発電
deserve	値するふさわしい	industrialization	産業化
ripe	熟す、機が熟す	urbanization	都市化
adjacent	隣接した	skyrocket	急上昇する

Darwinism on Everything #5

Dolphins and salmon have a similar body shape _____ taking different _____. They have _____ the _____ shape in adaptation to an _____ environment. This phenomenon is called _____ evolution; the _____ of the same solution to a _____ in _____ different places. When organisms are faced with similar environmental conditions and similar challenges, they _____ develop similar solutions.

This is also the case in the development of human culture and technology. We know that Edison was not the only inventor of the light bulb in the 1870s. Almost all discoveries, not just the light bulb, _____ different people _____; there were six different inventors of the _____, four of _____, five of the electric telegraph, and six of the electric _____.

Culture and technology develop _____ in adaptation to the social condition and _____ by combining and _____ the existing ideas. The way we learn human history can _____, because _____ far too much emphasis on design, direction and planning, and far too little on _____, environmental conditions, and _____ of society. We _____ that artists create _____, inventors make breakthroughs, and philosophers change minds. Individuals can make a difference, of course, and so can big companies and institutions. Leadership _____. But the truth is that artists can create _____ by social changes, inventors can make breakthroughs when new technologies are _____ to _____, and philosophers can change minds when ordinary people are ready to _____ new ideas.

It is the sea that _____ dolphins and salmon. The shape of _____ animals are not designed top down by God, but _____ spontaneously through adaptation to the environment. Similarly, the shape of ships is not _____ by human shipbuilders, but rather by the sea itself. Some ships _____ successfully and their designs are _____, while others are _____ and never be copied. It is the sea that _____ which ships succeed or _____ and which characteristics are _____.

Dolphins and salmon have a similar body shape despite taking different evolutionary paths. They have independently acquired the streamlined shape in adaptation to an underwater environment. This phenomenon is called convergent evolution; the appearance of the same solution to a particular problem in widely different places. When organisms are faced with similar environmental conditions and similar challenges, they tend to develop similar solutions.

This is also the case in the development of human culture and technology. We know that Edison was not the only inventor of the light bulb in the 1870s. Almost all discoveries, not just the light bulb, occurred from different people simultaneously; there were six different inventors of the thermometer, four of vaccination, five of the electric telegraph, and six of the electric railroad.

Culture and technology develop inevitably in adaptation to the social condition and needs by combining and refining the existing ideas. The way we learn human history can therefore mislead, because it places far too much emphasis on design, direction and planning, and far too little on coincidence, environmental conditions, and dynamics of society. We were taught that artists create genres, inventors make breakthroughs, and philosophers change minds. Individuals can make a difference, of course, and so can big companies and institutions. Leadership still matters. But the truth is that artists can create genres when they are prompted by social changes, inventors can make breakthroughs when new technologies are ripe to appear, and philosophers can change minds when ordinary people are ready to accept new ideas.

It is the sea that shaped dolphins and salmon. The shape of marine animals are not designed top down by God, but rather emerged spontaneously through adaptation to the environment. Similarly, the shape of ships is not determined by human shipbuilders, but rather by the sea itself. Some ships sail successfully and their designs are inherited, while others are shattered by waves and never be copied. It is the sea that determines which ships succeed or fail and which characteristics are passed on.

independently	独立して、独自に	vaccination	ワクチン接種
streamlined	流線型の	telegraph	電信、電報
convergent evolution	収斂進化	coincidence	偶然の一致
simultaneously	同時に、一斉に	genre	ジャンル
thermometer	温度計	shatter	粉々に砕く