



How Did Change Accelerate?

A lot has changed in the last 500 years. But what were the drivers of all this change and why did it begin to accelerate?



0:00 Sped up aerial views of a modern cityscape, followed by a construction zone with blue/green cranes, and finally a transit hub under construction.	Our world has been utterly transformed. At the heart is a sharp increase in rates of innovation. But why did rates of innovation increase so suddenly?
0:20 Montage of images starting with a color world map, a map of Africa, a map of Atlantic trade routes, a painting of people grouped under trees, people on canoe like boats, a painting of a mosque with people on the streets, a castle, people standing around a harbor, a black and white photo of a street market, a video of a black and white stone building, a color video of a clothing store, black and white video of people walking in traditional clothing, color video of a street food market, video of a floating food market, coal mining cave, a video of coal in a train, a painting of a man, color video of a steam engine, black and white figure of a steam engine, coal miners, black and white photo of a steam engine, photo of a war boat, a photo of a boat, finally an aerial video of oil rigs.	The first crucial change was a breakdown in the barriers between the four world zones. This allowed a rapid expansion in the size and diversity of exchange networks as different regions contributed their own plants, animals, customs, trade goods, ideas to an emerging global network the first in human history. The second crucial change was an increase in the importance of commerce and markets. In agrarian civilizations as we've seen, elites and rulers tended to extract resources through the threat of force. But there were many groups such as merchants, or artisans, or wage earners who actually had to get revenues on competitive markets. What they did was they sold their goods, or their labor, or their services on competitive markets. And to succeed on competitive markets what you have to do is you have to innovate. That means you have to offer better goods, services, or labor than your rivals. After 1500, expanding global networks of exchange increased the importance of commerce and markets everywhere. The third crucial change was this discovery of new sources of energy from fossil fuels. And in the 1700s some innovators, such as James Watt, began to develop cost efficient steam engines that could turn the world's vast and largely untapped sources of coal into cheap energy. The steam engine marked the beginnings of an energy revolution that would revolutionize our world. By the late 19th and early 20th century new innovations, such as the creation of the internal combustion engine, made it possible to harness the power of two other fossil fuels: oil and natural gas.
2:15 Sped up black and white video of a powerplant followed by a three white silhouettes of a man each	Never before had so much cheap energy been available. We estimate that in the Paleolithic era each human used on average something like 2 to 3,000 kilo calories of energy a day. That's a little bit more than you need just to survive. With agriculture, the domestication of animals, and the harnessing of wind and waterpower that figure may have risen in some regions to perhaps 10 or 12,000 kilo calories a day per person.



with a different colored circle above their head each one bigger than the last.	In the early 21st century it's estimated that each person is using on average perhaps 200,000 kilo calories of energy a day. And most of it comes from fossil fuels. Now imagine what it would mean if fossil fuels vanished overnight and you had to cut your personal energy budget by 90 or 95%.
3:16 Grey and white world map with purple shading added in the north Atlantic countries, a black and white image of a factory, two paintings of steel factories, a telephone pole with birds sitting on the wires, a train station, a steam ship, drawing of a hand on a telegraph, a picture of a man holding an old telephone, a woman sitting next to an old radio, and finally a scientific laboratory.	By 1900 industrial methods of production based on fossil fuels had spread to Europe, to North America, to Russia, and Japan. Innovations particularly affected the production of textiles, of iron and steel, and of chemicals such as dyes and fertilizers. They also transformed communications and transportation with the creation of railways, of steamship, of the telegraph, of the telephone, and of the radio and also the introduction of commercial scientific laboratories.
3:51 Grey screen with purple icons connected by white lines which zoom out to show a world map.	All of these processes accelerated the exchange of people, of goods, and of ideas.
3:57 Montage of images starting with two paintings of royal men, a royal woman, a video of coins dropping, paper money being rolled out in a sheet, black and white video of a government, image of the Bill of Rights, black and white painting of a government building, a color video of a parade, video of a child taking a test, video of a bank, black and white image of smoke over a power plant, ending with a video of a statue holding a scale.	As governments began to face new managerial challenges in a world increasingly dominated by commerce and markets no longer was it possible for governments simply to skim off resources from peasants through the threat of force. Now as increasing numbers of their citizens became wage earners, they had to become managers of markets. During the French and American Revolutions governments began to develop entirely new types of partnerships with their citizens through the creation of elections and the introduction sometimes of compulsory military service. They also began to provide new services such as mass education or banking. The Industrial Revolution transformed the international balance of wealth and power.
4:48	It shifted it right away from the old hub regions of the Agrarian era, the Mediterranean, Mesopotamia, India, and East Asia and it shifted it towards a new hub



Grey and white world map with countries highlighted in purple.	zone whose center was the North Atlantic region. Other beneficiaries included European settler societies such as the Americas, South Africa, and Australasia.
5:11 Montage of images starting with a painting of a town, image of a trolley, a color photo of a factory, painting of horses and a stagecoach, picture of boats in a harbor, warships, soldiers huddled around a gun, soldiers standing in formation.	By the late 19th century early industrializing societies including Britain, the USA, France, Germany, and then Russia and Japan began to use their growing wealth and modern military technologies, such as ironclad gunships and machine guns, to build powerful armies and eventually to create empires.
5:31 A colored world map replaced by the grey and white map with countries labeled in purple followed by a montage of images starting with a black and white painting of a person holding a sword and shield, a man pulling boats, a man cutting a pie, and finally a color picture of a city.	So, by 1900 the world seemed to be divided into two regions. A smaller industrial, wealthy, and extremely powerful region and a much larger weaker unindustrialized and much poorer region. It began to seem as if the main changes of recent centuries or the main result of those changes was to create two regions. One region at the expense of another to create a rich region and a poor region.