The Anthropocene and the Near Future: Crash Course Big History #9

Crash Course: Big History
https://youtube.com/watch?v=3WpaLt_Blr4
https://nerdfighteria.info/v/3WpaLt_Blr4

===== Introduction =====

(0:00)
Hi, I'm John Green, this is Crash Course Big History and today we're going to talk about the Anthropocene.

(0:05)
Mr. Green! Mr. Green! Anthropocene? What does that even mean? That sounds like gibberish.

(0:08)
No 'me from the past', your tenth grade essays were gibberish.

(0:10)
The Anthropocene is a word derived from the Greek word for human. Like you know how anthropologists study humans? Well, the Anthropocene is an unofficial geologic era where humans have an immense influence over the biosphere.

(0:24)
But I want to emphasize that it is unofficial because geologists are a vicious and terrifying bunch and the word is not official until they say it's official.

(0:31)
But even if it's not yet a word, the underlying concept is very useful. So due to the intensification of collective learning and the continued rise of complexity we've been talking about, you could argue that more change has happened in the past century than in the previous, like, 250,000 years of human history.

And it's all roughly within living memory. You, your parents and your grandparents have lived in one of the most complex and interesting times ever.

===== John =====

(1:03)
So, since 1800, we've had a Cambrian explosion of innovation and discovery, like in the last few years alone we've discovered a fundamental particle that weaves together the fabric of the universe - The Higgs Boson.

(1:14)
We discovered the largest ever black hole, which is about 17 billion times the mass of our sun, we found preserved woolly mammoth blood, we even have electric cars that go more than 125 miles per hour.
Although, you should drive them more slowly, obviously.

(1:28)
We've grown to a population of seven billion people and your phone has more computing power than all of NASA did when they sent men to the Moon in 1969.

(1:36)
And collective learning is increasing exponentially, here's Emily Graslie from The Brain Scoop to help us understand the scale of that growth of knowledge.

===== Emily =====

(1:34)
As human populations grow exponentially, collective learning is undergoing a snowball effect.
In humanity's first 250,000 years as foragers, about nine billion people lived and died.
Thanks to agriculture in the last thousand years, about 55 billion people have lived and died, and seven billion of them are around now.

(2:03)
This is great for rising complexity. We now live in a unified global network of billions of brains.
Communication is almost instantaneous and we harness the power of the Earth and Sun on a massive scale.
The potential for new breakthroughs in technology or in our understanding of the cosmos is heightened by all of this.

(2:20)
It's all part of the continuous rising complexity in big history, a trend that has been preceding for over 13,8 billion years - from gas clouds to stars to single-celled organisms to trilobites to dinosaurs to culture.

===== Hank =====

(2:33)
The beginnings of the Anthropocene weren't all sunshine and daisies, however.
The late 19th century was marked by an increase in the destructiveness of weaponry, a number of colonial empires covered the entire Earth, with the exception of a few non-European states which managed to maintain their independence, and mounting nationalism and bigotry led to some terrible chaos in the early 20th century.

(2:53)
World War I killed 15 million people, the Spanish flu which followed it and spread largely as a result of the unified global system that had previously been so valuable to collective learning killed off three times as many, and 50 million people were killed during World War II.

(3:07)
Such is the devastating cost of increased innovation and connectivity.

(3:10)
Following World War II, a new wave of industrialization entered East Asia, Central and South America, The Middle East and other areas.
Newly developed crops, especially strains of wheat and rice, helped places like India and China, which in the mid-20th century still suffered famines.

(3:24)
Their populations exploded for better or worse, and we harnessed the power of atomic fission, putting immense power in the hands of humans to be used for good or ill.

(3:34)
It's the threat of nuclear holocaust combined with the possibility of an asteroid impact or super-volcanic eruption that makes scientists like Stephen Hawking encourage the colonization of the Solar System to increase the chances of our species surviving.

===== John =====

(3:47)

Coping with scarcity is the bottom line of much of organic history encompassing all species, including humans.
So for most of human history the world was separated into four isolated zones. The agrarian communities within those zones were largely subdivided into separate social orders and classes and varying degrees of wealth.

(4:03)
And the number of the wealthy, landed gentry and aristocrats in the average agrarian civilization, whether it was Mughal India or Louis XIV's France, was between ten and twenty percent of the total population. So, at most, twenty percent of people were not poor.

(4:19)
Today, in a united global system (I mean, except for North Korea) if you earn more than roughly $20,000 per year, as most working adults in the developed world do, you are in the top 20% of the world's richest people. You are part of the global aristocracy.

(4:33)
But I should note that a couple things definitely have changed.
For one thing, if you are a part of the global aristocracy, you are enjoying a standard of living better than what kings had only a couple centuries ago. You probably have a refrigerator. You flip a switch and the lights come on. You have antibiotics, at least for a few more years. I mean, admittedly Netflix doesn't have any of the good movies, but that's still a better entertainment option than what Louis XIV had. All he had was public executions.

(4:56)
And hopefully the average person in the developed world today is a little more enlightened about the challenges of poverty than an 18th century aristocrat would have been, but the jury is still out on that one.

(5:06)
I mean that's why "first world problems" is a meme, right? But, how we behave toward the developing world in the next 100 years will determine much of how we are viewed not only by them, but by the thousands of future generations that come after us and read of our deeds in history.

=====Hank=====

(5:22)
So, is human history a story of progress where life has become better for most people over the course of 250,000 years and will life continue to get better for most people during the Anthropocene? We're going to try to answer that by looking at the Anthropocene in light and shade, which is basically just a list of pros and cons.

(5:38)
Pro
Since 1970, manufacturing jobs have lifted approximately 600 million people out of poverty, modern technologies can now feed and clothe more humans than ever before.

(5:48)
Con
More people in the developing world are forced from traditional ways of life and into factory jobs with poor safety standards, long hours and measly wages.
And a lot of the goods that they produce go overseas to enhance the standard of living of a prosperous and wealthy developed world.

(6:03)
And while the ratio of impoverished to wealthy countries in 1820 was about 3:1, today it's closer to 72:1.
Standards of living may be increasing on average, but the wealth inequality gap is getting wider and wider.

(6:16)
But pro - we have managed to harness a lot of energy, our use of coal and oil and nuclear power.
These energy flows have allowed us to generate an astounding amount of complexity in our little corner of the universe and improved people's standards of living.

(6:31)
Yeah, but con - current modes of production rely heavily on non-renewable resources that are not great for the environment
Unless you've been hiding under a rock for the past twenty years, you will probably have heard of climate change and potentially devastating effects it will have.

(6:45)
Furthermore, as humanity continues to force the environment to adapt to our needs, we are accelerating the rate of extinction of plant and animal species that don't happen to be useful to us.

(6:54)
One of the reasons we call this period the Anthropocene is, if humanity were to suddenly disappear and aliens were to land on Earth 500 million years later and start excavating, even if they saw no sign of the humans on the fossil record, they would see a mass extinction event rivaling the five most devastating mass extinctions in pre-human history.

(7:11)
Pro - collective learning's advances in medicine, agriculture and genetic engineering have in the past 200 years lowered the death rate and freed billions of people from the cycles of starvation and famine that affected agrarian civilizations.

(7:23)
Con - the tremendous expansion of populations in India and China have created a severe problem for the infrastructures of those countries.

(7:31)
We now have seven billion people on Earth and we'll grow to between 9,6 and 12 billion later in the century.
Yet, at our current rates of consumption and modes of production, the world could only support a population of two or three billion people who enjoyed the same standard of living as people in the United States do.

(7:45)
China's population may level off by around 2050, India's might level off by 2070, but Sub-Saharan Africa, a region of the world that already suffers from the highest levels of poverty and is least equipped to deal with problems of overpopulation is set to expand enormously even past the year 2100.

(8:02)
Add to this the likelihood that climate change will reduce the amount of arable cropland on the Earth by 10-25% and we may have a severe population problem on our hands.

(8:11)
And as we can see from the population cycles of the agrarian period, overpopulation tends to spark more violence.

(8:17)
Pro - in the long term, development of a country's economy tends to change demographic trends. While an agrarian civilization benefited

greatly from a farmer having half a dozen kids, first to combat the high infant mortality rate, and second, because by the time they were twelve, they could help out at the farm, today, kids take 18-22 years to educate and they're expensive.

(8:36)
Also, adults end up having other opportunities open to them.
Fewer kids, more hours on the Xbox or pursuing a law degree or a high-flying business career, whatever.
Economic development can slow population growth.
And many of the developed regions' of the world populations are stabilizing, which is why it is important to foster economic growth in places like Sub-Saharan Africa.

(8:55)
Con - but what drives a lot of the economic growth? Energy production, and developing countries are more prone to use inexpensive, fast and dirty forms of fuel to develop, rather than more expensive, eco-friendly alternatives.

(9:07)
This compounds the environmental problem, which in turn can mess up the environment and compound the population problem.
So it turns out, it's complicated and we are a little bit ambivalent about the Anthropocene.

===== John =====

(9:18)
In the next century, humanity's population growth will continue, but it'll hopefully level off between 10 and 12 billion people due to declining birth rates.
If it doesn't, we might be in trouble. Well, we'll definitely be in trouble at some point, we just don't know when.

(9:31)
But even if it does level off, we've still got problems concerning how to support all those people at a decent standard of living and how to find the energy to fuel that process.

(9:41)
I mean, we're talking about between 10 and 12 billion people.
The first time the world's population got to one billion humans was 1804. So right now, we're still heavily dependent on non-renewable fossil fuels.
Well technically, they are renewable but you need, like, a 100 million years.

(9:57)
But there are a few possible future scenarios.
One - we are miraculously saved by some technology in the same way that the industrial revolution lifted humanity out of the recurring cycles of famine in the agrarian era.

(10:08)
Two - we collapse miserably into ruins and ashes.
I don't like 'two', Stan, is there an option three?
Oh there is, that's good news!

(10:14)
Three - we can guide human society into a 'creative descent', a gentle decline of complexity to more simple, subsistence living.

(10:22)
Actually, you know what, I'm not crazy about 'three' either, I am all for 'one'.
Now, at present, we don't know what scenario will play out. We're acting as if we will be saved by some technology, and in fact, that's the only way that leads to the continuing rise of complexity, but we can't just assume that will happen.

(10:38)
And as for the potential dangers of the 21st century, there are environmental disasters, the rise of a superbug that wipes out millions upon millions of people, possible global conflict or a rise in instability.

(10:49)
The next fifty years will be fraught with a lot of risk.
But if we can somehow make it through what some call the 21st century bottleneck, things start to brighten again.

(10:58)
We'll be a stable population of 10-12 billion increasingly well-educated and interconnected innovators, and that's great for collective learning in the 21st century.
Who knows where such massive potential could lead?

(11:09)
It's important to remember that while there are seven billion people in the world right now, many of them don't have access to good education and that limits their innovative potential.
If in the future we see less poverty, as we've seen in the last twenty years, and more access to education, I'm kind of hopeful.

(11:25)
As far as we know, we are unique in the universe, and if for nothing else, it is our duty to our own innate curiosity to survive and to see where this rising complexity leads.

(11:36)
Our task as a species in this century is to survive it. If we can just manage that, from the end of the 21st century, the universe may take us in a thousand astonishing directions.
More on that next time.