7.2
MIGRATIONS & INTENSIFICATIONS

0:00–0:33

THE SPREAD OF HUMANS

Hi, I'm John Green. Welcome to Crash Course Big History. Today we're gonna be talking about the spread of human foragers across the world and the start of the agrarian era.

Mr. Green, Mr. Green, didn't we study all that agrarian stuff in World History, because I'm a very busy person. I don't want to do it again.

Yeah, a couple things, me from the past. First off, playing Zelda alone in your basement does not constitute being busy. Also, in Crash Course World History, we zoomed through a lot of this stuff because we wanted to get to, like, the real history-ish parts of history. You know, the parts with the funny hats and the Mongols.

0:33–1:04

FUNNY HATS!

But if it weren't for agriculture and the surpluses that came with it, we never would've had funny hats. That's why we study Big History.

So, as mentioned last week, humans anatomically similar to us have been around for about 200 or 250,000 years. Like, here's a picture of one of the oldest known fossil remains of our species from Ethiopia dated to approximately 195,000 years ago.

1:04–1:35

EARLY HUMANS

For the vast, vast majority of our existence, Homo sapiens were hunter-gatherers, like... farming, civilization, modernity all of that happened in the last 10 to 15,000 years.

And you'll remember that the eruption of Mount Toba about 74,000 years ago reduced the human population to a few thousand and that scrappy group of survivors held on, and for the next 60,000 years, human populations migrated over the world, separating into their own little Petri dishes.

1:35–2:16

WORLD ZONES

And that was interesting, because the human experiment could proceed in isolation in several different zones in the world: the Afro-Eurasia, the Americas, Australasia and the Pacific. And this was really useful, because it allowed each of those world zones to develop their own distinct brand of football, which makes for such a beautiful game today.

Apparently, there was no football back then. Really? What did they do all day? Apparently, they were hunting and gathering.

Okay, so by 11,000 years ago, the human population had recovered from the Mount Toba disaster and grown to about six to eight million people. Now, because foraging requires humans to constantly move on to new ecosystems to find food while the old ones regrow and replenish themselves, six to eight million is about the largest population of foragers that the entire surface of the Earth could support.

2:16–3:00

ABUNDANT ECOSYSTEMS

Now, you may remember in the very first episode of Crash Course World History, we talked about the mystery of why humans developed agriculture, even though foraging is easier.

One theory involves so-called Gardens of Eden, where the warming climate of the Earth created some lush ecosystems with enough food for foragers to quit migrating and settle down for several generations. The Natufians, of what later became the Fertile Crescent in the Middle East, hunted gazelles and fished and harvested wild grains, but they weren't really farmers. But then, after a few generations of vigorous population growth, food started to grow scarce in these Gardens of Eden. Given their new relatively sedentary lifestyle, those humans may have forgotten how to forage effectively. Also, surrounding areas may have been already overpopulated with other foragers.

3:00–3:27

RISE OF AGRICULTURE

So humans had to choose between starving to death and getting more out of the land that they were currently on. A choice that historically we make by trying not to die.

These humans already had a deep knowledge of plants and animals, and if you've got organisms nearby that might be useful to domesticate, like wheat or goats or wild pigs, bingo, agriculture.

Now, of course, there are also many other theories about why agriculture emerged around the world, but regardless agriculture represents a massive shift in human activity.

3:27–4:06

ADAPTING THE ENVIRONMENT

Hunter-gatherers adapted themselves to the resources provided by the environment, right? But agriculturalist increasingly adapted the environment to suit their needs.

Forcing the environment to adapt to humans became an increasingly big deal until, you know, like, today, when it is arguably the biggest deal of all.

Now, all that being said, the advent of agriculture didn't, like, immediately lead to wars and cities and kings and funny hats. In fact, another 5,000 years would pass before the first states emerged. So for the first half of the agrarian era, humans lived in a world of villages with transient herders and foragers and the gaps between.

4:06–4:42

POPULATION GROWTH

Giving up foraging and settling down did have some down sides in the form of back-breaking labor and diseases moving easily among denser and more numerous populations, but farming allowed humans to support a much larger number of people within a much smaller land area than foraging.

This was very good for collective learning, which relies on both the number of potential innovators and the close connectivity between them.

The world population had grown from roughly six million people at the beginning of agriculture to 50 million by the emergence of states 5,000 years ago. Roughly 5,000 times the size of the population that survived the Mount Toba disaster 70,000 years prior.

4:42–5:13

AGRICULTURE LED TO STATES

And because early farmers didn't really understand or have the technology to solve the problem of pooping near the drinking water, another upside was that we invented alcohol, which was safer to drink instead.

So next time you see a person looking fancy with a glass of champagne, just remember, it's a tradition that started from there being too much poop in the water, and ever since has fueled millions of bad decisions.

States did eventually appear, but not all states emerged at once, anymore than all agriculture emerged at once.

5:13–5:44

EARLY STATES

Agriculture first emerged in the Fertile Crescent and Egypt around 11,000 years ago, and then in East Asia and Papua New Guinea around 9,000 years ago. Agriculture emerged in West Africa and the Americas around 5,000 years ago, though estimates definitely vary for the Americas.

Accordingly, the first states to arise were in the Middle East, where agriculture first emerged, followed shortly by the Chinese and Indus Valley civilizations. Papua New Guinea may have invented agriculture around the same time, but they never developed enough agricultural surplus to support states.

So, yeah, in every world zone, the invention of agriculture was a precursor for the rise of states.

5:44–6:40

SURPLUSES & DIVISION OF LABOR

The key to having a state is agrarian surplus. If you produce enough food, you can have a class of people who don't need to farm. They can then fulfill other duties in this increasingly numerous and complex society, whether they be leaders or judges who settle disputes, bureaucrats who deal with administration and infrastructure, doctors who heal the sick, priests who make sacrifices to vengeful gods, or soldiers who provide security, or at least extract a portion of the agricultural surplus for the leadership through some kind of taxation.

And with more people filling new jobs and generating new ideas about them, this is also good news for collective learning. Diversification of labor is also the first step of early states toward hierarchies and classes, aristocrats and popular and despotic kings and pharaohs and sultans, shahs and emperors. It also meant the first divisions into unequal, unfair and undemocratic hierarchies, dividing man from man, man from woman, and the high from the low.

6:40–7:24

HOBBES V. ROUSSEAU

All of this brings us back to the Hobbes versus Rousseau debate. Hobbes viewed life without state control as nasty, brutish and short, while Rousseau viewed humanity as largely egalitarian before claims to land and wealth and property corrupted them.

Now, certainly the idea of an age of innocence or a golden age has been popular with many philosophers and political idealists throughout history. I mean, if humanity had once been perfect and was simply corrupted by societal structures or political systems, then it would take only a few tweaks or reforms to get us back to perfection.

Unfortunately, it now seems clear that a lot of humanity's evils are created simply by the bad wiring of our evolutionary biology, and the solution to the problem is somewhat complicated.

7:24–7:45

"YOU KNOW WHAT?"

It's very difficult for me to imagine a world in which humans will say "You know what? If the Earth can only support 6-8 million foragers, then there should only be 6-8 million of us."

So where you stand on this Hobbes v. Rousseau question affects your view of the entire 250,000 years of human history and also your view about much of human morality, character and potential.

7:45–8:30

THE ROLE OF ENERGY

Another big history take on agriculture is this: Consider the sun. We are made up of the leftovers of its formation and the debris of stars that came before it, but its role in our history doesn't stop there. Fusion reactions happen in the sun's core. This generates energy, which is released into space and takes approximately eight minutes to get to us.

Here on Earth, plants capture that energy and store it via photosynthesis. Agriculture let's one species, us, harness more of that energy. We either eat it or we use it to feed animals that we eat or we use it to feed animals like horses and oxen that pull carts and carry burdens, providing 500 — 750 watts of power, about ten times more than what a human being could do. So essentially, agriculture is the act of harnessing more energy from the Sun, way more than we could as foragers.

8:30–9:10

ENERGY & COMPLEXITY

All of this leads to an interesting perspective. Human history had frequently been viewed as too chaotic or complex to allow us to find an underlying trend, a bottom line or overarching theme. And this, to some people, makes conventional history differ greatly from the natural sciences.

However, given what we know of energy and complexity, consider the following: if we want to prevent our bodily complexity as wall as all the complexity that we have created from descending into chaos, we must keep harvesting matter and energy flows on a regular basis. This is the bottom line of human history. I will therefore argue that during most, if not all, of human history, the quest for sufficient matter and energy to survive and reproduce...has been the overriding theme.

9:10–9:43

MANAGING ENERGY FLOWS

That doesn't mean that the bottom line is all there is to human history. You've got political history and the history of warfare and gender history, class history, art history, environmental history, oral traditions, creation myths and much, much more.

But none of those would matter if we were all dead. If you don't eat, if you don't drink, you die.

Much of the collective learning, inventions, shifts in the social structure, has been geared toward coping with the problem of energy flows as the population continued to expand by leaps and bounds from a tiny 10,000 people 74,000 years ago to over seven billion people today.

9:43–10:35

MANAGING IDEAS

So the beautiful thing about being able to remember and accumulate the ideas of your ancestors is that some of their ideas are great for agriculture. Also other things, but mostly food.

Whether it's new forms of irrigation invented in ancient Mesopotamia, or the four-crop rotation that gradually proliferated across Europe in the 17th and 18th centuries, these innovations increased the number of potential innovators who could exist in a social order without starving.

There was also great innovative leaps in connectivity. For instance, the invention of writing in ancient states about 5,000 years ago. Like, starting from a bureaucratic form of accounting, mostly to count livestock, to an art largely enjoyed by the elite, writing gradually communicated more abstract and complex ideas, and those ideas became available to more and more people as more people could read until eventually writing became so popular that these days, everyone writes books, even some of your Crash Course Big History hosts.

10:35–11:12

SHARING IDEAS

We also like writing because it made it less likely that things we'd learned would be forgotten. Like, when people started to write down what they knew, that knowledge became set in stone, sometimes literally.

And then, with the invention of printing in China and later Korea, and the printing press in Europe, more writing could be produced and circulated more quickly, and often more cheaply, than books copied out by hand.

All of this turned into a beneficial feedback cycle. Potential innovators raised the carrying capacity of the population. More people go on to produce more ideas, which raises the carrying capacity of the population, which in turn, produces more potential innovators.

11:12–11:51

IMPROVED CARRYING CAPACITY

And we can do it all without anything bad happening to the environment. What's that? Oh. Oh, my.

So throughout the agrarian period, collective learning continued to raise the carrying capacity of the world. Populations grew from six million 10,000 years ago to 50 million by the dawn of states to 120 million by 1000 BCE in the midst of classical civilizations. By the end of the agrarian era and the beginning of the Industrial Revolution, 954 million people lived on the Earth.

But while collective learning gradually raised the carrying capacity in the agrarian era, it did not keep pace with population growth. And this is a significant problem with humanity.

11:51–12:27

STRAINING THE LIMITS

Just like any other animals in nature, we breed until we strain the resources of our environment. So we are prone toward unsustainable levels of overpopulation. So every two or three centuries, humans would hit the carrying capacity, and then the population would recoil, resulting in famine, disease, periods of infighting and population decline.

In every agrarian civilization, from civil wars between Caesar and Pompey, the English War of the Roses, to the revolt of the Janissaries in Ottoman Empire, and similar events all across the world, the cycles of prosperity, strain, crisis and civil infighting repeated themselves.

12:27–13:40

THE AGE OF EXPLORATION

And I do worry a little bit that when we talk about traditional history, we don't do it enough in the context of carrying capacity. We are, after all, organisms, and we behave a lot like other animals on this planet. We want there to be more of us, and we want more resources for that more of us to enjoy.

So that broad, big history take on the agrarian era takes us to the Age of Exploration. Explorers, including Christopher Columbus, but also many others, united the previously isolated world zones of Afro-Eurasia, the Americas, Australasia and the Pacific. Eventually, this combination of world zones into one unified global network, although not that unified, would produce an even more astounding rise in complexity: the Modern Revolution.

We'll talk about that next time.