

Grand Transitions

What's in it for me? A macro tour of history that'll help you understand the modern world.

Humans are remarkably resilient. It's amazing what civilizations have survived so far – war, famine, natural disasters, pandemics . . . and we've not merely survived, but thrived. Average living standards across the world are much higher than they were just a century ago. But before we start feeling smug about our collective achievements, let's take a look at the long and winding road that led us here. In these blinks, you'll see how global changes in society have shaped the world, for better or worse. In these blinks, you'll discover

why you might be better off living in Guatemala than South Korea; why we're hopeless when it comes to making predictions and; that when it comes to global problems, humans are both the cause and solution.

The major transitions that have taken place across the world have had mixed results.

The arc of a grand transition can be summed up in the story of a single person. A girl is born in rural China in 1945. Her family is desperately poor. But this girl is one of the lucky ones. She survives a devastating famine that kills her family, friends, and neighbors. She grows up, gets married, and has a son. The incredible pace of change in China – a result of economic reforms – opens up a world of opportunity for this woman and her family. In the 1990s, her adult son graduates from university, and then gets a job in the burgeoning market of electronics manufacturing. He makes a fortune and buys multiple properties. He starts a family of his own. In the twenty-first century, the man's adult son drives a sports car and enjoys a life of luxury and international travel. The family has come a long way from the grandmother's humble origins. Although this story is fictional, it could well be true. For many people in China, life changed beyond recognition in just two generations. It's a story of progress. Or is it? The key message here is: The major transitions that have taken place across the world have had mixed results. China was transformed by interdependent transitions: population change, economic change, agricultural change. Similar transitions have happened across the world on different scales. For example, the improvements in quality of life that took place in twentieth-century China happened earlier for many Europeans, but over a longer period. In poorer parts of the world, such as sub-Saharan Africa, the transition is still ongoing. Many of the changes in the world have been undeniably positive. Your chances of survival are infinitely higher than those of your ancestors. And just think of the astonishing advances in technology. Thanks to the internet, you have access to unlimited information – something that would have been unthinkable not so long ago. But other recent changes have been far less benign. Aging populations in Japan and Europe pose economic challenges for the next generation. Antibiotic-resistant bacteria are a ticking time bomb. Then there's the environment – a victim of human progress. Our existence has quite literally shaped the world, for better and worse. In the next

blinks, we'll look at these transformations in depth.

With its aging, shrinking population and expanding megacities, Japan represents the next stage of the transition.

There's a major transition going on in Japan. In the next 50 years, the population is expected to shrink by 45 million people. That's about the entire population of Spain! This is an extreme example of the population decline that's taking place across the world. The boom of the nineteenth and twentieth centuries couldn't last forever, and most countries are now heading in the opposite direction. To some extent, the shift from high to low fertility is a sign of progress – reduced infant mortality, higher education, and higher living standards. But this transition isn't without its problems. The fertility decline means that 70 percent of the world's populations will have a reproduction rate below replacement level by 2050. As populations get older and smaller, we're going to face new challenges. The key message here is: With its aging, shrinking population and expanding megacities, Japan represents the next stage of the transition. In Japan, nearly 40 percent of the population will be 65 or older by the year 2040. The cost of taking care of an aging population is already taking its toll as the state pours money into healthcare and welfare. And of course, there are far fewer people of working age. Without young people working and keeping the economy going, how can a country afford to care for the elderly? By 2050, there will be more than 400,000 people in Japan who are at least 100 years old. But the average centenarian is unlikely to have a high quality of life. Reaching an advanced age is associated with a myriad of problems, from frailty to dementia. And sadly, many elderly people in Japan are living – and dying – alone. Japan also presents another key feature of demographic transition – urbanization. In the past century, it's seen cities explode into megacities. With a population of nearly 40 million, Tokyo offers a worrying glimpse of the future – high housing costs, overcrowding, and lower quality of living. Megacities are bad news for the environment, too. Compared to a village resident, a person living in a megacity uses up double or even triple the environmental resources. In the next blink, we'll look at another important transition, which is inextricably linked to changing populations – food production and diet.

Agricultural transitions have revolutionized how we produce and consume food.

How would you like to eat lumpy oat bread every day, for every meal? Not so enticing? Then be glad you aren't a worker in eighteenth-century England! Actually, monotonous diets were the norm for most people for centuries. But for a large part of the world, our diets have changed and improved radically. The variety and quality of ingredients in modern diets would be impossible without extremely efficient food production. Thanks to mechanization, modern farming methods, and the improvement of crop varieties,

food is much easier to produce on a large scale. That means greater affordability and accessibility for consumers too. The key message here is: Agricultural transitions have revolutionized how we produce and consume food. Famine and malnutrition used to be widespread. These days, famine is common only in sub-Saharan Africa, which is still at an earlier stage of the transition. But in the rest of the world, famine is a thing of the past, and malnutrition is in decline. This is an important achievement that we often take for granted. But it's really amazing. Just think about the variety and low cost of the food in your local supermarket, and the availability of international cuisine. But before we pat ourselves on the back, we should remember that obesity and unhealthy eating are also on the rise. The average adult body mass index has been increasing in virtually every country, and the trend is affecting children too. There'll soon be more obese children than malnourished children worldwide – we've overcorrected from one extreme to another. It's not just that we eat too much, but that we also produce much more than we could ever consume. In the US, the food supply is equivalent to about 4,000 calories per person per day. That's alright for a lumberjack or a miner, but the average person living a more sedentary lifestyle should eat about half those calories. Affluent countries are responsible for millions of tons of food waste every year. The problem with producing unnecessary food is that it causes equally unnecessary environmental damage. Modern agriculture is wreaking havoc on the biosphere, using up huge amounts of land and producing between 20 to 30 percent of all greenhouse gases. In most of the world, the main stage of the agricultural transition has been completed. But an exciting phase of another transition – energy – is only just beginning.

We're going through a positive new energy transition, but it'll take longer than we think.

If you're starting to feel ambivalent or even gloomy about all this so-called progress, just remember – it could be worse! For example, while pollution is a problem, the world would be far more polluted if all eight billion of us were still reliant on burning wood or dung as a source of heat. Thankfully, that's not the case. The shift from reliance on wasteful and inefficient biomass to fossil fuels has been a huge improvement. Fossil fuels have a bad reputation, but they could be considered a lesser evil . . . or at least a stop on the way to a greener future. There have been other transformative energy transitions, too. For example, the switch from relying on animals and manpower to using machines, which are infinitely more efficient, reliable, and durable. Then there's electrification, which has influenced just about every aspect of life, from improved labor productivity to household chores. But none of these changes took place overnight! The key message here is: We're going through a positive new energy transition, but it'll take longer than we think. The possibilities offered by renewable energy are undeniably exciting. There are also encouraging statistics about declines in energy intensity and improving conversion efficiencies. For example, in terms of fuel consumption, the latest Boeing airplane is about 70 percent more efficient than the first commercial Boeing, which was produced in 1958. Innovative technological solutions should result in similar improvements in the years to come. In other words, we're going in the right direction. But these changes will take far longer than people expect – this is the very nature of energy transitions. The shift to using renewable energy on a wider scale will take decades. We should also be cautious when interpreting statistics. Let's take China as an example. Between 1990 and 2015, energy intensity in China decreased by two-thirds –

far more than in other countries. It may seem like an impressive achievement, but really it's just an example of China catching up with the rest of the world. It's still a very energy-intensive country, and the rapid growth of the economy means ever-increasing energy consumption. The connection between energy consumption and economic growth is clear. We'll get more into the mixed blessings of a successful economy in the next blink.

Rapid economic growth comes at a cost - for humans and the environment.

Next time you go shopping, keep this in mind. Our ancestors considered themselves lucky if they could upgrade from a stool to a chair, or afford multiple cooking pots. In early eighteenth-century France, for example, the average family spent 80 percent of their income on food. Most of us now live in a consumer society, buying far more than just the basics. This was made possible by the rapid economic growth that began in the nineteenth century, after centuries of very gradual growth. While we can't know exactly what the future holds, the statistics suggest we have reason to be optimistic. This age of relatively high worldwide economic growth should continue in the decades to come, albeit at a slower pace. This is good news, right? Economic growth raises standards of living, allows us to travel, and to upgrade to the next smartphone in addition to a new cooking pot. The key message here is: Rapid economic growth comes at a cost - for humans and the environment. The flip side of a booming economy is a widening gap between rich and poor. China has the fastest growing economy, but also the sharpest rise in inequality. There are some other factors to keep in mind, too. On the surface, they all seem like signs of progress and higher living standards. First, mass consumption. Our insatiable appetite for buying things shows no signs of slowing down, even though it doesn't make us happier. In a recent global ranking of happiness, wealthy South Korea languished in 54th place, below much poorer countries such as Guatemala. Second, increased mobility. We travel more often and far further than our ancestors could have imagined, leading to exciting opportunities. But stressful commutes are making many of us miserable, and excessive travel has an environmental impact. Third, modern technology and communications. Of course, there are positives, but what about the negatives? Information overload, loss of privacy, reduced face-to-face interaction, a decline in reading . . . and many others. These issues have received a lot of media attention in recent years, unlike another consequence of the technological revolution - the toll on the environment. Despite their diminishing sizes, many devices have extremely high energy and material intensities, as well as short lifespans. The average smartphone lasts for around 20 months and likely won't be recycled. Since our environment is undeniably important, let's take a closer look at our impact on it in the next blink.

Humans have had a monumental impact on the earth, and some of the changes are devastating and irreversible.

It's a widespread misconception that humans have only caused the planet harm since the Industrial Revolution. Because actually, human-caused environmental problems are nothing new – just ask the dodo! Our ancestors burned vast areas of vegetation and over-hunted some species to extinction. Admittedly, there have been some improvements in recent years. For example, deforestation has plateaued in many parts of the world. In some more affluent countries, such as Spain and Canada, forest sizes have remained unchanged or even increased in the last two decades. Another encouraging sign is the increase in protected areas, covering millions of square kilometers across the globe. But is it enough? In short, no. The key message here is: Humans have had a monumental impact on the earth, and some of the changes are devastating and irreversible. Human activity has left a mark on the majority of the earth's surface, transforming up to 67 percent of all ice-free land. By the end of the twenty-first century, we'll have reached a limit – there's only so much land, and only so much we can do with it. One of the clearest signs of human impact is the fact that there's essentially no wilderness left. It's not even a twenty-first-century problem. In 1782, the philosopher Rousseau walked into an isolated stretch of an Alpine ravine. As he relished the sensation of being the only person to have ever reached this remote spot, he heard a noise – the sound of machinery. Walking on, he was dismayed to see a mill. Even in the deepest, most isolated parts of the Alps, Rousseau was unable to escape from human influence. The loss of wilderness is bad enough, but the real tragedies are the qualitative changes – the loss of animals and biodiversity as a direct result of human activities. Elephants, tigers, whales, countless fish species . . . once they're gone, they're gone forever. It would take millions of years to undo the damage we've caused and return to previous levels of biodiversity. Of course, we have to protect animals and land, and tackle pollution and climate change. But we also have to keep the economy going and in the future, meet the needs of a potential 10 billion people. Protecting the environment and meeting human needs are essentially at odds with each other. It's a difficult challenge that's becoming increasingly more difficult.

The transitions so far haven't been all good, nor all bad, so our future predictions should also be balanced.

The modern world is messy, but it's magical too. The science-fiction writer Arthur C. Clarke once observed that any sufficiently advanced technology is indistinguishable from magic. The dramatic, rapid improvements in quality of life over the last two centuries are similarly magical. We're living longer, with higher incomes and access to an incredible variety of food. Travel is fast and affordable. We have unlimited access to free information. What's that, if not magical? The media tends to focus on catastrophes, but we should appreciate our achievements too. The key message here is: The transitions so far haven't been all good, nor all bad, so our future predictions should also be balanced. Many predictions about the future are far too extreme. We tend to think in pessimistic, apocalyptic terms, which is just not realistic. A lot of gloomy predictions have turned out to be way off the mark. For instance, in 1968 acclaimed biologist Paul Ehrlich forecast that the next decade would see the starvation of hundreds of millions of people. He was completely wrong, but that hasn't stopped others from making apocalyptic predictions. On the other hand, we should avoid the opposite extreme – the optimistic and simplistic belief that we can continue improving endlessly. It's like picturing the future as a series of escalators going up and up in a

skyscraper where the floors never end. When looking forward, we should also look back. History shows us that life is full of unpredictable shifts. Some predict that technology and human innovation will lead to a brighter future. For example, the inventor and futurist Ray Kurzweil has envisioned a world of exponential growth, achieving 200,000 years of progress in a single century. Machine intelligence might surpass our own in just a few decades. According to some thinkers, in that same timescale technology will take care of everything. But it won't matter how godlike humans become through technological advances if we destroy the environment in the meanwhile. Ultimately, we'll always be dependent on the biosphere – a reality that techno-optimists tend to forget. Life is unpredictable. However the future unfolds, it won't be a story of endless progress, nor definite doom and destruction. But that doesn't mean we should stop making plans.

We must make a global effort to reduce inequality and protect the environment, but reaching a compromise won't be easy.

As we ponder our next steps, let's go back to one of the few things that's going in the right direction – energy. We're slowly shifting toward renewable electricity. But we're still heavily dependent on fossil fuels, which currently provide almost 85 percent of primary energy supplies. Change may be possible, but the cost of changing the global system is an eye-watering \$30 trillion. Progress will take time. It always does. And given the scale of the modern world, we can expect the next transitions to be slow. For that reason, we should also be cautious when making predictions. It's very difficult to make accurate forecasts, particularly in the long term. In the short term, only a few things seem certain, like booming population growth in Africa and aging populations in many countries. The key message here is: We must make a global effort to reduce inequality and protect the environment, but reaching a compromise won't be easy. Despite the progress of the past two centuries, 4.5 billion people still have a poor quality of life. Reducing this inequality should be one of our main goals, but how can we do this without causing irreparable damage to the environment? Improving living conditions inevitably requires more resources and energy consumption. Imagine a future where more affluent countries voluntarily cut their energy and material use by half, allowing lower-income countries to use more. This unrealistic scenario still wouldn't be enough. Similarly, avoiding the devastating environmental consequences of global warming will be impossible unless we stop using fossil fuels. And that's not going to happen any time soon. The future doesn't exactly look bright, but we shouldn't despair either. Remember, doomsayers like Paul Ehrlich are rarely right, and they underestimate the human ability to adapt. Whatever happens next, we'll adapt – that's what we've always done, after all. So, what's the right approach? We need a mixture of determination and flexibility, experimenting with different solutions instead of relying on just one. We should also keep an open mind. Take nuclear power, for example. We shouldn't boycott it, but it's also a mistake to treat it as the solution. Taking a balanced, discriminating approach will help us to make the right decisions in other areas too. As we go through another epochal transition, we should be proactive without panicking. The next phase of humanity all depends on the choices we make today.

Final summary

The key message in these blinks: A person living in 1940 would be amazed to see the world of 2020, transformed by technology, yet on the verge of a climate crisis. The coming decades are just as impossible to predict, but will likely be just as surprising and transformative – another grand transition. Got feedback? We'd love to hear what you think about our content! Just drop an email to with Grand Transitions as the subject line and share your thoughts!