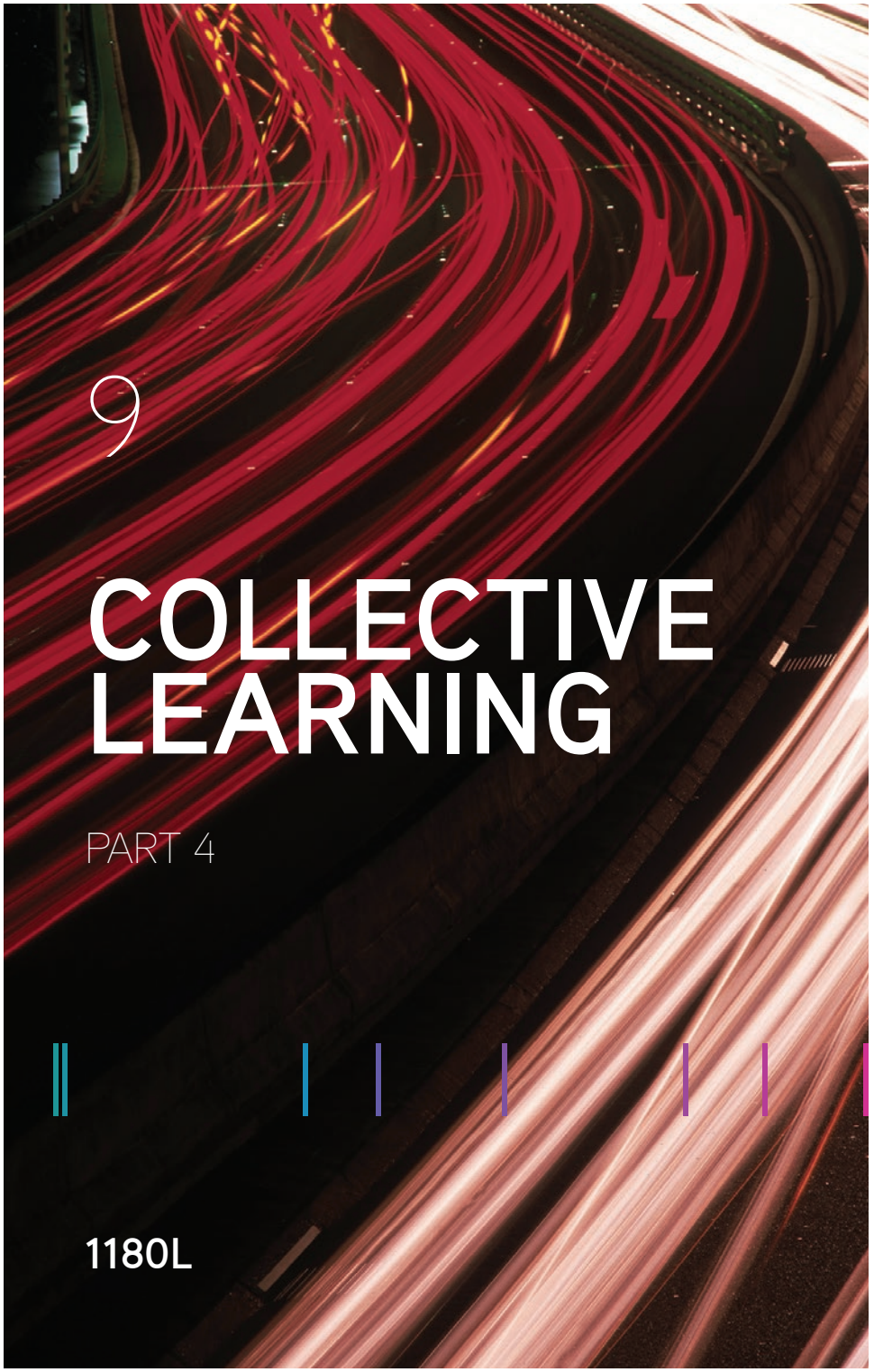


9

COLLECTIVE LEARNING

PART 4

1180L

BIG HISTORY PROJECT

COLLECTIVE LEARNING

RAPID ACCELERATION

By David Christian

In the final essay of a four-part series, David Christian explains how advances in communication and transportation accelerated collective learning.

Postindustrial connections

We have explored some of the ways in which networks of collective learning evolve. And we've focused on those processes that make collective learning operate more powerfully. Now let's explore why collective learning has taken off like a rocket since the beginning of the Industrial Revolution. This time period is sometimes called the Anthropocene, suggesting a geologic epoch in which humans have played the dominant role in shaping our biosphere.

To understand how quickly the networks of collective learning have grown, consider that the current global population of 7 billion is now connected into a single network covering the entire planet. Try calculating the number of possible connections between 7 billion different people!

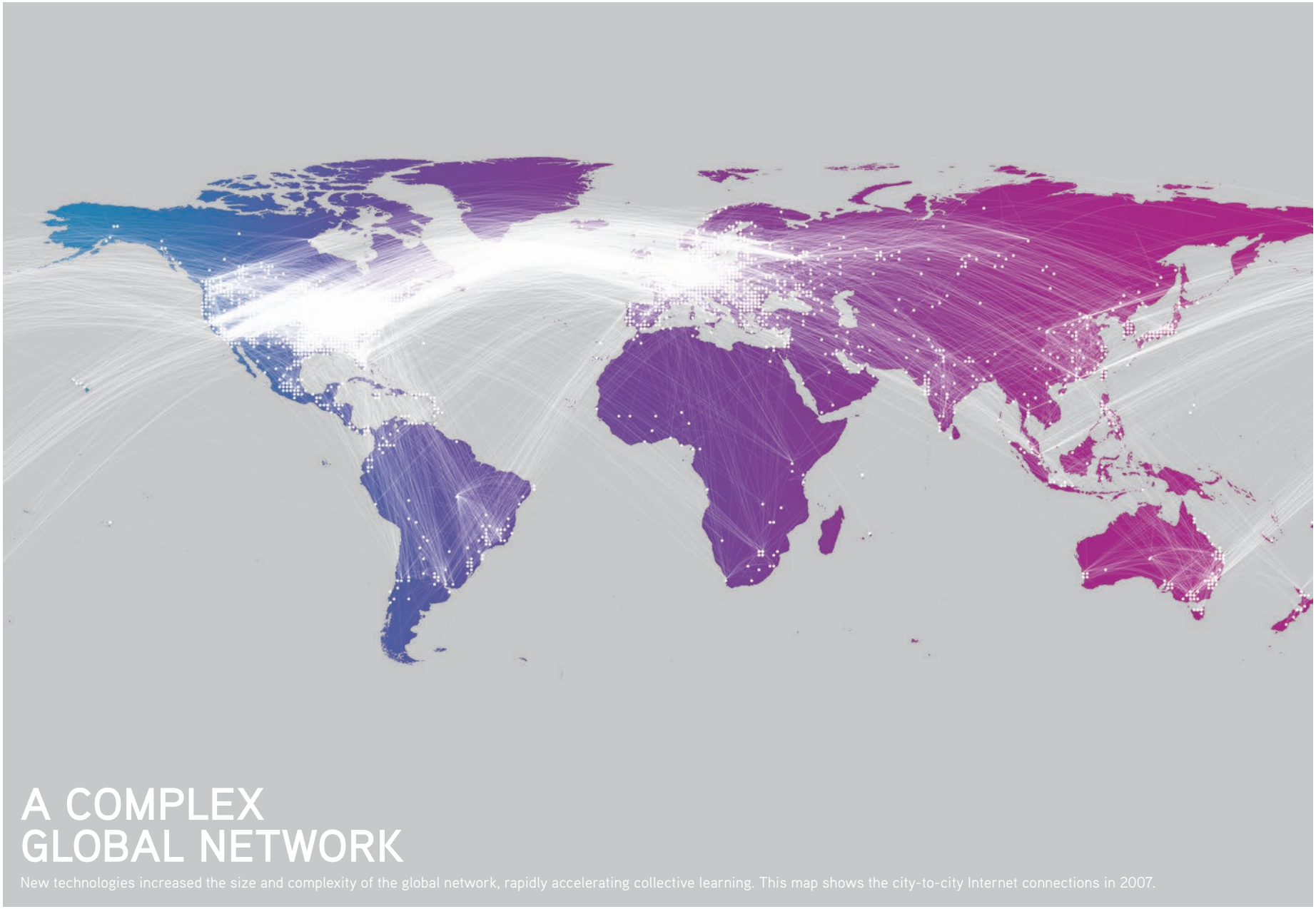
This network is also much more diverse than any that has ever existed because it includes all the different cultures of the entire world and all the knowledge that people in each of those cultures possess. It includes all the different ideologies and religions that have spread as people have moved from continent to continent. With these moves, different materials are relocated, crops are transplanted, and goods are exchanged.

By the nineteenth century, refrigerated steamships made it possible to sell New Zealand butter and Argentine beef in London, Paris, and Beijing. Today, exotic plants and hardwoods make their way from the Amazon jungle to global markets; Australian Aboriginal elders teach about the Dreamtime in the United States; and 10,000 nuclear scientists from 113 countries visit the Large Hadron Collider in Switzerland to do research on particle physics — perhaps helping us to, collectively, explain unanswered questions about the Big Bang. Collective learning is now a global process fueled by the size and diversity of an entire planet. Anyone want to start compiling a list of the different things and ideas traded around the world today?

The power of a global network

Within these vast and diverse networks, there are huge differences in connectedness, wealth, and power. Search engines have links to just about every computer in the world. If unevenness in connectedness is linked to unevenness in wealth and power, we shouldn't be surprised to find that levels of inequality are greater than ever before. Currently, the most powerful individual in the world is probably the president of the United States. The president has the power, theoretically, to launch a nuclear war that could destroy much of the biosphere in a few hours. The rulers of agrarian civilizations had nowhere near as much power. Inequalities in power are matched by inequalities in wealth. By many measures, the gap between the very poorest in the world and the very richest has widened spectacularly in the last two centuries. In 2008, almost 1 billion people lived on less than $1 a day. That is more people than the total population of the world just 500 years ago! Meanwhile, the number of fabulously wealthy has also increased, so the gap between the very rich and the very poor is much wider than ever before.

We can see powerful feedback cycles everywhere, but perhaps most clearly in technologies of communication and transportation. It took Darwin three years to sail around the world. Today, you can be in Sydney one day and in New York the next. Changes in communications are even more incredible. Just over 500 years ago, the breakthrough technology in communications was printing. Instead of copying the Bible laboriously by hand, printing presses could churn out many copies a day. Printing also aided the spread of ideas such as Copernicus's and Newton's views on the Universe. Then, in the nineteenth century, there came a flood of new technologies — steamships, telegraphs, railways, and telephones — followed in the next century by planes, radios, televisions, rockets, computers, and the Internet. Today almost anyone can communicate instantly with anyone else.



A COMPLEX GLOBAL NETWORK

New technologies increased the size and complexity of the global network, rapidly accelerating collective learning. This map shows the city-to-city Internet connections in 2007.

Think about the impact and scale of this change. More people, more diversity, and more complex networks with greater imbalances in knowledge, wealth, and power. Collective learning has become so widespread that it has turned us humans into a species capable of transforming an entire biosphere. It is these interconnected feedback cycles — a spiral of acceleration — that explain why collective learning now seems to be operating at warp speed. Where is it all headed?

How collective learning works

Rule 1	Collective learning increases when more people are connected
Rule 2	Collective learning increases when there is greater diversity within a network
Rule 3	Uneven distributions of information produce uneven distributions of power and wealth

Positive feedback cycles compound the effects of these three rules, accelerating collective learning

Image credits

City traffic at night
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A Complex Global Network,
Chris Harrison/Carnegie Mellon and The Big History Project

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