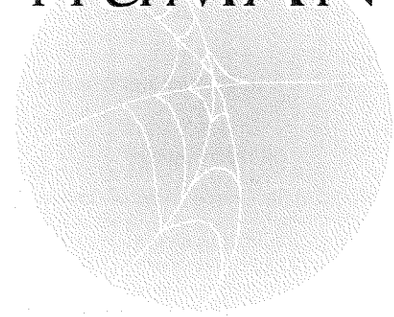
THE HUMAN WEB



A BIRD'S-EYE VIEW OF

WORLD HISTORY

J. R. McNeill and William H. McNeill

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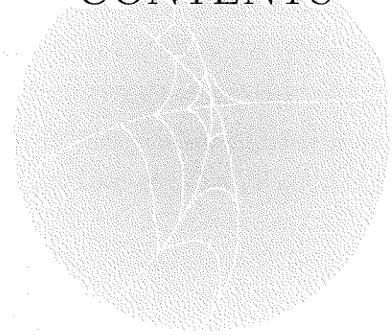
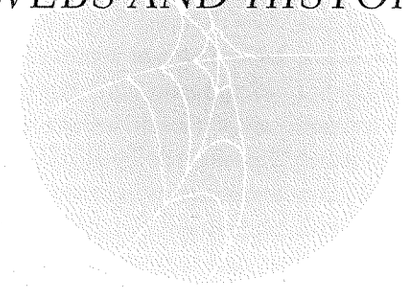


INTRODUCTION: WEBS AND HISTORY



HARDLY ANYTHING COULD BE MORE ISOLATED OR MORE SELF-CONTAINED THAN THE LIVES OF THESE TWO WALKING HERE IN THE LONELY HOUR BEFORE DAY. . . . AND YET THEIR LONELY COURSES FORMED NO DETACHED DESIGN AT ALL, BUT WERE PART OF THE PATTERN IN THE GREAT WEB OF HUMAN DOINGS THEN WEAVING IN BOTH HEMISPHERES FROM THE WHITE SEA TO CAPE HORN.

— THOMAS HARDY, *The Woodlanders (1887)*

This book mixes old and new wine, and pours the blend into a new bottle. Some of the ideas and perspectives offered here are distilled versions of ones first proposed half a century ago. Others are set forth here for the first time. The new bottle, giving shape to the book, is the notion of the centrality of webs of interaction in human history.

A web, as we see it, is a set of connections that link people to one another. These connections may take many forms: chance encounters, kinship, friendship, common worship, rivalry, enmity, economic exchange, ecological exchange, political cooperation, even military competition. In all such relationships, people communicate information and use that information to guide their future behavior. They also communicate, or transfer, useful technologies, goods, crops, ideas, and much else. Furthermore, they inadvertently exchange diseases and weeds, items they cannot use but which affect their lives (and deaths) nonetheless.

The exchange and spread of such information, items, and inconveniences, and human responses to them, is what shapes history.

What drives history is the human ambition to alter one's condition to match one's hopes. But just what people hoped for, both in the material and spiritual realms, and how they pursued their hopes, depended on the information, ideas, and examples available to them. Thus, webs channeled and coordinated everyday human ambition and action—and still do.

Although always present, over time the human web changed its nature and meaning so much that we will speak of webs in the plural. At its most basic level, the human web dates at least to the development of human speech. Our distant ancestors created social solidarity within small bands by talking together, and exchanging information and goods. Furthermore, bands interacted and communicated with one another, if only sporadically. Despite migrations that took our forebears to every continent except Antarctica, we remain a single species today, testament to the exchange of genes and mates among bands through the ages. Moreover, the spread of bows and arrows throughout most of the world (not Australia) in remote times shows how widely a useful technology could pass from group to group. These exchanges are evidence of a very loose, very far-flung, very old web of communication and interaction: the *first worldwide web*. But people were few and the earth was large, so the web remained loose until about 12,000 years ago.

With the denser populations that came with agriculture, starting some 12,000 years ago, new and tighter networks arose within the loose, original web. The first worldwide web never disappeared, but segments within it became so much more interactive that they formed smaller webs of their own. These arose in select environments where agriculture or an unusual abundance of fish made a more settled life feasible, allowing regular, sustained interactions among larger numbers of people. These tighter, denser webs were local or regional in scope.

Eventually, about 6,000 years ago, some of these local and regional webs grew tighter still, thanks to the development of cities that served as crossroads and storehouses for information, goods, and infections. They became *metropolitan webs*, based on interactions connecting cities to agricultural and pastoral hinterlands, and to one another. Metropolitan webs did not link everyone. Some people (until recent times) remained outside, economically self-sufficient, culturally distinct, and politically independent. The first metropolitan web formed around the cities of ancient Sumer beginning nearly 6,000 years ago. Some metropolitan webs spread, and absorbed or merged with others. Others prospered for

a time but eventually frayed and fell apart: the process of web building had many reversals. The largest, the *Old World Web*, spanning most of Eurasia and North Africa, formed about 2,000 years ago by a gradual amalgamation of many smaller webs. In the last 500 years, oceanic navigation united the world's metropolitan webs (and its few remaining local webs) into a single *cosmopolitan web*. And in the last 160 years, beginning with the telegraph, the cosmopolitan web became increasingly electrified, allowing more and far faster exchanges. Today, although people experience it in vastly different ways, everyone lives inside a single global web, a unitary maelstrom of cooperation and competition. The career of these webs of communication and interaction constitutes the overarching structure of human history.

Before we begin our brief account of that history, a few further observations about webs are in order, concerning their cooperative and competitive character; their tendency to expand; their growing importance in history; and their impact on the earth's history.

(1) All webs combined cooperation and competition. The ultimate basis of social power is communication that sustains cooperation among people. This allows many people to strive toward the same goals, and it allows people to specialize in what they do best. Within a cooperative framework, specialization and division of labor can make a society far richer and more powerful than it would otherwise be. It also makes that society more stratified, more unequal. If a cooperative framework can be maintained, the larger the web gets, the more wealth, power, and inequality its participating populations exhibit.

But, paradoxically, hostile competition also fostered a parallel process. Rivals shared information too, mainly in the shape of threats. Threats, when believed, provoked responses. Effective responses usually involved some closer form of cooperation. If, for example, one kingdom threatens another, the threatened king will seek ways to organize his subjects more effectively in defense of the realm. He may also seek closer alliance with other kingdoms. Competition at one level, then, promoted cooperation at other levels.

(2) Over time, those groups—families, clans, tribes, chiefdoms, states, armies, monasteries, banking houses, multinational corporations—that achieved more efficient communication and cooperation within their own ranks improved their competitive position and survival chances. They

acquired resources, property, followers, at the expense of other groups with less effective internal communication and cooperation. So the general direction of history has been toward greater and greater social cooperation—both voluntary and compelled—driven by the realities of social competition. Over time, cooperating groups of every sort tended to grow in size to the point where their internal cohesion, their ability to communicate and conform, weakened and broke down.

Larger metropolitan webs of interaction, linking all sorts of groups, also tended to grow, for three reasons. First, they conferred advantages on their participants. Through their communication and cooperation, societies inside metropolitan webs became far more formidable than societies outside. Participation in such a web brought economic advantages via specialization of labor and exchange. Military advantages came in the form of larger numbers of well-equipped warriors, often full-time specialists in the arts of violence, aware of (and usually choosing to use) the cutting edge of military technology. Epidemiological advantages also accrued to people born inside metropolitan webs, because they were more likely to acquire immunities to a wider array of diseases than could other people.

All these advantages to life inside a metropolitan web came at a cost. Economic specialization and exchange created poverty as well as wealth. Skilled warriors sometimes turned their weapons against people who looked to them for protection. And populations acquired disease immunities only by repeated exposure to lethal epidemics. Nonetheless, the survivors of these risks enjoyed a marked formidability in relation to peoples living outside such webs.

But there was more to the expansion of metropolitan webs than this. Webs were unconscious and unrecognized features of social life. Nonetheless, they contained within them quite conscious organizations—lineages, tribes, churches, companies, armies, bandit gangs, empires—all of which had leaders who exercised unusual power. These leaders caused metropolitan webs to expand by pursuing their own interests. Leaders of any hierarchy enjoyed an upward flow of goods, services, deference, and prestige. They normally sought to expand the scope of their operations so as to increase this upward flow. Their followers helped, to avoid punishment and to earn a share (however paltry in comparison to the leaders') of the anticipated rewards. In the past, this urge to expand often came at the expense of people outside of metropolitan webs, who were poorly organized to defend their own persons, property, resources, or religion. Survivors found themselves enmeshed in new economic, political, and cultural linkages, in a word, in a web. Thus, leaders of organizations, seeking to enhance their own power and status, persistently (if unconsciously) expanded the webs in which they operated.

Finally, metropolitan webs tended to expand because communications and transport technology improved. Writing, printing, and the Internet, for example, were major advances in the transmission of information. Each reduced information costs, and made it easier to build and sustain larger networks of cooperation and competition. Sailing vessels, wheels, and railroads similarly cut transport costs and promoted exchanges of goods and information over broader spaces and among larger populations.

(3) So webs involved both cooperation and competition, and over time their scale tended to grow. So too did their influence upon history. The original worldwide web lacked writing, wheels, and pack animals. The volume and velocity of messages and things that circulated within it was always small and slow by later standards. Its power to influence daily life was weak, although it could occasionally transmit major changes. But the more tightly woven metropolitan webs that evolved beginning about 6,000 years ago transmitted more information and more things more quickly, and thus played a larger role in history. As these webs grew and fused, fewer and fewer societies existed in isolation, evolving in parallel with others, and more and more existed and evolved in communication with others. Between 12,000 and 5,000 years ago, at least seven societies around the world invented agriculture, in most cases quite independently: parallel pressures led to parallel solutions. But the steam engine did not have to be invented seven times to spread around the world: by the eighteenth century, once was enough.

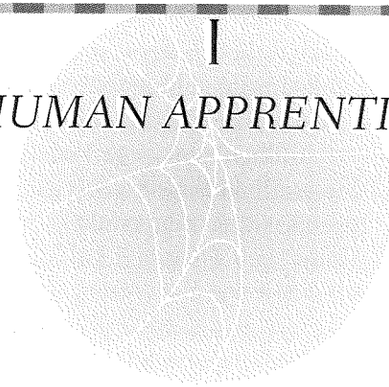
(4) The power of human communication, cooperation, and competition shaped the earth's history as well as human history. Concerted human action upset prevailing ecological relationships, first through the deliberate use of fire, coordinated hunting of big game, and the domestication of animals and plants. Gradually, humankind learned to divert ever larger shares of the earth's energy and material flows for our own purposes, vastly expanding our niche and our numbers. This, in turn, made the infrastructure of the cosmopolitan web, the ships, roads, rails, and Internet, easier to build and sustain. The process of web building and the process of enlarging the human niche supported one another. We would not be 6 billion strong without the myriad of interconnections, the flows and exchanges of food, energy, technology, money, that comprise the modern worldwide web. We have inaugurated a new era of

earth history—the *Anthropocene*—in which our actions are the most important factor in biological evolution, and in several of the planet's biogeochemical flows and geological processes.

How people created the webs of interaction, how those webs grew, what shapes they took in different parts of the world, how they combined in recent times into a single cosmopolitan web, and how this altered the human role on earth is the subject of our book. With luck, this perspective on the past will shed a ray of light on the dilemmas of the present—and future.

I

THE HUMAN APPRENTICESHIP



Shattered bones, chipped stones, and bits of charcoal are all the evidence we have of how our remote ancestors actually lived. By now, archeologists have studied thousands of sites and retrieved millions of fragments from them; but interpreting how humanity's career on earth got started on the basis of such evidence remains a matter of guesswork. A lively imagination is needed to reconstruct human communities from scattered bones and stones; and the resulting figments of expert imagination immediately become targets for other experts to shoot down. Yet some landmarks seem sure; and recently introduced techniques of chemical analysis date many finds with more and more precision. All the same, almost everything remains tentative. Even a single new discovery may upset currently prevailing notions at any time.

Amidst the resulting uncertainty, what are the most plausible guesses about the human apprenticeship starting from the time when our ancestors came down from the trees?

First of all, this fateful grounding took place in Africa, where our apelike ancestors ventured onto savanna landscapes something like 4 million years ago. Savannas are dry, grassy plains with scattered clumps of drought-resistant trees that presumably offered them more or less secure sleeping places at night. On the savanna, rainy seasons alternate with dry periods when access to water for drinking was essential for grazing animals and for our ancestors as well. Protohumans were unusually versatile. They sustained their bodies and their energy-consuming, enlarged brains with a varied, high-quality diet of nuts, fruits, roots, and leaves as well as the bodies of small animals, insects, and grubs. Almost