MASTERS OF THE WORD

How Media Shaped History

WILLIAM J. BERNSTEIN

Grove Press
New York

Published simultaneously in Canada
Printed in the United States of America

FIRST EDITION

ISBN-13: 978-0-8021-2138-7

Grove Press
an imprint of Grove/Atlantic, Inc.
841 Broadway
New York, NY 10003

Distributed by Publishers Group West

www.groveatlantic.com

13 14 15 16 10 9 8 7 6 5 4 3 2 1

CONTENTS

Introduction

The morning, like all mornings, began poorly for Winston Smith. Awakened by the screeching alarm of the omnipresent telescreen, Winston, the hero of George Orwell's *Nineteen Eighty-Four,* hurled his cold, naked, arthritic body out of bed for the mandatory calisthenics. "Thirty to forty group! Thirty to forty group! Take your places, please. Thirties to forties!" screamed the personal trainer from hell.

Winston—or, more accurately, 6079 Smith W—struggled gamely against his infirmities, but his efforts did not satisfy his tormentor, whose exhortations to bend lower yielded only waves of searing spinal pain.[1]

From the moment of the book's appearance in 1948, both casual readers and critics argued about its meaning. Was it a specific indictment of socialism, as conservative readers supposed? Or was it a more generalized warning about the totalitarian tendencies inherent not only in communism and fascism, but also in liberal democracies? (Orwell eventually made clear that he meant the latter.)[2]

The debate over *Nineteen Eighty-Four*'s political meaning obscured a much larger point: by the middle of the twentieth century, advances in telecommunications had decisively tipped the balance of power between the ruler and the ruled toward the former, and the book's miserable characters could not hope to escape the malevolent new electronic media technologies. Almost a decade before the book's publication, Orwell wrote:

> The Inquisition failed, but then the Inquisition had not the resources of the modern state. The radio, press censorship, standardized education, and the secret police have altered everything. Mass-suggestion is a science of the last twenty years, and we do not yet know how successful it will be.[3]

Orwell certainly had in mind Hitler's fascist state and the security apparatus of Stalin, the likely model for Big Brother. Yet no state organ, before or since, has ever exceeded the relentless efficiency of the *Ministerium für Staatssicherheit* of the German Democratic Republic—the feared Stasi. At its height, its ranks comprised nearly 100,000 East Germans, one of every 160 in the population.

Walter Ulbricht and Erich Honecker commanded a larger security apparatus in their small corner of the Teutonic world than Adolf Hitler had in all of greater Germany. The Stasi employed more resources, and about as many personnel, as East Germany did for health care. East Germans even coined a word that described a life permeated by listening devices and informers: *flächendeckend*—nothing left uncovered. Three thousand operatives tapped telecommunications, a remarkable number considering the scarcity of private phone service; the wait for a new line could be twenty years, and quicker installation generally meant that the applicant had been targeted for surveillance. The Stasi could place a hidden camera in a room in any large hotel on two hours' notice.

East German surveillance was not all high-tech. In a police state, the avoidance of microphones, wiretaps, and cameras becomes second nature, and the Stasi increasingly relied on older methods, particularly informers. Overall, about 2 percent of East Germans regularly snitched on their friends, neighbors, and colleagues. In many professions and locales, the Stasi penetrated even more deeply. For example, it responded to high defection rates among physicians with intense recruitment of informers; one doctor in twenty spied on his or her colleagues.

After the regime fell, citizens rummaging through Stasi facilities came across rooms filled with numbered, sealed glass jars containing bits of cloth. In time, their purpose was discovered: each specimen was impregnated with sweat, obtained from men's armpits and between the thighs of women, so dogs could track them, if necessary, at some future date.[4]

Counting the newborn People's Republic of China, at the time of *Nineteen Eighty-Four*'s publication, nearly a third of the planet's population lived in Orwellian states.[5] But something happened on the road from *Nineteen Eighty-Four* to 1984, or at least 1989, the year East Germans threw out Big Brother. After the Berlin Wall fell, the portion of the world's population suffering under the heel of technologically empowered totalitarian regimes

plummeted. By the turn of the twenty-first century, the number of such smothering, omniscient regimes could be counted on the fingers of one hand: Myanmar (Burma), North Korea, and perhaps Cuba and Vietnam. Data from Freedom House, an organization that systematically tracks human rights, confirm that political freedom is breaking out all around the world: between 1975 and 2010, it estimates that the portion of "free" and "partially free" nations has increased from 54 percent to 78 percent.[6]

Longer-run data confirm this trend. Many researchers have compiled measures of global democracy over the past two centuries, but their data tell a curious story: increasing democratic development over the course of the nineteenth century suffered a "setback," characterized by a stagnation in the percent of nations considered democratic, which lasted from about 1920 to 1980, followed by a rapid upswing in the past few decades.[7]

Even more dramatically, between 1920 and 1980—the decades of the primacy of radio and television—the world saw a sharp upward spike in the number of nations considered despotic. (Figures I-1 and I-2 are not symmetrical, because they do not include a third category of nations: those with indeterminate governmental systems.) Note how the early- and mid-twentieth century increase in the percent of despotic states coincides with Orwell's literary career; the downswing after about 1980 would certainly have surprised the author.

Obviously, correlation is not causation, but this turn of events would certainly have astounded Orwell, since the technology available to today's totalitarian state would have overwhelmed even his fertile imagination: cameras capable of reading license plates from space, Internet-based "data mining" technology with an analytic capacity of millions of messages per minute, and microphones able to record the sonarman's "gnat's fart at fifty thousand yards." Given, then, the ever-advancing nature of surveillance technology, how did the state lose the battle for control of the individual?

Simply put, in a free market economy, communications and surveillance technologies rapidly become cheaper and more accessible to and—more important—controlled by the general population. Any device that increases the speed and volume of communication enhances the ability of its user to influence events; and, after all, such influence is the very essence of political power. With the passage of time, the same communications technologies that empowered the state in due course empowered the individual even more; the same technologies that allowed governments

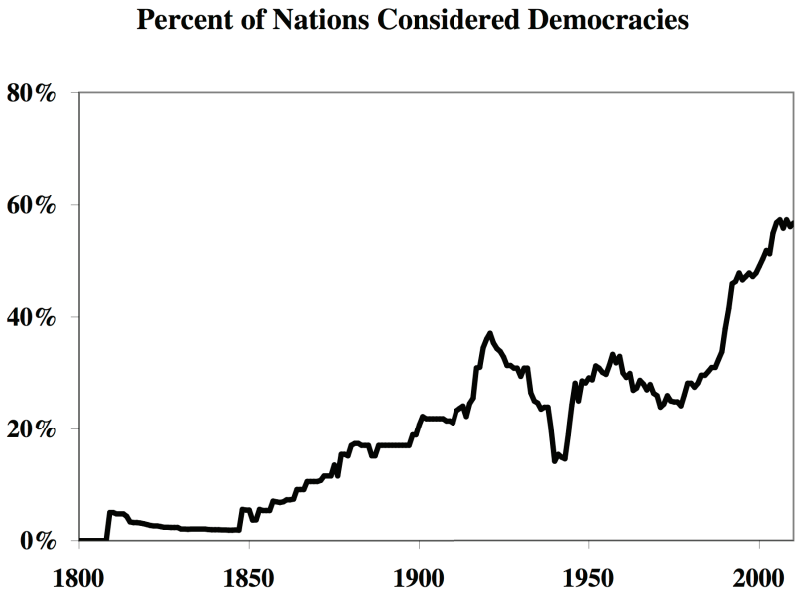

Figure I-1. Percent of Nations Considered Democracies

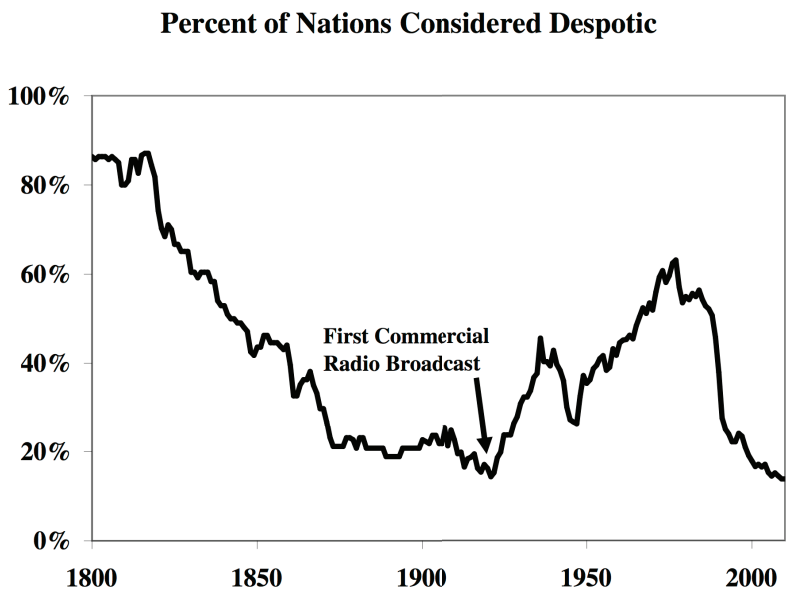

Figure I-2. Percent of Nations Considered Despotic

to spy on citizens allowed citizens to evade surveillance, and indeed to monitor governments themselves.[8]

After the development of the telegraph by Morse, Cooke, and Wheatstone in the 1830s and 1840s, the first commercial services were so expensive as to prohibit their deployment in everyday life, and their use was largely restricted to the transmission of essential financial, government, and military data. Later, radio and television stations were, similarly, so costly that they and their enormous propaganda potential were either directly run, or at least closely regulated, by the state. Even the lowly printing press, then entering its fifth century, still lay beyond the control of most private citizens.

When Orwell wrote *Nineteen Eighty-Four* in the mid-twentieth century, he could not have imagined that mere individuals would ever command such complex and expensive technologies. Orwell died in 1950, so he never lived to see the spread of modern communications devices into everyday personal use—the photocopying and fax machines, the cassette tape, the personal computer, the Internet, and the camera-equipped cell phones that helped save the world from the end he so feared.

The spread of these new technologies occurred with stunning speed. By 1960, only armies, governments, and very large corporations operated computers; by 1970, even small organizations had acquired them. By 1980, hobbyists happily assembled kits; by 1990, inexpensive personal computers had entered the home; by 2000, most citizens of the developed world had access to the Internet; and by 2004, residential broadband penetration in the United States, by no means in the vanguard of high-speed access, exceeded 50 percent. In the second half of the twentieth century, the easy availability of such communication technologies helped dismantle the totalitarian regimes that had originally used them to oppress citizens.

This cycle, in which cutting-edge communications technologies are first acquired by the state and employed to oppress the population, and then are embraced and controlled by the general population, thus enabling the people to take back power, is nothing new.

Further back in history, the growing availability of more basic technologies drastically altered the political, religious, and even cultural balance of power. In eighteenth- and nineteenth-century England, the so-called "corn laws" oppressed the urban poor by placing onerous tariffs on imported grain. (For centuries the word "corn" simply referred to grain in general, particularly wheat.) Simple economics mandates that tariffs on imported

goods benefit the domestic producers by shielding their goods from competition. In this way, the corn laws increased the price of imported grain to consumers and so, too, raised the price of domestic grain, with which it competed. Consequently, the corn laws greatly profited the landowning aristocracy and simultaneously savaged the pocketbooks of the urban and rural poor, and occasionally precipitated outright mass starvation.

By the early nineteenth century, a titanic battle raged between the ruling aristocracy, who favored the laws, and two groups that supported repeal: urban slum dwellers and the factory owners who employed them. The ground for repeal had been laid by the Reform Act of 1832, which expanded the voting franchise; by the spread of the railroad; and by the establishment of the penny post, which greatly lowered the cost of sending letters. In the end, poor wheat harvests and the Irish potato famine in 1845–1846 provided the final impetus for repeal.

What did the railroad and the passage of the penny post have to do with repealing the corn law? Everything. Cheap rail travel enabled the leaders of the Anti-Corn-Law League to crisscross the country to give speeches and organize their supporters, and cheap postage allowed the League to send out millions of pamphlets, newspapers, and magazines. When the penny post cleared the House of Lords, Richard Cobden, the charismatic leader of the League, shouted, "There go the Corn Laws!"[9]

If we go back another four hundred years, to around AD 1500, we find that industrially produced paper and the printing press amplified the burgeoning literacy revolution, and with it, the power of ordinary people to spread their opinions and influence. By the time Martin Luther arrived at the University of Wittenberg, its library shelves already groaned with the fruit of the Gutenberg revolution. It was not Luther the theologian who effected the Reformation, but rather Luther the publisher.

Throughout history, novel communications technologies have fascinated the public. Well before Luther's time, lay readers had became so entranced with vernacular Bibles, lurid accounts of papal corruption, and the new heresies that the Roman Catholic Church found it difficult to sell its own texts. Moreover, the new presses became, as coffeehouses would become two centuries later, meeting places where the most philosophically and technologically advanced practitioners of the age exchanged ideas and fomented change.

The relationship between the accessibility of communications technology and individual liberty, in fact, extends all the way back to the dawn of human history. Five thousand years ago in Sumer and Egypt, literate elites exploited the new—and highly complex, and thus inaccessible—cuneiform and hieroglyphic scripts to exert power over increasingly large populations and geographic areas. It is no coincidence that the rise of the world's first large-scale empires in Mesopotamia and Egypt followed fast on the heels of dramatic improvements in cuneiform and hieroglyphic writing, respectively. Although very different in outward form, Mesopotamian cuneiform and Egyptian hieroglyphic had quite similar inner structures: in each written language, individual symbols stood for syllables and entire words. In both Mesopotamia and Egypt, writing consisted of several hundred to a thousand such symbols, and the mastery of literacy could take decades; the scholar and scribe did not so much read a text as decipher it.

Not only was reading conceptually difficult in remote antiquity; so, too, was the mechanical act of writing. Merely obtaining writing materials could constitute an insurmountable hurdle; a single sheet of papyrus, the medium of everyday correspondence in Egypt, cost the equivalent of at least several hours of a skilled craftsman's time. Outside the Nile Valley, even less appealing materials were available: stone and animal skins. Until papermaking technology spread from China to the Muslim world and Europe in the late first millennium after Christ, the production of a single folio might consume an entire herd of sheep. Only in Mesopotamia, with its abundant moist clay—cheap, durable, and relatively easy to write on—was this problem less acute.

Small wonder, then, that before about 1000 BC, rulers deployed these complex and powerful writing systems to gradually increase their power over individuals and to assemble ever-larger nation-states. The scribe became the ancient equivalent of a high-tech entrepreneur, whose command of the era's cutting-edge technology—literacy—gave him an unbeatable edge on the road to wealth and power. Said one Egyptian father to his son:

> Put writing in your heart that you may protect yourself from hard labor of any kind. . . . I have seen the metal-worker at his task at the mouth of the furnace with fingers like a crocodile's. He stank worse than fish spawn. . . . The weaver in a workshop is worse off than a woman; he squats with his knees to his belly and he does not taste fresh air.[10]

In any age, illiteracy disempowers, and the formidable physical and cognitive barriers to reading and writing in Mesopotamia and Egypt served to exclude almost everyone except the aristocrats and their scribes from meaningful political influence. In societies where only a tiny minority can read and write, the illiterate are in awe of literacy and of the literate, and the ruling classes exploit this awe to the hilt. That was especially true in the ancient world, where religion provided ruling elites with their most potent source of political power. In Egypt the god Thoth, "The Lord of the Divine World," was, in the words of philologist Harold Innis,

> the unknown and mysterious, the lord of scribes and of all knowledge, since the setting down of words in script suggested the possession of mysterious and potent knowledge in the scribe who "brought into being what was not."[11]

In preliterate societies, that magic is yet more powerful, evoking a special wonder, even among native elites. Anthropologists have long observed the divine properties assigned by preliterate cultures to written material. Historians and paleographers (specialists in ancient documents and scripts) even have a term—the adjective *numinous*—that is used as shorthand to describe the nearly magical power exuded by the potency of the word in ancient societies.

The British social anthropologist Jack Goody, for example, noted that Africans used books as magic totems. A book "is a powerful object, and too close an acquaintance with it can drive a man to madness."[12] The experience of Cyprian Equiano, a Nigerian slave brought to England in the eighteenth century, illustrates this awe: taken to church, he waited for others to leave before placing the Bible to his ear to hear its words.[13] America's most famous escaped slave, Frederick Douglass, well understood both the magical and the repressive power of literacy: "Once you learn to read, you will be forever free."[14]

On the other hand, the French ethnographer Claude Lévi-Strauss enunciated perhaps the best-known, and certainly the darkest, assessment of the power, magic, and omnipotence of writing. He began by noting that none of mankind's greatest early technological achievements—the domestication of animals, the development of settled agriculture, the invention

of the wheel, and the mastery of fire—required this satanic art. He then went on to equate literacy with subjugation:

> The only phenomenon with which writing has always been concomitant is the creation of cities and empires, that is, the integration of large numbers of individuals into a political system and their grading into castes or classes. . . . It seems to have favored the exploitation of human beings rather than their enlightenment. . . . The primary function of written communication is to facilitate slavery. The use of writing for disinterested purposes, and as a source of intellectual and aesthetic pleasure, is a secondary result.[15]

In a world where only the thin upper crust can master the written word, this rings more or less true. Sometime around 1500 BC, however, the first cracks in this ancient monopoly of the scribal class appeared. During that period, somewhere in the southern Levant, possibly at a turquoise mine near Serabit el-Khadim in the western Sinai Peninsula, the worlds of literacy and politics turned on their respective axes. At this dusty location, surely one of history's least likely fulcrums, a small number of Egyptian overseers directed a workforce of foreigners, most likely from Palestine or Syria. These Semitic laborers felt the magic and power of Egyptian writing, and they extracted from it the key to mass literacy: about two dozen individual phonemes—elemental sounds, each represented by its own symbol, that is, a letter—that could be combined to yield any known word. That an entire language could be encoded with so few symbols, and thus easily used by the general population, had probably not escaped the Egyptians, but their empire's scribal class was unlikely to simplify its meal ticket out of existence; outsiders were far more inclined to start the literacy revolution.

Biblical scholar Martin Sprengling speculated about how the complex Egyptian system might have become transmuted to an alphabetic one: The Egyptians frequently honored the Semitic foremen at their mines by naming individual shafts after the men who oversaw them. These foremen would probably have been in contact with the low-level Egyptian scribes, who generally wrote in hieratic script, a simplified cursive form of hieroglyphics. (Egyptians used hieratic for everyday writing, and reserved the more complex and pictographic-appearing hieroglyphic forms for stone monuments.) The foremen, in order to

memorialize themselves, would naturally have implored the scribes to teach them hieratic, and the scribes would have responded by showing the foremen—brush, ink, and papyrus in hand—the simplest characters, which the foremen would later inscribe into stone.[16] This so-called proto-Semitic system was a vast improvement over the Egyptian and Sumerian syllabic scripts; in due course it evolved into the Phoenician, Hebrew, and Arabic alphabets. To this day, modern Western alphabets consist of essentially the same few dozen phonemes.

The Hebrew alphabet may have produced the first faint stirrings of mass literacy in the kingdom of Judea just before Babylonian exile in the sixth century BC, and the later prophets probably used the new medium to reach the masses. Historian William H. McNeill suggests:

> Prophesies and protests, criticisms of prevailing customs, and radical assertion of new standards of righteousness could create only temporary and local disturbances so long as their impact was confined to the range of a man's voice and the memory of the immediate hearers. . . . Had writing remained the monopoly of a privileged clique, the angry words of prophets who so freely attacked established practices would never have been written down. Hence the democratization of learning implicit in simplified scripts must be counted as one of the major turning points in the history of civilization.[17]

The Phoenicians, indefatigable traders, spread their alphabet far and wide throughout the Mediterranean. Sometime in the eighth century BC, they, and their writing, arrived in Greece. Several of the Phoenician consonants encoded sounds not used in Greek, and at some point an unknown genius took a momentous step: he or she converted these unneeded letters into vowels. The new Greek vowels eliminated nearly all the ambiguity of a consonant-only script and thus enabled mastery of the alphabet by children as young as five or six.[18] By the fourth century BC, literacy in Athens probably approached a third to half of male citizens; for the first time in history, written language, civilization's primary method of control, was shared widely among the population. The banishment of an Athenian required that six thousand citizens write the victim's name on pottery fragments, ostraca (in Greek, *ostraka*, from which the word "ostracism" derives). That democracy developed in Greece, rather than Egypt or Mesopotamia, was no accident.

* * *

For the past fifteen years, I have been writing about finance and history. I laced my first two books, which focused on finance, with a liberal amount of market and economic history. Just as the most successful military officers, lawyers, and political practitioners possess a keen sense of history, so, too, can the best investors detect not merely the echoes of the past but entire symphonies of it in current market events. This ability yields both intellectual and material benefits.

No work of history has influenced me more than Daniel Yergin's 1991 book, *The Prize.* Ostensibly the story of the petroleum industry, it was nothing less than a *tour d'horizon* of the modern world as seen through the murky and turbulent prism of oil. When I wrote *The Birth of Plenty,* the story of the nineteenth-century acceleration of world economic growth, I used Yergin's magisterial volume as my model. My book laid the epic of modern economic growth over the fabric of modern history, and this in turn led to my next effort, *A Splendid Exchange,* which followed global trade from its beginnings in prehistory to the 1999 World Trade Organization riots in Seattle.

While researching *A Splendid Exchange,* I was riveted by the repeal of the corn laws, a major event in the ideological history of world trade. Since AD 1066, a tiny minority of aristocrats had dominated England's rich agricultural endowment; drawing on this wealth, and the influence it produced, they dominated its politics as well, using the corn laws to impose high grain prices on both peasants and the urban poor. As recounted earlier in this introduction, the deft use of the printing press, the penny post, and inexpensive rail travel by Richard Cobden and his associates broke that stranglehold. The inescapable conclusion: in a world where only the powerful and wealthy can communicate over long distances, everyone else is disenfranchised.

Once we are aware of the connection between political power and access to communication technology, it becomes obvious throughout all of human history. These technologies are not in and of themselves oppressive or liberating. Rather, it is relative access to them that determines political reality. Hitler and Stalin, who inspired *Nineteen Eighty-Four,* had complete control of the era's leading-edge communications and surveillance technologies. That their hapless populations did not have access to these devices resulted as much from their expense and the expertise required to operate them as from their illegality.

When ordinary people eventually gain access to and control of leading-edge communication technologies, they can more effectively oppose the power of the state. In the democratic Greek city-states, the alphabet proved mightier than the sword; in the medieval era, the printing press was mightier than the Roman Catholic Church; and in the modern world, the cell phone camera is mightier than the surveillance camera.

Viewed through the widest possible lens, four great communications technologies have engulfed the human race: first, language itself; second, writing; third, the mechanization of writing, that is, printing with movable type; and fourth, the electronic encoding of information. In the mid-twentieth century, George Orwell, and numerous other observers, viewed the electronic technologies of the era with dread; as the twenty-first dawns, our view of these technologies has executed a complete *volte face*. Neither view is correct. It is not enough to ask, "What do these machines do?" We must also ask, "How many control them?"

The persistence of a form of black slavery long after the end of the Civil War highlights how poor access to even the simplest of communications technologies can yield gross injustice. For generations after the Emancipation Proclamation and Reconstruction, hundreds of thousands of black men found themselves victims of a new form of slavery: arbitrary arrest for minor crimes—vagrancy and loitering would do—followed by sentencing to privately owned factories, farms, and mines.[19]

These facilities often featured working conditions and mortality rates worse than those on the slave plantations of the antebellum South. In 1906 the U.S. Department of Labor sent a team of researchers under the direction of the pioneering black sociologist W. E. B. Du Bois to investigate the condition of African Americans in Lowndes County, Alabama, which had become a hotbed of the new slavery.

Du Bois submitted his report to the government later that year, and waited—and waited—for its publication. A year later, the government finally informed Du Bois that it had found his report too hot to handle, and destroyed the single handwritten copy he had submitted. For want of a mid-twentieth-century commonplace—a copying machine—his report was lost forever, and this clandestine form of black slavery continued well into the twentieth century.[20]

I have not attempted to write an encyclopedic history of communications technology and politics. It is simply not possible to conduct a

rigorously chronological survey of the topic within a single volume of moderate size, nor will it be possible to cover in great detail all of the significant technologies. Radio more clearly demonstrates the nature of the communications/power nexus than does television, particularly in totalitarian states, and so the former will receive much more attention than the latter; for similar reasons, more time will be spent on copying machines, and, in particular, carbon paper, than on the telephone and fax machine. Rather, the book's structure will be thematic; I have selected the most compelling illustrative anecdotes available to me and woven them into a historical narrative. This thread winds through Mesopotamia, Serabit el-Khadim, ancient Athens, Strasbourg, and ultimately the media complexes and research labs of the modern West.

Mere edification and amusement, while worthy enough goals in and of themselves, should not satisfy the nonfiction reader. If an author has truly succeeded, he or she also provides a conceptual framework within which to grasp the present and glimpse the future. In the process of writing this book, I have become convinced that precisely how technologies disseminate constitutes their most important aspect.

At this point in history it seems plausible that the affordability and widespread availability of both older analog and newer digital communications technologies have tipped the balance of power toward the individual and away from the state. In 2010–2011, amateur video clips of the self-immolation and subsequent funeral of a Tunisian vegetable seller, Mohammed Bouazizi, triggered the fall of Tunisia's brutal and corrupt regime. This uprising was followed shortly thereafter by similar events, some successful and some not, but all fed by personal communications technologies, all across the Arab world.

Alas, the invention of the telegraph, radio, and television also raised hopes that they would, by bridging the communications gap among peoples and among nations, usher in the New Jerusalem. But, as John Adams famously pointed out, political wisdom has not improved over the ages; even as technology has advanced, mankind steps on the same rakes, and the new inventions often magnify the damage.

Historian Daniel Boorstin referred to the nonprogressivity of human nature and politics as "Adams' law," but Boorstin was far too modest, for he appended several of his own astute observations to it, among which was that technology, far from fulfilling needs and solving problems, creates

needs and spreads problems. "Boorstin's law," then, could be formulated thus in the modern world: beware of optimism about the social and political benefits of the Internet and social media, for while technology progresses, human nature and politics do not.[21]

It is quite fair to ask if technologies alone can determine politics, independent of their social and political context. The cynic can easily argue that who uses these technologies, and where they are used, rather than their nature, determines their political fallout. This is usually followed by the scornful hurling of the epithet "determinism" at anyone foolish enough to suggest that technologies can be inherently democratic or despotic.[22]

Yet, when viewed over the ages, technologies *do* matter: a writing system that is simple to master is inherently more democratic than one that is difficult; a printing press capable of inexpensively turning out thousands or millions of tracts is inherently more democratic than limiting book production to a few Church-controlled *scriptoria,* and two-way cell phone and Internet communications are inherently more democratic than mass-market one-way radio and television. The history of the past two centuries, I believe, confirms this view; over the course of the twentieth and twenty-first centuries, an ever greater portion of the human race lives under democratic rule, and it is not difficult to credit this happy result to recent advances in two-way communications technologies.

In the future science may yet provide governments with complex, powerful, and expensive new tools with which to observe and control citizens. Optimists would do well to expand their definition of "information technology." Over the past decade, the cost of sequencing the human genome has fallen even faster than the cost of computing; within the next decade, this technology could become available in pharmacies and bathrooms. While these advances will likely bestow upon humankind untold medical bounties, they may also give dictators new tools with which to oppress their citizens.

This book's rationale is deceptively simple: at the most basic level, the words "politics" and "communication" are nearly synonymous; all politics, after all, is nothing more and nothing less than communication applied in the service of power. Only by understanding the relative access to and control over information and communications technology, which has grown ever more complex over the centuries, can we understand the ebb and flow of politics, of culture, and of the human condition itself.

1

ORIGINS

Speech, the universal way by which humans communicate and transmit experience, fades instantly: before a word is fully pronounced it has already vanished forever. Writing, the first technology to make the spoken word permanent, changed the human condition.—Denise Schmandt-Besserat[1]

The Greek historian Herodotus tells us that Oroetes, the Persian satrap of Sardis, could reckon with men and arms, but not with the might of the written word.

First appointed to the post around 530 BC by Cyrus the Great, Oroetes had ruled his satrapy (near present-day Izmir in western Turkey) for decades, through the reigns not only of Cyrus but of his successors, Cambyses II and then Darius I. The last transition had been particularly turbulent, and during it Oroetes grew increasingly independent of the empire's capital in faraway Susa, in what is now southern Iran.

With this independence came increasingly erratic behavior. When Mitrobates, the governor of a neighboring province, taunted him for not dealing decisively with Polycrates, the Greek tyrant of Samos, Oroetes first killed Polycrates, then the complaining governor, and finally the governor's son. Later, Oroetes' apparent neutrality in the revolt of the Greek Ionians against the empire further displeased Darius. The last straw came when the satrap began murdering the king's couriers when their messages displeased him. Not for Darius the subtlety of "Who will rid me of this troublesome priest?" Oroetes "has made away with Mitrobates and his son, and now he kills my messengers whom I send to summon him," Herodotus records Darius as saying. "This is a defiance of authority which is not to be tolerated. Before he can do us further harm he must be stopped—and the way to stop him is by death."[2]

Dealing with the irritating graybeard, however, would prove problematic. The widespread revolts during and following Darius's accession had sapped the imperial army of its vigor. Moreover, Sardis lay 1,500 miles of

mountainous terrain northwest of Susa—a formidable distance even today, let alone 2,500 years ago, in spite of the road built by Darius. In addition, Oroetes commanded a thousand crack Persian troops. Nonetheless, each of Darius's courtiers clamored so loudly for command of this seemingly suicidal mission that the king resolved the matter by lot. The "winner," Bagaeus, realized that brains would have to succeed where brawn could not. He had the royal scribes prepare several papyrus scrolls on various subjects, closed them with the king's seal, and set off for Sardis.

When he arrived, he handed the scrolls to Oroetes' scribe in a carefully choreographed order. The first few scrolls pertained to innocuous topics, but when Bagaeus observed the respectful hearing given those first missives by the satrap's guards, he gathered up his courage and handed the scribe a scroll instructing the guards to refuse further service to Oroetes. Upon hearing this imperial command, they threw their spears down at Bagaeus's feet. The final scroll read: "King Darius commands the Persians in Sardis to kill Oroetes." Problem solved.[3]

In all likelihood, Darius, Bagaeus, and Oroetes could not read or write fluently, if at all—certainly Oroetes could not, since had he been literate he would have read the scrolls himself, interpreted them more favorably, and survived. In fact, the only truly literate participants in the tale likely were the scribes at either end of this 1,500-mile information chain. Such was the magic and power of the written word that Herodotus, who was not shy about expressing his skepticism of many of the tales he related in *The Histories,* took this particular one at face value.

Archaeologists and paleographers pinpoint the birth of that magic and power to a small area in southern Mesopotamia about five millennia ago. Their discoveries make one paramount fact nearly certain: the first writing arose not from the desire to record history or produce literature, but rather to measure grain, count livestock, and organize and control the labor of the human animal. Accounting, not prose, invented writing.

About a hundred thousand years ago, probably in northeast Africa, humans rapidly evolved the repertoire of behaviors that define our species. These included the desire to cooperate, the ability to conceive abstractions of the physical world, and, critically, the first major communications technology: language. The second major communications technology, writing, is simply the *recording* of those abstractions.

Humans abstract and record information in five major ways: with writing, mathematical notation, painting/photography/videography, maps, and clocks—that is, we can abstract and record verbal, numerical, visual, spatial, and temporal information. (Scholars might argue about whether to include additional classes, such as musical notation.) Since interpreting a painting, map, or clock requires little training, this book will focus almost exclusively on writing, and to a much lesser extent, numbering.[4]

As measured by standardized testing, human intelligence seems to be increasing at a rapid clip, on the order of several IQ points per decade. This phenomenon, known as the "Flynn effect," cannot possibly be real, since extrapolating the process backward implies that the average IQ would have been approximately zero in Newton's time, and about negative 1,000 in Aristotle's.

To resolve this conundrum, it helps to think about the format of the modern IQ test. A typical question runs something like this: Which item does not belong in the following list—gun, arrow, chisel, and deer? The overwhelming majority of modern people would not hesitate to answer "deer," since the other three are inanimate objects. People from preliterate societies, on the other hand, usually give the "wrong" answer to this question: chisel.

Why? Because guns and arrows are used to kill deer, but chisels are not. Simply put, separating the living deer from the other three inanimate objects requires a significant degree of abstraction. Human intelligence has almost certainly not been increasing all that rapidly, if at all, over the past few centuries—but the level of abstraction demanded by modern civilization certainly has.[5]

Among the multitude of abstractions ultimately mastered by humans, arguably the first and most important is counting. Well into modern times, not all societies have emphasized this basic skill; many aboriginal languages contain only three numbers: "one," "two," and "many." (To be sure, all peoples can tell the difference between five and six things, but not all languages have words denoting these quantities.) If writing is nothing more and nothing less than the notation of abstractions, then the first, and easiest, place to look for the development of abstract ability is counting.

Archaeologists have found complex carved notches in bones from as early as one hundred thousand years ago in southern France at sites

inhabited by Neanderthal man. By 28,000 BC, more complex notched specimens turn up at sites in Lebanon and Israel, and one particularly complex bone sample, dating to approximately 15,000–12,000 BC, contains scores of elaborately arranged V- and X-shaped incisions.[6]

Precisely what these incised bones represent is anybody's guess. The best-accepted theory—that they compute lunar cycles—remains highly controversial.[7] But *something* was being counted, and so these specimens are probably the earliest known examples of the physical recording of abstract information for later use. Archaeologists and paleographers have postulated that Paleolithic peoples almost certainly employed other counting devices—knots in string, carvings in wood, and carefully arranged twigs—but only more durable bone and stone have survived through the millennia. Further, the archaeological flashlight shines brightest in dry climates: because moisture destroys, the researcher is far more likely to find interpretable specimens of any type and from any era in the Middle East than in England or Cambodia.

The significance of this escape from the chains of memory is impossible to overestimate. The new recorded abstractions changed the very way that humans thought, behaved, and probably evolved. They made armies more effective and societies more prosperous. Those cultures that understood the value of record keeping would advance, while those that did not would sooner or later succumb to their more abstractly endowed competitors.

After 10,000 BC a new counting technology, based on small tokens, took hold in the Fertile Crescent. Strangely, until very recently these tokens remained largely ignored by paleographers, anthropologists, and archaeologists.

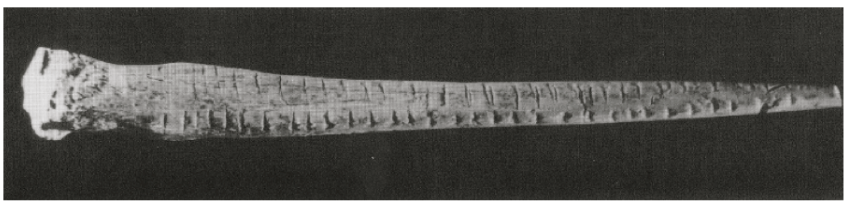

Figure 1-1. The first long-lasting notation systems were likely notched bones, like this specimen from the Ksar Akil site in Lebanon, ca. 15,000–12,000 BC.

That would change in 1968, when Denise Schmandt-Besserat, a recent graduate of the École du Louvre, headed off to Middle Eastern museums to examine pots, figurines, and fragments of ovens. She also began to notice smaller clay tokens that were frequently scattered around them.[8] For generations before, archaeologists had puzzled over these disks, cones, cylinders, and other, more complex shapes. As noted by one archaeologist, "From Levels 11 and 12 come five mysterious unbaked conical clay objects, looking like nothing in the world but suppositories. What they were used for is anyone's guess."[9]

Over the ensuing decades, Schmandt-Besserat solved this arcane mystery. The earliest tokens, dating to about 7500 BC, were unadorned spheres, cylinders, cones, tetrahedrons, and disks, almost all a centimeter or two in size, and were usually found in association with grain storage sites. That they appeared in the same place, time, and precise locations as storage facilities was no coincidence. Schmandt-Besserat found no evidence of the tokens in the deepest—that is, oldest—levels of excavation, associated with hunter-gatherers; she took particular note that archaeologists found tokens only in levels containing evidence of settled agriculture.

With the spread of farming after 7500 BC, the geographical extent of token finds also expanded; by 6000 BC, their use had spread to many sites in the Fertile Crescent. With the passage of time, their shapes became more complex, and they began to carry incised markings.

The development of settled agriculture and, four thousand years later, of cities, and with them civilization itself, meant increasing specialization of labor. While most people farmed, other groups that did not produce their own food—slaves, industrial workers, soldiers, priests, and bureaucrats—became prominent. An accounting system for transferring food from producers to these groups, or to the state, became necessary. Gradually, Schmandt-Besserat concluded that the tokens served this purpose. One of the most common tokens, the cone, probably represented about a liter of grain, whereas a small sphere signified approximately a bushel, and a large sphere stood for some larger amount. Similarly, a small and a large incised ovoid might have represented small and large jars of oil. A certain quantity of grain might be represented by five small spheres, and a certain quantity of oil by five small ovoids.[10] Note that at this stage, the tokens' users had yet to abstract the actual numbers. The

system employed no tokens symbolizing quantities themselves; entirely different tokens stood for a given quantity of grain or of oil. The abstraction of the detached number five, which could be applied to any object, remained millennia in the future.

Around 3300 BC, with the appearance of large administrative municipal centers, the Sumerians began to seal groups of tokens within spherical clay containers, or "envelopes," upon which was incised a symbolic representation of the contents. One of the first such envelopes found contained three cones and three spheres, representing three small and three large measures of grain.[11] Archaeologists have found a surprising number of sealed, intact envelopes, suggesting that they perhaps served as a sort of legal document, which might be opened in the event of a dispute.[12] In the most likely scenario, the contents of the envelopes referred to debt.

Sometime around 3250 BC, the tokens began to disappear, and the envelopes rapidly evolved into flat tablets upon which only the token symbols were written. Because the "backup information" of the contents was lacking, the clarity of the symbols impressed upon the tablets became critical. Did an impressed design represent a disk or a sphere, a triangle or a tetrahedron? At this point, the need for a more clear and definitive system of notation arose. Schmandt-Besserat contends that the first writing

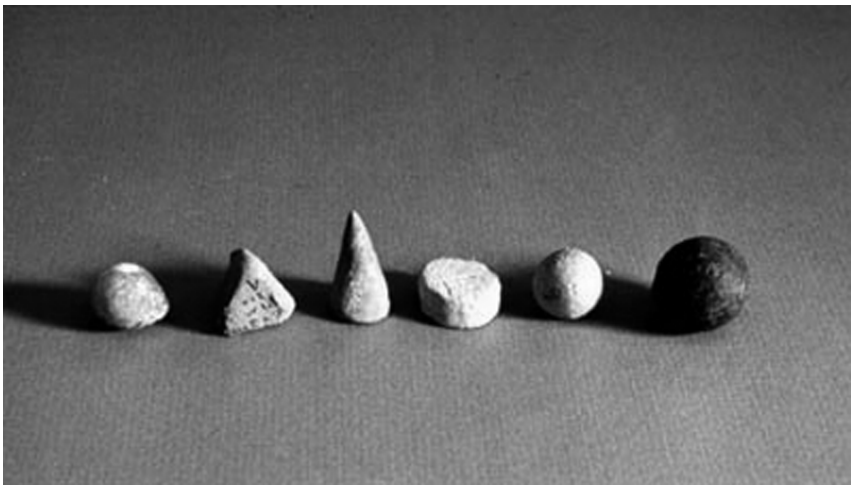

Figure 1-2. Simple tokens, representing measures of grain.

Figure 1-3. An ancient legal contract? Envelope containing one large cone, three small cones, and three disks; note the impressions of each on the face of the envelope.

system—the familiar Sumerian cuneiform script—evolved in this way directly from the token system.[13]

Precisely how, or even if, the Sumerians extended their accounting notation to written language will probably never be known. Schmandt-Besserat's work caused a stir mainly because it seemed to contradict the "pictographic theory," that writing evolved directly from pictures—a theory that is still taught to schoolchildren. Her "token hypothesis" was so bold and so different from the pictographic theory that it could not help but evoke controversy.[14] In reality, there's no real contradiction between the token and pictographic hypotheses; after all, Schmandt-Besserat's tokens are nothing if not "three-dimensional pictographs."

The token hypothesis need not be accepted to understand the importance of the cuneiform script that appeared around 3150 BC. Both tokens and early scripts had three pivotal effects: First, they freed humans from the limitations of memory. Second, they almost certainly imparted to those who mastered them enormous advantages over those who did not;

it is not difficult to imagine the token users as the administrative elite of preliterate Sumerian society who dealt out life and death according to how much food each member contributed and how much each received. Third, these tokens probably served a central role in the formation of history's first city-states around 3300 BC. The Sumerian economy was based on the temple, and its priests collected and accounted for "gifts to the gods," particularly the monthly festivals.

The older pictographic theory still has some virtues. First proposed by William Warburton, an Anglican cleric who eventually became bishop of Gloucester and who wrote in the 1730s, it was, and probably remains, the most commonly accepted theory about the origins of writing. Warburton, who appears never to have traveled outside Europe, propounded his theory in *The Divine Legation of Moses Demonstrated.* He proposed that written language passed through three stages of development: a "Mexican" painting stage, based on Spanish reports of Aztec storytelling with the use of pictures painted on cloth; a "hieroglyphic" stage, in which pictures were gradually abstracted and simplified; and a final, "Chinese" phase, in which the actual images were discarded in favor of more abstract symbols that increased dramatically in number to the tens of thousands over the subsequent millennia. In Warburton's scheme a hieroglyphic eye represented God's omniscience, while a serpent in a circle stood for the universe.[15]

To the modern eye, and certainly to Warburton's, Egyptian hieroglyphics *look* pictographic. What he could not know was that the "eye of god" and the "serpent" actually conveyed a meaning that was simultaneously far more banal, but ultimately far more powerful, than the mystical, abstract meanings he ascribed to them.

Egyptian writing went undeciphered until Napoleon invaded Egypt in 1798, when, in the process of fortifying the port of Rosetta on the Nile Delta, French engineers came upon a stone inscribed in three different scripts: Greek, hieroglyphic, and demotic (the cursive form of hieroglyphic used in the first millennium BC for everyday writing). After the British ejected the French from Egypt, the stone found its way to London, where both British and French scholars struggled with the three texts. Paleographers generally give credit for its ultimate decipherment to Jean-François Champollion, whose knowledge of the later Egyptian Coptic alphabet enabled him to translate the stone's demotic passage, since the two scripts

share several characters. As demotic is simply a different rendition of hieroglyphic, Champollion soon deciphered it as well.

At the time that Warburton wrote *Divine Legation,* Europeans had a relatively high awareness of Egypt. They had, however, almost no knowledge of Mesopotamian civilization. True, fragmentary Greek and biblical sources made frequent reference to the Assyrians and Babylonians. As early as the twelfth century, travelers had returned from the Land Between the Rivers with stories of ancient cities buried under mounds scattered across the region's hot, dusty plains. But the Greeks, Romans, and medieval Europeans were utterly unaware of the earlier Sumerian civilization buried under many of those mounds. The Egyptians and the later Mesopotamians often built with durable stone. The early Mesopotamian cities, in contrast, arose in an alluvial environment that offered scant access to stone, and so the inhabitants built their cities and temples from mud brick that the forces of nature leveled into near-invisibility over the ages. In 1849, archaeologist Austen Henry Layard remarked that from the walls of the northern Iraqi city of Tel Afar, "The ruins of ancient towns and villages rose on all sides; and, as the sun went down, I counted above one hundred mounds, throwing their dark and long thinning shadows across the plain. These were the remains of Assyrian civilisation and prosperity."[16]

Not until the late nineteenth century did British, French, German, and American adventurers penetrate the mounds' treasures, and not until the 1920s did the painstaking, systematic layer-by-layer excavation that is the hallmark of modern archaeology begin to slowly expose the spectacular secrets of these long-lost civilizations.

In the 1920s and 1930s, near Ur, in modern-day southern Iraq, Sir Leonard Woolley first opened royal tombs dating to approximately 2500 BC. The most lurid and spectacular, dubbed the "Great Death Pit," contained dazzling hoards of lapis lazuli, gold, and silver—as well as the remains of over seventy retainers, almost all female, who had been sacrificed and buried with their ruler.[17]

The mounds' contents dazzled archaeologists, yet in the end their intellectual treasures far outshone the bones and baubles. For centuries, Westerners had been dimly aware of an angular script—now known as cuneiform—found on ancient ruins and pottery in Mesopotamia. Easily the most spectacular specimen of this mysterious ancient writing was inscribed, not on the clay tablets inside a mound, but rather on a faraway

cliff that rose nearly two thousand feet above the tiny town of Bisitun, in what is now northwest Iran. Constructed between 520 BC and 518 BC by the Persian emperor Darius I, it depicted a warrior with a bow in one hand towering over his enemies, his foot on the neck of one of them. This forbidding image was surrounded by several panels of engraved inscriptions in different languages, all in cuneiform-like scripts.

To prevent vandalism, Darius ordered all of the monument's lower paths quarried away and the cliff's footholds removed. The destruction of these approaches succeeded in preserving the monument over the next two millennia, but at a price: the lack of access prevented travelers on the ancient road from Ecbatana in Persia to Babylon in Mesopotamia, along the Zagros Mountains, from getting close enough to actually *read* the inscriptions.

In the 1820s, an Englishman, Robert Kerr Porter, made some sketches of the reliefs and intuited the significance of the inscriptions; were they ever deciphered, he mused, "what a treasure-house of historical knowledge would be unfolded here."[18] Alas, like all previous visitors to Bisitun, he had neither the time nor the climbing ability to get close enough to the inscriptions to copy them. The task required a unique combination of athleticism, intellectual drive, and linguistic talent; these three factors finally came together in the person of a young British subaltern, Henry Rawlinson, who had been assigned by the East India Company (EIC) as military adviser to the shah's brother, the local governor.[19]

When Rawlinson left England in 1827, the seventeen-year-old soldier knew nearly nothing about ancient Mesopotamian languages beyond the fact that travelers occasionally came across seemingly impenetrable wedge-shaped inscriptions. As was usually the case in that era with English military missions abroad, Rawlinson's employer was not the British army, but rather the EIC, in whose service he remained for nearly three decades. In the EIC's employ he acquired a thirst for Oriental languages, and he mastered, among others, Persian, Sanskrit, Hebrew, and Arabic.

When he first came to Bisitun, Rawlinson did not know that in the late eighteenth century and the early nineteenth two Germans—the explorer Carsten Niebuhr and the classicist Georg Friedrich Grotefend—had met with limited success deciphering some short cuneiform inscriptions from the ruins of Persepolis, Darius's palace. Decoding any cipher or script, however, usually requires a large amount of it, and the relatively brief passages at Persepolis simply did not provide enough cryptographic fuel.

At Bisitun, Rawlinson struck linguistic paydirt: over a thousand lines of text in three different cuneiform-based scripts: Babylonian, Elamite, and Old Persian. Over the next decade, the young, athletic Rawlinson scaled the slippery face of the cliff—at first, without rope, ladder, or assistant. In the words of his brother George, his efforts "were made at some risk to life and limb—happily, however, he was a good cragsman."[20]

Because of the monument's layout, each language group in the inscription required a different climbing approach. As we'll soon learn, the characters of scripts can represent letters, syllables, whole words, or some combination of these. Rawlinson deduced that Old Persian constituted an alphabetic, and not a logographic or syllabic, script, since it contained only thirty-six different symbols. Since this would make the Old Persian inscriptions relatively easy to decipher, he attacked them first, making as many as four perilous ascents per day using nothing more than boots, notepad, and pen. He noticed that three groups of characters frequently repeated in the same order, and reasoned that they must be the names of three successive emperors. He quickly noted that the phonetic sequence of Hystaspes, Darius, and Xerxes (the pronunciation of which was known from Herodotus) perfectly fitted the pattern of the symbols in each group. This allowed him to deduce the phonetic values of twelve symbols; he was soon able to identify six more.

The decipherment of the Bisitun inscriptions underscores how peculiar skill sets often underlie many intellectual discoveries; it is doubtful, for example, that anyone without Rawlinson's climbing ability could have turned the trick. Over the ensuing years, other climbers found it nearly impossible to repeat his ascents up the sheer cliff face, yet Rawlinson remarked little on making several sorties per day for weeks at a time.[21]

In 1838, the untutored Rawlinson communicated his findings to the Royal Asiatic Society in London, where they created a sensation; the Society almost immediately accorded him membership, an unheard-of honor for an inexperienced outsider. He would soon be acclaimed by Assyriologists across Europe, and in collaboration with his new colleagues, he would decode the rest of the Old Persian alphabet.

The EIC, whose interests extended well beyond paleography, later posted Rawlinson all over Asia, but he regularly returned to Mesopotamia, where he collected more inscriptions and helped excavate the Assyrian capital of Nineveh. In spite of his far-flung postings, he visited Bisitun

repeatedly, ultimately recording all its inscriptions. Rawlinson instinctively understood that the cliff's inscriptions were the "Mesopotamian Rosetta stone," containing identical passages in three extinct languages and scripts, one of which he and others had already decrypted. Ultimately, he deciphered 246 Babylonian cuneiform characters and laid the foundation for the translation of that language by those who followed, and of the much earlier texts uncovered by subsequent generations of Assyriologists.[22]

This work at least partly confirmed Warburton's pictographic hypothesis: the earliest Egyptian and Mesopotamian systems contained many pictograms (literally, "word pictures," words whose appearance clearly conveyed their meaning) and logograms (words conveying a more abstract meaning not obvious from their appearance) that perhaps evolved from earlier pictograms. Far more important, however, the efforts of Champollion and Rawlinson demonstrated that the heart of both systems was largely *syllabic,* with the most commonly used symbols—even those that superficially appeared to be pictographic—representing a distinct syllable.

Champollion and Rawlinson supplied the essential linguistic tools to later generations of archaeologists who plumbed the origins of writing in southern Mesopotamia and in Egypt. Working at the site of the Sumerian city of Uruk, researchers dated its first evidence of urban civilization in deep strata to about 3500 BC; this evidence was defined by particular building, utensil, and pottery styles.

Archaeologists do not know whether the appearance of these artifacts around 3500 BC signified the conquest of one ethnic group by another, or simply the slow evolution of a culture. One thing is certain: in more superficial strata, dating to around 3100 BC, archaeologists have unearthed approximately five thousand clay tablets containing symbols that probably constituted the first writing. Paleographers can distinguish the symbols found in the deepest, and thus oldest, Uruk IV layer, from those found in the slightly more superficial Uruk III layer. Further, while archaeologists have found Uruk III–type specimens outside the city of Uruk, Uruk IV–type specimens appeared only in this city and its immediate environs, suggesting that the birth of writing occurred in Uruk just before 3100 BC.[23]

The probable origin of writing in Uruk was no accident. Archaeologists estimate that during the late fourth millennium, its city walls