BOOK
Work: A Deep History from the Stone Age to the Age of Robots

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SYNOPSIS [From the publisher]
Work defines who we are. It determines our status, and dictates how, where, and with whom we spend most of our time. It mediates our self-worth and molds our values. But are we hard-wired to work as hard as we do? Did our Stone Age ancestors also live to work and work to live? And what might a world where work plays a far less important role look like?

To answer these questions, James Suzman charts a grand history of "work" from the origins of life on Earth to our ever more automated present, challenging some of our deepest assumptions about who we are. Drawing insights from anthropology, archaeology, evolutionary biology, zoology, physics, and economics, he shows that while we have evolved to find joy meaning and purpose in work, for most of human history our ancestors worked far less and thought very differently about work than we do now.

"We work to live and live to work and are capable of finding meaning, satisfaction, and pride in almost any job: from the rhythmic monotony of mopping floors to gaming tax loopholes. The work we do also defines who we are; determines our future prospects; dictates where and with whom we spend most of our time; mediates our sense of self-worth; molds many of our values; and orients our political loyalties."

"Keynes believed that reaching his economic promised land would be our species' most singular achievement because we will have done nothing less than solve what he described as 'the most pressing problem of the human race . . . from the beginnings of life in its most primitive form."

"There is far more to work than our efforts to solve the economic problem. This is something we all recognize: we routinely describe all sorts of purposeful activities beyond our jobs as work. We can work, for instance, at our relationships, on our bodies, and even at our leisure."

"The closest thing to a universal definition of 'work'--one that hunter-gatherers, pinstriped derivatives traders, calloused subsistence farmers, and anyone else would agree on--is that it involves purposefully expending energy or effort on a task to achieve a goal or end."

"The first [pathway] maps the story of our story of our relationship with energy. At its most fundamental, work is always an energy transaction and the capacity to do certain kinds of work is what distinguishes living organisms from dead, inanimate matter. For only living things actively seek out and capture energy specifically to live, to grow, and to reproduce."

"The second pathway follows the human evolutionary and cultural journey. Its early physical milestones take the form of rough stone tools, ancient hearths, and broken beards. Later milestones take the form of powerful engines, giant cities, stock exchanges, industrial-scale farms, nation states, and vast networks of energy-hungry machines."

"And it too represents a major new chapter in the history of work--one defined not by the need to capture energy by working in the fields, but rather by the demands of spending it. The birth of the first cities seeded the genesis of a whole new range of skills, professions, jobs, and trades that were unimaginable in subsistence farming or foraging societies."

"It is no coincidence that tension between chaos and order is a feature of the world's mythologies. After all, science also insist that there is a universal relationship between disorder and work, one that was first revealed during the heady days of the Enlightenment in Western Europe."

"It was in 1828, then describing a version of the latter phenomenon, that Coriolis first introduced the term 'work' to describe the force that needed to be applied to move an object over a particular distance."

"'Work' is now used to describe all transfers of energy, from those that occur on a celestial scale when galaxies and stars form to those that take place at a subatomic level. Science also now recognizes that the creation of our universe involved colossal amounts of work , and that's what makes life so extraordinary."

"Living things have a number of distinct characteristics that non-living things do not. The most obvious and important of these is that living things actively harvest and use energy to organize their atoms and molecules into cells, their cells into organs, and their organs into bodies; to grow and to reproduce; and when they stop doing that they die and, with no energy to hold together, they decompose. Put another way, to live is to work."

"For the pioneers of the Industrial Revolution, entropy revealed itself by thwarting their efforts to build perfectly efficient steam engines."

"A generation younger than Darwin, Ludwig Boltzmann's work was no less a challenge to God's authority than Darwin's proposal that it was evolution rather that God that best accounted for the diversity of life. In a universe governed by the laws of thermodynamics, there was no room for God's commandments, and the ultimate destiny of everything was pre-determined."

"Schrödinger was convinced that the relationship between life and entropy was fundamental. Others before him, including Boltzmann, had made the point that living organisms were all thermodynamic engines: like steam engines they required fuel in the form of food, air, and water to work, and in working they also converted some of this fuel into heat that was subsequently lost to the universe. But no one followed this idea to its investable conclusion until Schrödinger presented a series of lectures to an audience at Trinity College in Dublin in 1943."

"Schrödinger recognized that life simply could not exist in violation of the second law of thermodynamics. This meant that life needed to contribute to the overall entropy in the universe, and he concluded that it did this by seeking out and capturing free energy, using it to do work, which generated heat, and thus added to the total entropy in the universe."

"Human work is purposeful, they insisted, whereas the work done by animals is only purposive."

"Purposive behavior by contrast is behavior that an external observer may be able to attribute purpose to but that the agent of that behavior neither understands nor could describe."

"'The sight of a father in a peacock's tail, whenever I gaze at it, makes me sick!' he wrote to a friend in 1860. To [Darwin], the unblinking eyes that adorned their oversized tail feathers mocked the efficient logic of evolution. He wondered how it was possible that natural selection allowed any creature to evolve such unwieldy, impractical, and energy-expensive tails that, he was convinced, made the males easy pickings for predators."

"In 1871, he published The Decent of Man, and Selection in Relation to Sex, in which he explained how mate choice--sexual selection--encouraged the development of all sorts of bizarre secondary traits, from peacocks' tails to oversized horns, aimed purely at making individuals in some species irresistible to the opposite sex."

"Few phrases have been so misused and generated such misleading thoughts as 'survival of the fittest,' an idea that has been invoked again and again to justify corporate takeovers, genocides, colonial wars, and playground spats, among many other things. Even if [Herbert] Spencer believed that humankind held an exalted position in the animal kingdom, what he intended when he coined the phrase was not that the strongest, the smartest, and the hardest working were destined to succeed, but rather that those organisms that are best adapted by the slow mill of evolution to 'fit' into any particular environmental niche will thrive, at the expense of those that are less well adapted."

"Homo sapiens are by far the most prolific, expert, and versatile makers and users of tools in the history of life. Almost everything we do involves a tool of some sort, and occurs in a space that we have modified in some way or another . . . Homo sapiens, by contrast, can master an extraordinary array of different skills, which in each case, once mastered, masquerades as instinct."

"Mastering a skill sufficiently well for it to masquerade as an instinct takes time and energy, and lots of work. The rudiments of it must be first learned, usually by means of a combination of instruction, imitation, and experimentation. Then it must be practiced, often for years, before it becomes second nature. Acquiring skills also requires energy, dexterity, and cognitive processing power, as well as some less tangible qualities that scientists are far more wary of discussing than poets: perseverance, desire, determination, imagination, and ambition."

"Another possible answer reveals itself if we abandon the idea that intelligence is a single, generalized trait and instead view it as a collection of different cognitive traits, which evolved, initially at least, to do different jobs in response to different adaptive pressures. Thus problem solving can be thought of as one form of intelligence responsive to a particular set of adaptive pressures, abstract reasoning another, spatial reasoning another, and the ability to acquire and absorb socially transmitted information another still."

"The fact that our languages are more than a collection of words and are governed by rules of syntax that enable us to purposefully convey complex ideas may well have arisen in parallel with tool-making."

"With our super-plastic neocortices and well-organized senses, homo sapiens are gluttons of the informavore world. We are uniquely skilled at acquiring, processing, and ordering information, and uniquely versatile when it comes to letting that information shape who we are. And when we are deprived of sensory information, like a prisoner in solitary confinement, we conjure sometimes fantastical information-rich worlds from the darkness to feed our inner informavore."

"Ever since Adam Smith's death in 1790, historians, theologians, and economists have trawled through his writings to establish whether he was a religious man or not. Most agree that if Smith was a man of faith, he was probably at best a lukewarm believer, one who always looked first to reason rather than dogma to make sense of the world around him. Even so, it is clear that he was convinced that there were certain mysteries one could describe and analyze, but not fully explain . . . he also believed that when people acted in their own self-interest somehow everybody benefitted, as if they were guided in their actions by 'an invisible hand.'"

"Adam Smith was neither the unapologetic champion for selfishness nor the apostle for unregulated markets that he is portrayed as by his fiercest critics and most ardent fans alike. And even if Smith's hidden hand is still solemnly invoked by some as gospel, few would defend an inflexible interpretation of it now."

"During the depths of winter, the pace of life and work will have fallen into step with the more glacial tempo of the season. Besides occasional hunting, or expeditions to refresh stocks of firewood, many hours would have been spent huddled close to the fire. Busy minds would entertain and be distracted by stories, ceremonies, songs, and shamanic journeys. Agile fingers would have found purpose in developing and mastering new skills."

"The complexity of any particular society at any particular time is often a useful measure for the quantities of energy that they capture, and also the amount of work (in the raw, physical sense of the word) that is needed to build and then maintain complexity."

"Benjamin Franklin--founding father of the United States, intrepid flyer of kites in thunderstorms, inventor of bifocals, the Franklin Stove, and the urinary catheter--had a conflicted relationship with work. On the one hand, he lamented that he was 'the laziest person in the world' and quipped that his inventions were nothing more than labor-saving devices intended to spare him from future effort. Like John Maynard Keynes 150 years later, he also believed that human ingenuity might spare future generations from a life of hard labor."

"Authorship of the phrase 'time is money' is now often attributed to Franklin, whose face stares from every hundred-dollar bill minted by the United States Treasury. But it has a far more venerable provenance than Franklin's famous letter. The oldest recorded use of the phrase is in the book *Della Mecatura et del Mercante Perfetto* (*Commerce and the Perfect Merchant*), a tome published in 1573 by a Croatian trader, Benedetto Cotrugli."

"'Every man thus lives by exchanging, or becomes in some measure a merchant,' Smith concludes, 'and the society itself grows to be what is properly a commercial society.'"

"It was not until the Industrial Revolution that cities anywhere routinely accounted for more than a fifth of the total population of any region, yet by then what happened in cities had already been dictating the trajectory of human history for upward of 5,000 years."

"Up until the Industrial Revolution, even in the most sophisticated and productive agricultural civilizations, like ancient Rome, four out of five people still lived in the countryside and worked the land. But the one in five people who lived in cities in the most productive ancient agricultural economies were pioneers of a whole new way of working."

"With urbanities no longer hostage to the challenges of food production, the first cities gave rise to an efflorescence of new professions. And in cities, some of their professions assumed a level of social importance that would have been unimaginable to mobile foragers or even farmers working in small villages."

"Keynes broke ranks with many of his colleagues in this respect when he made the case that automation would solve the economic problem."

"We tend to progressively align our world views and expectations with those of both our teachers and co-workers, and also tend to look for work among similar people and, where possible, make use of existing social networks to do so."