

CHAPTER ONE

The Troubled Craftsman

The Craftsman summons an immediate image. Peering through a window into a carpenter's shop, you see inside an elderly man surrounded by his apprentices and his tools. Order reigns within, parts of chairs are clamped neatly together, the fresh smell of wood shavings fills the room, the carpenter bends over his bench to make a fine incision for marquetry. The shop is menaced by a furniture factory down the road.

The craftsman might also be glimpsed at a nearby laboratory. There, a young lab technician is frowning at a table on which six dead rabbits are splayed on their backs, their bellies slit open. She is frowning because something has gone wrong with the injection she has given them; she is trying to figure out if she did the procedure wrong or if there is something wrong with the procedure.

A third craftsman might be heard in the town's concert hall. There an orchestra is rehearsing with a visiting conductor; he works obsessively with the orchestra's string section, going over and over a passage to make the musicians draw their bows at exactly the same speed across the strings. The string players are tired but also exhilarated because their sound is becoming coherent. The orchestra's manager is worried; if the visiting conductor keeps on, the rehearsal will move into overtime, costing management extra wages. The conductor is oblivious.

The carpenter, lab technician, and conductor are all craftsmen because they are dedicated to good work for its own sake. Theirs is practical activity, but their labor is not simply a means to another end. The carpenter might sell more furniture if he worked faster; the technician might make do by passing the problem back to her boss; the visiting conductor might be more likely to be rehired if he watched the clock. It's certainly possible to get by in life without dedication. The craftsman represents the special human condition of being *engaged*. One aim of this book is to explain how people become engaged practically but not necessarily instrumentally.

Craftsmanship is poorly understood, as I noted in the Prologue, when it is equated only with manual skill of the carpenter's sort. German employs the word *Handwerk*, French the word *artisanal* to evoke the craftsman's labors. English can be more inclusive, as in the term *statecraft*; Anton Chekhov applied the Russian word *mastersvo* equally to his craft as a doctor, and as a writer. I want first to treat all such concrete practices as like laboratories in which sentiments and ideas can be investigated. A second aim of this study is to explore what happens when hand and head, technique and science, art and craft are separated. I will show how the head then suffers; both understanding and expression are impaired.

All craftsmanship is founded on skill developed to a high degree. By one commonly used measure, about ten thousand hours of experience are required to produce a master carpenter or musician. Various studies show that as skill progresses, it becomes more problem-attuned, like the lab technician worrying about procedure, whereas people with primitive levels of skill struggle more exclusively on getting things to work. At its higher reaches, technique is no longer a mechanical activity; people can feel fully and think deeply what they are doing once they do it well. It is at the level of mastery, I will show, that ethical problems of craft appear.

The emotional rewards craftsmanship holds out for attaining skill are twofold: people are anchored in tangible reality, and they can take pride in their work. But society has stood in the way of these rewards in the past and continues to do so today. At different moments in Western history practical activity has been demeaned, divorced from supposedly higher pursuits. Technical skill has been removed from imagination, tangible reality doubted by religion, pride in one's work treated as a luxury. If the craftsman is special because he or she is an engaged human being, still the craftsman's aspirations and trials hold up a mirror to these larger issues past and present.

The Modern Hephaestus

Ancient Weavers and Linux Programmers

One of the earliest celebrations of the craftsman appears in a Homeric hymn to the master god of craftsmen, Hephaestus: "Sing clear-voiced Muse, of Hephaestus famed for skill. With bright-eyed Athena he taught men glorious crafts throughout the world—men who before used to dwell in caves in the mountains like wild beasts. But now that they have learned crafts through Hephaestus famous for his art they live a peaceful life in their own houses the whole year round."¹ The poem is contrary in spirit to the legend of Pandora, which took form at roughly the same time. Pandora presides over destruction, Hephaestus over the craftsman as a bringer of peace and a maker of civilization.

The hymn to Hephaestus may seem to celebrate no more than a cliché, that of civilization commencing when human beings began to use tools. But this hymn was written thousands of years after the fabrication of such tools as knives, the wheel, and the loom. More than a technician, the civilizing craftsman has used these tools for a collective good, that of ending humanity's wandering existence as hunter-gatherers or rootless warriors. Reflecting on the Homeric hymn to

Hephaestus, a modern historian writes that because craftwork "brought people out of the isolation, personified by the cave-dwelling Cyclopes, craft and community were, for the early Greeks, indissociable."²

The word the hymn used for craftsman is *demioergos*. This is a compound made between public (*demios*) and productive (*ergon*). The archaic craftsman occupied a social slice roughly equivalent to a middle class. The *demioergoi* included, in addition to skilled manual workers like potters, also doctors and lower magistrates, and professional singers and heralds who served in ancient times as news broadcasters. This slice of ordinary citizens lived in between the relatively few, leisured aristocrats and the mass of slaves who did most of the work—many of whom had great technical skills but whose talents earned them no political recognition or rights.³ It was in the middle of this archaic society that the hymn honored as civilizers those who combined head and hand.

Archaic Greece, like many other societies that anthropologists until quite recently labeled "traditional," took it for granted that skills would be handed down from generation to generation. This assumption is more remarkable than it might appear. Social norms counted for more than individual endowments in the traditional "skills society." Developing one's talents depended on following the rules established by earlier generations; that most modern of words—personal "genius"—had little meaning in this context. To become skilled required, personally, that one be obedient. Whoever composed the hymn to Hephaestus accepted the nature of this communal bond. As with deeply held values in any culture, it seemed self-evident that people will identify with other craftsmen as fellow citizens. Skill would bind them to their ancestors as to their fellows. In their gradual evolution, traditional skills thus seem exempt from Hannah Arendt's principle of "natality."

If the artisan was celebrated in the age of Homer as a public man or woman, by classical times the craftsman's honor had dimmed. The reader of Aristophanes finds a small sign of this change in the con-

tempt with which he treats the potters Kittos and Bacchios as stupid buffoons due to the work they do.⁴ A graver portent of the artisan's darkening fortunes appears in the writings of Aristotle on the nature of craft. In the *Metaphysics*, he declares, "We consider that the architects in every profession are more estimable and know more and are wiser than the artisans, because they know the reasons of the things which are done."⁵ Aristotle abandons the old word for the craftsman, *demi-oergos*, and uses instead *cheirotechnon*, which means simply hand-worker.⁶

This shift had a particular, ambiguous meaning for women workers. From earliest times, weaving was a craft reserved for women that gave them respect in the public realm; the hymn singles out crafts like weaving as practices that helped civilize the hunter-gatherer tribes. As archaic society became classical, still the public virtue of women weavers was celebrated. In Athens, women spun a cloth, the *peplos*, that they then paraded through the city streets in an annual ritual. But other domestic crafts like cooking had no such public standing, and no craftwork would earn Athenian women in the classical era the right to vote. The development of classical science contributed to the gendering of skill that produced the word *craftsman* as applying to men. This science contrasted the man's hand dexterity to the inner-organ strength of women as childbearers; it contrasted the stronger arm and leg muscles of men to those of women; it supposed that men's brains were more "muscular" than those of women.⁷

This gender distinction sowed the seed of a still-living plant: most domestic crafts and craftsmen seem different in character than labor now outside the home. We do not think of parenting, for instance, as a craft in the same sense that we think of plumbing or programming, even though becoming a good parent requires a high degree of learned skill.

The classical philosopher most sympathetic to the archaic ideal of Hephaestus was Plato, who also worried about its demise. He traced

skill back to the root word for “making,” *poiein*. This is the parent word for *poetry*, and in the hymn, too, poets appear as just another kind of craftsman. All craftsmanship is quality-driven work; Plato formulated this aim as the *arete*, the standard of excellence, implicit in any act: the aspiration for quality will drive a craftsman to improve, to get better rather than get by. But in his own time Plato observed that although “craftsmen are all poets . . . they are not called poets, they have other names.”⁸ Plato worried that these different names and indeed different skills kept people in his day from understanding what they shared. In the five centuries between the hymn to Hephaestus and his own lifetime, something seemed to have slipped. The unity in archaic times between skill and community had weakened. Practical skills still sustained the ongoing life of the city but were not generally honored for doing so.



To understand the living presence of Hephaestus, I ask the reader to make a large mental jump. People who participate in “open source” computer software, particularly in the Linux operating system, are craftsmen who embody some of the elements first celebrated in the hymn to Hephaestus, but not others. The Linux technicians also represent as a group Plato’s worry, though in a modern form; rather than scorned, this body of craftsmen seem an unusual, indeed marginal, sort of community.

The Linux system is a public craft. The underlying software kernel in Linux code is available to anyone, it can be employed and adapted by anyone; people donate time to improve it. Linux contrasts to the code used in Microsoft, its secrets until recently hoarded as the intellectual property of one company. In one current, popular Linux application, Wikipedia, the code kernel makes possible an encyclopedia to which any user can contribute.⁹ When established in the 1990s, Linux sought to recover some of the adventure of the early days of computing in the

1970s. During these two decades, the software industry has morphed within its brief life into a few dominant firms, buying up or squeezing out smaller competitors. In the process, the monopolies seemed to churn out ever more mediocre work.

Technically, open-source software follows the standards of the Open Source Initiative, but the brute label “free software” doesn’t quite capture how resources are used in Linux.¹⁰ Eric Raymond usefully distinguishes between two types of free software: the “cathedral” model, in which a closed group of programmers develop the code and then make it available to anyone, and the “bazaar” model, in which anyone can participate via the Internet to produce code. Linux draws on craftsmen in an electronic bazaar. The kernel was developed by Linus Torvalds, who in the early 1990s acted on Raymond’s belief that “given enough eyeballs, all bugs are shallow”—engineer-speak for saying that if enough people participate in the code-writing bazaar, the problems of writing good code can be solved more easily than in the cathedral, certainly more easily than in proprietary commercial software.¹¹

This, then, is a community of craftsmen to whom the ancient appellation *demioergoi* can be applied. It is focused on achieving quality, on doing good work, which is the craftsman’s primordial mark of identity. In the traditional world of the archaic potter or doctor, standards for good work were set by the community, as skills passed down from generation to generation. These heirs to Hephaestus have experienced, however, a communal conflict about the use of their skills.

The programming community is grappling with how to reconcile quality and open access. In the Wikipedia application, for instance, many of the entries are biased, scurrilous, or just plain wrong. A break-away group now wants to apply editing standards, an impulse that runs smack up against the movement’s desire to be an open community. The editor “elitists” don’t dispute the technical proficiency of their adversaries; all the professional parties in this conflict feel passionately about maintaining quality. The conflict is equally strong in the generative

realm of Linux programming. Its members are grappling with a structural problem: how can quality of knowledge coexist with free and equal exchange in a community?¹²

We'd err to imagine that because traditional craft communities pass on skills from generation to generation, the skills they pass down have been rigidly fixed; not at all. Ancient pottery making, for instance, changed radically when the rotating stone disk holding a lump of clay came into use; new ways of drawing up the clay ensued. But the radical change appeared slowly. In Linux the process of skill evolution is speeded up; change occurs daily. Again, we might think that a good craftsman, be she a cook or a programmer, cares only about solving problems, about solutions that end a task, about closure. In this, we would not credit the work actually involved. In the Linux network, when people squash one "bug," they frequently see new possibilities open up for the use of the code. The code is constantly evolving, not a finished and fixed object. There is in Linux a nearly *instant* relation between problem solving and problem finding.

Still, the experimental rhythm of problem solving and problem finding makes the ancient potter and the modern programmer members of the same tribe. We would do better to contrast Linux programmers to a different modern tribe, those bureaucrats unwilling to make a move until all the goals, procedures, and desired results for a policy have been mapped in advance. This is a closed knowledge-system. In the history of handcrafts, closed knowledge-systems have tended toward short lifespans. The anthropologist André Leroi-Gourhan contrasts, for instance, the open, evolving, difficult, but long-lasting craft of metal knife-making in preclassical Greece to the craft of wooden knife-making—a more precise, economical, but static system of fabricating knives that was soon abandoned for the problems of metal.¹³

Linux is most deeply "Greek" in its impersonality. In Linux online workshops, it's impossible to deduce, for instance, whether "aristotle

@mit.edu" is a man or a woman; what matters is what "aristotle@mit.edu" contributes to the discussion. Archaic craftsmen experienced a kindred impersonality; the *demioergoi* were frequently addressed in public by the names of their profession. All craftsmanship, indeed, has something of this impersonal character. That the quality of work is impersonal can make the practice of craftsmanship seem unforgiving; that you might have a neurotic relation to your father won't excuse the fact that your mortise-and-tenon joint is loose. In one of the British-based Linux chat rooms to which I belong, the normal polite feints and indirections of British culture have disappeared. Gone are such locutions as "I would have thought that . . ."; in are "This problem is fucked-up." Looked at another way, this blunt impersonality turns people outward.

The Linux community might have served the mid-twentieth-century sociologist C. Wright Mills in his effort to define the character of the craftsman. Mills writes: "The laborer with a sense of craft becomes engaged in the work in and for itself; the satisfactions of working are their own reward; the details of daily labor are connected in the worker's mind to the end product; the worker can control his or her own actions at work; skill develops within the work process; work is connected to the freedom to experiment; finally, family, community, and politics are measured by the standards of inner satisfaction, coherence, and experiment in craft labor."¹⁴

If Mills's description seems impossibly idealistic, rather than reject it we might ask instead why craftsmanship of the Linux sort is so unusual. The question is a modern version of Plato's ancient worry; the Linux programmers are certainly grappling with fundamental issues like collaboration, the necessary relation of problem solving to problem finding, and the impersonal nature of standards, yet the community seems special if not marginal. Some cluster of social forces must be pushing these fundamental issues to the sidelines.

Weakened Motivation

Workers Demoralized by Command and by Competition

The modern world has two recipes for arousing the desire to work hard and well. One is the moral imperative to do work for the sake of the community. The other recipe invokes competition: it supposes that competing against others stimulates the desire to perform well, and in place of communal cohesion, it promises individual rewards. Both recipes have proved troubled. Neither has—in naked form—served the craftsman's aspiration for quality.

The problems with the moral imperative appeared to me personally and sharply on a visit my wife and I made to the communist empire in 1988, on the eve of its collapse. We'd received an invitation from the Russian Academy of Sciences to visit Moscow, a trip to be organized without the "support" of the foreign ministry and its resident spies; we were promised the freedom of the city. We toured Moscow churches previously locked, now overflowing, and the offices of an unauthorized newspaper where people smoked, talked, and at odd moments wrote. Almost as an afterthought, our hosts led us out to the Moscow suburbs, which I had never seen before.

These housing developments were built mostly in the decades after the Second World War. Laid out as enormous chessboards, the suburbs stretch to the horizon across flat land sparsely planted with birch and aspen. The architectural design of the suburban buildings was good, but the state had not been able to command good-quality work. The signs of poorly motivated workers appeared in the details of construction: in almost every building, concrete had been badly poured and sloppily reinforced, well-conceived, prefabricated windows had been set askew into the concrete shells, and little caulk had been applied to the seams joining window frames to concrete. In one new building we found the empty cartons of caulk for sealing the windows, but the contents had been sold, our guides said, on the black market. In a few apartment

towers workers had stuffed pieces of newspaper between the window frames and walls, then painted over the seams to give the appearance—lasting only a season or two—that the buildings had been sealed.

Poor craftsmanship was a barometer of other forms of material indifference. The housing we saw was meant for relatively privileged citizens, the Soviet scientific class. These families were allotted individual apartments rather than forced to live in communal space. Yet the negligence of construction was mirrored in the inhabitants' neglect of their surroundings: window boxes and balconies were bare of plants; walls had crusted over with crayon graffiti or spray-painted obscenities that nobody had bothered to clean up. When I asked about the dilapidated state of these buildings, our tour guides gave us a sweeping explanation. "People"—in general—don't care; they are demoralized.

This broad condemnation could not apply generally in the empire, since Soviet construction workers had long proved capable of making high-quality scientific and military buildings. Still, the guides seemed bent on proving the emptiness of the collective, moral recipe for craftsmanship. They led my wife and me from block to block with grim satisfaction, pointing out fraudulence and deception, taking almost a connoisseur's pleasure in contemplating the fake caulking that nature required mere winter to expose. When prodded, one of our guides coined "the ruins of Marxism" to explain the evidence both of demoralized workers and of inhabitants indifferent to their surroundings.

The young Karl Marx thought of himself as a secular Hephaestus whose writings would set the modern craftsman free. In the *Grundrisse*, he framed craftsmanship in the broadest possible terms as "form-giving activity."¹⁵ He emphasized that self and social relations develop through making physical things, enabling the "all-round development of the individual."¹⁶ Before Marx became an analyst of economic injustice, he was a Moses to workers, promising to realize the dignity of labor natural to people as part of a community. This utopian core of Marxism survived even as the older Marx hardened into a bitter, rigid

ideologue. As late as his essay "The Gotha Program," he returned to the view that communism would rekindle the spirit of craftsmanship.¹⁷

On the ground, Russia's command economy seems to explain the ruin of Marxism. Economists note the abysmally low productivity of Russian civil society throughout the 1970s and 1980s. The construction industry suffered particular problems of centralized command: its central bureaucracy was bad at estimating the materials needed for a project; the movement of materials across Russia's vast distances was slow and followed irrational paths; factories and construction crews seldom communicated directly. And authorities overreacted to initiative on building sites, fearing that local self-management might germinate general resistance to the state.

For these reasons, the moral imperative, "Do a good job for your country!" rang hollow. The problems on the ground are hardly unique to Russia's construction industry. The sociologist Darren Thiel has found equally demoralized workers at many British building sites. The construction industry in free-market Britain suffers from low productivity; its craft workers are treated badly or indifferently; onsite initiative is discouraged.¹⁸

The moral imperative is not, though, inherently empty. In the same decades that Russia was rotting, Japan was prospering under a command economy suffused with its own cultural imperatives to work well for the common good. Japan has been called "a nation of craftsmen," which is a little like calling England a nation of shopkeepers or observing that New Zealanders are good at raising sheep.¹⁹ Still, in the past half-century the Japanese manifested a practical creativity that brought the country back to life after the Second World War. In the 1950s the Japanese mass-produced cheap, simple goods; by the early 1970s they produced cheap, high-quality automobiles, radios, and stereos, as well as superb steel and aluminum for special applications.

Working precisely to high standards provided the Japanese during these years a sense of mutual and self-respect. In part they needed the

collective goal because workers, particularly those in the middle ranks of organizations, spent long hours together laboring, seldom seeing their wives or children, in order to make ends meet. But the moral imperative worked because of how it was organized.

In the postwar years Japanese corporations embraced the nostrums of the business analyst W. Edwards Deming, who advocated, for the sake of "total quality control," that managers get their hands dirty on the shop floor and subordinates speak frankly to their superiors. When Deming spoke of "collective craftsmanship," he meant that the glue binding an institution is created by sharp mutual exchanges as much as by shared commitment. Caricatures of the Japanese frequently depict them as herd-loving conformists, a stereotype that hardly makes sense of how sharply critical Japanese at work in Toyota, Subaru, and Sony plants could be of one another's efforts.

Hierarchy governed the Japanese workplace, but the plain speaking of the Linux community was normal in these plants. Within the Japanese factories it was possible to speak truth to power, in that an adept manager could easily penetrate the codes of courtesy and deference in speech to get across the message that something was wrong or not good enough. In Soviet collectivism, by contrast, the ethical as well as the technical center was too far removed from life on the ground. Marx dealt with "the worker"; Deming and his Japanese followers dealt with the work.

Rather than become Japanese, this comparison asks us to think again about the triumphalism that greeted the collapse of the Soviet empire a generation ago, capitalism winning out as communism collapsed from within. A large part of the triumphalist story turned on contrasting the virtues of competition to the vices of collectivism--individual competition taken to be more likely to produce good work, competition to spur quality. Not only capitalists have subscribed to this view; in the "reform" of public services like health care, the effort has been to promote internal competition and markets to improve the

quality of services. We need to look more deeply at this triumphalist view, because it obscures both the roles competition and cooperation actually play in getting good work done and, more largely, the virtues of craftsmanship.



The making of the mobile telephone tells an illuminating story about the superiority of cooperation to competition in getting good work done.

The mobile phone is the result of the metamorphosis of two technologies, the radio and the telephone. Before these two technologies fused, telephone signals were broadcast by landline wires, radio signals emitted in the air. In the 1970s mobile phones of a sort existed in the military. These were large, clunky radios with dedicated bands for communication. Domestic versions of the mobile phone operated domestically in taxicabs, their range limited, their sound quality poor. The landline telephone's fixity was its defect, its virtue the clarity and security of transmission.

At the heart of this virtue lay the switching technology of the landline phone, elaborated, tested, and refined with care over several generations of use. It was this switching technology that had to change in order for the radio and telephone to amalgamate. The problem and its solution were clear enough. Much ambiguity lurked, however, in connecting the two.

The economists Richard Lester and Michael Piore have studied the firms that sought to create the switching technology, finding that cooperation and collaboration within certain companies allowed them to make headway on the switching technology problem, whereas internal competition at other corporations diminished engineers' efforts to improve the quality of the switches. Motorola, a success story, developed what it called a "technology shelf," created by a small group of engineers, on which were placed possible technical solutions that other

teams might use in the future; rather than trying to solve the problem outright, it developed tools whose immediate value was not clear. Nokia grappled with the problem in another collaborative way, creating an open-ended conversation among its engineers in which salespeople and designers were often included. The boundaries among business units in Nokia were deliberately ambiguous, because more than technical information was needed to get a feeling for the problem; lateral thinking was required. Lester and Piore describe the process of communication this entailed as "fluid, context-dependent, undetermined."²⁰

By contrast, companies like Ericsson proceeded with more seeming clarity and discipline, dividing the problem into its parts. The birth of the new switch was intended to occur through "the exchange of information" among offices "rather than the cultivation of an interpretative community."²¹ Rigidly organized, Ericsson fell away. It did eventually solve the switching technology problem, but with greater difficulty; different offices protected their turf. In any organization, individuals or teams that compete and are rewarded for doing better than others will hoard information. In technology firms, hoarding information particularly disables good work.

The corporations that succeeded through cooperation shared with the Linux community that experimental mark of technological craftsmanship, the intimate, fluid join between problem solving and problem finding. Within the framework of competition, by contrast, clear standards of achievement and closure are needed to measure performance and to dole out rewards.

Any musician would find the story of the mobile phone eminently clear: good chamber music and orchestral work can only improve, especially in rehearsal, in the same way. Listeners may sometimes imagine that working with a superstar conductor or soloist inspires orchestral players, the virtuoso setting a standard that lifts everyone's game, but this depends on how the star behaves. A soloist withdrawn from collegiality can actually diminish the will of orchestra players

to perform well. Engineers, like musicians, are intensely competitive creatures; the issue for both is what happens when a compensating cooperation vanishes: the work degrades. The triumphalist story, however, has tended to be blind to this necessary balance.

The evidence of demoralized Russian workers that my wife and I encountered in the Moscow suburbs can be found closer to home. When I returned from this final trip to the empire, I began studying the demioergoi of the new American economy: middle-level workers whose skills should have earned them a secure place in the "new economy" in formation since the 1990s.²² The label refers to labor in the high-technology, finance, and human services sectors, supported by global investors, conducted in institutions that are more flexible, responsive, and focused on the short-term than in the rigid bureaucratic cages of the past. My students and I focused on people who write computer code, do accounting in backoffices, or arrange shipments to local stores in a retail chain—all competent but without sexy job titles or showy incomes.

The world that their fathers and grandfathers knew was in a way protected from the rigors of competition. Skilled middle-class workers found a place, in twentieth-century corporations, in relatively stable bureaucracies that moved employees along a career path from young adulthood to retirement. The forebears of the people we interviewed worked hard for their achievements; they knew fairly well what would happen to them if they didn't.

It's no longer news that this middle-class world has cracked. The corporate system that once organized careers is now a maze of fragmented jobs. In principle, many new economy firms subscribe to the doctrines of teamwork and cooperation, but unlike the actual practices of Nokia and Motorola, these principles are often a charade. We found that people made a show of friendliness and cooperation under the watchful eyes of boss-minders rather than, as in good Japanese firms, challenging and disputing their superiors. We found, as have other

researchers, that people seldom identified as friends the people with whom they worked in teams. Some of the people we interviewed were energized by this individualized competition, but more were depressed by it—and for a particular reason. The structure of rewards didn't work well for them.

The new economy has broken two traditional forms of rewarding work. Prosperous companies are intended, traditionally, to reward employees who work hard, at all levels. In these new economy firms, however, the wealth share of middle-level employees has stagnated over the past generation, even as the wealth of those at the top has ballooned. One measure is that in 1974 the chief executive officer of a large American corporation earned about thirty times as much as a median-level employee, whereas in 2004 the CEO earned 350 to 400 times as much. In these thirty years, real-dollar earnings at the median point have risen only 4 percent.

Sheer service to a company was, in an earlier generation, another reward for work, set in bureaucratic stone through automatic seniority increases in pay. In the new economy, such rewards for service have diminished or disappeared; companies now have a short-term focus, preferring younger, fresher workers to older, supposedly more ingrown employees—which means for the worker that, as his or her experience accumulates, it loses institutional value. The technicians whom I first began interviewing in Silicon Valley thought they could see themselves through this problem of experience by developing their skills, creating an inner armory that they could transport from company to company.

But craft does not protect them. In today's globalized marketplace, middle-level skilled workers risk the prospect of losing employment to a peer in India or China who has the same skills but works for lower pay; job loss is no longer merely a working-class problem. Again, many firms tend not to make long-term investments in an employee's skills, preferring to make new hires of people who already have the new skills needed rather than to engage in the more expensive process of retraining.

There are wrinkles in this gloomy picture. The sociologist Christopher Jencks has shown that economic "returns to skill" are robust at the upper reaches of the skills ladder but weaker lower down; crack systems designers are handsomely rewarded today, but low-level programmers often do no better and sometimes worse than people with manual service skills like plumbers and plasterers. Again, Alan Blinder argues, although many higher-skilled technical jobs in the West are being sent offshore to places in Asia and the Middle East, there are unexportable jobs that require face-to-face contact. If you live in New York, you can work with an accountant in Bombay, but you cannot usefully deal with a divorce lawyer there.²³

Still, the trials of the craftsmen of the new economy are a caution against triumphalism. The growth of the new economy has driven many of these workers in America and Britain inside themselves. Those firms that show little loyalty to their employees elicit little commitment in return—Internet companies that ran into trouble in the early 2000s learned a bitter lesson, their employees jumping ship rather than making efforts to help the imperiled companies survive. Skeptical of institutions, new economy workers have lower rates of voting and political participation than technical workers two generations ago; although many are joiners of voluntary organizations, few are active participants. The political scientist Robert Putnam has explained this diminished "social capital," in his celebrated book *Bowling Alone*, as the result of television culture and the consumerist ethic; in our study, we found that withdrawal from institutions was tied more directly to people's experiences at work.²⁴

If the work people do in new economy jobs is skilled and high pressure, requiring long hours, still it is dissociated labor: we found few among the technicians who believed that they would be rewarded for doing a good job for its own sake. The modern craftsman may hew inside him- or herself to this ideal, but given the structuring of rewards, that effort will be invisible.



From the social point of view, in sum, demoralization has many sides. It can occur when a collective goal for good work becomes hollow and empty; equally, sheer competition can disable good work and depress workers. Neither corporatism nor capitalism as crude labels get at the institutional issue. The forms of collective communication in Japanese auto plants and the practices of cooperation in firms like Nokia and Motorola have made them profitable. In other realms of the new economy, however, competition has disabled and disheartened workers, and the craftsman's ethos of doing good work for its own sake is unrewarded or invisible.

Fractured Skills

Hand and Head Divided

The modern era is often described as a skills economy, but what exactly is a skill? The generic answer is that skill is a trained practice. In this, skill contrasts to the *coup de foudre*, the sudden inspiration. The lure of inspiration lies in part in the conviction that raw talent can take the place of training. Musical prodigies are often cited to support this conviction—and wrongly so. An infant musical prodigy like Wolfgang Amadeus Mozart did indeed harbor the capacity to remember large swatches of notes, but from ages five to seven Mozart learned how to train his great innate musical memory when he improvised at the keyboard. He evolved methods for seeming to produce music spontaneously. The music he later wrote down again seems spontaneous because he wrote directly on the page with relatively few corrections, but Mozart's letters show that he went over his scores again and again in his mind before setting them in ink.

We should be suspicious of claims for innate, untrained talent. "I could write a good novel if only I had the time" or "if only I could pull myself together" is usually a narcissist's fantasy. Going over an action