
THE RISE OF THE KNOWLEDGE SOCIETY

BY PETER F. DRUCKER

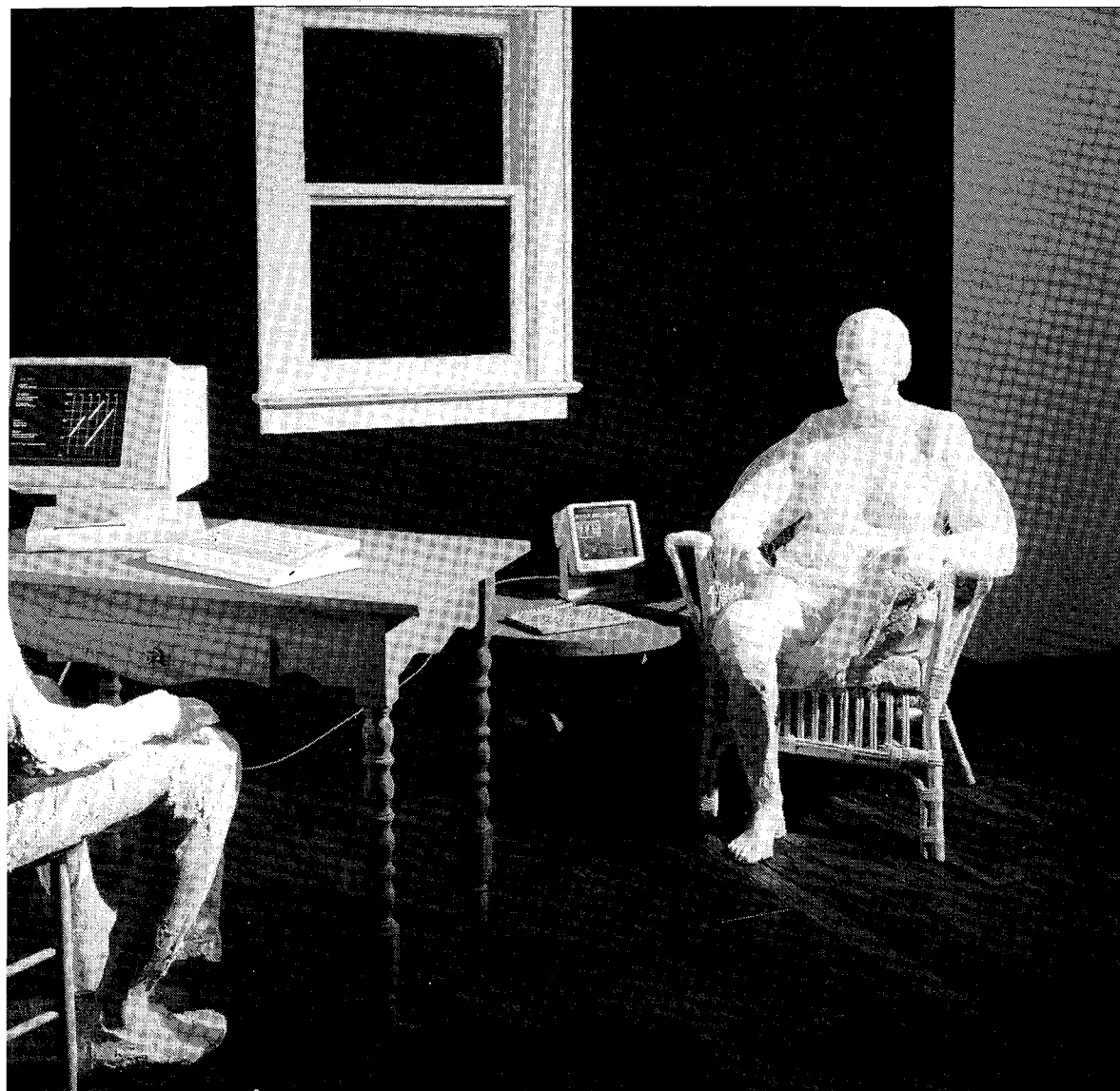
Since ancient times, new knowledge and new inventions have periodically remade human societies. Today, however, knowledge is assuming greater importance than ever before. Now more essential to the wealth of nations than either capital or labor, Peter Drucker argues here, it has already created a "postcapitalist" society and promises further transformations on a global scale.



In only 150 years, between about 1750 and 1900, capitalism and technology conquered the globe and created a world civilization. Neither capitalism nor technical innovations were new; both had been common, recurrent phenomena throughout the ages in both the West and the East. What was new was the speed of their diffusion and their global reach across cultures, classes, and geography. And it was this speed and scope that converted technical advances into the Industrial Revolution

and capitalism into Capitalism. Instead of being one element in society, as all earlier expressions of capitalism had been, Capitalism—with a capital C—became society. Instead of being confined, as always before, to a narrow locality, Capitalism prevailed throughout all of Western and Northern Europe by 1850. Within another 50 years it spread throughout the entire inhabited world.

This transformation was driven by a radical change in the meaning of knowledge. In both the West and Asia knowledge had al-



George Segal's *Machine of the Year* (1983)

ways been seen as applying to *being*. Almost overnight, it came to be applied to *doing*. It became a resource and a utility. Knowledge had always been a private good. Almost overnight it became a public good.

For 100 years—in the first phase—knowledge was applied to *tools, processes, and products*. This created the Industrial Revolution. But it also created what Marx called “alienation” and new classes and class war, and with them communism. In its second phase, beginning around 1880 and culminating

around World War II, knowledge in its new meaning came to be applied to work. This ushered in the Productivity Revolution, which in 75 years converted the proletariat into a middle-class bourgeoisie with near-upper-class income. The Productivity Revolution thus defeated class war and communism. The last phase began after World War II. Knowledge is being applied to *knowledge* itself. This is the Management Revolution. Knowledge is now fast becoming the *one* factor of production, sidelining both capital and labor. It may

be premature (and certainly would be presumptuous) to call ours a "knowledge society." So far we have only a knowledge economy. But our society today is surely "postcapitalist."

From earliest times, new tools, new processes, new materials, new crops, new techniques—what we now call "technology"—diffused swiftly throughout the Old World. Few modern inventions, for instance, spread as rapidly as a 13th-century one: eyeglasses. Derived around 1270 from the optical experiments of an English Franciscan friar, Roger Bacon, reading glasses for the elderly were in use at the papal court at Avignon by 1290, at the sultan's court in Cairo by 1300, and at the court of the Mongol emperor of China no later than 1310. Only the sewing machine and the telephone, fastest-spreading of all 19th-century inventions, moved as quickly.

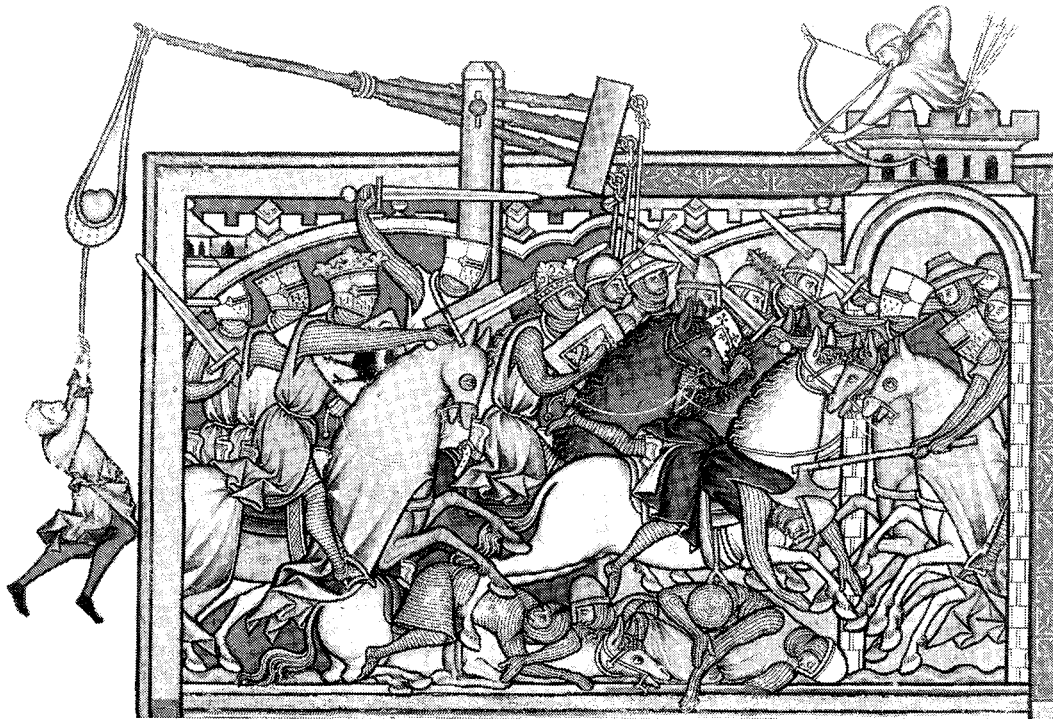
But earlier technological change almost without exception remained confined to one craft or one application. It took another 200 years, until the early 16th century, before Bacon's invention acquired a second application: to correct nearsightedness. Similarly, the redesign of the windmill around A.D. 800, which converted it from the toy it had been in antiquity into a true machine, was not applied to ships for more than 300 years. Ships were still oared; if wind was used at all to propel them it was as an auxiliary and only if the breeze blew in the right direction.

The inventions of the Industrial Revolution, however, were immediately applied across the board, and across all conceivable crafts and industries. They were immediately seen as technology. James Watt's redesign of the steam engine between 1765 and 1776 made it into a cost-effective provider of power. Watt himself throughout his own pro-

ductive life focused on only one use of his engine: to pump water out of mines—the use for which the steam engine had first been designed by Thomas Newcomen in the early years of the 18th century. But one of England's leading iron masters immediately saw that the redesigned steam engine could also be used to blow air into a blast furnace, and so he put in a bid for the second engine Watt built. Furthermore, Watt's partner, Matthew Boulton, promptly promoted the steam engine as a provider of power for all kinds of industrial processes, especially, of course, for what was then the largest of all manufacturing industries, textiles. Thirty-five years later, an American, Robert Fulton, floated the first steamboat on New York's Hudson River. Twenty years later the steam engine was put on wheels and the locomotive was born. And by 1840—at the latest by 1850—the steam engine had transformed every single manufacturing process, from glassmaking to printing. It had transformed long-distance transportation on land and sea, and it was beginning to transform farming. By then, too, it had penetrated almost the entire world—with Tibet, Nepal, and the interior of tropical Africa the only exceptions.

As in the 19th century, most people today still believe that the Industrial Revolution was the first time a change in the "mode of production" (to use Karl Marx's term) changed social structure and created new classes, the capitalist and the proletarian. It was not. Between A.D. 700 and 1100 two new classes emerged in Europe as a result of technological change: the feudal aristocracy and urban craftsmen. The knight was created by the invention of the stirrup, an innovation coming out of Central Asia around the year A.D. 700; the craftsman by the redesign of water wheel and windmill into true

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The age of the feudal knight, an invincible fighter supported on horseback by stirrups, was already succumbing to technological and social change at the time of this 13th-century French painting.

machines that, for the first time, used inanimate forces rather than muscle as motive power.

The stirrup made it possible to fight on horseback. Without it a rider wielding a lance, sword, or heavy bow would have been thrown off his horse by the force described in Newton's Third Law: "To every action there is always opposed an equal reaction." For several hundred years the knight was an invincible fighting machine. But this machine had to be supported by a "military-agricultural complex"—something quite new in history. Germans until this century called it a *rittergut*, a knight's estate endowed with legal status and with economic and political privileges, and populated by at least 50 peasant families to produce the food needed to support the fighting machine: the knight, his squire, his three horses, and his 12 to 15 grooms. The stirrup, in other words, created feudalism.

The craftsmen of antiquity had been slaves. The craftsmen of the first "machine age," the craftsmen of Europe's Middle Ages, became the urban ruling class, the "burghers" who created Europe's unique city, and both the Gothic period and the Renaissance.

The technical innovations—stirrup, water wheel, and windmill—traveled throughout the entire Old World, and fast. But the social transformations involved in this earlier industrial revolution remained largely contained within Europe. Only in Japan around A.D. 1100 did there arise proud and independent craftsmen who enjoyed high esteem and, until 1600, considerable power. But while the Japanese adopted the stirrup for riding, they continued to fight on foot. The rulers in rural Japan were the commanders of foot soldiers—the *daimyo*. They levied taxes on the peasantry but possessed no feudal estates. In China, in India, and in

the world of Islam, the new technologies had no social impact whatever. Craftsmen in China remained serfs without social status. The military did not become landowners but remained, as in Europe's antiquity, professional mercenaries. Even in Europe, the social changes generated by this early industrial revolution took almost 400 years to take full effect.

By contrast, the social transformation of society brought about by Capitalism and the Industrial Revolution took fewer than 100 years in Western Europe. In 1750 capitalists and proletarians were still marginal groups. In fact, proletarians in the 19th-century meaning of the term—that is, factory workers—hardly existed at all. By 1850 capitalists and proletarians were the dynamic classes of Western Europe. They rapidly became the dominant classes wherever capitalism and modern technology penetrated. In Japan the transformation took fewer than 30 years, from the Meiji Restoration in 1867 to the war with China in 1894. It took not much longer in Shanghai and Hong Kong, Calcutta and Bombay, or in the tsar's Russia. Capitalism and the Industrial Revolution—because of their speed and their scope—created a world civilization.

Unlike those "terrible simplifiers," Hegel, Marx, and other 19th-century ideologues, we know that major historical events rarely have just one cause and just one explanation. They typically result from the convergence of a good many separate and independent developments. Many disparate trends—most of them probably quite unconnected with one another—went into making capitalism into Capitalism and technical advance into the Industrial Revolution. The best-known theory—that Capitalism was the child of the "Protestant Ethic"—expounded in the opening years of this century by the German sociologist Max Weber, has been largely discredited. There is simply not enough evidence for it. There is only a little more evidence to support Karl Marx's earlier thesis that the steam engine, the new

prime mover, required such enormous capital investment that craftsmen could no longer finance their "means of production" and thus had to cede control to the capitalist. There is one critical element, however, without which capitalism and technical advance could not possibly have turned into a worldwide social pandemic. It is the radical change in the meaning of knowledge that occurred in Europe around the year 1700.

There are as many theories about what we can know and how we know it as there have been metaphysicians, from Plato in antiquity to Ludwig Wittgenstein and Karl Popper in our own century. But since Plato's time there have been only two theories in the West—and since roughly the same time, two theories in Asia—regarding the meaning and function of knowledge. According to Plato, Socrates held that the only function of knowledge is self-knowledge, that is the intellectual, moral, and spiritual growth of the person. Socrates' ablest opponent, the brilliant and learned Protagoras, held, however, that the purpose of knowledge is to make the holder effective by enabling him to know what to say and how to say it. For Protagoras knowledge meant logic, grammar, and rhetoric—later to become the trivium, the core of learning in the Middle Ages and still very much what we mean by a "liberal education" or what the Germans mean by *allgemeine Bildung* (general education). In Asia there were essentially the same two theories of knowledge. Knowledge for the Confucian was knowing what to say and how to say it, the way to advancement and earthly success. Knowledge for the Taoist and the Zen monk was self-knowledge, and it was the road to enlightenment and wisdom. But while the two sides thus sharply disagreed about what knowledge means, they were in total agreement about what it did not mean. It did not mean *ability to do*. It did not mean utility. Utility was not knowledge; it was skill—the Greek word for which is *techné*.

Unlike their Eastern contemporaries, the

Chinese Confucians, with their infinite contempt for anything but book learning, both Socrates and Protagoras respected *techné*. But even to Socrates and Protagoras, *techné*, however commendable, was not knowledge. It was confined to one specific application and involved no general principles. What the shipmaster knew about navigating from Greece to Sicily could not be applied to anything else. Furthermore, the only way to learn a *techné* was through apprenticeship and experience. A *techné* could not be explained in words, whether spoken or written. It could only be demonstrated by one who had mastered it. As late as 1700 or even later, the English did not speak of "crafts." They spoke of "mysteries"—not only because the possessor of a craft skill was sworn to secrecy but also because a craft by definition was inaccessible to anyone who had not been apprenticed to a master and taught by example.

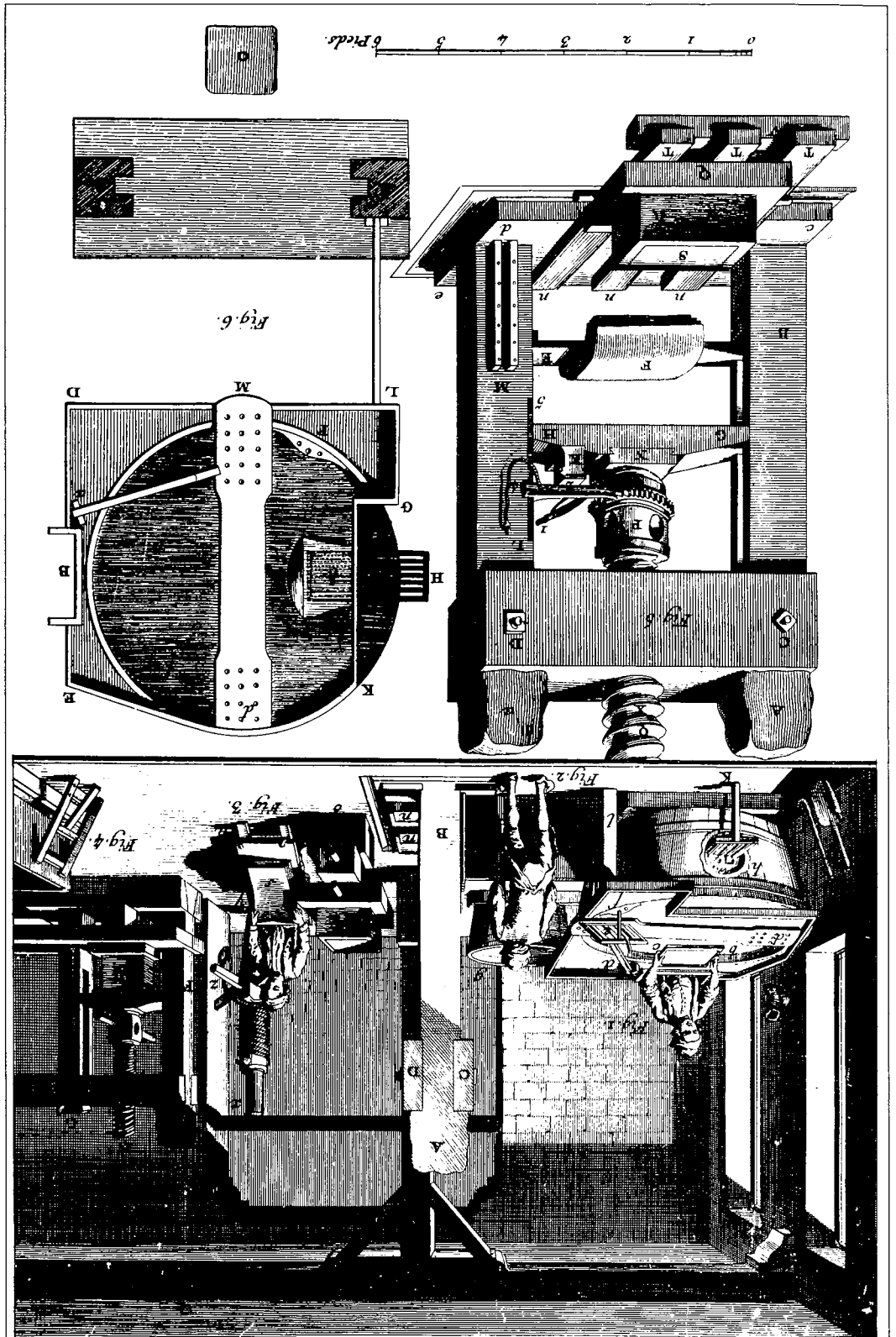
Then, beginning after 1700—and within the incredibly short span of 50 years—technology was invented. The very word is a manifesto in that it combines *techné*, that is the mystery of a craft skill, with *logy*, organized, systematic, purposeful knowledge. The first engineering school, the French École des Pontes et Chaussées, was founded in 1747, followed around 1770 in Germany by the first school of agriculture, and in 1776 by the first school of mining. In 1794 the first technical university, France's École Polytechnique, was founded and with it was born the profession of engineering. Shortly thereafter, between 1820 and 1850, medical education and medical practice were reorganized as a systematic technology.

As part of a parallel development in Britain, the meaning of patents shifted between 1750 and 1800. Once monopolies to enrich royal favorites, patents now were granted to encourage the application of knowledge to tools, products, and processes, and to reward inventors, provided they published their inventions. This not only triggered a century of feverish mechanical invention in Britain; it finished craft mystery and secretiveness.

The great document of this dramatic shift from skill to technology—one of the more important books of all time—was the *Encyclopédie* (1751–72), edited by Denis Diderot and Jean d'Alembert. This monumental work attempted to bring together in organized and systematic form the knowledge of all crafts, and in such a way that the non-apprentice could learn to be a "technologist." It was by no means accidental that articles in the *Encyclopédie* that describe individual crafts such as spinning or weaving were not written by craftsmen. They were written by "information specialists": people trained as analysts, as mathematicians, as logicians. Both Voltaire and Rousseau were contributors. The underlying thesis of the *Encyclopédie* was that effective results in the material universe—in tools, processes, and products—are produced by systematic analysis, and by systematic, purposeful application of knowledge. But the *Encyclopédie* also preached that principles that produced results in one craft would produce results in any other. That was anathema, however, to both the traditional man of knowledge and the traditional craftsman.

None of the technical schools of the 18th century aimed at producing new knowledge—nor did the *Encyclopédie*. None even talked of the application of science to tools, processes, and products, that is, to technology. This idea had to wait until around 1840, when Justus Liebig, a German chemist, applied science to invent artificial fertilizers and a way to preserve animal protein, in the form of meat extract. What the early technical schools and the *Encyclopédie* did, however, was perhaps more important. They brought together, codified, and published the *techné*, the craft mystery, as it had been developed over millennia. They converted experience into knowledge, apprenticeship into textbook, secrecy into methodology, doing into applied knowledge. These are the essentials of what we have come to call the Industrial Revolution, in other words, the transformation by technol-

Diderot's Encyclopédie included descriptions of some 250 crafts. This illustration is one of more than a dozen accompanying a lengthy technical article on paper- and book-making.



ogy of society and civilization worldwide.

It is this change in the meaning of knowledge that then made modern Capitalism inevitable and dominant. Above all, the speed of technical change created a demand for capital far beyond anything the craftsman could possibly supply. The new technology also required the concentration of production: thus the shift to the factory. Knowledge could not be applied in thousands of small individual workshops and in the cottage industries of the rural village. The new technology also required large quantities of energy, whether water power or steam power, which also encouraged concentration. Although they were important, these energy needs were secondary. The central point was that production almost overnight moved from being craft-based to being technology-based. As a result the capitalist moved into the center of economy and society.

As late as 1750, large-scale enterprise was governmental rather than private. The earliest and for many centuries the greatest of all manufacturing enterprises in the Old World was the famous arsenal owned and run by the government of Venice. And the 18th-century "manufactories" such as the porcelain works of Meissen and Sèvres were still government-owned. But by 1830 large-scale private capitalist enterprise dominated in the West. By the time Karl Marx died in 1883, private capitalist enterprise had penetrated everywhere except to such remote corners of the world as Tibet and the Empty Quarter of Arabia.

Adam Smith's *Wealth of Nations* appeared in the same year—1776—in which James Watt patented the perfected steam engine. Yet the *Wealth of Nations* pays practically no attention to machines or factories or industrial production. The production it describes is still craft-based. Even 40 years later, after the Napoleonic Wars, factories and machines were not yet seen as central even by acute social observers. They play practically no role in the economics of David

Ricardo. Even more surprising, neither factory workers nor bankers can be found in the novels of Jane Austen, England's most perceptive social critic. Her society (as has often been said) is thoroughly bourgeois. But it is still totally preindustrial, a society of squires and tenants, parsons and naval officers, lawyers, craftsmen, and shopkeepers. Only in far-away America did Alexander Hamilton see very early that machine-based manufacturing was fast becoming the central economic activity. But few even among his followers paid much attention to his 1791 *Report on Manufactures* until long after his death.

By the 1830s, however, Honoré de Balzac was turning out best-selling novel after best-selling novel depicting a capitalist France whose society was dominated by bankers and the stock exchange. And 15 years later, capitalism, the factory system, and the machine, were central in the mature works of Charles Dickens, as were the new classes, the capitalists and the proletarians. In *Bleak House* (1852), the new society and its tensions form the subplot in the contrast between two able brothers, both sons of the squire's housekeeper. One becomes a great industrialist in the North who plans to get himself elected to Parliament to fight the landowners and break their power. The other chooses to remain a loyal retainer of the broken, defeated, ineffectual, precapitalist "gentleman." And Dickens's *Hard Times* (1854) is the first and by far the most powerful industrial novel, the story of a bitter strike in a cotton mill and of class war at its starkest.

The social tensions and conflicts of the new order were created by the unheard-of speed with which society was transformed. We now know that there is no truth in the nearly universal belief that factory workers in the early 19th century were worse off and treated more harshly than they had been as landless laborers in the preindustrial countryside. They were badly off, no doubt, and harshly treated. But they flocked to the factory precisely because they were still better off

there than they were at the bottom of a static, tyrannical, and starving rural society. The new factory workers experienced a much better "quality of life." In the factory town infant mortality immediately went down and life expectancy rose, thus triggering the enormous population growth of industrializing Europe. Today—in fact, since World War II—we have the example of the Third World countries. Brazilians and Peruvians stream into the *favelas* and barrios of Rio de Janeiro and Lima. However hard, life there is better than in the impoverished *Noreste* of Brazil or on Peru's altiplano. As an Indian saying goes, "The poorest beggar in Bombay still eats better than the farm hand in the village."

While industrialization from the beginning meant material improvement rather than Marx's famous "immiseration," the pace of change was so breathtaking as to be deeply traumatic. The new class, the "proletarians," became "alienated," to use Marx's term. Their alienation, Marx predicted, would make inevitable their exploitation. They were becoming totally dependent for their livelihood on access to the "means of production," which were owned and controlled by the capitalist. This, Marx predicted, would increasingly concentrate ownership in fewer and bigger hands and increasingly impoverish a powerless proletariat—until the day when the system would collapse of its own weight, with the few remaining capitalists being overthrown by proletarians who "had nothing to lose but their chains."

Most of Marx's contemporaries shared his view of capitalism even if they did not necessarily share his prediction of the outcome. Even anti-Marxists accepted Marx's analysis of the "inherent contradictions of capitalism." Some, such as J. P. Morgan, the American banker, were confident that the military would keep the proletarian rabble in check. Liberals of all stripes believed that somehow there could be reform and amelioration. But practically every thinking person of the late

19th century shared with Marx the conviction that capitalist society was a society of inevitable class conflict—and in fact by 1910 most "thinking people," at least in Europe (but also in Japan), were inclining toward socialism. The greatest of 19th-century conservatives, Benjamin Disraeli, saw capitalist society very much as Marx did. So did his conservative counterpart on the Continent, Otto von Bismarck, and it motivated him, after 1880, to enact the social legislation that ultimately produced the 20th-century welfare state.

By 1950 a good many observers already knew that Marxism had failed both morally and economically. (I had said so already in 1939, in my book, *The End of Economic Man*.) But Marxism was still the one coherent ideology for most of the world. And for most of the world it looked invincible. What finally overcame the "inevitable contradictions of capitalism," the "alienation" and "immiseration" of the proletarians and with it the "proletarian" condition altogether? The answer is the *Productivity Revolution*.

When knowledge changed its meaning 250 years ago, it began to be applied to tools, processes, and products. This is still what "technology" means to most people and what is being taught in engineering schools. But two years before Marx's death the Productivity Revolution began. In 1881, Frederick Winslow Taylor, then a foreman in a steel plant, first applied knowledge to the study of work, the analysis of work, and the engineering of work.

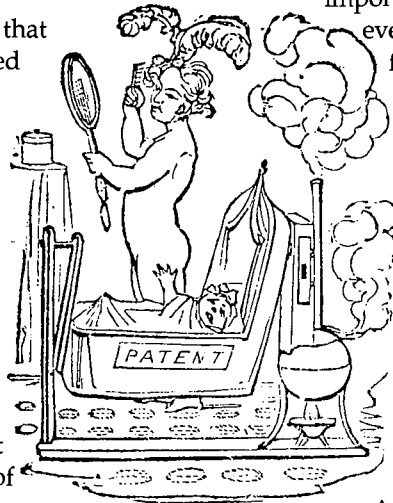
In the West the dignity of work has received lip service for a long time. The second oldest Greek text, following the Homeric epics by only 100 years or so, is a poem by Hesiod (eighth century B.C.), entitled *Works and Days*, which sings of the work of the farmer. One of the finest Roman poems is Virgil's *Georgics*, a cycle of songs about the farmer's labor written in the first century B.C. Although there is no such concern with work in Asia's literary traditions, the emperor of China once a year touched a plow to celebrate rice planting. But neither in the West nor in

Asia did work receive more than token gestures. Neither Hesiod nor Virgil actually looked at what a farmer *does*. Nor did anybody else throughout most of recorded history. Work was beneath the attention of the educated, the well-to-do, and the powerful. Work was what slaves did. "Everybody knew" that the only way a worker could produce more was by working longer hours or by working harder. Marx too shared this belief, as did every other 19th-century economist or engineer.

It was by pure accident that Taylor, a well-to-do, educated man, became a worker. Poor eyesight forced him to abandon plans to enter Harvard, where he had been accepted, and to take instead a job as an apprentice machinist. Being highly gifted, Taylor very soon rose to be one of the bosses. His metalworking inventions made him a rich man very early. What got Taylor started on the study of work was his shock at the mutual and growing hatred between capitalists and workers, which had come to dominate the late 19th century. Taylor, in other words, saw what Marx saw and what Disraeli and Bismarck saw. But he also recognized something else: The conflict was unnecessary. He set out to make workers productive so that they would earn decent money.

Taylor's goal was not to improve efficiency. It was not to create profits for the owners. To his death he maintained that the major beneficiary of rising productivity had to be the worker, not the owner. His main concern was the creation of a society in which owners and workers, capitalists and proletarians, had a common interest in productivity and could build a relationship of harmony based on the application of knowledge to work. His lesson has been best understood by Japan's post-World War II employers and unions.

Few thinkers in history have had greater impact than Taylor. And few have been so willfully misunderstood and so assiduously misquoted. In part, Taylor has suffered because history has proven him right and the intellectuals wrong. In part, Taylor is ignored because contempt for work still lingers, above all among the intellectuals. Surely shoveling sand—the subject of Taylor's most famous analysis—is not something an "educated person" would appreciate, let alone consider important. In much larger part, however, Taylor's reputation has suffered precisely because he applied knowledge to the study of work. This was anath-



The steam engine's influence was felt in many different realms—including the popular imagination.

ema to the labor unions of his day, and they mounted against Taylor one of the more vicious campaigns of character assassination in American history. Taylor's crime,

in the eyes of the unions, was his assertion that there is no "skilled work." In manual operations there is only "work." All work can be analyzed the same way. Any worker who is willing to do the work the way analysis shows it should be done, is a "first-class man," deserving a "first-class wage"—that is, as much as, or more than, the skilled worker got with his long years of apprenticeship.

The unions that were most respected and powerful in Taylor's America were the unions in the government-owned arsenals and shipyards in which, prior to World War I, virtually all peacetime U.S. defense production occurred. These unions were craft monopolies, and membership in them was largely restricted to sons or relatives of members. They required an apprenticeship of five to seven years but had no systematic training or work study. The unions allowed nothing to be writ-

ten down. There were not even blueprints or any other drawings of the work to be done. Union members were sworn to secrecy and forbidden to discuss their work with non-members. Taylor's assertion that work could be studied, analyzed, and divided into a series of simple repetitive motions, each of which had to be done in its one right way, in its own best time, and with its own right tools, was indeed a frontal attack on such encrusted guild practices. And so the unions vilified him. They even succeeded in persuading Congress to ban Taylor's "task study" method in government arsenals and shipyards, a ban that remained in force until after World War II.

Taylor's dealings with owners were as bad as those with unions, a fact that further hurt his cause. While he had little use for unions, he was contemptuous of owners. His favorite epithet for them was "hogs." And then there was his insistence that the workers rather than the owners should get the lion's share of the increased revenue that the application of his theory of "Scientific Management" would produce. Adding insult to injury, his "Fourth Principle" demanded that work study be done in consultation, if not in partnership, with the worker. Finally, Taylor held that authority in the plant should be based not on ownership but solely on superior knowledge. He demanded, in other words, what we now call "professional management"—and that was anathema to 19th-century capitalists. They bitterly attacked him as a troublemaker and a socialist. (Some of his closet disciples and associates, especially Carl Barth, his right-hand man, were indeed avowed leftists and strongly anticapitalist.)

Taylor's axiom that all manual work, skilled or unskilled, could be analyzed and organized by the application of knowledge seemed preposterous to his contemporaries. The ancient belief that there was a mystique to craft skill continued to be accepted for many years after Taylor made his case. This belief encouraged Hitler in 1941 to welcome

war with the United States. For the United States to field an effective force in Europe would require a large fleet to transport troops, and America at that time had almost no merchant marine or destroyers to protect it. Modern war, Hitler further argued, required precision optics in large quantities for bombsights and other devices, and there were no skilled optical workers in America.

Hitler was absolutely right. The United States did not have much of a merchant marine, and its destroyers were few and ludicrously obsolete. It also had almost no optical industry. But by applying Taylor's "task study," American industry, which played a far more important role in war production than the old government arsenals, learned how to train totally unskilled workers, many of them former sharecroppers raised in a preindustrial environment, and convert them in 60 or 90 days into first-rate welders and shipbuilders. The United States trained within a few months the same kind of people to turn out precision optics superior in quality to what the Germans produced, and did this, furthermore, on an assembly line.

Taylor's greatest impact was in showing the importance of training. Only a century before Taylor, Adam Smith had taken for granted that it took at least 50 years of experience (and more likely a full century) for a country or a region to acquire the necessary skills to turn out high-quality products. His examples were the production of musical instruments in Bohemia and Saxony and of silk fabrics in Scotland. Seventy years later, around 1840, August Borsig—one of the first people outside England to build a steam locomotive—invented what is still the German system of apprenticeship, combining practical plant experience under a master with theoretical grounding in school. This system remains the foundation of Germany's industrial productivity. But even Borsig's apprenticeship took three to five years. Then, first during World War I, but especially during World War II, the United States systematically applied

The Art and Science of Shoveling

	Old Way	New Way
Number of Laborers	500	140
Mr. Ton per man per day	16	34
Mr. earnings per man per day	\$1.15	\$2.33
Mr. Cost per ton	0.71	0.33

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Taylor's approach, training “first-class men” (and women) to perform simplified tasks in a few months' time. This, more than any other factor, explains why the United States was able to defeat Japan and Germany.

All earlier economic powers in modern history—England, the United States, Germany—emerged through leadership in new technology. The new post-World War II economic powers—first Japan, then South Korea, Taiwan, Hong Kong, and Singapore—all owe their rise to an appreciation of Taylor's teachings about training. It enabled them to endow a still largely preindustrial and therefore still low-wage work force with world-class productivity in practically no time. In the post-World War II decades Taylor-based training became the one truly effective engine of economic development.

The application of knowledge to work af-

Taylor's “optimum shovel load” was a significant discovery at a time when workers still moved mountains of coal, coke, and other materials by hand.

ter 1880 explosively increased productivity.* For hundreds of years there had been no increase in the ability of workers to turn out goods or to move goods. Machines created greater capacity. But workers themselves were no more productive than they had been in the workshops of ancient Greece, in building the roads of imperial Rome, or in producing the highly prized woolen cloth that gave Renaissance Florence its wealth. But within a few years after Taylor began to apply knowledge to work, productivity began to rise at a rate of 3.5 to four percent annually, which meant that productivity doubled every 18 years or so. Ever since Taylor's principles took hold at the turn of the century, productivity has increased some 50-fold in all advanced countries. On this unprecedented expansion rest all the increases in both standard of living and quality of life in developed countries.

Half of this additional productivity has been used to increase purchasing power—creating a higher standard of living. But people have used between one-third and one-half to increase their leisure time. As late as

*The term *productivity* was unknown in Taylor's time. In fact, it was unknown until World War II, when it first began to be used in the United States. As late as 1950 the most authoritative English dictionary, the *Concise Oxford*, still did not define the term as it is used today.

1910, workers in developed countries still labored as long as they ever had before, that is, at least 3,000 hours per year. Today even the Japanese work only 2,000 hours, Americans around 1,850, and Germans at most 1,600—and all three nations produce 50 times as much per hour as they produced 80 years ago. Other substantial shares of the increased productivity have been taken in the form of health care, which has grown from a negligible percentage of gross national product (GNP) to between eight and 12 percent in developed countries, and in the form of education, which has grown from around two percent of GNP to 10 percent or more.

Most of this increase—as Taylor predicted—has been taken by the workers, that is, by Marx's proletarians. Henry Ford brought out the first cheap automobile, the Model T, in 1908. It was cheap, however, only by comparison with all other automobiles on the market, which in terms of average incomes cost as much as a two-engine private plane costs today. At \$825, the Model T cost what an American industrial worker earned in three to four years—80 cents was then a good day's wage (and, of course, there were no benefits). Today, a unionized automobile worker in the United States, Japan, or Germany, working only 40 hours a week, earns \$50,000 in wages and benefits—\$45,000 after taxes—which is roughly six times what a cheap new car costs today.

By 1930 Taylor's Scientific Management—despite resistance from unions and intellectuals—had swept the developed world. As a result Marx's proletarian became a bourgeois. The blue-collar manufacturing worker rather than the capitalist became the true beneficiary of Capitalism and the Industrial Revolution. This explains the total failure of Marxism in the highly developed countries for which Marx had predicted revolution by 1900. It explains why, after 1918, there was no proletarian revolution, even in the defeated countries of Central Europe where there was misery, hunger, and un-

employment. It explains why the Great Depression did not lead to a communist revolution, as Stalin and practically all Marxists had confidently expected. By the 1930s, Marx's proletarians had not yet become affluent. But they had already become middle class. They had become productive.

Darwin, Marx, and Freud make up the trinity often cited as the "makers of the modern world." Marx would be taken out and replaced by Taylor if there were any justice. But that Taylor is not given his due is a minor matter. It is a serious matter, however, that too few people realize that it is the application of knowledge to work that created developed economies by setting off the productivity explosion of the last hundred years. Technologists give credit to machines, economists to capital investment. But both elements were as plentiful in the first hundred years of the capitalist age, that is before 1880, as they were afterward. But there was absolutely no increase in worker productivity during the first hundred years—and consequently also little increase in workers' real incomes or any reduction in their working hours. What made the second hundred years so critically different can be explained only as the result of *the application of knowledge to work*.

The Productivity Revolution, however, has come to an end. When Taylor started propounding his principles, nine out of every 10 working people did manual work, making or moving things, whether in manufacturing, farming, mining, or transportation. The productivity of people engaged in making and moving things is still going up at the historical rate of 3.5 to four percent annually—and in American and French agriculture, even faster. Forty years ago people who engaged in work to make or to move things were still a majority in all developed countries. By 1990 this group had shrunk to one-fifth of the work force. By 2010 it will constitute no more than one-tenth. Increasing the productivity of manual workers in manufacturing, in farming, in mining, in transportation, can no longer create wealth by itself. The Productivity Revolu-

tion has become a victim of its own success. From now on what matters is the productivity of nonmanual workers. And that requires *applying knowledge to knowledge*.

When I decided in 1926 not to go to college after finishing secondary school, my father was quite distressed. Ours had long been a family of lawyers and doctors. Yet my father did not call me a dropout. He did not try to change my mind. And he did not even predict that I would never amount to anything.

I was a responsible adult wanting to work as an adult. (That I then also got a doctorate on the side had more to do with my trying to annoy my father than with any belief on my part that it would make any difference in my life and career.) Thirty years later, when my son reached age 18, I practically forced him to go to college. Like his father, he wanted to be an adult among adults. Like his father, he felt that in 12 years of sitting in school he had learned little, and that his chances of learning much by spending four more years in school were not particularly great. And yet by 1958, 31 years after I had moved from being a high-school graduate to being a trainee in an export firm, the college degree had become a necessity. It had become the passport to virtually all careers. Not to go to college in 1958 was "dropping out" for an American boy who had grown up in a well-to-do family and who had done well in school. My father did not have the slightest difficulty finding a trainee job for me in a reputable merchant house. Thirty years later such firms would not have accepted a high-school graduate as a trainee. All of them would have said, "Go to college for four years—and then you probably should go on to graduate school."

In my father's generation—he was born in 1876—going to college was either for the sons of the wealthy or for a very small number of poor but exceptionally brilliant youngsters (such as himself). Of all the American business successes of the 19th century, only one went to college: J. P. Morgan, who went

to Goettingen to study mathematics but dropped out after one year. Few others even attended high school, let alone graduated from it. By my time, going to college was already desirable. It gave social status. But it was by no means necessary, nor much of a help in one's life and career. When I made my first study of a major business corporation, General Motors (published as *Concept of the Corporation* in 1946), the GM public-relations department tried very hard to conceal the fact that a good many of the company's top executives had gone to college. The proper thing then was to start as a machinist and work one's way up. As late as 1960, the quickest route to a middle-class income—in the United States, Great Britain, and Germany (though already no longer in Japan)—was to go to work at age 16 in one of the unionized mass-production industries. There one earned a middle-class income after a few months—the result of the productivity explosion. These opportunities are practically gone. Now there is virtually no access to a good income without a formal degree attesting to the acquisition of knowledge that can be obtained only systematically and in a school.

The change in the meaning of knowledge that began 250 years ago has transformed society and economy. Formal knowledge is seen as both the key personal resource and the key economic resource. *Knowledge is the only meaningful resource today*. The traditional "factors of production"—land (i.e. natural resources), labor, and capital—have not disappeared, but they have become secondary. They can be obtained, and obtained easily, provided there is knowledge. And knowledge in this new meaning is knowledge as a utility, knowledge as the means to obtain social and economic results.

These developments, whether desirable or not, are responses to an irreversible change: *Knowledge is now being applied to knowledge*. This is the third and perhaps the ultimate step in the transformation of knowledge. Supply-

AN INTERVIEW WITH PETER DRUCKER

WQ: *American schools now seem incapable of educating students even in the traditional curriculum. How can they hope to prepare youngsters for the new era you describe?*

Drucker: It isn't true that American schools are incapable of educating students. The parochial schools, both Catholic and Protestant, do a reasonable job by being totally old-fashioned, that is, by running the way they did during the 1950s. This is exactly what the Japanese are doing, too. In fact, the various Christian schools, Catholic and Protestant, are almost indistinguishable—except for the cross on the wall and the absence of “examination hell”—from Japanese schools. And a good many experimental schools, such as those in Harlem's District Four in New York City, do a good job.

There is an old saying of mountaineers and hikers: If you have lost your way, don't try to be clever. Go back to where you last knew where you were. I am an old “progressive educator”—I taught at two ultraprogressive colleges, Sarah Lawrence and Bennington, during the 1940s—but it's clear to me that we have lost our way since the 1950s. Other countries—Japan, Germany, France—stayed where they were, and their schools still work. We have to go back, I have become increasingly convinced. That's why I believe that we have no choice but to go ahead with voucher plans that allow parents to put their children in schools of their choice. At least the kids will acquire core skills and—the most important things—standards and self-confidence.

Above all there are three things children need to obtain very early: the ability to read, which is still the foundation skill; self-confidence, which means success in one area; and the ability to learn in other areas. None of these do America's public schools pay much attention to today.

WQ: *You emphasize the need to educate people broadly in what you call the “knowledge,” or various technical disciplines. Which ones?*

Drucker: I have an old answer that I used to give to students 50 years ago (and which Montaigne had, though he formulated it differently): Be a first-rate expert in one area and at least a journeyman in a second and totally unrelated one. This way you'll *understand*. If you know only one area you can't understand; and if you try to cover more than two you'll be a dilettante.

This kind of exposure does not have to come in school. One of the more successful people I know today, for instance, is a physician who at the same time has learned enough to manage successfully a fair-size medical clinic. Another is the head of a medium-size company who came up through the financial route but has learned enough biology to work closely with his scientists.

Or look at what volunteers get when they join groups at one of the pastoral churches. The groups cut across all social layers and people work together in, say, the church's drug-abuse program. While they are volunteers, they are not dilettantes. Counseling is professional work. The volunteers gain respect for one another and also for a very different kind of work.

WQ: *Although the Japanese colossus seems somewhat diminished today, Japan will remain one of America's major competitors in the future. What are the advantages and disadvantages of the two countries in the new economy you describe?*

Drucker: Never underrate the Japanese. That said, they may be in for many years of transition. The competitors to watch out for now may no longer be primarily the Japanese but the Chinese and other economic newcomers.

The Japanese advantage is clearly shrinking—the Japanese are wedded to a “bigger is better and the biggest is best” approach. Our main competitive advantage in the knowledge economy is that the young people increasingly get training with the big companies but then quit—something you still cannot easily do in Japan—and go to work for me-

dium-size or small businesses. As a result, these businesses have the talent they need to succeed. And it is becoming increasingly clear that the future no longer belongs to the giants. They are too slow, too bureaucratic, and too focused on what worked yesterday.

Our competitive disadvantage is rooted in the failure so far to work out the implications of the shift of corporate ownership from individuals to institutional investors and as a result the absence of any paradigm for corporate governance—something which I have written about at considerable length in the past, most recently in my book *Managing for the Future* (1992). This failure largely explains the short-term preoccupations of America's large companies.

WQ: *In Frederick W. Taylor's time the key conflict was between "capital" and "labor." Is there a comparable conflict today?*

Drucker: The significant division in postcapitalist society is between knowledge workers and nonknowledge, service workers, between, for instance, lawyers, advertising copywriters, and teachers, on the one hand, and salespeople, clerks, and window washers, on the other. But it isn't a conflict, and I hope it never will become one. The two kinds of workers are moving in different directions. There will be tension between the two groups unless a way is found for the service workers to rapidly increase their productivity and their income potential.

The situation today is very different from any the world has seen before. The nature of social mobility has changed. The idea that there was no upward mobility in earlier society is a kind of Marxist nonsense. In fact, mobility was probably greater in 18th- and 19th-century Europe than it has ever been in this country. But if you moved out of your class, you moved out. You cut your bonds. That's what happens in the black community today. A colleague of mine, whose parents were sharecroppers and who is now a full professor and a very distinguished one, has totally cut his bonds with his background. Totally. That was common in the past. The saying was that if a bright boy from a blue-collar family got a scholarship, his father would say, "I've lost my son. I'm very proud of him, but I've lost him." That's not true in most of

our society today. Now in the same family you might have a fellow who becomes a doctor while his brother or sister works at a check-out counter in a store, yet they remain a family. And that is why the analogy with conflicts and class war is probably the wrong analogy. But the division between knowledge workers and service workers is a source of tension.

WQ: *How does your vision of the knowledge society differ from that of Daniel Bell, who argued in *The Coming of Post-Industrial Society* (1973) that such a society, unable to provide a transcendent ethic for its people, was bound to experience a profound cultural crisis?*

Drucker: Daniel Bell and I—I in 1969, he four years later—started at very different points but came out at pretty much the same place. Even earlier, in my 1959 book *Landmarks of Tomorrow*, I tried to sketch out the kind of philosophy and ethic Bell was asking for. I called the chapter, overoptimistically, "The New Philosophy Comes to Life." It hasn't. And because I cannot answer the question I am profoundly interested in the rapidly growing pastoral churches in this country, which the new affluent two-earner families are coming to in great numbers in a search for community, ethics, and responsibility.

Altogether our society will have to be based on *individual responsibility*. There are some movements in that direction. We now expect the person to take responsibility for keeping himself or herself healthy. We now expect—or are moving toward expecting—that parents take responsibility for the education of their children, which is what the voucher movement is all about. We now increasingly expect individuals—and especially people with a lot of schooling—to take responsibility for their careers, since obviously the corporate personnel department is unable and unwilling to do so (despite all the talk about "organization development" and "management development"). But these are still only signs.

There is a great deal of talk today about "empowerment"—a term I have never used and never will. It does not do any good simply to take power from the top and move it to the bottom. Power always corrupts unless it is first earned through responsibility.

ing knowledge to find out how existing knowledge can best be applied to produce results is, in effect, what we mean by management. But knowledge is now also being applied systematically and purposefully to define what new knowledge is needed, whether it is feasible, and what has to be done to make knowledge effective. It is being applied, in other words, to systematic innovation.

This third change in the dynamics of knowledge can be called the Management Revolution. Like its two predecessors—knowledge applied to tools, processes, and products, and knowledge applied to work—the Management Revolution has swept the earth. It took 100 years, from the middle of the 18th century to the middle of the 19th century, for the Industrial Revolution to become dominant and worldwide. It took some 70 years, from 1880 to the end of World War II, for the Productivity Revolution to do so. It has taken fewer than 50 years—from 1945 to 1990—for the Management Revolution to prevail.

When they hear the word “management,” most people still hear “business management.” Management did first emerge in its present form in large-scale business organizations. When I first began to study management some 50 years ago, I too concentrated on business management. But we soon learned that management is needed in all modern organizations, whether they are businesses or not. In fact, we soon learned that it is needed even more in organizations that are not businesses, whether not-for-profit (what I call “the Social Sector”) or government agencies. They need management the most precisely because they lack the discipline of the bottom line. That management is not confined to business was recognized first in the United States. But it is now becoming accepted in all developed countries. We now know that management is a generic function of all organizations, whatever their specific mission. It is the generic

organ of the knowledge society.

Management has been around for a very long time. I am often asked whom I consider the best or the greatest executive. My answer is always “the man who conceived, designed, and built the first Egyptian pyramid more than 4,000 years ago—and it still stands.” But management as a specific kind of work was not seen until after World War I—and then by a handful of people only. Management as a discipline emerged only after World War II. As late as 1950, when the World Bank began to lend money for economic development, the word “management” was not even in its vocabulary. In fact, while management was *invented* thousands of years ago, it was not *discovered* until after World War II.

One reason for its discovery was the experience of World War II and especially the performance of American industry. But perhaps equally important to the general acceptance of management has been the performance of Japan since 1950. Japan was not an underdeveloped country immediately after World War II, but its industry and economy were almost totally destroyed and it had practically no domestic technology. The nation's main resource was its willingness to adopt and to adapt the forms of management that the Americans had developed during World War II (especially training). By the 1970s it had become the world's second leading economic power and a technology leader.

When the Korean War ended in 1953 South Korea was even more devastated than Japan had been eight years earlier. And it had never been anything but a backward country; indeed, the Japanese had systematically suppressed Korean enterprise and Korean higher education during their 35 years of occupation. But by using the colleges and universities of the United States to educate its able young people and by importing and applying management, South Korea became a highly developed country within 25 years.

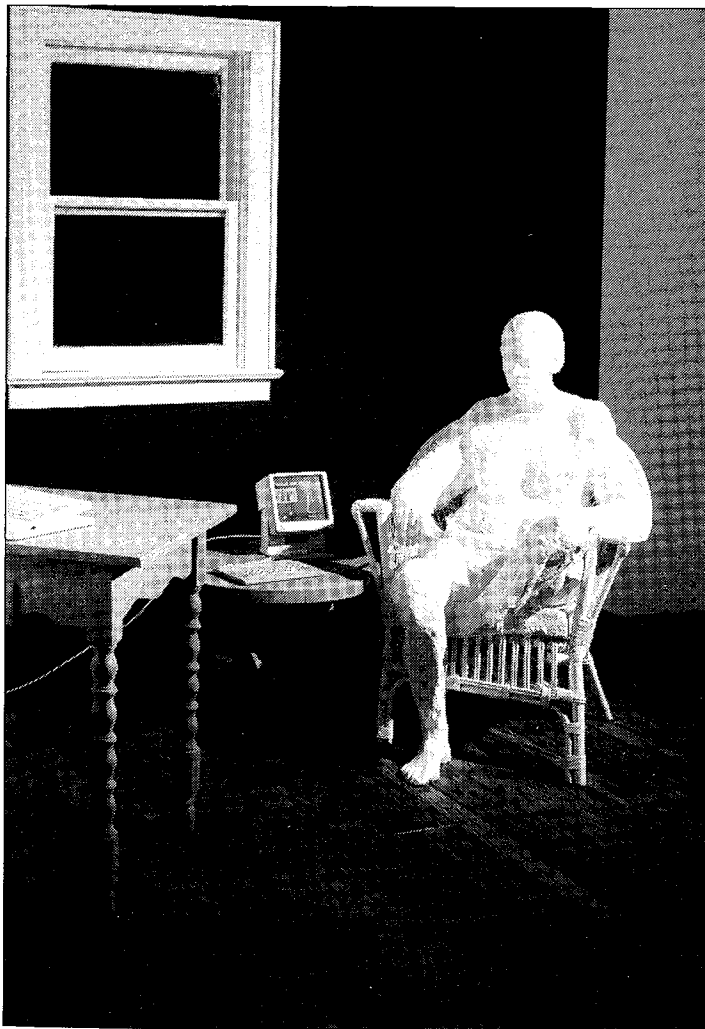
With this powerful expansion of management came a growing understanding of what management really is. When I began to study

management, during and immediately after World War II, a manager was defined as "someone who is responsible for the work of subordinates." A manager in other words was a "boss," and management was rank and power. This is probably still the definition many people have in mind when they speak of managers and management. But by the early 1950s the definition had already changed to "a manager is responsible for the performance of people." Now we know that this is also too narrow a definition. The right definition is "*a manager is responsible for the application and performance of knowledge.*" Implicit in this definition is that we now see

knowledge as the essential resource. Land, labor, and capital are chiefly important as restraints. Without them even knowledge cannot produce. Without them even management cannot perform. Where there is effective management, that is, application of knowledge to knowledge, we can always obtain the other resources. The fact that knowledge has become *the* resource, rather than *a* resource, is what makes our society "postcapitalist." It changes, and fundamentally, the structure of society. It creates new social dynamics. It creates new economic dynamics. It creates new politics.

Underlying all three phases in the shift to knowledge—the Industrial Revolution, the Productivity Revolution, the Management Revolution—is a profound change in the meaning of knowledge. We have moved from *knowledge* to *knowledges*.

Traditionally, knowledge was general. What we now consider knowledge is of necessity highly specialized. We never before spoke of a man or woman "of knowledge." We spoke of an "educated person." Educated persons were generalists. They knew enough to talk or write about a good many things, enough to understand a good many things. But they did not know enough to do any one thing. Knowledge today must prove itself in action. What we now mean by knowledge is information effective in action, information focused on results. Results are outside the person, in society and the economy, or in the advancement of knowledge itself. To accomplish anything, this knowledge has to be highly specialized. This is the very



reason why the tradition—beginning with the ancients but still persisting in what we call “liberal education”—relegated it to the status of *techné* or craft. It could neither be learned nor taught. Nor did it imply any general principle whatever. It was specific and specialized. It was experience rather than learning, training rather than schooling. But today we do not speak of these specialized knowledges as “crafts.” We speak of “disciplines.” This is as great a change in intellectual history as any ever recorded.

A discipline converts a craft into a methodology—such as engineering, the scientific method, the quantitative method, or the physician’s differential diagnosis. Each of these methodologies converts ad hoc experience into a system. Each converts anecdote into information. Each converts skill into something that can be taught and learned. The shift from knowledge to knowledges has given knowledge the power to create a new society. But this society has to be structured on the basis of knowledge being specialized and of “knowledge people” being specialists. This gives them their power. But it also raises basic questions—of values, of vision, of beliefs, in other words, of all the things that hold society together and give meaning to life. It also raises a big—and new—question: What constitutes the educated person in the knowledge society?

Tomorrow’s educated person will have to be prepared to live in a global world. It will be a Westernized world. But educated people will also live in an increasingly tribalized world. They must be able to be citizens of the world—in their vision, their horizons, their information—but they will also have to draw nourishment from their local roots and, in turn, enrich and nourish their own local culture.

Most, if not all, educated people will practice their knowledge as members of an organization. The educated person will therefore have to prepare to live and work simultaneously in two cultures, that of the intellec-

tual, the specialist who focuses on words and ideas, and that of the manager, who focuses on people and work. Intellectuals need their organization as a tool; it enables them to practice their *techné*, their specialized knowledge. Managers see knowledge as a means to the end of organizational performance. Both are right. They are poles rather than contradictions. Indeed, they need each other. The intellectual’s world, unless counterbalanced by the manager, becomes one in which everybody “does his own thing” but nobody does anything. The manager’s world becomes bureaucratic and stultifying without the offsetting influence of the intellectual. Many people in the postcapitalist society will actually live and work in these two cultures at the same time. And many more could and should be exposed to both by rotation early in their career—by having the young computer technician, for example, serve as a project manager and team leader. All educated persons in the postcapitalist society will have to be prepared to understand both cultures.

For the educated person of the 19th century *techné* were not knowledge. They were already taught in the university. They had become “professional disciplines.” Their practitioners were “professionals” rather than “tradesmen” or “artisans.” But they were not part of the liberal arts or of the *allgemeine Bildung* and thus not part of knowledge. Now that the *techné* have become *knowledges*, they have to be integrated into knowledge. The classics, whatever that term may mean, may still be the core of the educated person’s knowledge. But the *techné*, too, have to be incorporated into the educated person’s learning. That the liberal arts they enjoyed so much in their college years do not do that, cannot do that—in fact refuse even to try—is the reason why many young people repudiate them a few years out of college. They feel let down, indeed, betrayed. They have good reason to feel that way. Liberal arts and *allgemeine Bildung* that do not integrate the knowledges into a “universe of knowl-

edge" are neither liberal nor *bildung* (education). They fall down on the first task: to create mutual understanding—that "universe of discourse" without which there can be no civilization. Instead of uniting, such liberal arts fragment.

We neither need nor will get polymaths who are at home in many knowledges. We will probably become even more specialized. But what we do need—and what will define the educated person in the Knowledge Society—is the ability to understand the knowledges, from law to computer science. What is each about? What is it trying to do? What are its central concerns? What are its central theories? What major insights has it produced? What are its important areas of ignorance, its problems, its challenges? To make knowledges into knowledge requires that the holders of the knowledges, the specialists, take responsibility for making both themselves and their knowledge area understood. The media, whether magazines, movies, or television, can help. But they cannot do the job. Nor can any other kind of popularization. The knowledges must be understood as what they are: serious, rigorous, demanding. And such understanding can be acquired only if the leaders in each of the knowledges—beginning with the learned professors in their tenured university chairs—take responsibility for making their own knowledge understood

and are willing to do the hard work this requires.

Capitalism had been dominant for over a century when Karl Marx in the first volume of *Das Kapital* (1867) identified it as a distinct social order. The term *capitalism* was not coined until 30 years later, well after Marx's death. It would therefore not only be presumptuous in the extreme to attempt to write *The Knowledge* today; it would be ludicrously premature. All that can be attempted is to describe society and polity as we begin the transition from the Age of Capitalism (which, of course, was also the Age of Socialism). But we can hope that 100 years hence a book of this kind, if not a book entitled *The Knowledge*, can and will be written. For that would mean that we have successfully weathered the transition upon which we have embarked. It would be as foolish today to predict the Knowledge Society as it would have been to predict in 1776—the year of the American Revolution, of Adam Smith's *Wealth of Nations*, and of James Watt's steam engine—the society of which Marx wrote 100 years later, and as it was foolish of Marx to predict "with scientific infallibility" 20th-century society.

But one thing is predictable: The greatest change will be in the form and content of knowledge, in its meaning and its responsibility, and in what it means to be an educated person.

BACKGROUND BOOKS

Futurology tends to make scholars queasy. They generally prefer to leave the forecasting trade to science-fiction scribblers, freelance prognosticators, and other untenured sorts. Social scientists somberly agree that their work must have "predictive value," but actual predictions, apart from economists' exercises in number crunching, are few. It is unique, then, to find somebody from the scholarly world who not only has tried his hand at prediction but is in a position to act: Secretary of Labor Robert Reich.

The former Harvard professor cannot be faulted for pulling his punches. "We are living through a transformation that will rearrange the politics of the coming century," he begins **The Work of Nations** (Knopf, 1991). "There will be no national products or technologies, no national corporations, no national industries." In Reich's new world aborning, the wealth of nations depends upon workers who develop the strategic problem-solving, problem-identifying, and brokering skills driving today's high-value production. These "symbolic analysts," as Reich calls them, include engineers and management consultants as well as film editors and architects.

The United States excels at producing symbolic analysts, Reich says. What worries him is the fate of the remaining four-fifths of the population—and the prospect that the symbolic analysts, finding more in common with their counterparts overseas than with their fellow Americans, will quietly retreat to their own affluent exurban communities. The answer, Reich argues, is to equip more Americans to *apply* symbolic analysis, to prepare the grocery-store checkout clerk, for example, to help manage inventory. In Reich's view, that will require massive new spending on education, training, nutrition, and health care.

Joel Kotkin's **Tribes: How Race, Religion, and Identity Determine Success in the New Global Economy** (Random, 1991) also depicts a world in which nation-states hardly matter. Kotkin, a Senior Fellow at the Center for the New West in Denver, argues that several quintessentially cosmopolitan, globally dispersed ethnic groups or "tribes"—the Jews, Japanese, Indians, "Anglo-Americans," and Chinese—are uniquely positioned to succeed in this new world. "It is likely such dispersed peoples—and their worldwide business and cultural networks—will increasingly shape the economic

destiny of mankind," Kotkin predicts.

While Reich and Kotkin see the new world economy as an interconnected "global web," traditional "armed camp" metaphors persist in Lester Thurow's **Head to Head: The Coming Economic Battle Among Japan, Europe, and America** (Morrow, 1992) and Paul Kennedy's **Preparing For The Twenty-First Century** (Random, 1993). To Thurow and Kennedy, knowledge, technology, and skills are important but not decisive. Institutions, beliefs, political policies—and national differences—matter a great deal. Thurow, dean of MIT's Sloan School of Management, argues that Americans and their companies must change their ways—concentrating on production instead of consumption, for example, and maximizing market share rather than profits. Kennedy's book, which expands upon his much-discussed (if seldom read) *The Rise and Fall of the Great Powers* (1987), is a compendium of worldwide economic, demographic, and technological trends, surprising in neither its content nor the ambiguity of its predictions.

The history of transformations on the scale of today's suggests that such modesty may be wise. How could those who lived through the subtle, centuries-long emergence of capitalism detailed in Fernand Braudel's three-volume **Civilization and Capitalism, 15th–18th Centuries** (Harper, 1983–85) have realized what they were creating when they expanded medieval fair markets or petitioned their sovereigns for charters to send out trading ships? Like Braudel's medieval traders, we are confronted today by many small but significant choices, most of them involving uses of the computer and other new information technologies.

In **The Age of the Smart Machine: The Future of Work and Power** (Basic, 1988), for example, Shoshana Zuboff of Harvard Business School stresses that computerizing the workplace can lead down two very different paths. Using the new technology only to automate existing jobs will further depersonalize work. Going beyond automation to create what Zuboff calls "informating," however, holds out the promise of empowering workers with knowledge of the production process and the ability to participate in its management.

At several paper mills Zuboff studied, workers not so long ago operated a single piece of equipment on a production line, dipping their hands into the pulp to gauge its progress. Today, however,

they do their jobs from computer control rooms. Where the transition to "informating" is succeeding, these workers are no longer merely repeating routine tasks; they are analyzing data, which encourages them "to notice, to think, to explore, to experiment, to improve."

Likewise in the schools, writes Sherry Turkle, an MIT sociologist, there are important choices to be made. If computers are used only as tools to implement conventional teaching methods, their potential will be squandered. But if students are allowed to adapt computers to their own learning styles, the machines may become arenas for exploration and self-expression, more akin to musical instruments than to hammers. "The question is not what the computer will be like in the future," Turkle argues in *The Second Self: Computers and the Human Spirit* (Simon & Schuster, 1984), "but what will *we* be like?"

Most speculation focuses more on technology than on people. Stewart Brand looks at the future of "idiosyncratic systems" in *The Media Lab: Inventing the Future at MIT* (Viking, 1987). These include electronic newspapers that customize themselves to fit a reader's tastes, and educational software that molds itself to a child's learning style. Brand, the founder of *The Whole Earth Catalog*, sees in such technology the hope of "connecting, diversifying, [and] increasing human complexity rather than reducing it."

A different kind of liberation is hoped for by George Gilder, who sees a global network of interactive telecomputers linked by fiber optics as the key to a rebirth of American individualism. "Through this crystal web," he writes in *Life After Television* (Norton, 1992), "we can reclaim our culture from the centralized influence of mass media. We can liberate our imaginations from programs regulated by bureaucrats, chosen by a small elite of broadcasting professionals, and governed by the need to target the lowest common denominators of public interests."

There are some, however, who see the alternatives posed by the likes of Gilder, Turkle, and Zuboff as no alternatives at all. All of the "choices," argues Neil Postman in *Technopoly: The Surrender of Culture to Technology* (Knopf, 1992), are dictated by technology and deflect consideration of the uses to which technology and

knowledge are to be put. "Self-directed" computer learning, for example, is offered as a wonderful humanistic panacea, but it could spell the end of cooperative group learning in the classroom.

Postman, chairman of the department of communication arts at New York University, regards such naive computer worship as a symptom of "Technopoly," a state of culture and of mind in which "culture seeks its authorization in technology, finds its satisfactions in technology, and takes its orders from technology." Technopoly "casts aside all traditional narratives and symbols that suggest stability and orderliness, and tells, instead, of a life of skills, technical expertise, and the ecstasy of consumption." Signs of technology's dominion, Postman maintains, are everywhere—from the doctor's office, where technology encourages physicians to treat patients as inanimate objects, to the classroom, where children are classified according to their scores on intelligence tests.

Postman's antidote is a new curriculum based on "the transcendent belief that humanity's destiny is the discovery of knowledge"—through both the arts and the sciences, and not only for the sake of technological progress but to conquer "loneliness, ignorance, and disorder."

Benjamin Barber, a Rutgers University political scientist, sees a Technopoly-like "McWorld tied together by technology, ecology, communications, and commerce" as one of two possible global futures. The other, even gloomier, is "Jihad," the "retribalization" of large portions of the post-Cold War world and an eruption of the great sectarian plagues, war and civil strife. In an article in the *Atlantic* (March 1992) based on his forthcoming book, Barber suggests that neither of these forces—one that integrates and homogenizes, another that divides and tribalizes—needs or promotes democracy. The real challenge of the 21st century, he insists, is political: to preserve democracy.

Perhaps this suggests why scholars shy away from prognostication. The future may bring the diminution of traditional politics, à la Reich, or its violent reassertion, as in Barber's Jihad. One thinker's dawning era of humanistic promise may look to another like dread Technopoly. Imagining the future, it seems, is less important than interrogating it in order to understand the present.

CURRENT BOOKS

After Chaos

ARTIFICIAL LIFE: The Quest for a New Creation. By Steven Levy. Pantheon. 390 pp. \$25

COMPLEXITY: The Emerging Science at the Edge of Order and Chaos. By M. Mitchell Waldrop. Simon & Schuster. 380 pp. \$23

COMPLEXITY: Life at the Edge of Chaos. By Roger Lewin. Macmillan. 208 pp. \$22

We take our metaphors where we can find them. With every scientific revolution, failed or otherwise, new metaphors and images wedge themselves into the public mind. In the 19th century, "entropy" and "the Second Law of Thermodynamics" generated a perverse glee among those, including Protestant fundamentalists, who were taken with the idea that the universe is heading inevitably toward a state of complete disorder, a scientific version of the biblical fall. Earlier in this century, "relativity" and "the Heisenberg Uncertainty Principle" (i.e. there is no such thing as an immaculate perception) provided English majors and seminarians with offbeat dissertation topics. Then came successive waves of journal articles in the humanities whose keywords included one of the four C's—*cybernetics*, *catas-trophe theory*, *chaos*, and now, the newest of them all, *complexity*.

Several years ago, James Gleick's *Chaos* (1987) popularized the notion that there is a new science of chaos. Tiny differences in the numbers plugged into seemingly simple equations, such as those used to model weather or the turbulent flow of water, Gleick showed, can lead to wild swings in the output. The behavior of these so-called chaotic nonlinear systems can be predicted only if we can be *infinitely* precise about the initial conditions; since that is impossible we are left with systems that, though completely deterministic, exhibit what to all appearances is random behavior.

Not all nonlinear systems are so badly behaved, and that is where complexity comes in. Once again simple systems turn out to be

full of surprises, but instead of spiraling off into chaos they produce intricate patterns that seem to capture the essence of what we mean by complexity. In the jargon of this emerging field, complex adaptive systems—which might include cells, brains, organisms, ecosystems, and maybe even corporations and economies—exist on the "edge of chaos," in a regime not so ordered as to be rigid and dull but not so chaotic as to be meaningless. Like water turning from solid to liquid to vapor, the story goes, these systems go through "phase transitions" from order to chaos. And when they are poised on a cusp between these two extremes, such "complex systems" gain the ability to gather and process information, a flexibility that allows them to both alter and adapt to their worlds.

Whether this is more than an arresting metaphor is still anybody's guess. In the meantime, science journalists, hoping to replicate Gleick's success, have seized on complexity as the hot new topic. For the last few years they have been descending on an interdisciplinary research center called the Santa Fe Institute, which functions as the focus of the quest, to explain how complexity arises from simplicity—networks of genes giving rise to cells, networks of cells giving rise to organisms, networks of organisms giving rise to societies, all because of their ability to process information. The hope is that all of these webs are strung together according to general rules that have eluded mainstream science, that there is a science of complexity.

With all the sudden attention, scientists at the Santa Fe Institute must feel at times like the local Pueblo Indian communities being scrutinized by anthropologists. While some retreat into their offices for the more civilized company of computer screens, others have come to enjoy the limelight, repackaging their lives with the kinds of anecdotes they have learned that journalists like to hear. The result has been a

number of magazine articles and three recent books—Steven Levy's *Artificial Life*, M. Mitchell Waldrop's *Complexity*, and Roger Lewin's *Complexity*—in which we can read about the fomenters of this revolution. We hear, for example, three renditions of the life of Stuart Kauffman, a philosopher-turned-physician-turned-theoretical biologist, who is so sure that humanity must be more than a random fluke that he is trying to recast Darwinian evolution and uncover a grammar that leads inexorably to increasingly complex creatures. We also get the thrice-told tale of Christopher Langton, a Vietnam-era conscientious objector and blues guitarist who survived a horrible hang-gliding accident and went on to launch a new field called Artificial Life ("A-life," for short), which attempts to create self-reproducing computer programs so fluid and complex that it might someday seem smug and anthropocentric not to grant that they too are alive. Hovering in the background of all three books is Murray Gell-Mann, who is more gun-shy of journalists. Gell-Mann, who earned his Nobel Prize for the ultimate simplification, showing how hundreds of subatomic particles can be reduced to a handful of quarks, has come to Santa Fe to study the other side of the story: how nature goes from the simple to the complex.

These and the other scientists featured in these books are fascinating, brilliant people. Still, no one but a reviewer, who gets the books for free, is likely to read all three. But deciding among them is not an easy task.

First out of the chute was Levy, whose publisher ensured that his book came out in time to benefit from the publicity surrounding the biennial Artificial Life conference, which was held in Santa Fe last summer. Levy was there for a book-signing at a store just off the Plaza, where the first customers got free t-shirts with the legend "Get A-Life." Perhaps because it was first, *Artificial Life* feels rushed in places, but for the most part it is a solid piece of work. Levy showed in his first book, *Hackers: Heroes of the Computer Revolution* (1985), how good he is at capturing the excite-

ment of quixotic seekers on the fringe of computer science. One of the best chapters of *Artificial Life*, called "Garage Band Science," tells how, long before the Santa Fe Institute began, several young veterans of the chaos wars, including Doyne Farmer and Norman Packard, started a research lab in an old adobe tavern down the hill from nearby Los Alamos. Following their intuition that life is a process that can be skimmed from its carboniferous substrate and programmed into a computer, the three scientists studied mathematical kaleidoscopes called cellular automata. A cellular automaton consists of a grid of cells that changes colors according to a few simple rules. Displayed on a computer screen at lightning speed, cellular automata can generate astonishingly complex patterns, some capable of navigating around their checkerboard universe and even cloning themselves. In explaining how this works, Levy gives a nice historical sketch of John Horton Conway, who in the days before cheap, abundant computer power, invented one of the more well-known cellular automata, The Game of Life, by manipulating tokens on a vast expanse of graph paper.

The next book on the shelves was Waldrop's *Complexity*. Though he focuses more broadly on complex systems—economies as well as organisms—and specifically on the Santa Fe Institute itself, we learn a lot about A-life along the way. Readers of the journal *Science* know that Waldrop is very good at translating the grayest abstractions into pictures we can hold comfortably in our heads. His book includes the best descriptions I have read of what can be very difficult work: Kauffman's attempts to tease out hidden orders that would show evolution to be less of a free-for-all than traditional Darwinists suppose, for example, or Langton's invention of the so-called lambda parameter, which may provide a rough measure of where a cellular automaton lies on a continuum between order and chaos. The other books say that there is something called the lambda param-

eter; Waldrop tells readers precisely what it is.

But Waldrop's apparent efforts to emulate Tracy Kidder's book, *Soul of a New Machine* (1981), are less successful. In Kidder's book, the drama comes from the reader's wondering whether the hero-engineers will succeed or fail in developing a new computer, and we know we will find out before we turn the final page. We will not know for years whether the Santa Fe Institute will come to be seen as the catalyst of a new science or as a noble footnote to history. Consequently, it is hard to develop an interest in all the institutional minutiae and blow-by-blow descriptions of political battles that Waldrop presents. The people-to-science ratio is much higher than in *Chaos*. Gleick used the scientists as vehicles to explain some pretty abstract mathematics; one learns very little about their personal lives and feels none the poorer for it. The scientists in *Complexity* are spun into full-blown characters. Much of this is very well done, but (as I heard the wife of one of the scientist-characters say) by the time you have read the third or fourth life story of an unappreciated genius who found a home at the intellectual mecca in Santa Fe, it is an effort to keep from skimming.

Both Levy's and Waldrop's books set a fast (sometimes frenetic) pace with the volume of the prose set at full blast. In some ways, then, it is refreshing to find that the third complexity book, by Roger Lewin, is more low-key, focusing on relaxed encounters with remarkable people. I liked how Lewin, whose long career as a science writer (he was also an editor at *New Scientist* and *Science*) gives him perspective and authority, and he ranges farther afield than Waldrop does. In addition to the conversations in Santa Fe, we listen in on discussions with the likes of Dan-

iel Dennett and Patricia Churchland, two philosophers who speculate on the most complex of complex systems, human consciousness, and with those, like Stephen Jay Gould, who view the work at Santa Fe with a more jaundiced eye. Lewin's book is shaped not by the happenstances of the Santa Fe Institute but by the author's own curiosity. The scientific explanations are not as crisp or detailed as Waldrop's; nor is the writing as well-honed. But science writing too often comes off like cheerleading, and Lewin makes up for some of the book's shortcomings with his more detached, critical tone.

Yet I felt that even Lewin could have been more skeptical. Like the other two authors, he treats the idea of a phase transition between order and chaos as though it were done science. One would not know from these books that a backlash against the idea is already developing. The term *edge of chaos* has become so nearly a cliché that whenever it is uttered at the Santa Fe Institute, one can count on hearing groans from the loyal opposition. In their recent work, even some of the institute's more enthusiastic supporters raise serious questions about ideas that all three books take as gospel.

We will have to wait to see how all of this comes out. Meanwhile, now that the journalists have had their say, it will soon be the scientists' turn. Kauffman, Langton, and Gell-Mann all have contracts to write books about complexity. And they are aiming their words not at their students or colleagues but at the book-buying public.

—George Johnson is an editor for "The Week in Review" section of the New York Times. His most recent book is *In the Palaces of Memory: How We Build the Worlds Inside Our Heads* (1991).

The Amoralist

KISSINGER: A Biography. By Walter Isaacson. Simon & Schuster. 893 pp. \$30

Except for John Kennedy, no recent public figure in American life has been the subject of more adulation and attack than Henry Kissinger. By 1974, five years after leaving his professorship at Harvard, Richard Nixon's national security adviser and secretary of state had ascended to the superstar status reserved for Hollywood actors and sports heroes. In an hour-long television documentary that year, ABC's Ted Koppel described the country as "half-convinced that nothing was beyond the capacity of this remarkable man. Kissinger already threatens to become a legend, the most admired man in America, the magician, the miracle worker."

Kissinger consciously contributed to this larger-than-life portrait by encouraging a view of himself as America's first true practitioner of *Realpolitik*—a combination of Machiavelli, Metternich, and Bismarck—who popularized the term geopolitics, offered brilliant monologues on world affairs in a German accent, and had the capacity to meet every conceivable challenge abroad. The Watergate crisis, which led to the first resignation of a president in U.S. history, added to Kissinger's hold on the public imagination. "As an individual I led a charmed life," Kissinger wrote in his memoirs. "I became the focal point of a degree of support unprecedented for a non-elected official. It was as if the Public and Congress felt the national peril instinctively and created a surrogate center around which the national purpose could rally."

Yet Kissinger was never immune to criticism. Stories about his arrogance, affinity for intrigue, bureaucratic back-stabbing, ruthless treatment of subordinates, and willingness to lie to the public, press, and Congress to advance himself and his policies coincided with his rise to prominence as a master of the diplomatic game. This assault on his reputation

reached something of a high point in 1983 with the publication of Seymour Hersh's *The Price of Power: Kissinger in the Nixon White House*. Graphic details about Kissinger's sycophancy toward superiors and abuse of staffers—as well as about illegal wiretaps to plug press leaks—caused some Americans to have second thoughts about Dr. Kissinger. When coupled with complaints that the Nixon-Kissinger policies unnecessarily extended the war in Vietnam at a cost of more than 20,000 American lives, provoked the slaughter of millions of Cambodians, and caused the toppling of a democratically elected regime in Chile and the death of its president, Salvador Allende, Kissinger's reputation suffered a further erosion.

Now comes a new, massively detailed biography by *Time's* assistant managing editor,



Walter Isaacson. The book provides a fresh look at Kissinger—an interpretation based on extensive interviews with some 150 people, including Richard Nixon and Kissinger himself, previously unavailable transcripts of conversations, and numerous documents from the Nixon Presidential Papers Project in Alexandria, Virginia. Yet, despite Isaacson's impressive research, the great bulk of the documentary record on Kissinger's service as national security adviser and secretary of state was unavailable and will remain so until at least five years after Kissinger's death. Kissinger dismisses the need to open these materials any time soon by cavalierly arguing that "what is written in diplomatic documents never bears much relation to reality." He should understand, however, that it is in the national interest for Americans to have a realistic understanding of their history. Isaacson's book is a significant advance toward that end, but historians will do well to press the case for early disclosure of the entire Kissinger record.

Isaacson's reconstruction of Kissinger's life from those records at his disposal makes a powerful indictment of the man's character and behavior. It is a portrait of a temperamental neurotic, an insecure but stunningly brilliant man whose paranoia, petty rages, and deceitfulness in the service of his ambitions make the reader cringe at the thought that such ugly characteristics could have been rewarded with such high station and so much honor. Isaacson pulls no punches in describing this side of Kissinger's nature. In fact, the recounting of Kissinger's intrigues against and manipulation of university and government colleagues, including President Nixon, Secretary of State William Rogers, and Secretaries of Defense Melvin Laird and James Schlesinger, become at times a distraction from the larger public matters on which Kissinger's historical reputation must ultimately rest. There sometimes is a quality of journalistic sensationalism to Isaacson's revelations about Kissinger's personality. And while such disclo-

tures propelled the book onto bestseller lists, they may in the long run diminish it as a serious work of analysis about some of the more important foreign-policy decisions of the latter 20th century.

That is particularly unfortunate because Isaacson provides telling insights into and astute assessments of Kissinger's diplomacy in Vietnam, the opening to China, *détente* with the Soviet Union, and the 1973 Yom Kippur War. On balance, Isaacson sees Kissinger's diplomacy as a success story. He writes: "The structure of peace that Kissinger designed places him with Henry Stimson, George Marshall, and Dean Acheson atop the pantheon of modern American statesmen. In addition, he was the foremost American negotiator of this century and, along with George Kennan, the most influential foreign policy intellectual." All this was accomplished, Isaacson points out, despite the fact that Kissinger lacked "an instinctive feel for American values and mores" and failed to satisfy American cravings for a "moral" foreign policy based on democratic give-and-take.

However much Isaacson's book may add to Kissinger's reputation for undemocratic and unprincipled actions, it will do little to undermine his continuing grip on the country's imagination. As the journalist George Black wrote in September 1992, Kissinger's "public reputation has never stood higher. His advice bends ears in the nation's top boardrooms, and the rest of us can rely on hearing those familiar wet-gravel tones on TV whenever international events require expert commentary." Henry Kissinger is, so to speak, our foreign-policy safety net. Should some awful maelstrom erupt abroad, we can continue to look to Dr. Kissinger for life-saving advice. Especially at a time when the country sees the need for a domestically minded president, it reassures Americans to know that Kissinger remains ready to provide needed expertise in foreign affairs.

But will we truly want it? Yes and no. Kissinger's record of foreign-policy leadership was a mixture of big successes and big fail-

ures. Perhaps the most striking feature of Kissinger's public service was his eagerness to address large questions. Kissinger shared with men like Lyndon Johnson and Richard Nixon an affinity for the grandiose. Each of them was determined to leave a large mark on American life. But large designs do not necessarily make for an unblemished record.

Kissinger, as Isaacson depicts him, was at his best in dealing with the Middle East, China, and the Soviet Union. The Nixon-Kissinger actions here will be remembered as vital achievements in the winning of the Cold War, comparable to the Truman Doctrine, the Marshall Plan, John F. Kennedy's resolution of the Cuban Missile Crisis, his Test Ban Treaty, and Ronald Reagan's later embrace of Gorbachev, perestroika, and glasnost. Likewise, Kissinger will win high marks for his shuttle diplomacy during and after the Yom Kippur War. His efforts to strike a balance between Israel and Egypt will be celebrated as ultimately leading to the Camp David Accords and greater stability in the Middle East.

Yet, as Isaacson shows, Kissinger also bears (along with Nixon) a heavy burden of guilt and shame for the massive loss of life and the substantial suffering inflicted on Southeast Asia. The two men's conviction that U.S. prestige required a slow, negotiated withdrawal from Vietnam—which in turn led to attacks upon Cambodia that brought internal instability and millions of deaths to that benighted country—was a flawed judgment.

It deserves to be remembered as among the worst decisions made by American statesmen in this century. And it was an extension of the deeper failing that will plague Kissinger's reputation forever. His affinity for realism—his readiness to sacrifice moral considerations for what he considered the national interest—should remind us that America's greatness as a nation rests partly on our antagonism to the more disastrous aspects of traditional international power politics.

In the final analysis Kissinger's record—and the heated response to it by the public and the press—seem a microcosm of America's 20th-century struggle with itself over realism and idealism. His use of balance-of-power diplomacy to advance the national interest takes its place in this country's century-long transformation into an orthodox nation-state practicing power politics. By contrast, complaints about Kissinger's unethical or illegal foreign policy reflect America's ongoing belief in, and hope for, a world governed by right rather than might. Ultimately, biographers and historians will debate and study Kissinger for what he tells us not only about U.S. diplomacy but also about the national anguish over what makes sense in our conduct of foreign affairs.

—Robert Dallek is professor of history at UCLA and the author of *Lone Star Rising: Lyndon Johnson and his Times, 1908–1960* (1991).

Criticizing the Critics

A HISTORY OF MODERN CRITICISM, 1750–1950: Volume 8; French, Italian, and Spanish Criticism, 1900–1950. By René Wellek. Yale. 367 pp. \$42.50

A history of literary criticism? Why would anyone want to read such a thing? One possible answer is that literary criticism is comment on literature as an

image of human life, a fiction of possible lives. There is no reason to believe that the lives that have been lived exhaust the possibilities of living. The future may contain lives you or I could not imagine. So we have literature—as we have painting, sculpture, music, film, and dance—to sustain us in the conviction that life is, or may be, more various than anyone has known it to be.

Literary critics are concerned with such possibilities, such fictions. They bring to their talk about poems, novels, and stories many different interests. A work of literature may be read with many concerns in mind—religious, social, political, historical, or aesthetic. You might read *Pride and Prejudice* to understand what the lives of young, genteel, unaffluent English women in the early years of the 19th century were like, why the question of marriage was so urgent, how it comes about that one young woman differs so much from her sisters, her mother, and her father—or you might read it to see what the English novel in the early 19th century was up to and good at. Then again you might read it to marvel at the inventive power of a writer named Jane Austen, or, alternatively, to consider the creative capacity of the English language in particular or of language in general. Or you might simply read it for entertainment, diversion, to pass the time that would have passed anyway but not as pleasantly. Such is literary criticism. But why, having talked about literature, would anyone want to talk about the criticism of it—or to write a history of that criticism?

Because literary criticism is part of the history of ideas, of what the mind has made. You are interested in the ideas people have had and continue to have. Ideas, in this case, about literature. Why not? Literary criticism is at least as interesting as philosophy, if only because it deals with imagined lives in some relation to chaos and order, to possibility and fate, to conditions and the ingenuity called upon to overcome them. Literature is other lives, so far as they can be imagined and understood. To write the history of literary criticism is to write the history of certain ideas that have arisen from the experience not of writing literature but of reading it. That is where René Wellek comes in. He is interested in the ideas critics have had who have read many works of literature and tried to make sense of their experience as readers.

But Wellek, I am pleased to note, is not a detached observer. He has an axe to grind. As a young man in Prague, he took part in a

particular movement of literary theory and criticism which considered literature as an aesthetic activity, one that entails a formally distinctive use of language. The problem was how to show those formal attributes in practice and to distinguish the literary or poetic use of language from other, more mundane employments of it. A difficult proceeding. Impelled by his formalist conviction, Wellek proposed to trace the history of literary criticism as it has been practiced during the past 200 years in many countries and many languages. The present volume concludes his long travail. For ease of reference and to note the scale of his undertaking, I list the earlier volumes: (1) *The Later Eighteenth Century*, (2) *The Romantic Age*, (3) *The Age of Transition*, (4) *The Later Nineteenth Century*, (5) *English Criticism, 1900–1950*, (6) *American Criticism, 1900–1950*, and (7) *German, Russian, and Eastern European Criticism, 1900–1950*.

In 1982 Wellek, now professor emeritus of literature at Yale, published *The Attack on Literature, and Other Essays*. I shall refer to two of those essays, "Literature, Fiction, and Literariness" and "Reflections on my *History of Modern Criticism*." In the first of these Wellek defended his understanding of literature. While he conceded that any kind of writing may be of interest to someone for some purpose, it is reasonable to claim for literature a particular form of existence and a corresponding privilege. Literature exists and may be recognized as "high imaginative fiction"—*fiction* in the sense of a world conceived rather than a world alluded to or annotated; *imaginative*, meaning that a writer, composing a work of literature, exerts the distinctively human capacity to imagine what otherwise does not exist; *high*, presumably in the sense of spiritually and morally serious rather than trivial or sordid. Literature, Wellek declared, is an aesthetic experience that "yields a state of contemplation, of intransitive attention that cannot be mistaken for anything else." Wellek means that while one reads the mind is content to pay full attention

to the object, say a novel, and to postpone, for the time being, going forward to any other experience or interest. Wellek's precursors here are Kant and Schiller. The aesthetic experience is, as they have taught us to say, disinterested; it is pure; it is not possessive or predatory.

But Wellek hasn't gone much further than this to say what precisely the mind is doing while it pays the work of art the tribute of intransitive attention. The clearest account of this "act of the mind," so far as my reading goes, is in Susanne K. Langer's *Feeling and Form* (1953), where works of art are deemed to be created "only for perception." Their elements, Langer maintains, have no other design upon us than to be perceived. If I am listening well to a symphony, I am paying such complete attention to its internal relations, experiencing its forms with such concentration of mind in their favor, that every other interest I have in my life is suspended.

Criticism comes into existence as debate about literature. Wellek wants to understand the history of criticism as one might hope to understand the history of any other ideas. Over the centuries, criticism has become an apparently endless argument about a few concepts, notably concepts of language, style, meaning, form, structure, and beauty. To understand the debate, we should hold it within brackets, to see criticism "as a relatively independent activity," not for the purpose of establishing "criticism for criticism's sake" but to keep our minds concentrated on the main issues. Wellek has been examining criticism, according to this understanding of it, for many years and making his own sense of it in these eight volumes.

His achievement is immense. Only a great linguist and a tough-minded scholar could have written this *History*. So much talk, so many distinctions, all those languages, those contexts. I hope his work will continue to be appreciated. But I can't be sure that it will be. Wellek brings the story of criticism to a con-

clusion, if not to an end, in 1950, just at the moment when criticism, in his view, started turning into something else. In 1953 Roland Barthes published *Writing Degree Zero* and announced that "the whole of literature, from Flaubert to the present, has become the problematics of language." This is another story, as Wellek says, and he evidently does not propose to tell it. He says nothing about critical theory or practice in the past 30 years. Nor does he use its strange words like indeterminacy, *différance*, deconstruction, phallogocentric, and minority discourse.

So the *History* is likely to be consulted rather than read; or, if read, construed as a monument to humane letters and scholarship, a concatenation of once-proud hopes. Wellek's terms of reference are nearly gone. Take for instance his use of the word "aesthetic." In American colleges and universities it is becoming virtually impossible to gain a hearing for "aesthetic function," much less for its dominance in a work of literature. Only a few years ago, Wellek said that "we must concede the final inexplicability of a great work of art, the exception of genius." It would be hard to write a less fashionable sentence. It is widely deemed a scandal to talk of genius; and a scandal just as grave to speak of "a great work of art" without indicting its author. Wordsworth, it is now common to claim, should have written not about his feelings on the occasion of visiting Tintern Abbey but about the "wretched of the earth" who sheltered behind its walls. And so on. The motto for this indictment comes from Walter Benjamin: "There is no document of civilization that is not at the same time a document of barbarism." So an interest in literature and criticism, such as Wellek has been expressing for many arduous years, is now commonly—not universally—regarded as sleeping with the enemy.

No matter. Wellek believes, I assume, that great literature will continue to attract the intransitive attention he describes, and that the history of criticism will

continue to interest a sufficient number of readers. But this final volume doesn't make a strong case for criticism as a lively debate. Perhaps Wellek got tired and couldn't face the chore of dealing with the proliferation of critical theories as they have been made to serve every conceivable ideological cause. Who could cope with this exorbitance? There is another problem. Wellek knows, or thinks he knows, what literature is, what the literary character of language is. I judge that he has lost patience with the error of other critics. He can't be expected to dispute with adepts of deconstruction, feminism, postmodernism, queer theory, cultural studies, and a babel of other rhetorics. Wellek confines his attention to the standard sages. The big names in the present volume are Jean-Paul Sartre, Paul Valéry, Benedetto Croce, and José Ortega y Gasset. But each of these is presented as a sloppy thinker, and the whole progress of modern criticism appears as a trek from one Cave of Error to the next. Even when he falls into enthusiasm, Wellek recovers his severity almost at once.

The labor of writing this *History* has evidently been appalling, and it shows. Wellek often drives himself to paraphrase a book he

finds uncongenial or indeed silly—Jacques Maritain's *Creative Intuition in Art and Poetry*, for instance. He does his best to be equable, but in the end confesses that "an outsider who is suspicious of vague and mystical concepts" cannot make much of Maritain. "It is a pity," he wearily reports, "that such a book, filled with fine reflections on poetry, on inspiration, and on different genres and figures in literary history, ends with a somewhat empty gesture toward a religious metaphysics." It is a more acute pity that Wellek has felt honorably obliged to read hundreds of such babbling books.

In the end, the *History of Criticism* is most interesting, most touching, as Wellek's intellectual autobiography. The pressure of his life in literature and criticism is felt in a word here, a word there, an interpolated *strange* or *curious* or *odd* when Wellek cannot bear to leave the paraphrased sentences without comment. His own life is in those adjectives, for the most part ruefully enforced.

—Denis Donoghue, a Wilson Center Fellow, holds the Henry James Chair of Letters at New York University. His most recent book is *The Pure Good of Theory* (1992).

OTHER TITLES

Contemporary Affairs

BOILING POINT: Democrats, Republicans, and the Decline of Middle-Class Prosperity. By Kevin Phillips. Random House. 307 pp. \$23

The "American dream" has always been vague, but most people (especially outsiders) have assumed that it was fundamentally material rather than spiritual. Phillips's sprawling threnody to American exceptionalism makes the assumption explicit. His argument is that the American "middle-class squeeze" has reached a decisive historical

moment. "Previous cyclical troughs for the U.S. middle class," he writes, were "mere hiccups in the historical expansion that reached a late 20th-century zenith at some point in the 1960s or 1970s when 50 to 55 percent of Americans belonged to an economic middle class without any foreign or historical equivalent." Other analysts tend to see the present economic slippage of the American middle class as merely another symptom of worsening global economic conditions, but Phillips puts the blame on specifically American circumstances, on bad choices made by American business and political leaders.

Phillips has some claim to the role of a political prophet. His *Emerging Republican Majority* (1967) predicted the conservative resurgence—and, as the architect of Richard Nixon's 1968 "southern strategy" he helped bring it about. Two decades later, in *The Politics of Rich and Poor* (1990), he suggested that middle-class woes might finally break the Republican monopoly on the White House. The relatively short time it took Phillips to go from a Republican to a Democratic Jeremiah was the time it took America, he believes, to undergo a secret revolution. In the early 1950s, he points out, \$600,000-a-year executives were taxed at around 75 percent of their income, while the median family "breadwinner" (in his quaint terminology) paid five percent. By the late 1980s "the effective combined rate of federal taxes on median or average families had climbed to the 25–28 percent range," while taxes on half-million dollar incomes had



fallen to almost the same level. "There, in a sentence," he says, "was the fiscal revolution."

But what is the middle class, anyway, in a "classless society" such as America? Even though Phillips is always ready to make assertions about "the middle-class psyche," his characterization is purely financial: It is the mathematical middle-income group. He indignantly dismisses any alternative methods that might take behavior or attitudes into account. Such rigidity forces him to banish from the middle class those most bourgeois of professions, medicine and law, and to cast them as profiteering enemies of his median group. The tendency of young householders, unable to achieve their parents' norm of "a suburban home with two reasonably new cars in the garage," to substitute "stylish clothing and sophisticated wine and food" he mocks as "simulating affluence." Such reasoning reduces his middle class to a tabular abstraction drained of social or cultural content.

Phillips's assessment of the American dream in strictly financial terms also makes it hard to assess his dark hints that bourgeois "boiling-points" have alarming political consequences. Historically, populist movements have involved marginal groups, but for the first time, he argues, it is the middle class that is in revolt. What, exactly, are the terrifying signs of this revolt? Phillips has little to display other than George Bush's receipt of a smaller percentage of the vote in 1992 than Herbert Hoover got in '32 and, also, the twangy antiestablishment gibes of a Texas billionaire. Knowing what has happened to the middle class elsewhere in the industrial world might allow readers to evaluate not Phillips's statistics—which most economists accept—but his prognostications about what these statistics portend. Yet almost the only analogy Phillips offers is to the *brede middenstand* (broad middle group) of the 17th-century Dutch Republic, with its comely houses along the Keizersgracht and Heerengracht. Readers skeptical of Phillips's barely veiled threat of a populist or fascist reaction to overtaxation may take comfort from the fact that the middle class of Amsterdam and Utrecht survived the decline on which he morbidly focuses. There is life after exceptionalism.

NO FRIENDS BUT THE MOUNTAINS: The Tragic History of the Kurds. By John Bulloch and Harvey Morris. Oxford. 242 pp. \$25

During the 1991 Persian Gulf War, responding to President George Bush's call for the oppressed peoples of Iraq to rise up, Kurdish guerrillas seized control of much of northern Iraq. Once the UN truce was signed, Saddam Hussein sent his surviving troops north, slaughtering the lightly armed Kurds and driving millions more into exile. For the Kurds, the Allies' indifference to their fate was business as usual. Constituting the world's largest stateless nationality, the Kurds reside in countries where they have at times been denied the use of their language and even fatally poisoned by chemical sprays—persecutions that are rarely reported in the world press. Why this neglect? British journalists Bulloch and Morris suggest that the major international powers share an "Arabocentric view" of the Middle East. Those who consider the region essentially an Arab domain believe that the claims of the Palestinian Arabs demand attention and redress, while those of the Kurds, an ancient non-

Arabic people, seem less legitimate. It has hardly helped that Kurdistan is partitioned among five countries (Iraq, Iran, Turkey, Syria, and Armenia) and that Kurdish insurgents are too faction-ridden to form a single independence movement. In this first book-length history of the Kurds in English, Bulloch and Morris make clear that the Arab-Israeli conflict is neither the longest nor the bloodiest struggle in the Middle East.

LEAD US NOT INTO TEMPTATION: Catholic Priests and the Sexual Abuse of Children. *By Jason Berry.* 407 pp. Doubleday. \$22.50

In the summer of 1983, in the heart of Louisiana's Cajun country, a nightmare became real when two parishioners of St. John's Catholic church learned that their trusted pastor, Father Gilbert Gauthé, had been sexually abusing their three sons, along with dozens of other St. John's altar boys. Horrible as the crime was, the response of the church hierarchy to its disclosure was nearly as appalling. Gauthé, it turns out, had been removed from a previous assignment for similar offenses. The vicar general of the diocese tried to downplay the more recent incidents, cautioning that too much talk might hurt Gauthé's career.

While journalist Berry devotes considerable space to the Gauthé affair and other similar scandals, his book is far more than a mere exposé. A devout Catholic, Berry is concerned with fundamental problems threatening the Catholic church, including the practice of celibacy and the evasive political machinations of an out-of-touch church hierarchy. Celibacy, Berry believes, and the allied opposition to women in clerical roles, are at least partially responsible for the declining number—and quality—of those choosing a priestly vocation. While there has been throughout history no lack of sexually active priests, giving rise to one scandal or another, seldom have there been so many as today. And according to several priests whom Berry quotes, there has never been so large a preponderance of gay clerics—around 40 percent, by many estimates.

To be sure, very few homosexuals are pedophiles, and heterosexuals can also be fixated upon children. The larger point of Berry's book is that an unhealthy, unventilated atmosphere now prevails in the Catholic church—one that could bring on legions of angry Luthers, far less temperate than

the loyal Erasmians of Berry's stripe. The Vatican would do well to listen now.

A DAY IN THE NIGHT OF AMERICA. *By Kevin Coyne.* Random House. 316 pp. \$22

THE TWENTY-FOUR HOUR SOCIETY: Understanding Human Limits in a World That Never Stops. *By Martin Moore-Ede.* Addison-Wesley. 230 pp. \$22.95

America's "new frontier," declares journalist Kevin Coyne, is the night. No nation in history (except, possibly, contemporary Japan) has ever had so many people working through the night—7.3 million—as America does now. To map this world, Coyne zigzagged nocturnally through 41 states, covering 18,000 miles and consuming, no doubt, about as many gallons of coffee. He accompanied oil workers on the Alaskan pipeline, Federal Express package handlers, and Las Vegas "working girls" on their nightly rounds. He soon came to view day workers "the way the military often sees civilians—pampered, undisciplined, ignorant of life's harsher truths." Most Americans who work at night do so not because they want to but because the job requires it. And the monetary rewards for night labor are meager, at best. Still, Coyne concludes his survey with an upbeat message: Humans can adapt to almost any situation.

Moore-Ede, a physiologist at the Harvard Medical School, disagrees. Why, he asks, have most notorious industrial accidents—Bhopal, Chernobyl, the Rhine chemical spill—occurred at night? Human sleep rhythms, millennia in the shaping, are ill-suited to a technological society that demands of everyone, from hospital employees to Wall Street currency traders, an elusive efficiency at 3 A.M. Moore-Ede, however, is not a Luddite who would (so to speak) turn back the clock. He proposes alternative night-work measures—ranging from artificial lighting that mimics the sun's rays to "polyphasic sleep" (strategic napping) to machines that monitor alertness. Such precautions, he believes, can save lives and billions of dollars. The growing world of night work has, until now, caught planners unprepared. No one foresaw that differences between day and night would become blurred in response to a global economy driven by telecommunications, computers, and faxes. "Societal revolutions," Moore-Ede comments, "have the habit of sneaking up on us."

History

PROTECTING SOLDIERS AND MOTHERS:

The Political Origins of Social Policy in the United States. By Theda Skocpol. Harvard. 714 pp. \$34.95

For decades scholars have been trying to understand why the American welfare state was such a late bloomer and why, by European standards, its growth remains stunted. Was the absence of a strong, European-style labor movement to blame? Or were America's individualistic values? These and other theories are admirably surveyed (and, with varying degrees of success, refuted) by Skocpol, a Harvard sociologist, on her way to introducing yet another theory: The United States was no latecomer; indeed, it pioneered the welfare state.

Her case rests on two early trial runs for a welfare state in America. The first took form with the gradual expansion of Civil War pensions, which were inaugurated to aid disabled veterans and the dependents of men killed in the war. These pensions, Skocpol writes, evolved into "an open-ended system of disability, old-age, and survivors' benefits for any who could claim minimal service time on the northern side of the Civil War." By 1910, more than one third of elderly northern men were receiving federal pensions averaging a relatively generous \$172 annually. Skocpol concedes, however, that the pension system was "not really a 'welfare state.'" It was more an elaborate patronage scheme—the Republican Party's answer to the turkeys handed out at Thanksgiving by Democratic ward heelers—and it helped to ensure the GOP's domination of national politics during the late 19th century.

The first modern welfare-state measures were enacted in Germany during the 1880s and in Britain during the early 1900s, but the United States emphatically declined to join in. An early 20th-century attempt by reform groups such as the American Association for Labor Legislation to win pensions and other programs for the "army of labor" failed miserably. But even as these efforts fizzled, reform-minded women's groups were crusading for programs that could have become, in Skocpol's view, the foundation of a "maternalist" welfare state. By mutual agreement, the sexes inhabited "separate spheres" in late 19th- and early 20th-century America, with men immersed in the world of work and partisan politics and women

presiding over hearth, home, and morals. Middle- and upper-class women, supplied not only with moral authority but with leisure, expanded their horizons through innumerable local church and civic clubs, which were then united through such organizations as the General Federation of Women's Clubs (GFWC). "All clubs," the GFWC stated, "as bodies of trained housekeepers, should consider themselves guardians of the civic housekeeping of their respective communities." They took up a host of causes, from temperance to juvenile delinquency, and pressured many states into enacting labor laws regulating the hours, wages, and safety conditions of female workers. In 1912, the federal government created a Children's Bureau, which during the 1920s briefly offered prenatal and child-care education for mothers.

By the mid-1920s, Skocpol notes, this wave of reform had passed. Women cast their first votes in a national election in 1920, and feminists embarked on a quest for equality, which could not be squared with the notion of separate spheres. The exalted moral status that had allowed women to prevail was gone. Skocpol's study illustrates, albeit unintentionally, that in America receiving public support posed questions that bore a higher moral charge than they did elsewhere. Only extraordinary circumstances could overcome popular doubts about the welfare state. It took nothing less than the Great Depression to bring about passage of the cornerstone Social Security Act of 1935. But uniquely American doubts—as President Clinton's pledge to "abolish welfare as we know it" suggests—still linger.

ANTISEMITISM: The Longest Hatred. By Robert S. Wistrich. Pantheon. 341 pp. \$25

Before the 1870s no one ever encountered an anti-Semite, at least by name. Only in that decade did a German journalist, Wilhelm Marr, invent the term *anti-Semitism* to advertise a new, improved way of hating Jews. Prejudice against Jews on religious grounds was then coming to seem backwards, even medieval; Marr and others like him proposed better grounds, reasons based on economics and race—a hatred of Jews that was, so they claimed, modern and "scientific." To understand a prejudice that has existed for millennia but whose shape and justification keep changing, Wistrich, a noted historian at Jerusalem's Hebrew University, has written

erning the latter. Joseph Conrad, Graham Greene, and V. S. Naipaul might have exposed the evils of colonialism, but Said finds these "reformers" little better than the imperialists they criticized. Conrad's and Greene's fiction still presents a "Western view of the non-Western world," Said writes, that "is so ingrained as to blind [them] to other histories, other cultures, other aspirations."

This kind of argument—which owes a debt to Michel Foucault's linkages between power and knowledge—has become standard fare in the years since *Orientalism* was published. A reader might want less to question it than to wonder why a literary critic has so obviously checked literature at the door. Said discusses a novel no differently than he does a Verdi opera or a film such as *Apocalypse Now*. Since only extractable messages interest him, novels could just as well all be op-ed pieces in the *New York Times*. Said also tends to focus not on the best but on the worst work of an author and, in it, on some minor point. So in a chapter intriguingly titled "Jane Austen and Empire," he deigns to analyze only *Mansfield Park* and, in that, only a few passing references to Sir Thomas Bertram's having been a planter in Antigua, without ever considering the structure, language, characters, or irony of the novel. Does a person come to resemble, finally, that which he most violently opposes? It would seem so. Having so long unmasked Western literature as propaganda, Said writes literary criticism that is itself barely distinguishable from ideological polemics.



CATULLUS. By Charles Martin. Yale. 197 pp. \$30

THE POEMS OF CATULLUS. Translated by Charles Martin. Johns Hopkins. 181 pp. \$35

THE NORTON BOOK OF CLASSICAL LITERATURE. Edited by Bernard Knox. Norton. 866 pp. \$29.95

Who was the first Modernist poet? Ezra Pound? T. S. Eliot? Martin, a critic and translator, suggests an earlier candidate—Gaius Valerius Catullus, a Roman of the first century B.C. Catullus is the only surviving poet from a group known as "the modern ones" (the *neoterics*), a group of Roman bards who sought to throw off the prevailing Homeric yoke and explore new metrical patterns and shorter lyric forms. Even Catullus's subjects—adultery, homosexuality, licentiousness—surprise readers today, who seldom expect such candor in ancient verse. (In fact, as Martin observes, such racy topics were relatively familiar to literate Romans.) Catullus, who was born in Verona but spent most of his brief life (84?–54 B.C.) in a Rome approaching the zenith of its powers and sophistication, has long been regarded as a guilty pleasure among classicists. Repressed by Christian authorities, his work came close to disappearing altogether. After centuries in which he was only a name, a single manuscript of his surfaced in the 14th century in his native Verona, where it was recopied before vanishing forever.

Beyond mere prurience, what is the secret of Catullus's appeal for such 20th-century poets as Pound and Yeats? Catullus sought to explore the kind of truth that exists in everyday life, to release verse from the constraints of the epic. He created short, witty poems, sometimes on deliberately trivial subjects, teasing out his message through irony and innovative perspective. Consider this miniature poem (one of the few possible to quote in its entirety in a stodgy periodical):

I hate & love. And if you should ask how I can do
both,
I couldn't say; but I feel it, and it shivers me.

Catullus reveals the same complicated emotions, expressed in conversational tone, whether embarrassing a friend into returning a stolen napkin, attacking a bitter enemy with biting sarcasm, or wooing some object of his affections, notably the married female lover to whom he gave the name Lesbia. The very juxtaposition of Catullus's words and—in a larger sense—of the poems themselves

has a contemporary ring to modern readers. A poem that extols the merits of marital fidelity will be followed by one discussing the potential benefits of adultery; one that speaks of erotic obsession will accompany a poem that treats the sanctity of marriage. It is Catullus's ambivalence, his ability to present contradictory views and to encompass the full erotic spectrum, that led Yeats to invoke his name to mock the logical consistency of modern academics and thinkers:

Lord, what would they say
Did their Catullus walk that way?

Martin's commentary is part of Yale University Press's new Hermes series, whose aim is to reintroduce the classics to a popular audience. Bernard Knox, in his introduction to *The Norton Book of Classical Literature*, reminds us that even fragments of the works of poets such as Catullus "give us unforgettable glimpses into a brilliant archaic world." Those wanting a longer look might start with Knox's introduction to this comprehensive volume. In 40 pages, Knox covers everything from the development of written language to the fall of Rome, tracing the course of classical literature from Homer to St. Augustine. "It would be a pity," Nietzsche wrote in the 19th century, "if the classics should speak to us less clearly because a million words stood in the way." The million words are, by now, probably a billion words, but Martin's study and translation of Catullus, the Hermes series, and Knox's work all skirt the industrial complex of technical scholarship to present ancient literature afresh to the common reader.

UNDERSTANDING THE DEAD SEA

SCROLLS: A Reader from the *Biblical Archeology Review*. Ed. by Hershel Shanks. Random House. 336 pp. \$23

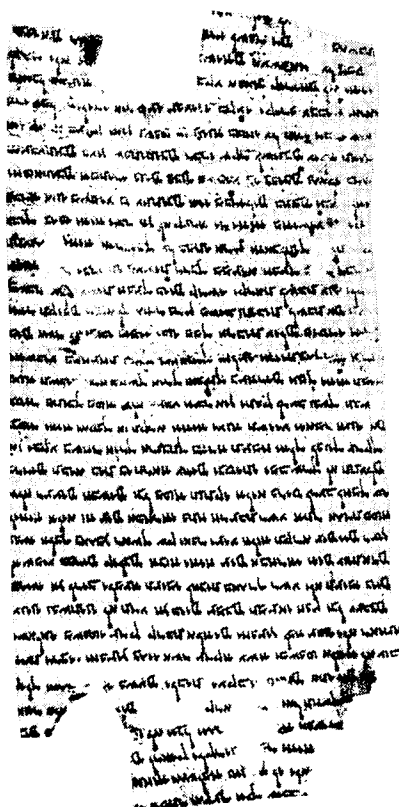
JESUS AND THE RIDDLE OF THE DEAD

SEA SCROLLS. By Barbara Thiering. HarperCollins. 451 pp. \$24

The very name Dead Sea Scrolls has come to evoke, rather like "The Curse of the Mummy," images of temple robbers and age-old intrigue. But if there is a mystery surrounding these documents—the only Hebrew manuscripts on either papyrus or leather to have survived from pre-Christian times—it is a modern one. Not long after Bedouin

shepherd boys discovered them in 1947, a seven-man scholarly team in East Jerusalem gained control of the scrolls and severely limited access to them. "The greatest manuscript find of modern times" (in archeologist W. E. Albright's words) has thus had its meaning deciphered and publicized only piecemeal and slowly. Even the scrolls' long-awaited but unauthorized publication in 1991, through a still-unnamed source, remains something of a puzzle.

Shanks, editor of the *Biblical Archaeology Review* (BAR), here collects from his own publication the more important essays bearing upon the scrolls' meaning. The scrolls have provoked unending controversy by revealing that many practices once thought to be unique to the early Christian church were prefigured by the beliefs and rituals of a Jewish Essene community near the Dead Sea. The little that was previously known about the Essenes came from a few first-century A.D. writers—Josephus, Philo of Alexandria, and Pliny the Elder, the latter of whom characterized the Essene sect as "remarkable beyond all the other tribes in the world,



in that it has no women and has renounced all sexual desire, has no money, and has only palm trees for company." In the Dead Sea Scrolls, however, the Essenes come to life, although it is a life that no one could have imagined for them. They staged sacred meals with eschatological significance, complete with the blessing of bread and wine, and they performed baptisms by immersion. Moreover, both the early Christians and the Essenes expected the Messiah to appear imminently. One scroll, "The Messiah of Heaven and Earth," clearly alludes to the idea of bodily resurrection.

So much from the scrolls seems clear, but a number of questions they raise have no ready answers: Was John the Baptist a member of the community that wrote the scrolls? Was Jesus, in fact, an Essene? Is the "Temple Scroll" the lost sixth book of the Torah? Taken together, however, these essays establish that early Christianity is grounded more completely in Jewish thought than any authority before 1947 had proposed.

If the scholarly team controlling the scrolls was worried about their falling into the wrong hands, *Jesus and the Riddle of the Dead Sea Scrolls* illustrates what happens when they do. There is no direct mention of Jesus in the scrolls, but such a small detail hardly deters Australian biblical scholar Barbara Thiering. She uses them to argue that Jesus was born to an unwed (hence, officially "virgin") woman, that he married twice and fathered three children, and that he did not die on the cross but was drugged and later revived in a cave. What Thiering has done, in fact, is substitute for the *texts* of the scrolls—which are fragmentary, sometimes contradictory, and in archaic script—the idea of a *subtext*, a hidden code, which she then "decodes" into a narrative that is fluent, coherent, and, of course, unverifiable.

There will likely be no such bold and final "solving" of the Dead Sea Scrolls. But a wide range of scholars, such as those represented in the *BAR* reader, are now providing reliable information and possible interpretations of these manuscripts that, as Shanks notes, "ignited the imagination of nonscholar and scholar alike."

THE ULTIMATE ART: Essays Around and About Opera. By David Littlejohn. Univ. of Calif. 303 pp. \$25

Samuel Johnson characterized opera as "an exotick

and irrational entertainment"; two centuries later, the French composer Pierre Boulez proposed blowing up the world's opera houses on the grounds that they were devoted to an absurdly costly and indefensible art form. If opera is a bastard art—the "illegitimate" offspring of music, libretto, dance, historical costume, and theatrical production—then novelist-critic Littlejohn (like Edmund in *King Lear*) argues that bastard is best. For all its hybrid qualities, he insists, opera produces effects, such as "the human voice at its most powerful and expressive," found nowhere else. Littlejohn pursues his argument in essays ranging from "Why We Put Up with Dumb Opera Plots" to the changing public tastes of "The Janáček Boom." Everywhere, Littlejohn opposes popular excesses, such as Peter Sellars's stagings of Mozart, in which the "directorial conceit [is] alien to the score," as well as academic excesses, such as Cornell University's "new opera studies," which treat librettos as autonomous works and subject them to advanced literary theory. Littlejohn may fail to convert the skeptic or to interest the academic specialist: Eschewing theory and what Shaw called the "Mesopotamian words" of technical musical analysis, he writes not to preach to the converts but to delight them.

Science & Technology

THE CREATIVE MOMENT: How Science Made Itself Alien to Modern Culture. By Joseph Schwartz. HarperCollins. 252 pp. \$25

Joseph Schwartz has an unusual complaint: "Our poets do not tell of the intricacies of microminiature electronic circuitry." For that matter, he continues, "the mere mention of relativity makes every intellectual in Europe and the United States start to stammer." To believe the former physics professor, little has changed during the 35 years since C. P. Snow identified the gulf between sciences and the humanities as perhaps *the* problem for modern society.

Schwartz, moreover, maintains that this division is unnecessary, indeed little more than a historical accident. To locate the origins of the accident, he returns to Renaissance Italy, when Galileo's study of the heavenly bodies landed him in trouble with the pope. Galileo's solution was to convert his arguments into the rarefied language of mathematics, which mollified the church by being inaccessi-

ble to the laity. A trend, a long trend, began. Schwartz's book is an examination of those scientific breakthroughs—from Sadi Carnot's heat engine to the creation of nuclear physics and the "genetic revolution"—that were couched in unnecessarily complex terminologies baffling to the layperson. "The form in which understanding in physics [and other contemporary sciences] is expressed," he writes, "has been mistaken for the understanding itself." Schwartz himself wrote *Einstein for Beginners* (1979) to demonstrate how technical scientific theories can be made comprehensible to the general reader.

Is there a solution to the "two-cultures" problem? Is it even possible for science again to learn the language of daily speech? Schwartz's proposals for achieving popular scientific literacy—supporting a Green-movement awareness of the environment and adding a new undergraduate-level science course on technology—seem feeble. What Schwartz has to offer is less a program than a different perspective. Science writers today tend to fall into two opposing camps: the supporters who view science as the most legitimate method of acquiring knowledge and the detractors who take stock of ever more deadly engines and destructive technologies. To his credit, Schwartz avoids the stock jargon of either group. He wants to promote science but at the same time to shame it into abandoning its claim to an "occult" or privileged status. His outlook, at least, is refreshing.

THE ANT AND THE PEACOCK: Altruism and Sexual Selection from Darwin to Today. By *Helena Cronin*. Cambridge. 490 pp. \$39.95

Despite its imposing simplicity and awesome explanatory power, the theory of natural selection has never achieved the status of a universally accepted scientific law. As recent surveys reveal, an astonishingly large proportion of people in the otherwise rational West do not believe in evolution. Belief, however, is not the only issue: The idea of design-without-a-designer has had to struggle for survival against not only those who dislike its implications but also those who just misunderstand

it—including many eminent scientists. Cronin, an infectiously enthusiastic classical Darwinist at Oxford, begins her book with a handy if unsympathetic survey of rival views such as creationism, idealism, and Lamarckism, all of which she dismisses as "follies" and "hopelessly off-target."

Cronin is not, however, attempting to argue the perfection of Darwin's original ideas. Rather she confronts two crucial weaknesses that even many Darwinians have skimmed over. These problems are "beauty" and "altruism." The peacock's beautiful tail, for example, requires enormous energy to grow, even while it hampers the bird's ability to fly—hardly a solid support for Darwin's theory that only traits useful for survival survive. And neuter ants, with what Cronin calls "saintly self-abnegation," work dutifully for the community, seemingly in denial of natural selection's famous self-interested, utilitarian imperative. Beauty and altruism were telling arguments against Darwin a century ago and caused him immense difficulty. To explain beauty, Darwin resorted to the argument of sexual selection—that peahens, for example, preferred mates with gaudier tails—an idea that other 19th-century male scientists mocked. They maintained that females could never choose anything consistently enough to have a lasting evolutionary effect. To explain altruistic behavior, Darwin was driven even further afield: He posited a rudimentary moral sense in animals.

Cronin proves a stricter Darwinian than Darwin himself. The problem of altruism, she writes, "dissolves, gratifyingly, before our eyes" when we take a "gene-centered view" of evolution. Since the 1960s the idea of selfish genes has become increasingly accepted. According to this view, animals, once considered the basic evolutionary unit, are nothing more than vehicles for the transmission of genes between generations. The problem of beauty is more intractable, and Cronin (and others) are reviving Darwin's once-ridiculed idea of sexual selection. Sensible peahens could well prefer men-folk with sexy tails, she argues, because such plumage might indicate beneficial genetic characteristics. Darwinism is now in the midst of a revival, and perhaps not since the master himself has it found a more eloquent exponent than Cronin.

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POETRY

W E L D O N K E E S

Selected and Introduced by Joseph Brodsky

If Weldon Kees were alive today, he would be 79 years old; but the first thing that makes this unthinkable is his poems. Their vehement bleakness makes it all too plausible that on July 19, 1955, when a car registered in his name was found near the Golden Gate Bridge in San Francisco, the 41-year-old Weldon Kees had committed suicide.

No body was ever found. Now and then a rumor would have him alive and well under an assumed name, south of the border. However, during the last 35 years, nothing even remotely close to his diction, either under his or an assumed name, has appeared in print. As far as this evidence goes, the poet is dead.

Suicide, as the great Czech poet Vladimir Holan once said, is not an exit; it is the word "exit" painted on a wall. Suicide—or, for that matter, a disappearing act—is also bad PR, particularly when the general disposition of the public toward poetry is that of benign neglect (of such extraordinary proportions, it must be added, that one wonders what the word *benign* is doing here). Whatever happened to the body of Weldon Kees, the body of his work, given the size of this nation's potential readership, might just as well also rest at the bottom of the Pacific.

The consolation, perhaps, is that it is not there alone. Scores and scores of outstanding American poets see their work consigned to the same fate by the existing system of book distribution in this country. "The American people"—in the memorable phrase of a former U.S. senator—"have the right to be wrong." This sounds truly democratic and in line with the Constitution, yet nature and Providence, or both, thrust poets into the nation's midst to make it more lucid. As things are, the American people's right to know their own poetry is denied to most of them.

With that, democracy is denied its purpose, for democracy is not an end unto itself. The purpose of democracy is to become enlightened democracy. Democracy without enlightenment is but a well-policed jungle. What does this have to do with Weldon Kees? Not much, perhaps, except that his dark vision could spare many an individual the loneliness of his or her agony. It could because in Kees's poetry agony is raised to the level of art. And this is the level to which, to paraphrase Walter Pater, all human experience, be it negative or positive, aspires.

This is what enlightenment is all about. It should not be mistaken for therapy, although it can perform that task also. At a certain point, men and women should grow up and recognize that they are the sum not only of their intentions and convictions but also of their deeds. In clarifying this point, the poems of Weldon Kees come in handy. He is a poet of remarkable totality of

approach toward the world and his very self. Behind his irate dismissal of both, one discerns a fierce Calvinist spirit; one sees a man summoning his epoch and himself to his own last judgment and finding no argument in either's defense, and, naturally, no grace.

He does this with relish and with savage irony. How is it, one may wonder, that a boy from Nebraska turned into this merciless, supreme agonist? Was there something in his background? Was it the Wall Street Crash, or the years of the Great Depression? Was it the war on the Continent, and perhaps the need to compensate for his guilt at not taking part in it? A failed marriage? Should we wax Freudian?

We should not. Neither taken separately nor in their totality will these explanations account for this poet's diction. They will not because Kees was not alone on the scene, although there is no denying his cooperation in that diction's hardening. Its origins are not in his life but in his very art and in its terrifying ability to impose standards upon work and life alike. The measure of one's surrender to these standards is, frankly, the measure of one's talent, and Kees was a man of immense talent. Herein lies the explanation of his artistic success and his human tragedy.

To put it simply, by the time of Weldon Kees's arrival, the dominant note in poetry on both sides of the Atlantic was that of negation of the modern reality. The source of that note was, of course, European Romanticism; its current mouthpiece, Modernism. To be sure, the reality by and large did not deserve any better. On the whole, art's treatment of contemporary reality is almost invariably punitive—so much so that art itself, especially the incurably semantic art of poetry, can be suspected of having a strong Calvinist streak.

It does: because aesthetic authority cannot be delegated. However, unlike its practitioners, it is capable of an equivalent of grace.

Be that as it may, Kees had no alternative but to pick up that note of negation and play it the best he could. He did, and he played it better than anyone around, to the bitter end. He was a genuine American soloist, with no mute and no support. He played better, to my mind, than Eliot and, on occasion, Auden, whose respective repertoires were wider to begin with. Because they existed, Kees had to go further. He had to go further, I suspect, also because he was from Nebraska. Unlike his great and small contemporaries, he took negation and alienation literally.

His poems display neither the incoherence of nostalgia for some mentally palatable past nor, however vaguely charted, the possibility of the future. All he had was the present, which was not to his Muse's liking, and eventually not to his own either. His poetry, in other words, is that of the here and now and of no escape, except for poetry itself. Yet for all he had to say about the present, his language is amazingly clear and direct, and the formal aspects of his verse are amazingly conservative. Evidently Kees did not feel the imperative of arrhythmia so palpable among his less memorable peers, not to mention successors.

This makes his sanity less questionable than many a melodrama buff would have liked. As for his spiritualistic imagery, that, too, I believe, owes

more to Max Ernst than to his own nightmares. The real nightmare for him was to do a mediocre job; his 1975 *Collected Poems* (edited by Donald Justice) shows him in absolute control of his subconscious. Kees was a professional, not an amateur, and certainly not a sissy. Amateurs and sissies don't write poems as tough as the ones you find in this selection. Once or twice this toughness could be faked, but not for 12 years: the duration of Weldon Kees's career as a poet. Then, too, it's deliberate, which is to say genuine. And it makes one think that whatever happened on July 19, 1955, was not a fluke. It was deliberate.

On that day America lost a very tough poet. For him, it was presumably the end of his rope, but it should not be that way for us. He should be read, and here are a few of his poems. In them, you will hear that keen, implacable, truly American solo, which cannot be mistaken for anything else. This is our trumpet; this, if you will, is our early cool. It is calling to us from the depth of the 1950s, the Eisenhower years. It is very pure, very heart-rending. Its silver penetrates the darkness, and vice versa, almost in gratitude. It sounds sort of like a trumpet solo by Clifford Brown, who also died around the same time.

The Scene of the Crime

There should have been some witness there, accusing—
Women with angry mouths and burning eyes
To fill the house with unforgiving cries;
But there was only silence for abuse.

There should have been exposure—more than curtains
Drawn, the stairway coiling to the floor
Where no one walked, the sheeted furniture,
And one thin line of light beneath the door.

Walking the stairs to reach that room, a pool
Of blood swam in his thought, a hideous guide
That led him on and vanished in the hall.
There should have been damnation. But, inside,
Only an old man clawed the bed, and drooled,
Whispering, "Murderer!" before he died.

The Patient is Rallying

Difficult to recall an emotion that is dead,
Particularly so among these unbelieved fanfares
And admonitions from a camouflaged sky:

I should have remained burdened with destinations
Perhaps, or stayed quite drunk, or obeyed
The undertaker, who was fairly charming, after all.

Or was there a room like that one, worn
With our whispers, and a great tree blossoming
Outside blue windows, warm rain blowing in the night?

There seems to be some doubt. No doubt, however,
Of the chilled and empty tissues of the mind
—Cold, cold, a great gray winter entering—
Like spines of air, frozen in an ice cube.

A Distance from the Sea

To Ernest Brace

*"And when the seven thunders had uttered their voices, I was about to
write: and I heard a voice from heaven saying unto me, Seal up those things
which the seven thunders uttered, and write them not."—Revelations, X, 4.*

That raft we rigged up, under the water,
Was just the item: when he walked,
With his robes blowing, dark against the sky,
It was as though the unsubstantial waves held up
His slender and inviolate feet. The gulls flew over,
Dropping, crying alone; thin ragged lengths of cloud
Drifted in bars across the sun. There on the shore
The crowd's response was instantaneous. He
Handled it well, I thought—the gait, the tilt of the head, just
right.

Long streaks of light were blinding on the waves.
And then we knew our work well worth the time:
The days of sawing, fitting, all those nails,
The tiresome rehearsals, considerations of execution.
But if you want a miracle, you have to work for it,
Lay your plans carefully and keep one jump
Ahead of the crowd. To report a miracle
Is a pleasure unalloyed; but staging one requires
Tact, imagination, a special knack for the job
Not everyone possesses. A miracle, in fact, *means* work.
—And now there are those who have come saying

That miracles were not what we were after. But what else
Is there? What other hope does life hold out
But the miraculous, the skilled and patient
Execution, the teamwork, all the pain and worry every miracle
involves?

Visionaries tossing in their beds, haunted and racked
By questions of Messiahship and eschatology,
Are like the mist rising at nightfall, and come,
Perhaps, to even less. Grave supernaturalists, devoted wor-
shippers
Experience the ecstasy (such as it is), but not
Our ecstasy. It was our making. Yet sometimes
When the torrent of that time
Comes pouring back, I wonder at our courage
And our enterprise. It was as though the world
Had been one darkening, abandoned hall
Where rows of unlit candles stood; and we
Not out of love, so much, or hope, or even worship, but
Out of the fear of death, came with our lights
And watched the candles, one by one, take fire, flames
Against the long night of our fear. We thought
That we could never die. Now I am less convinced.
—The traveller on the plain makes out the mountains
At a distance; then he loses sight. His way
Winds through the valleys; then, at a sudden turning of a
path,
The peaks stand nakedly before him: they are something else
Than what he saw below. I think now of the raft
(For me, somehow, the summit of the whole experience)
And all the expectations of that day, but also of the cave
We stocked with bread, the secret meetings
In the hills, the fake assassins hired for the last pursuit,
The careful staging of the cures, the bribed officials,
The angels' garments, tailored faultlessly,
The medicines administered behind the stone,
That ultimate cloud, so perfect, and so opportune.
Who managed all that blood I never knew.

The days get longer. It was a long time ago.
And I have come to that point in the turning of the path
Where peaks are infinite—horn-shaped and scaly, choked with
thorns.
But even here, I know our work was worth the cost.
What we have brought to pass, no one can take away.
Life offers up no miracles, unfortunately, and needs assistance.
Nothing will be the same as once it was,
I tell myself.—It's dark here on the peak, and keeps on getting
darker.
It seems I am experiencing a kind of ecstasy.
Was it sunlight on the waves that day? The night comes down.
And now the water seems remote, unreal, and perhaps it is.

Aspects of Robinson

Robinson at cards at the Algonquin; a thin
Blue light comes down once more outside the blinds.
Gray men in overcoats are ghosts blown past the door.
The taxis streak the avenues with yellow, orange, and red.
This is Grand Central, Mr. Robinson.

Robinson on a roof above the Heights; the boats
Mourn like the lost. Water is slate, far down.
Through sounds of ice cubes dropped in glass, an osteopath,
Dressed for the links, describes an old Intourist tour.
—Here's where old Gibbons jumped from, Robinson.

Robinson walking in the Park, admiring the elephant.
Robinson buying the *Tribune*, Robinson buying the *Times*.
Robinson
Saying, "Hello. Yes, this is Robinson. Sunday
At five? I'd love to. Pretty well. And you?"
Robinson alone at Longchamps, staring at the wall.

Robinson afraid, drunk, sobbing Robinson
In bed with a Mrs. Morse. Robinson at home;
Decisions: Toynbee or luminol? Where the sun
Shines, Robinson in flowered trunks, eyes toward
The breakers. Where the night ends, Robinson in East Side
bars.

Robinson in Glen plaid jacket, Scotch-grain shoes,
Black four-in-hand and oxford button-down,
The jeweled and silent watch that winds itself, the brief-
Case, covert topcoat, clothes for spring, all covering
His sad and usual heart, dry as a winter leaf.

Equinox

Under black lace the bald skull shines and nods,
A melon seasoned in this winter sun,
Bare, yellowed, finial
Above the claw-and-ball-foot chair that mourns
North toward the frozen window and the bay. The gulls
Rise in a long line off the rocks, steer
For the lighthouse, shadowing the boats
That toss, abandoned, far beyond the point.
Dead fish are heaped upon the coast for miles.
Her life is sleep, and pain. With wakening
To this sequestered and snow-haunted world,
The black mantilla creaks with frost; red eyes
Break through the rinds of flesh, blur

Toward the dripping faucet and the last cans of
Spaghetti and baked beans, corroding on the shelves.

A bubble, then a sound that borders on a word
Breaks from her mouth. If she could think,
Her eighty years would bend toward Spain
Shadows of *santos*, crowds swarming in the heat,
Plumes, awnings, shields, the sun six hours high . . .

She believes this coast is in the South. A month ago,
Smoke from the village chimneys died. No lights burn
In windows of the cottages. Over the vacant docks
The birds are featureless, but her sight fails
Where these walls end.

Exile without remembrance,
Spawned in the heat to perish in this cold,
Ravaged by paresis, and her sight at last
A blackness in the blood, she moves her chair
Inch by excruciating inch, her face
Steered—raw, blank, aching—toward the beans:
The last survivor of the race.

Late Evening Song

For a while
Let it be enough:
The responsive smile,
Though effort goes into it.

Across the warm room
Shared in candlelight,
This look beyond shame,
Possible now, at night,

Goes out to yours.
Hidden by day
And shaped by fires
Grown dead, gone gray,

That burned in other rooms I knew
Too long ago to mark,
It forms again. I look at you
Across those fires and the dark.

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