

Post Capitalist Society

Introduction: The Transformation

by Peter Drucker

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The MEMO THEY don't want you to SEE

Transformations in Western History

EVERY FEW HUNDRED YEARS in Western history there occurs a sharp transformation.

We cross what in an earlier book (*The New Realities* (1989)).

I called a "divide."

Within a few short decades, society rearranges itself—its worldview; its basic values; its social and political structure; its arts; its **key institutions**.

Fifty years later, there is a new world.

And the people born then cannot even imagine the world in which their grandparents lived and into which their own parents were born. ...

We are currently living through just such a transformation.

It is creating the post-capitalist society, which is the subject of this book.

31 [Thirteenth Century: The New City]

32 One such transformation occurred in the thirteenth
century, when the European world, almost overnight,
became centered in the new city–
33 with the emergence of city guilds as the new dominant
social groups and with the revival of long-distance trade;
34 with the Gothic, that eminently urban, practically
bourgeois, new architecture;
35 with the new painting of the Sienese;
36 with the shift to Aristotle as the fountainhead of wisdom;
37 with urban universities replacing as the centers of culture
the monasteries in their rural isolation;
38 with the new urban Orders, the Dominicans and
Franciscans, emerging as the carriers of religion, of
learning, of spirituality;
39 and within a few decades, with the shift from Latin to the
vernacular and with Dante’s creation of European
literature.

40 [Renaissance]

41 Two hundred years later, the next transformation took
place in the sixty years between Johannes Gutenberg’s
invention in 1455 of printing with movable type and
Martin Luther’s Protestant Reformation in 1517.
42 These were the decades of the blossoming of the
Renaissance, peaking between 1470 and 1500 in
Florence and Venice;
43 of the rediscovery of antiquity;
44 of the European discovery of America;
45 of the Spanish Infantry, the first standing army since the
Roman legions;
46 of the rediscovery of anatomy and with it of scientific
inquiry;
47 and of the general adoption of Arabic numerals in the
West.
48 And again, no one living in 1520 could have imagined the
world in which their grandparents had lived and into
which their parents had been born.

49 [A New European Civilization]

50 The next transformation began in 1776–the year of the
American Revolution, of James Watt’s perfected steam
engine and of Adam Smith’s Wealth of Nations.
51 It came to a conclusion almost forty years later, at
Waterloo–forty years during which all the modern “isms”

were born.

52 Capitalism, Communism, and the Industrial Revolution emerged during these decades.

53 These years saw the creation—in 1809—of the modern university (Berlin), and also of universal schooling.

54 These four decades brought the emancipation of the Jews—and by 1815, the Rothschilds had become the great power, overshadowing kings and princes.

55 These forty years produced, in effect, a new European civilization.

56 Again, no one living in 1820 could imagine the world in which their grandparents had lived and into which their parents had been born.

57 [Our period: World History and World Civilization]

58 Our period, two hundred years later, is such a period of transformation.

59 This time it is not, however, confined to Western society and Western history.

60 Indeed, it is one of the fundamental changes that **there no longer is a “Western” history or, in fact, a “Western” civilization.**

61 **There is only world history and world civilization—but both are “Westernized.”**

62 It is moot whether this present transformation began with the emergence of the first non-Western country, Japan, as a great economic power—that is, around 1960—or with the computer—that is, with information becoming central.

63 My own candidate would be the American G.I. Bill of Rights after World War II, which gave every returning American soldier the money to attend a university—something that would have made absolutely no sense only thirty years earlier, at the end of World War I. The G.I. Bill of Rights—and the enthusiastic response to it on the part of America’s veterans—signaled the shift to the knowledge society.

64 Future historians may well consider it the most important event of the twentieth century. ...

65 We are clearly still in the middle of this transformation; indeed, if history is any guide, it will not be completed until 2010 or 2020.

66 But already it has changed the political, economic, social, and moral landscape of the world.

67 No one born in 1990 could possibly imagine the world in which one's grandparents (i. e., my generation) had grown up, or the world in which one's own parents had been born.

68 [Attempts to understand the transformations]

69 The first successful attempt to **understand** the transformation that turned the Middle Ages and the Renaissance into the **modern world**, the transformation that began in 1455, was not even attempted until fifty years later: with the *Commentaries* of Copernicus, written between 1510 and 1514; with Machiavelli's *The Prince*, written in 1513; with Michelangelo's synthesis and transcendence of all Renaissance art in the ceiling of the Sistine Chapel, painted between 1508 and 1512; and with the reestablishment of the Catholic Church at the Tridentine Council in the 1540s. ...

70 The next transformation—the one that occurred some two hundred years ago and was ushered in by the American Revolution—was first understood and analyzed sixty years afterward, in the two volumes of Alexis de Tocqueville's *Democracy in America*, published respectively in 1835 and 1840.

71 [Looking Backward and Looking Forward]

72 We are **far enough advanced** into the new post-capitalist society to review and revise the social, economic, and political history of the **Age of Capitalism** and of the **nation-state**.

73 This book will therefore take new looks at the period we are leaving behind ... and some of the things it sees from its new vantage point may come as distinct surprises (they did to me). ...

74 To foresee what the post-capitalist world itself will look like is however, risky still.

75 **What new questions** will arise and where the **big new issues** will lie, we can, I believe, already discover with some degree of probability.

76 In many areas we can also describe what will not work.

77 **"Answers" to most questions are still largely hidden in the womb of the future.**

78 The one thing we can be sure of is that the world that will emerge from the present **rearrangement of values, beliefs, social and economic structures, of political concepts and systems, indeed, of worldviews, will be different from anything anyone today imagines.**

79 In some areas—and especially in society and its structure—basic shifts have already happened.

80 That the new society will be both a non-socialist and a post-capitalist society is practically certain.

81 And it is certain also that its primary resource will be knowledge.

82 This also means that it will have to be a society of organizations.

83 Certain it is that in politics we have already shifted from the four hundred years of the sovereign nation-state to a **pluralism** in which the nation-state will be one rather than the only unit of **political integration.**

84 It will be one component—though still a key component—in what I call the “post-capitalist polity,” a system in which transnational, regional, nation-state, and local, even tribal, structures compete and co-exist. ...

85 These things have already happened.

86 They can therefore be described.

87 To do so is the **purpose** of this book.

88 ***Post Capitalist Society and Post Capitalist Polity***

89 Only a few short decades ago, everybody “knew” that a post-capitalist society would surely be a Marxist one.

90 Now we all know that a Marxist society is the one thing the next society is not going to be.

91 But most of us also know—or at least sense—that developed countries are moving out of anything that could be called “capitalism.”

92 The **market** will surely remain the effective **integrator of economic activity.**

93 But as a society, the developed countries have also already moved into post-capitalism.

94 **It is fast becoming a society of new “classes,” with a new central resource at its core. ...**

- 95 Capitalist society was dominated by two social classes: the capitalists, who owned and controlled the means of production, and the workers—Karl Marx’s “proletarians,” alienated, exploited, dependent.
- 96 The proletarians first became the “affluent” middle class as a result of the “Productivity Revolution”—the revolution that began at the very time of Marx’s death in 1883, and reached its climax in every developed country shortly after World War II.
- 97 Around 1950, the industrial worker—no longer a “proletarian” but still “labor”—seemed to dominate politics and society in every developed country.
- 98 But then, with the onset of the “Management Revolution,” the blue-collar workers in manufacturing industry rapidly began to decline both in numbers and, even more noticeably, in power and status.
- 99 By the year 2000 there will be no developed country where traditional workers making and moving goods account for more than one sixth or one eighth of the work force. ...
- 100 The capitalist probably reached his peak even earlier—by the turn of the century, and surely no later than World War I.
- 101 Since then, no one has matched in power and visibility the likes of Morgan, Rockefeller, Carnegie, or Ford in the United States; Siemens, Thyssen, Rathenau, Krupp in Germany; Mond, Cunard, Lever, Vickers, Armstrong in Great Britain; de Wendel and Schneider in France; or of the families that owned the great *zaibatsu* of Japan: Mitsubishi, Mitsui, and Sumitomo.
- 102 By World War II they had all been replaced by “professional managers”—the first result of the Management Revolution.
- 103 There are still a great many rich people around, of course, and they are still prominent in newspaper society pages.
- 104 But they have become “celebrities”; economically, they have almost ceased to matter.
- 105 Even on the business page all the attention is being paid to “hired hands,” that is, to managers.
- 106 And such talk of money as there is is about the “excessive salaries” and bonuses of these hired hands who themselves own little or nothing. ...
- 107 Instead of the old-line capitalist, in developed countries

pension funds increasingly control the supply and allocation of money.

108 In the United States, these funds in 1992 owned half of the share capital of the country's large businesses and held almost as much of these companies' fixed debts.

109 The beneficiary owners of the pension funds are, of course, the country's employees.

110 If Socialism is defined, as Marx defined it, as ownership of the means of production by the employees, then the United States has become the most "socialist" country around—while still remaining the most "capitalist" one as well.

111 Pension funds are run by a new breed of capitalists: the faceless, anonymous, salaried employees, the pension funds' investment analysts and portfolio managers. ...

112 But equally important: the **real, controlling resource and the absolutely decisive "factor of production" is now neither capital nor land nor labor.**

113 **It is knowledge.**

114 Instead of capitalists and proletarians, the classes of the post-capitalist society are **knowledge workers** and **service workers.**

115 _____

116 ¹ The best account of this shift, though it is limited to manufacturing in the United States, is Alfred D. Chandler's *The Visible Hand* (Cambridge, Mass.: Harvard University Press, 1977)

117 ***The Shift to the Knowledge Society***

118 The move to the post-capitalist society began shortly after World War II.

119 I first wrote of the "employee society" even before 1950.*¹

120 Ten years later, around 1960, I coined the terms "knowledge work" and "knowledge worker."

121 And my *The Age of Discontinuity* (1969) first talked of the "society of organizations."

122 *Post-Capitalist Society* is thus based on work done over forty years.

123 Most of its policy and action recommendations have been successfully tested. ...

124 _____

125 ¹ * See for example, *The New Society* (1949).

126 Only with the collapse of Marxism as an ideology and of Communism as a system,^{†1} however, did it become completely clear that we have already moved into a **new and different society**. Only then did a book like this become possible: a book that is not prediction but description, a book that is not *futuristic* but **a call to action here and now**. ...

127 The bankruptcy—moral, political, economic—of Marxism and the collapse of the Communist regimes were not “The End of History” (as a widely publicized 1989 article proclaimed).^{Δ2}

128 Even the staunchest believers in the free market surely hesitate to hail its triumph as the Second Coming.

129 But the events of 1989 and 1990 were more than just the end of an era; they signified the end of *one kind of history*.

130 The collapse of Marxism and of Communism brought to a close two hundred and fifty years that were dominated by a secular religion—I have called it *the belief in salvation by society*.

131 The first prophet of this secular religion was Jean-Jacques Rousseau (1712-1778).

132 The Marxist Utopia was its ultimate distillation—and its apotheosis. ...

133

134 ¹ † Both anticipated in *The New Realities*, written in 1986-7, several years ahead of the actual events.

135 ² Δ Francis Fukayama’s “The End of History,” *The National Interest* (Summer 1989).).

136 The **same forces** which destroyed Marxism as an ideology and Communism as a social system are, however, also making Capitalism obsolescent.

137 For two hundred and fifty years, from the second half of the eighteenth century on, Capitalism was the dominant social reality.

138 For the last hundred years, Marxism was the dominant social ideology.

139 Both are rapidly being superseded by a new and very different society. ...

- 140 The new society—and it is already here—is a post-capitalist society.
- 141 This new society surely, to say it again, will use the **free market as the one proven mechanism of economic integration**.
- 142 It will not be an “anti-capitalist society.”
- 143 It will not even be a “non-capitalist society”; the institutions of Capitalism will survive, although some, such as banks, may play quite different roles.
- 144 **But the center of gravity in the post-capitalist society—its structure, its social and economic dynamics, its social classes, and its social problems—is different from the one that dominated the last two hundred and fifty years and defined the issues around which political parties, social groups, social value systems, and personal and political commitments crystallized. ...**
- 145 The basic economic resource—“the means of production,” to use the economist’s term—is no longer capital, nor natural resources (the economist’s “land”), nor “labor.”
- 146 **It is and will be knowledge.**
- 147 The central wealth-creating activities will be neither the allocation of capital to productive uses, nor “labor”—the two poles of nineteenth- and twentieth-century economic theory, whether classical, Marxist, Keynesian, or neo-classical.
- 148 Value is now created by “productivity” and “innovation,” both applications of knowledge to work.
- 149 The leading social groups of the knowledge society will be “knowledge workers”—**knowledge executives** who know how to allocate knowledge to productive use just as the capitalists knew how to allocate capital to productive use; knowledge professionals; knowledge employees.
- 150 Practically all these knowledge people will be employed in organizations.
- 151 Yet, unlike the employees under Capitalism, they will own both the “means of production” and the “tools of production”—the former through their pension funds, which are rapidly emerging in all developed countries as the only real owners; the latter because knowledge workers own their knowledge and can take it with them wherever they go.
- 152 The *economic* challenge of the post-capitalist society will therefore be the productivity of knowledge work and the knowledge worker. ...

153 The *social* challenge of the post-capitalist society will, however, be the **dignity of the second class in post-capitalist society: the service workers**.

154 Service workers, as a rule, lack the necessary education to be knowledge workers.

155 And in every country, even the most highly advanced one, they will constitute a majority. ...

156 The post-capitalist society will be divided by a new dichotomy of values and of aesthetic perceptions.

157 It will not be the “Two Cultures”—literary and scientific—of which the English novelist, scientist, and government administrator C. P. Snow wrote in his *The Two Cultures and the Scientific Revolution* (1959), though that split is real enough.

158 The dichotomy will be between “**intellectuals**” and “**managers**,” the former concerned with words and ideas, the latter with people and work.

159 **To transcend this dichotomy in a new synthesis will be a central philosophical and educational challenge for the post-capitalist society.**

160 ***Outflanking the Nation-State***

161 The late 1980s and early 1990s also marked the end of another era, another “kind of history.”

162 If the fall of the Berlin Wall in 1989 was the climactic event that symbolized the fall of Marxism and Communism, **the transnational coalition** against Iraq’s invasion of Kuwait in 1990 was the climactic event that marked the end of four hundred years of history in which the sovereign nation-state was the main, and often the only, actor on the political stage. ...

163 Future historians will surely rank February 1991 among the “big dates.”

164 There is no precedent for such transnational action.

165 At no earlier occasion did nations—without a single dissenter of consequence (and almost without dissent altogether)—set the common interest of the world community in putting down terrorism ahead of their own national sentiments, and, in many cases, ahead even of their own national interest.

166 There is no precedent for the all but universal realization that **terrorism** is not a matter of “politics” to be left to

individual national governments, but requires transnational action.

167 It is widely believed, especially among so-called liberals in the United States, that the 1991 war against Iraq was mounted to protect the West's oil supply.

168 Nothing could be further from the truth.

169 Iraqi control of the oil wells of Kuwait—and those of Saudi Arabia as well—would have been very much in the West's economic interest; it would have meant much cheaper oil.

170 For while Kuwait and Saudi Arabia have practically no native population and therefore no urgent need for immediate petroleum income, Iraq is heavily overpopulated, and, except for petroleum, almost totally without natural resources.

171 It therefore needs to sell as much oil as it possibly can, whereas Kuwait and Saudi Arabia are primarily interested in keeping oil prices high, which means keeping production low. ...

172 This, by the way, explains why the United States heavily supported Saddam Hussein's regime in Iraq, even before the Iran-Iraq War, and why it continued to do so until the very moment when Saddam attacked Kuwait and thus indulged in an overt terrorist act.

173 It also explains, I suspect, why Saddam miscalculated; he must have been convinced that the United States would let him get away with flagrant aggression in order to ensure low petroleum prices.

174 And everyone I spoke to in one major petroleum company was sure when Iraq invaded Kuwait that the U.S. government would not do anything but make a few disapproving noises.

175 In the four hundred years since the French lawyer-politician Jean Bodin (1530-1596) invented it (in his *Six Livres de la République*, published in 1576), the nation-state became the sole organ of political power, both internally and externally.

176 And during the past two hundred years, since the French Revolution, it has also become the carrier of the secular religion, the belief in salvation by society.

177 In fact, totalitarianism—Communist as well as Nazi—was the ultimate distillation and apotheosis of the doctrine of the sovereign nation-state as the one and only organ of power. ...

178 Political theory and constitutional law still know only the sovereign state.

179 And in the last hundred years this state has steadily become more powerful and more dominant, mutating into a "megastate."

180 It is the one political structure we so far understand, are familiar with, and know how to build out of prefabricated and standardized parts: an executive, a legislature courts, a diplomatic service, national armies, and so on.

181 Every one of the nearly 200 new countries that have been carved out of the former colonial empires since the end of World War II has been set up as a sovereign nation-state.

182 And this is what every one of the various parts of the last of the colonial empires, the Soviet Empire, aspires to become. ...

183 And yet for forty years, since the end of World War II, the sovereign nation-state has steadily been losing its position as the sole organ of power.

184 Internally, developed countries are fast becoming pluralist societies of organizations.

185 Externally, some governmental functions are becoming transnational, others regional, in the European Community, for example; and others are being tribalized. ...

186 The nation-state is not going to wither away.

187 It may remain the most powerful political organ around for a long time to come, but it will no longer be the indispensable one.

188 Increasingly, it will share power with other organs, other institutions, other policy-makers.

189 What is to remain the domain of the nation-state?

190 What is to be carried out within the state by autonomous institutions?

191 How do we define "supranational" and "transnational"?

192 What should remain "separate and local"? ...

193 These questions will be central political issues for decades to come.

194 In its specifics, the outcome is quite unpredictable.

195 But the political order will look different from the political

order of the last four centuries, in which the players differed in size, wealth, constitutional arrangements, and political creed, yet were uniform as nation-states—each sovereign within its territory and each defined by its territory.

- 196 We are moving—we have indeed already moved—into *post-capitalist polity*. ...
- 197 The last of what might be called the “pre-modern” philosophers, Gottfried Leibniz (1646-1716), spent much of his life in a futile attempt to restore the unity of Christendom.
- 198 His motivation was not the fear of religious wars between Catholics and Protestants or between different Protestant sects; that **danger had already passed** when Leibniz was born.
- 199 He feared that **without a common belief in a supernatural God, secular religions would emerge**.
- 200 And a secular religion, he was convinced, would, **almost by definition, have to be a tyranny and suppress the freedom of the person**. ...
- 201 A century later, Jean-Jacques Rousseau confirmed Leibniz’s fears.
- 202 Rousseau asserted that **society** could and should control the individual human being.
- 203 It could and should create a “New Adam.”
- 204 It could and should create universal human perfection.
- 205 But it also could and should subordinate the individual to the impersonal, super-personal *volonté générale* (the general will)—what Marxists later came to call the “objective laws of history.”
- 206 Since the French Revolution, **salvation by society** has gradually evolved into the dominant creed—first in the West, then later (since the start of World War II) worldwide.
- 207 However much it pretends to be “anti-religious,” this is a religious faith.
- 208 The means are, of course, non-spiritual: banning liquor; killing all Jews; psychoanalysis for everybody; abolition of private property.
- 209 The goal however, is religious: to establish the Kingdom of God on Earth by creating the “New Man.” ...

- 210 For more than a hundred years, the most powerful and the most pervasive secular creed promising salvation through society was Marxism.
- 211 The religious promise of Marxism, far more than its convoluted ideology and its increasingly unrealistic economics, constituted its tremendous appeal, especially to intellectuals.
- 212 There were many reasons, for instance, for Eastern Jews to accept an ideology that promised an end to discrimination and persecution against them in Romania or the Russia of the tsars.
- 213 But the most powerful appeal for them was Marxism's promise of an earthly paradise, that is, Marxism's **appeal as a secular religion.** ...
- 214 Communism collapsed as an economic system.
- 215 Instead of creating wealth, it created **misery.**
- 216 Instead of creating economic equality, it created a *nomenklatura* of functionaries enjoying unprecedented economic privileges.
- 217 But as a creed, Marxism collapsed because it did not succeed in creating the "New Man."
- 218 Instead, it brought out and strengthened all the worst in the "Old Adam": corruption, greed, and lust for power; envy and mutual distrust; petty tyranny and secretiveness; lying, stealing, denunciation, and, above all, cynicism.
- 219 Communism, the system had its heroes.
- 220 But Marxism, the creed, did not have a single saint. ...
- 221 **The human being may well be beyond redemption.**
- 222 The Latin poet may have been right: **human nature** always sneaks in through the back door, no matter how many times the pitchfork tosses it out the front.
- 223 Maybe the cynics are right in asserting that there is no virtue, no goodness, no selflessness, only self-interest and hypocrisy (although there are enough witnesses to the contrary, as I remind myself in my darkest hours). ...
- 224 But surely the collapse of Marxism as a creed signifies the end of the belief in salvation by society.
- 225 What will emerge next, we cannot know; we can only **hope and pray.**

226 Perhaps nothing beyond stoic resignation?

227 Perhaps a rebirth of traditional religion, addressing itself to the **needs and challenges of the person in the knowledge society?**

228 The explosive growth of what I call “pastoral” Christian churches in America—Protestant, Catholic, nondenominational—might be a portent.

229 But so might the resurgence of fundamentalist Islam.

230 For the young people in the Muslim world who now so fervently embrace Islamic fundamentalism would, forty years ago, have been equally fervent Marxists.

231 Or will there be new religions?*

232 Still, redemption, self-renewal, spiritual growth, goodness, and virtue—the “New Man,” to use the traditional term—are likely to be seen again as **existential** rather than social goals or political prescriptions.

233 The end of the belief in salvation by society surely marks an inward turning.

234 It makes possible renewed emphasis on the individual, the person.

235 It may even lead—at least we can so hope—to a return to individual responsibility.

236

237 * What is unlikely is easier to forecast than what is likely. We will not, for example, see the rejection of material values and of technology, that “return to the Middle Ages” which a Japanese writer, Taichi Sakaya, predicted in a best-seller of the mid-1980s (published in English in 1991 by Kodansha International under the title *The Knowledge-Value Revolution*). The worldwide spread of information and of technology is certain to make this impossible.

238 ***The Third World***

239 This book focuses on the developed countries: on Europe, the United States, and Canada, on Japan and the newly developed countries on the mainland of Asia, rather than on the developing countries of the “Third World.” ...

240 This is not because I consider the less developed nations unimportant or even less important.

241 That would be folly.

242 Two thirds of the world’s population live, after all, in the Third World; and by the time the present period of

transition comes to an end (around 2010 or 2020), the Third World will house three quarters.

243 But I also consider it highly probable that within the next decade or two there will be new and startling “economic miracles,” in which poor, backward Third World countries transform themselves, virtually overnight, into fast-growth economic powers.

244 It is even possible that there will be far more such transformations than there have been in the last forty years, since we first began to talk about “economic development.” ...

245 All the elements for rapid economic growth are present in the coastal, urbanized areas of Mainland China—from Tianjin (Tientsin) in the north to Canton in the south.

246 They have a huge domestic market; a highly educated population with tremendous respect for learning; an ancient entrepreneurial tradition; and close ties to the “Overseas Chinese” in Singapore, Hong Kong, and Taiwan, with access to their capital, their trading networks, and their knowledgeable people.

247 All this might be released in an explosion of entrepreneurial growth if Beijing’s political and economic tyranny could be peacefully removed.

248 Similarly, Latin America’s larger countries offer an adequate domestic market.

249 Mexico may already be in the “takeoff” stage.

250 And Brazil might surprise everybody by the speed of its turnaround once it musters the political courage to follow Mexico’s recent example and abandon the failed, indeed suicidal, policies into which it plunged after 1970.

251 No one can possibly foretell what surprises the former Communist countries of Eastern Europe might produce. ...

252 But the developed countries also have a tremendous stake in the Third World.

253 Unless there is rapid development there—both economic and social—the developed countries will be inundated by a human flood of Third World immigrants far beyond their economic, social, or cultural capacity to absorb. ...

254 **But the forces that are creating post-capitalist society and post-capitalist polity originate in the developed world.**

255 They are the product and result of its development.
256 Answers to the challenges of post-capitalist society and
post-capitalist polity will not be found in the Third World.
257 If anything has been totally disproven, it is the promises of
the Third World leaders of the fifties and sixties—Nehru in
India, Mao in China, Castro in Cuba, Tito in Yugoslavia, the
apostles of “*Négritude*” in Africa, or Neo-Marxists like Che
Guevara.
258 They promised that the Third World would find new and
different answers, and would, in fact, create a new order.
259 The Third World has not delivered on these promises
made in its name.
260 The challenges, the opportunities, the problems of post-
capitalist society and post-capitalist polity can only be
dealt with where they originated.
261 And that is in the developed world.

262 ***Society, Polity, Knowledge***

263 *[Society, Polity, Knowledge are the parts
of this book]*

264 This book covers a wide range.
265 It deals with post-capitalist society; with post-capitalist
polity; and with new challenges to knowledge itself.
266 Yet it leaves out much more than it attempts to cover.
267 It is not a history of the future.
268 Rather, **it is a look at the present.** ...

269 The areas of discussion—Society, Polity, Knowledge—are
not arrayed in order of importance.

270 That would have put first the short discussion of the
educated person which concludes this work.

271 **The three areas are arrayed in order of predictability.** ...

272 With respect to the post-capitalist society, we know what
has happened and why, we know what is going to happen
and why—at least in outline—and a good deal is already
happening. ...

273 With respect to the post-capitalist polity, we have only

- programs so far.
- 274 How the needed changes will be brought about is still conjecture.
- 275 But we know what has happened and why; we can specify what needs to happen and why. ...
- 276 With respect to the knowledge challenges, however, we can only ask questions—and hope that they are the right questions. ...
- 277 I am often asked whether I am an optimist or a pessimist.
- 278 **For any survivor of this century to be an optimist would be fatuous.**
- 279 We surely are nowhere near the end of the turbulences, the transformations, the sudden upsets, which have made this century one of the meanest, cruelest, bloodiest in human history.
- 280 Anyone who deludes him- or herself that we are anywhere near the “end of history” is in for unpleasant surprises—the kind of surprises that afflicted America’s President George Bush when he first bet on the survival of the Soviet Empire under Michail Gorbachev, and then on the success of Boris Yeltsin’s “Commonwealth of ex-Russian Nations.” ...
- 281 **Nothing “post” is permanent or even long-lived.**
- 282 Ours is a transition period.
- 283 What the future society will look like, let alone whether it will indeed be the “knowledge society” some of us dare hope for, **depends on how the developed countries respond to the challenges of this transition period**, the post-capitalist period—their intellectual leaders, their business leaders, their political leaders, but above all each of us in our own work and life.
- 284 Yet surely this is a time to **make the future**—precisely because everything is in flux.
- 285 This is a time for action.

286 From Capitalism to Knowledge Society

287 WITHIN ONE HUNDRED FIFTY YEARS, from 1750 to
1900, capitalism and technology conquered the globe
and created a world civilization.

288 Neither capitalism nor technical innovations were new;
both had been common, recurrent phenomena
throughout the ages, in West and East alike.

289 What was brand new was their **speed of diffusion and
their global reach across cultures, classes, and geography.**

290 And it was this speed and scope that converted capitalism
into "Capitalism" and into a "system," and technical
advances into the "Industrial Revolution." ...

291 **This transformation was driven by a radical change in the
meaning of knowledge.**

292 In both West and East, knowledge had always been seen
as applying to being.

293 Then, almost overnight, it came to be **applied to doing.**

294 It became a resource and a utility.

295 Knowledge had always been a private good.

296 Almost overnight it became a public good. ...

297 For a hundred years—during the first phase—**knowledge
was applied to tools, processes, products.**

298 This created the Industrial Revolution.

299 But it also created what Karl Marx (1818-1883) called
"alienation," new classes and class war, and with them
Communism.

300 In its second phase, beginning around 1880 and
culminating around the end of World War II, **knowledge in
its new meaning came to be applied to work.**

301 This ushered in the Productivity Revolution, which in
seventy-five years converted the proletariat into a
middle-class bourgeois with near-upper-class income.

302 The Productivity Revolution thus defeated class war and
Communism. ...

303 The last phase began after World War II.

304 Today, **knowledge is being applied to knowledge itself.**

305 This is the Management Revolution.

306 Knowledge is now fast becoming the sole factor of production, sidelining both capital and labor.

307 It may be premature (and certainly would be presumptuous) to call ours a “knowledge society”; so far, we have only a knowledge economy.

308 But our society is surely “post-capitalist.” ...

309 Capitalism, in one form or another, has occurred and reoccurred many times throughout the ages, in the East as well as in the West .

310 And there have been numerous earlier periods of rapid technical invention and innovation—again in the East as well as the West—many of them producing technical changes fully as radical as any in the late eighteenth or early nineteenth centuries. *¹

311 **What is unprecedented and unique about the developments of the last two hundred fifty years is their speed and scope.**

312 Instead of being one element in society, as all earlier capitalism had been, Capitalism—with a capital C—became society.

313 Instead of being confined, as always before, to a narrow locality, Capitalism—again with a capital C—took over all of Western and Northern Europe in a mere one hundred years, from 1750 to 1850.

314 Then, within another fifty years, it took over the entire inhabited world. ...

315 All earlier capitalism had been confined to small, narrow groups in society.

316 Nobles, landowners, the military, peasants, professionals, craftsmen, even laborers, were almost untouched by it.

317 Capitalism with a capital C soon permeated and transformed all groups in society wherever it spread. ...

318 From earliest times in the Old World, new tools, new processes, new materials, new crops, new techniques—what we now call “technology”—diffused swiftly. ...

- 319 Few modern inventions, for instance, spread as fast as a thirteenth-century one: eyeglasses.
- 320 Derived from the optical experiments of an English Franciscan friar, Roger Bacon (d.1292 or 1294), around 1270, reading glasses for the elderly were in use at the papal court of 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.
- 321 Only the sewing machine and the telephone, fastest-spreading of all nineteenth-century inventions, moved as swiftly. ...
- 322 But earlier technological change almost without exception remained confined to one craft or one application.
- 323 It took another two hundred years-until the early 1500s-before Bacon's invention had its second application: eyeglasses to correct nearsightedness.
- 324 The potter's wheel was in full use in the Mediterranean by 1500 B.C.; pots for cooking, and for storing water and food, were available in every household.
- 325 Yet the principle underlying the potter's wheel was not applied until A.D. 1000 to women's work: spinning. ...
- 326 Similarly, the redesign of the windmill around the year 800, which converted it from the toy it had been in antiquity into a true machine (and a fully "automated" one at that), was not applied to ships for more than three hundred years, after 1100.
- 327 Until then, ships used oars; if wind was used at all to propel them, it was as an auxiliary power, and then only if it blew in the right direction.
- 328 The sail that drives a ship works exactly the same way as the sail that drives the windmill, and the need for a sail that would enable a ship to sail cross-wind and against the wind had been known for a long time.
- 329 The windmill was redesigned in Northern France or in the Low Countries, both regions thoroughly familiar with ships and navigation.
- 330 Yet it did not occur to anyone for several hundred years to apply something invented to pump water and to grind corn-for use on land-to use offshore. ...

331 The inventions of the Industrial Revolution, however, were immediately applied across the board, and across all conceivable crafts and industries.

332 They were immediately seen as *technology*.

333 James Watt's (1736-1819) redesign of the steam engine between 1765 and 1776 made it into a cost-effective provider of power.

334 Watt himself throughout his own productive life focused on one use only: to pump water out of a mine—the use for which the steam engine had first been designed by Thomas Newcomen in the early years of the eighteenth century.

335 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 bid for the second engine Watt had built.

336 And Watt's partner, Matthew Boulton (1728-1809), right away promoted the steam engine as a provider of power for all kinds of industrial processes, especially the largest of all manufacturing industries, textiles.

337 Thirty-five years later an American, Robert Fulton (1765-1815), floated the first steamship on New York's Hudson River.

338 Another twenty years later the steam engine was put on wheels and the locomotive was born.

339 And by 1840—or at the very latest 1850—the steam engine had transformed every single manufacturing process from glassmaking to printing.

340 It had transformed long-distance transportation on land and sea, and it was beginning to transform farming.

341 By then, it had penetrated almost the entire world—Tibet, Nepal, and the interior of tropical Africa being the sole exceptions.

342 The nineteenth century believed—and most people 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.

343 But this belief, too, is invalid.

344 Between 700 and 1100 A.D. , two brand-new classes were created in Europe by technological change: those of the feudal knight and the urban craftsman.

345 The knight was created by the invention of the stirrup—an invention that arose in Central Asia around the year 700; the craftsman by the redesign of water wheel and windmill into true machines which, for the first time, used

inanimate forces (water and wind) as motive power rather than human muscle. ...

346 The stirrup made it possible to fight on horseback; without it, a rider wielding lance, sword, or heavy bow would immediately have been thrown off his horse by the force of Newton's Second Law: "To every action there is an equal and opposite reaction."

347 For several hundred years, the knight remained an invincible "fighting machine."

348 But this machine had to be supported by a "military-agricultural complex"—something quite new in history.

349 Germans until this century called it a *Rittergut*, a knight's estate, endowed with legal status and economic and political privileges, and containing at least fifty peasant families or some two hundred people to produce the food needed to support the fighting machine: the knight, his squire, his three horses, and his twelve to fifteen grooms.

350 The stirrup, in other words, created feudalism. ...

351 The craftsman of antiquity had been a slave.

352 The craftsman of the first "machine age," the craftsman of Europe's Middle Ages, became the urban ruling class, the "burgher," who then created Europe's unique city, and both the Gothic and the Renaissance styles that followed.
...

353 The technical innovations—stirrup, water wheel, and windmill—traveled throughout the entire Old World, and fast.

354 But the classes of the earlier industrial revolution remained European phenomena on the whole.

355 Only in Japan, around 1100 A.D., did proud and independent craftsmen evolve, who enjoyed high esteem and, until 1600, considerable power.

356 But while the Japanese adopted the stirrup for riding, they continued to fight on foot.

357 The rulers in rural Japan were the commanders of foot soldiers—the *daimyo*.

358 They levied taxes on the peasantry but had no feudal estates.

359 In China, in India, in the world of Islam, the new

technologies had no social impact whatever.

360 Craftsmen in China remained serfs without social status.

361 The military did not become landowners but remained, as
in Europe's antiquity, professional mercenaries.

362 Even in Europe, the social changes generated by this early
industrial revolution took almost four hundred years to
take full effect. ...

363 By contrast, the social transformation of society brought
about by Capitalism and Industrial Revolution took less
than a hundred years to become fully effective in Western
Europe.

364 In 1750, capitalists and proletarians were still marginal
groups; in fact, proletarians in the nineteenth-century
meaning of the term, that is, factory workers, hardly
existed at all.

365 By 1850, capitalists and proletarians were the dynamic
classes of Western Europe, and were on the offensive.

366 They rapidly became the dominant classes wherever
capitalism and modern technology penetrated.

367 In Japan, the transformation took less than thirty years,
from the Meiji Restoration in 1867 to the war with China in
1894.

368 It took not much longer in Shanghai and Hong Kong,
Calcutta and Bombay, or in the tsars' Russia. ...

369 Capitalism and the Industrial Revolution—because of their
speed and their scope—created a world civilization. *₂

370

371 ¹ The best discussion of capitalism as a recurrent and fairly
frequent phenomenon can be found in two works by the
great French economic historian Fernand Braudel: *The
Mediterranean* (2 vols., first published in France in 1949
English translation, New York: Harper & Row, 1972); and
Civilization and Capitalism (3 vols., first published in
France in 1979; English translation, New York: Harper &
Row, 1981). The best discussions of earlier "industrial
revolutions" are *Medieval Technology and Social Change*,
by Lynn White, Jr. (Oxford University Press, 1962); *The
Medieval Machine: The Industrial Revolution of the Middle
Ages*, by Jean Gimpel (first published in France in 1975;
English translation, New York: Holt, Rinehart & Winston,
1976); and the monumental *Science and Civilization in
China* by the British biochemist, orientalist, and historian
Joseph Needham (Cambridge University Press),

publication of which began in 1954 with half of the planned twenty-five parts yet to appear. What Needham has published so far has already completely changed our knowledge of early technology. For earlier "industrial revolutions" see also my *Technology, Management and Society* (1973), especially Chapters 3, 7, and 11.

372 ² The best history of this development is *Prometheus Unbound*, by the Harvard historian David S. Landes (Cambridge University Press, 1969).

373

374 ***The New Meaning Of Knowledge***

375 Unlike those "terrible simplifiers," the nineteenth-century ideologues such as Hegel and Marx, we now know that major historical events rarely have just one cause and just one explanation.

376 They typically result from the convergence of a good many separate and independent developments. ...

377 One example of how history works is the genesis of the computer.

378 Its earliest root is the binary system, the realization of a seventeenth-century mathematician-philosopher, the German Gottfried Leibniz, that all numbers can be represented by just two: 0 and 1.

379 The second root is the discovery of a nineteenth century English inventor, Charles Babbage (1792-1871), that toothed wheels, that is, mechanics, could represent the entire decimal system and do all four elementary arithmetic functions: addition, subtraction, multiplication, and division—a genuine "computing machine."

380 Then in the early years of this century, two English logicians, Alfred North Whitehead and Bertrand Russell, in their *Principia Mathematica* showed that any concept, if presented in rigorously logical form, can be expressed mathematically.

381 From this: discovery an Austro-American, Otto Neurath, working as statistician for the U.S. War Production Board of World War I, derived the idea, then brand new and heretical, that all information from any area is exactly the same when quantified, and can be treated and presented the same way (the idea, by the way, that also underlies modern statistics).

382 A little earlier, just before World War I, an American, Lee De Forest, had invented the audion tube to convert electronic impulses into sound waves, thus making possible the broadcasting of speech and music.

- 383 Twenty years later it occurred to engineers working at a medium-sized punch-card manufacturer, called IBM, that the audion tube could be used to switch electronically from 0 to 1 and back again. ...
- 384 If any of these elements had been missing, there would have been no computer.
- 385 No one can say which of these was the essential element.
- 386 With all of them in place, however, the computer became virtually inevitable.
- 387 It was then pure accident that it became an American development—the accident of World War II, which made the American military willing to spend enormous sums on developing (quite unsuccessfully until well after World War II) machines to calculate at high speed the position of fast-moving aircraft overhead and of fast-moving enemy ships.
- 388 Otherwise the computer would probably have become a British development.
- 389 Indeed, an English company, the food producer and restaurant owner J. Lyons & Co., actually developed the first computer for commercial purposes that really worked, the “Leo,” in the 1940s.
- 390 Lyons just couldn’t raise the money to compete with the Pentagon, and had to abandon its successful (and much cheaper) machine. ...
- 391 Many separate developments—most of them probably quite unconnected with each other—went into turning capitalism into Capitalism and technical advance into the Industrial Revolution.
- 392 The best-known theory—that Capitalism was the child of the “Protestant Ethic”—was expounded in the opening years of this century by the German sociologist Max Weber(1864-1920).
- 393 It has now been largely discredited; there just is not enough evidence for it.
- 394 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 had to cede control to the capitalist. ...

395 There is one critical element, however, without which well
known phenomena—capitalism and technical advance—
could not possibly have turned into a social and
worldwide pandemic.

396 That is the radical change in the meaning of knowledge
that occurred in Europe around the year 1700, or shortly
thereafter.

397 (This change is explored in some depth in my 1961 essay,
“The Technological Revolution; Notes on the Relationship
of Technology, Science and Culture,” reprinted in
Technology, Management and Society (1972), and in my
The Ecological Vision (New Brunswick, N.J. : Transaction
Publishers, 1992). ..

398 There are as many theories as to what we can know and
how we know it as there have been metaphysicians, from
Plato in 400 B.C. to Ludwig Wittgenstein (1889-1951) and
Karl Popper (b. 1902) in our own day.

399 But since Plato’s time there have only been two theories in
the West—and since around the same time, two theories in
the East—regarding the meaning and function of
knowledge.

400 Plato’s spokesman, the wise Socrates, holds that the sole
function of knowledge is self-knowledge: the intellectual,
moral, and spiritual growth of the person.

401 His ablest opponent, the brilliant and learned Protagoras,
holds 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.

402 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.”

403 In the East, there were pretty much the same two theories
of knowledge.

404 Knowledge for the Confucian meant knowing what to say
and how to say it as the route to advancement and earthly
success.

405 Knowledge for the Taoist and the Zen monk meant self-
knowledge, and the road to enlightenment and wisdom.

406 But while the two sides thus sharply disagreed about what
knowledge actually meant, they were in total agreement
as to what it did not mean.

407 It did not mean ability to do.

408 It did not mean utility.

409 Utility was not knowledge; it was skill—the Greek word is technē. ...

410 Unlike their Far Eastern contemporaries, the Chinese Confucians with their infinite contempt for anything but book learning, both Socrates and Protagoras respected technē.

411 (In fact, in the West contempt for skill was unknown until England's eighteenth-century "gentleman."

412 This contempt which reached such heights in Victorian England was surely little but a futile last-ditch defense against the gentleman's being replaced as society's ruling group by capitalist and technologist.) ...

413 But even to Socrates and Protagoras, technē, however commendable, was not knowledge.

414 It was confined to one specific application and had no general principles.

415 What the shipmaster knew about navigating from Greece to Sicily could not be applied to anything else.

416 Furthermore, the only way to learn a technē was through apprenticeship and experience.

417 A technē could not be explained in words, whether spoken or written; it could only be demonstrated.

418 As late as 1700, or even later, the English did not speak of "crafts."

419 They spoke of "mysteries"—not just 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 thus learned by example.

420

421 ***The Industrial Revolution***

422 But then, beginning after 1700—and within an incredibly short fifty years—technology was invented.

423 The very word is a manifesto in that it combines "technē," that is, the mystery of a craft skill, with "logy," organized, systematic, purposeful knowledge.

424 The first engineering school, the French Ecole des Ponts et Chaussees, was founded in 1747, followed around 1770 by the first School of Agriculture and in 1776 by the first School of Mining, both in Germany.

- 425 In 1794, the first technical university, the French Ecole Polytechnique, was founded, and with it, the profession of engineer.
- 426 Shortly thereafter, between 1820 and 1850, medical education and medical practice were reorganized as a systematic technology. ...
- 427 In a parallel development, Great Britain between 1750 and 1800 shifted from patents as monopolies to enrich royal favorites to patents granted to encourage the application of knowledge to tools, products, and processes, and in order to reward inventors, provided they published their inventions.
- 428 This not only triggered a century of feverish mechanical invention in Britain; it put an end to craft mystery and secretiveness. ...
- 429 The great document of this dramatic shift from skill to technology—one of the most important books in history—was the Encyclopedie, edited between 1751 and 1772 by Denis Diderot (1713- 1784) and Jean d’Alembert (1717-1783).
- 430 This famous work attempted to bring together in organized and systematic form the knowledge of all crafts, in such a way that the nonapprentice could learn to be a “technologist.”
- 431 It was by no means accidental that articles in the Encyclopedie that describe an individual craft, such as spinning or weaving, were not written by craftsmen.
- 432 They were written by “information specialists”: people trained as analysts, as mathematicians, as logicians—both Voltaire and Rousseau were contributors.
- 433 The underlying thesis of the Encyclopedie was that effective results in the material universe—in tools, processes, and product—are produced by systematic analysis, and by the systematic, purposeful application of knowledge. ...
- 434 But the Encyclopedie also preached that principles which produced results in one craft would produce results in any other.
- 435 That was anathema, however, to both the traditional man of knowledge and the traditional craftsman. ...

436 None of the technical schools of the eighteenth century aimed at producing new knowledge; nor did the Encyclopedie.

437 None even talked of the application of science to tools, processes, and products, that is, to technology.

438 This idea had to wait for another hundred years, until 1830 or so, when a German chemist, Justus von Liebig (1803-1873), applied science to invent, first, artificial fertilizers, and then a way to preserve animal protein: meat extract.

439 What the early technical schools and the Encyclopedie did do, however, was perhaps more important.

440 They brought together, codified, and published the technē, the craft mystery, as it had been developed over millennia.

441 They converted experience into knowledge, apprenticeship into textbook, secrecy into methodology, doing into applied knowledge.

442 These are the essentials of what we have come to call the "Industrial Revolution"—the transformation by technology of society and civilization worldwide. ...

443 It was this change in the meaning of knowledge which then made modern Capitalism inevitable and dominant.

444 Above all, the speed of technical change created demand for capital way beyond anything the craftsman could possibly supply.

445 The new technology also required concentration of production, that is, the shift to the factory.

446 Knowledge could not be applied in tens of thousands of small individual workshops and in the cottage industries of the rural village.

447 It required concentration of production under one roof. ...

448 The new technology also required large-scale energy, whether water power or steam power, which could not be decentralized.

449 But, though important, these energy needs were secondary.

450 The central point was that production almost overnight moved from being craft-based to being technology-based.

451 As a result, the capitalist moved almost overnight into the center of economy and society.

- 452 Before, he had always been “supporting cast.” ...
- 453 As late as 1750, large-scale enterprise was governmental rather than private.
- 454 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.
- 455 And the eighteenth-century “manufactories” such as the porcelain works of Meissen and Sevres were still government owned. ...
- 456 But by 1830, large-scale private capitalist enterprise dominated in the West.
- 457 Another fifty years later, by the time Marx died in 1883, private capitalist enterprise had penetrated everywhere except to such remote corners of the world as Tibet or the Empty Quarter of Arabia. ...
- 458 There was resistance, of course, both to technology and to capitalism.
- 459 There were riots—in England, for instance, or in German Silesia.
- 460 But these were local, lasted a few weeks or at most a few months, and did not even slow down the speed and spread of Capitalism. ...
- 461 The machine and the factory system spread equally fast and equally without meeting much resistance, if any. ...
- 462 Adam Smith’s *Wealth of Nations* appeared in the same year in which James Watt patented the perfected steam engine.
- 463 Yet the *Wealth of Nations* pays practically no attention to machines, factories, or industrial production.
- 464 The production it describes is still craft-based.
- 465 Even forty years later, after the—Napoleonic Wars, factories and machines were not yet seen as central by acute social observers.
- 466 They play practically no role in the economics of David

Ricardo (1772-1823).

- 467 Neither factory workers nor bankers can be found in the novels of Jane Austen, England's most perceptive social critic at the turn of the nineteenth century.
- 468 Her society (as has often been said) is thoroughly "bourgeois."
- 469 But it is still totally pre-industrial, a society of squires and tenants, parsons and naval officers, lawyers, craftsmen, and shopkeepers.
- 470 Only in faraway America did Alexander Hamilton see very early that machine-based manufacturing was fast becoming the central economic activity.
- 471 But few even among his followers paid much attention to his 1791 Report on Manufactures until long after his death in 1804. ...
- 472 By the 1830s, however, Honore de Balzac was turning out bestselling novel after bestselling novel depicting a capitalist France whose society was dominated by bankers and by the stock exchange.
- 473 Another fifteen years later, the factory system and the machine are central in the mature works of Charles Dickens, and so are the new classes, the capitalists and the proletarians.
- 474 In Bleak House (1852-53), the new society and its tensions form the subplot in the contrast between two able brothers, both sons of the squire's housekeeper.
- 475 One becomes a great industrialist in the North, who plans to get himself elected to Parliament to fight the landowners and break their power.
- 476 The other chooses to remain a loyal retainer of the broken, defeated, ineffectual (but precapitalist) "gentleman."
- 477 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. ...
- 478 The unheard-of speed with which society was transformed created the social tensions and conflicts of the new order.
- 479 We now know that there is no truth in the all but universal belief that factory workers in the early nineteenth century were worse off and were treated more harshly than they had been as landless laborers in the pre-industrial countryside.

480 They were badly off, no doubt, and harshly treated.

481 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.

482 They still experienced a much better "quality of life."

483 "England's green and pleasant land" which William Blake (1757-1827) in his famous poem *The New Jerusalem* hoped to liberate from the new "Satanic Mills," was in reality one vast rural slum.

484 (We should have known this all along, by the way.

485 In the factory town, infant mortality immediately went down and life expectancies immediately went up, thus triggering the enormous population growth of industrializing Europe.

486 But we also have the example of the Third World countries since World War II.

487 Brazilians and Peruvians stream into the favelas and barrios of Rio de Janeiro and Lima.

488 However hard, life there is better than in the impoverished Noreste of Brazil or on Peru's Altiplano.

489 Indians today say: "The poorest beggar in Bombay still eats better than the farm hand in the village.") ...

490 While industrialization, from the beginning, meant material improvement rather than Marx's famous "immiseration," the speed of change was so breathtaking as to be deeply traumatic.

491 The new class, the "proletarians," became "alienated," to use the term Marx coined.

492 Their alienation, he predicted, would make inevitable their exploitation.

493 For they were becoming totally dependent for their livelihood on access to the "means of production," which were owned and controlled by the capitalist.

494 This in turn—so Marx predicted—would increasingly concentrate ownership in fewer and bigger hands, and increasingly impoverish a powerless proletariat—until the day at which the system would collapse under its own weight, the few remaining capitalists overthrown by proletarians who "had nothing to lose but their chains." ...

495 We know now that Marx was a false prophet—the very opposite of what he predicted has in fact happened.

496 But this is hindsight.

497 Most of his contemporaries shared his view of capitalism,
even if they did not necessarily share his prediction of the
outcome.

498 Even anti-Marxists accepted Marx's analysis of the
"inherent contradictions of capitalism."

499 Some were confident that the military would keep the
proletarian rabble in check, as was apparently the
greatest of nineteenth-century capitalists, the American
banker J. P. Morgan (1837-1913).

500 Liberals of all stripes believed that somehow there could
be reform and amelioration.

501 But practically every thinking person of the late
nineteenth 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.

502 The greatest of nineteenth-century Conservatives,
Benjamin Disraeli (1804–1881), saw capitalist society very
much as Marx did.

503 So did his conservative counterpart on the Continent,
Otto von Bismarck (1815-1898); it motivated him, after
1880, to enact the social legislation that produced
ultimately the twentieth-century Welfare State.

504 One conservative social critic, the nineteenth-century
American novelist Henry James, chronicler of American
wealth and European aristocracy, was so obsessed by
class war and the fear of class war that he made it the
theme of his most haunting novel, *The Princess
Casamassima*.

505 He was writing it in 1883, the very year of Marx's death.

506

507 ***The Productivity Revolution***

508 What, then, defeated Marx and Marxism?

509 By 1950, a good many of us already knew that Marxism
had failed both morally and economically.

510 (I had said so already in 1939 in my book *The End of
Economic Man*.)

511 But Marxism was still the one coherent ideology for most
of the world, and for most of the world it looked
invincible.

512 There were "anti-Marxists" galore, but, as yet, few
"nonMarxists," that is, people who thought that Marxism
had become irrelevant.

513 Even those bitterly opposed to Socialism were still

convinced that it was in the ascendant.”

514 (The father of Neo-Conservatism throughout the Western world, the Anglo-Austrian economist Friedrich von Hayek (1899-1992), argued in his *The Road to Serfdom* (1944) that Socialism would inevitably mean enslavement.

515 There was no such thing as “Democratic Socialism”; there was only “totalitarian socialism.”

516 But Hayek did not argue in 1944 that Marxism could not work.

517 On the contrary, he was very much afraid that it could and would work.

518 Yet his last book, *The Fatal Conceit* (University of Chicago Press, 1988), written forty years later, argues that Marxism could never have worked.

519 And by the time he published this book, almost everybody—especially in the Communist countries—had already come to the same conclusion.) ...

520 What, then, overcame the “inevitable contradictions of capitalism,” the “alienation” and “immiseration” of the laboring class, and with it the whole notion of the “proletarian”? ...

521 The answer is the Productivity Revolution.

522 When knowledge changed its meaning two hundred fifty years ago, it began to be applied to tools, processes, and products.

523 This is still what “technology” means to most people and what is being taught in engineering schools.

524 But two years before Marx’s death, the Productivity Revolution had already begun.

525 In 1881, an American, Frederick Winslow Taylor (1856-1915), first applied knowledge to the study of work, the analysis of work, and the engineering of work. ...

526 Work has been around as long as human beings.

527 All animals in fact have to work for their living.

528 And in the West, the dignity of work has been paid lip service to for a long time.

529 The second oldest Greek text, following the Homeric epics by only a hundred years or so, is a poem by Hesiod (fl.800 B.C. .) entitled *Works and Days*, which sings of the

work of the farmer.

530 One of the finest Roman poems is Virgil's (70-19 B.C.)
Georgics, a cycle of songs about the work of the farmer.

531 Although there is no such concern with work in the
Eastern literary tradition, the emperor of China once a
year touched a plow to celebrate rice planting. ...

532 But in both the West and the East, these were purely
symbolic gestures.

533 Neither Hesiod nor Virgil actually studied what a farmer
does.

534 Nor did anybody else throughout most of recorded
history.

535 (And there still is no history of work.

536 But then, despite all the philosophizing about knowledge,
there is no history of knowledge, either.

537 Both should become important areas of study within the
next decades or at least the next century.)

538 Work was beneath the attention of educated people, of
well-to-do people, of people of authority.

539 Work was what slaves did.

540 The only way a worker could produce more was by
working longer hours or by working harder.

541 Marx himself shared this belief with every other
nineteenth-century economist and engineer. ...

542 It was pure accident that F. W. Taylor, a well-to-do,
educated man, became a worker.

543 Poor eyesight forced him to give up going to Harvard and
instead to take a job in an iron foundry.

544 Being extremely gifted, Taylor very soon rose to be one of
the bosses.

545 And his metalworking inventions made him a rich man
very early.

546 What got Taylor to start 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 nineteenth century.

547 Taylor, in other words, saw what Marx saw—and Disraeli
and Bismarck and Henry James.

548 But he also saw what they failed to see: that the conflict
was unnecessary.

- 549 He set out to make workers productive so that they would earn decent money. ...
- 550 Taylor's motivation was not efficiency.
- 551 It was not the creation of profits for the owners.
- 552 To his very death, he maintained that the major beneficiary of the fruits of productivity had to be the worker, not the owner.
- 553 His main motivation was the creation of a society in which owners and workers, capitalists and proletarians could share a common interest in productivity and could build a harmonious relationship on the application of knowledge to work.
- 554 The people who have come closest to understanding this so far are Japan's post-World War II employers and Japan's post-World War II union leaders. ...
- 555 Few figures in intellectual history have had greater impact than Taylor—and few have been so willfully misunderstood or so assiduously misquoted.
- 556 (In fact, no factually reliable biography was published until 1991, when *Frederick W Taylor: Myth and Reality* by Charles D. Wrege and Ronald J. Greenwood appeared (Homewood, 111.: Irwin).
- 557 In part, Taylor has suffered because history has proven him right and the intellectuals wrong.
- 558 In part, he is ignored because contempt for work still lingers, above all among the intellectuals.
- 559 Surely shoveling sand (the most publicized of Taylor's analyzes) is not something an "educated man" would appreciate, let alone consider important. ...
- 560 In much larger part, however, Taylor's reputation has suffered precisely because he applied knowledge to the study of work.
- 561 This was anathema to the labor unions of his day; and they mounted against Taylor one of the most vicious campaigns of character assassination in American history. ...
- 562 Taylor's crime, in the eyes of the unions, was his assertion that there is no "skilled work."

563 In manual operations, there is only "work."
564 According to Taylor's system of "Scientific Management,"
all work can be analyzed the same way.
565 Any worker who is then 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. ...

566 But the unions that were respected and powerful in
Taylor's America were the unions in the government-
owned arsenals and shipyards in which, prior to World
War I, all peacetime defense production was done.
567 These unions were craft monopolies: membership in them
was restricted to sons or relatives of members.
568 They required an apprenticeship of five to seven years,
but had no systematic training or work study.
569 Nothing was ever allowed to be written down; there were
not even blueprints or other drawings of the work to be
done.
570 The members were sworn to secrecy and were not
permitted to discuss their work with non-members.
571 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, its own
best time, and with its own right tools—was indeed a
frontal attack on them.
572 And so they vilified him and succeeded in having
Congress ban any application of "task study" in
government arsenals and shipyards—a ban that prevailed
until after World War II. ...

573 Taylor did not improve matters by offending the owners
of his day as much as he offended the unions.
574 While he had little use for unions, he was contemptuously
hostile to the owners; his favorite epithet for them was
"hogs."
575 And then there was his insistence that the workers rather
than the owners should get the lion's share of the revenue
gains produced by "Scientific Management."
576 To add insult to injury, his "Fourth Principle" demanded
that work study be done in consultation, if not in
partnership with the worker. ...

577 Finally, Taylor held that authority in the plant must not be based on ownership.

578 It could be based only on superior knowledge.

579 He demanded, in other words, what we now call “professional management”—and that was anathema and “radical heresy” to nineteenth-century capitalists.

580 He was bitterly attacked by them as a “troublemaker” and a “socialist.”

581 (Some of his closest associates, especially Karl Barth, Taylor’s right-hand man, were indeed avowed “leftists,” and strongly anti-capitalist.) ...

582 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.

583 And the fact that there was a mystique to craft skill was still universally accepted for many, many years.

584 It was this belief that encouraged Hitler, as late as 1941, to declare war on the United States.

585 For the United States to field an effective force in Europe would require a large fleet to transport troops.

586 America at that time had almost no merchant marine and no destroyers to protect it.

587 Modern warfare, Hitler further argued, required precision optics in large quantities; and there were no skilled optical workers in America. ...

588 Hitler was absolutely right.

589 The United States did not have much of a merchant marine, and its destroyers were few and ludicrously obsolete.

590 It also had almost no optical industry.

591 But by applying Taylor’s Scientific Management, U.S. industry trained totally unskilled workers, many of them former sharecroppers raised in a pre-industrial environment, and converted them in sixty to ninety days into first-rate welders and shipbuilders.

592 Equally, the United States trained the same kind of people within a few months to turn out precision optics of better quality than the Germans ever did—and on an assembly line to boot. ...

593 Taylor's greatest impact all told was probably in training.

594 A hundred years before Taylor, Adam Smith had taken for granted that at least fifty years of experience (and more likely a full century) were required for a region to gain 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.

595 Seventy years after Smith, around 1840, a German, August Borsig (1804-1854)—one of the first people outside England to build a steam locomotive—invented the German system of apprenticeship, which combines practical plant experience under a master with theoretical grounding in school.

596 It is still the foundation of Germany's industrial productivity.

597 But even Borsig's apprenticeship took three to five years.

598 Then, first in World War I but above all in World War II, the United States systematically applied Taylor's approach to training "first-class men" in a few months' time.

599 This, more than any other factor, explains why the United States was able to defeat both Japan and Germany. ...

600 All the earlier economic powers in modern history—Great Britain, the United States, Germany—emerged through leadership in new technology.

601 The post-World War II economic powers—first Japan, then South Korea, Taiwan, Hong Kong, Singapore—all owe their rise to Taylor's training.

602 It enabled them to endow a still largely pre-industrial and therefore still low-wage work force with world-class productivity in practically no time.

603 In the post-World War II decades, Taylor-based training became the **one truly effective engine of economic development.** ...

604 The application of knowledge to work explosively increased productivity.

605 (The term itself was unknown in Taylor's time.

606 In fact, it was still unknown until World War II, when it first began to be used in the United States.

607 As late as 1950, the most authoritative English dictionary, the Concise Oxford, still did not list the word "productivity" in its present meaning.)

608 For hundreds of years there had been no increase in the

- ability of workers to turn out goods or to move goods.
- 609 Machines created greater capacity.
- 610 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 which gave Renaissance Florence its wealth. ...
- 611 But within a few years after Taylor began to apply knowledge to work, productivity began to rise at a rate of 3.5 to 4 percent compound a year—which means doubling every eighteen years or so.
- 612 Since Taylor began, productivity has increased some fiftyfold in all advanced countries.
- 613 **On this unprecedented expansion rest all the increases in both standard of living and quality of life in the developed countries.** ...
- 614 Half of this additional productivity has been taken in the form of increased purchasing power; in other words, in the form of a higher standard of living.
- 615 But between one third and one half has been taken in the form of increased leisure.
- 616 As late as 1910, workers in developed countries still worked as much as they had ever worked before, that is, at least 3,000 hours a year.
- 617 Today, the Japanese work 2,000 hours a year, the Americans around 1,850, the Germans at most 1,600—and they all produce fifty times as much per hour as they produced eighty years ago.
- 618 Other substantial shares of increased productivity have been taken in the form of health care, which has grown from something like zero percent of the gross national product to 8-12 percent in developed countries, and in the form of education, which has grown from around two percent of GNP to 10 percent or more. ...
- 619 Most of this increase—just as Taylor predicted—has been taken by the workers, that is, by Marx’s proletarians.
- 620 Henry Ford (1863-1947) brought out the first cheap automobile, the Model T, in 1907.
- 621 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 twin-engine private plane costs today.
- 622 At \$750, Henry Ford's Model T cost what a fully employed industrial worker in the United States earned in three to four years—for 80 cents was then a good day's wage, and of course there were no "benefits."
- 623 Even an American physician in those years rarely earned more than \$500 a year.
- 624 Today, a unionized automobile worker in the United States, Japan, or Germany, working only forty hours a week, earns \$50,000 in wages and benefits—\$45,000 after taxes—which is roughly eight times what a cheap new car costs today. ...
- 625 By 1930, Taylor's Scientific Management—despite resistance from unions and from intellectuals—had swept the developed world.
- 626 As a result, Marx's "proletarian" became a "bourgeois."
- 627 The blue-collar worker in manufacturing industry, the "proletarian" rather than the "capitalist," became the true beneficiary of Capitalism and Industrial Revolution.
- 628 This explains the total failure of Marxism in the highly developed countries for which Marx had predicted "revolution" by 1900.
- 629 It explains why, after 1918, there was no "Proletarian Revolution" even in the defeated countries of Central Europe where there was misery, hunger, and unemployment.
- 630 It explains why the Great Depression did not lead to a Communist revolution, as Lenin and Stalin—and practically all Marxists—had confidently expected.
- 631 By that time, Marx's proletarians had not yet become affluent, but they had already become middle class.
- 632 They had become productive. ...
- 633 "Darwin, Marx, Freud" form the trinity often cited as the "makers of the modern world."
- 634 Marx would be taken out and replaced by Taylor if there were any justice in the world.
- 635 But that Taylor is not given his due is a minor matter.
- 636 It is a serious matter, however, that **far too few people realize that the application of knowledge to work created developed economies by setting off the productivity explosion of the last hundred years.**

637 Technologists give the credit to machines, economists to capital investment.

638 Yet both were as plentiful in the first hundred years of the capitalist age, before 1880, as they have been since.

639 With respect to technology or to capital, the second hundred years differed very little from the first one hundred.

640 But there was absolutely no increase in worker productivity during the first hundred years— and consequently very little increase in workers’ real incomes or any decrease in their working hours.

641 What made the second hundred years so critically different can only be explained as the result of applying knowledge to work. ...

642 The productivity of the new classes, the classes of the post-capitalist society, can be increased only by applying knowledge to work.

643 Neither machines nor capital can do it.

644 Indeed, if applied alone, they are likely to impede rather than to create productivity (as will be discussed further in Chapter 4). ...

645 When Taylor started to study work, nine out of every ten working people did manual work, making or moving things; in manufacturing, in farming, in mining, in transportation.

646 The productivity of people engaged in making and moving things is still going up at the historical rate of 3.5 to 4 percent—and in American and French agriculture, even faster.

647 But the **Productivity Revolution is already over.**

648 Forty years ago, in the 1950s people who engaged in work to make or to move things were still a majority in all developed countries.

649 By 1990, they had shrunk to one fifth of the work force.

650 By 2010 they will form **no more than one tenth.**

651 Increasing the productivity of manual workers in manufacturing, in farming, in mining, in transportation, can no longer create wealth by itself.

652 The Productivity Revolution has become a victim of its own success.

653 From now on, what matters is the productivity of non-manual workers.

654 And that requires **applying knowledge to knowledge**.

655

656 *The Management Revolution*

657 When I decided in 1926 not to go to college but to go to work after finishing secondary school, my father was quite distressed; ours had long been a family of lawyers and doctors.

658 But he did not call me a “dropout.”

659 He did not try to change my mind.

660 And he did not prophesy that I would never amount to anything.

661 I was a responsible adult wanting to work as an adult. ...

662 Some thirty years later, when my son reached age eighteen, I practically forced him to go to college.

663 Like his father, he wanted to be an adult among adults.

664 Like his father, he felt that in twelve years of sitting on a school bench he had learned little, and that his chances of learning more by spending another four years on a school bench were not particularly great.

665 Like his father at that age, he was action-focused, not learning-focused. ...

666 And yet by 1958, thirty-two years after I had moved from high school graduate to trainee in an export firm, a college degree had become a necessity.

667 It had become the passport to careers.

668 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 done well in school.

669 My father did not have the slightest difficulty in finding a trainee job for me in a reputable merchant house.

670 Thirty years later, such firms would not have accepted a high school graduate as a trainee; they would all have said, “Go to college for four years—and then you probably should go on to graduate school.” ...

671 In my father’s generation (he was born in 1876), going to college was for the sons of the wealthy and a very small number of poor but exceptionally brilliant youngsters (such as he had been).

672 Of all the American business successes of the nineteenth century, only one went to college: J. P. Morgan went to Göttingen to study mathematics, but dropped out after one year.

673 Few of the others even attended high school, let alone graduated from it.*¹

674 By my time, going to college was already desirable; it gave one social status.

675 But it was by no means necessary nor much help in one's life and career.

676 When I did the first study of a major business corporation, General Motors †², the public relations department at the company tried very hard to conceal the fact that a good many of their top executives had gone to college.

677 The proper thing then was to start as a machinist and work one's way up.‡³

678 As late as 1950 or 1960, the quickest route to a middle-class income—in the United States, in Great Britain, in Germany (though no longer in Japan)—was not to go to college; it was to go to work at age sixteen in one of the unionized mass production industries.

679 There one could earn a middle-class income after a few months—the result of the productivity explosion.

680 Today these opportunities are practically gone.

681 Now there is practically no access to a middle-class income without a formal degree which certifies to the acquisition of knowledge that can only be obtained systematically and in a school. ...

682 The change in the meaning of knowledge that began two hundred fifty years ago has transformed society and economy.

683 Formal knowledge is seen as both the key personal and the key economic resource.

684 **In fact, knowledge is the only meaningful resource today.**

685 The traditional "factors of production"—land (i. e., natural resources), labor, and capital—have not disappeared, but they have become secondary.

686 They can be obtained and obtained easily, provided there is knowledge.

687 **And knowledge in this new sense means knowledge as a utility, knowledge as the means to obtain social and economic results. ...**

688 These developments, whether desirable or not, are responses to an irreversible change: knowledge is now being applied to knowledge.

689 This is the third and perhaps the ultimate step in the transformation of knowledge.

690 Supplying knowledge to find out how existing knowledge can best be applied to produce results is, in effect, what we mean by management.

691 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.

692 It is being applied, in other words, to systematic innovation. *4 ...

693 This third change in the dynamics of knowledge can be called the "Management Revolution."

694 Like its two predecessors— knowledge applied to tools, processes, and products, and knowledge applied to human work—the Management Revolution has swept the earth.

695 It took a hundred years, from the middle of the eighteenth century to the middle of the nineteenth century, for the Industrial Revolution to become dominant and worldwide.

696 It took some seventy years, from 1880 to the end of World War II, for the Productivity Revolution to become dominant and world-wide.

697 It has taken less than fifty years—from 1945 to 1990—for the Management Revolution to become dominant and worldwide. ...

698 Most people when they hear the word "management" still hear "business management."

699 Management did indeed first emerge in its present form in large-scale business organizations.

700 When I began to work on management some fifty years ago, I too concentrated on business management. †5

701 But we soon learned that management is needed in all modern organizations.

702 In fact, we soon learned that it is needed even more in organizations that are not businesses, whether not-for-profit but non-governmental organizations (what in this book I propose we call the "social sector") or government

- agencies.
- 703 These organizations need management the most precisely because they lack the discipline of the “bottom line” under which business operates.
- 704 That management is not confined to business was recognized first in the United States.
- 705 But it is now becoming accepted in every developed country. ...
- 706 We now know that management is a generic function of all organizations, whatever their specific mission.
- 707 It is the generic organ of the knowledge society. ...
- 708 Management has been around for a very long time.
- 709 I am often asked whom I consider the best or the greatest executive.
- 710 My answer is always: “The man who conceived, designed, and built the first Egyptian Pyramid more than four thousand years ago—and it still stands.”
- 711 But management as a specific kind of work was not seen until after World War I—and then by just a handful of people.
- 712 Management as a discipline only emerged after World War II.
- 713 As late as 1950, when the World Bank began to lend money for economic development, the word “management” was not even in its vocabulary.
- 714 In fact, while management was invented thousands of years ago, it was not discovered until after World War II. ...
- 715 One reason for its discovery was the experience of World War II itself, and especially the performance of American industry.
- 716 But perhaps equally important to the general acceptance of management has been the performance of Japan since 1950.
- 717 Japan was not an “underdeveloped” country after World War II but its industry and economy were almost totally destroyed, and it had practically no domestic technology.
- 718 The nation’s main resource was its willingness to adopt and adapt the management which the Americans had developed during World War II (and especially training).

- 719 Within twenty years—from the 1950s, when the American occupation of Japan ended, to the 1970s—Japan became the world’s second economic power, and a leader in technology.
- 720 When the Korean War ended in the early 1950s, South Korea was left even more devastated than Japan had been seven years earlier.
- 721 And it had never been anything but a backward country, especially as the Japanese systematically suppressed Korean enterprise and higher education during their thirty-five years of occupation.
- 722 But by using the colleges and universities of the United States to educate their able young people, and by importing and applying the concepts of management, Korea became a highly developed country within twenty-five years. ...
- 723 With this powerful expansion of management came a growing understanding of what management really means.
- 724 When I first 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.”
- 725 A manager in other words was a “boss,” and management was rank and power.
- 726 This is probably still the definition a good many people have in mind when they speak of “managers” and “management.” ...
- 727 But by the early 1950s, the definition of a manager had already changed to one who “is responsible for the performance of people.”
- 728 Today, we know that that is also too narrow a definition.
- 729 The right definition of a manager is one who “is responsible for the application and performance of knowledge.” ...
- 730 This change means that we now see knowledge as the essential resource.
- 731 Land, labor, and capital are important chiefly as restraints.
- 732 Without them, even knowledge cannot produce; with out them, even management cannot perform.

733 But where there is effective management, that is,
application of knowledge to knowledge, we can always
obtain the other resources. ...

734 That knowledge has become the resource, rather than a
resource, is what makes our society “post-capitalist.”

735 **This fact changes—fundamentally—the structure of society.**

736 **It creates new social and economic dynamics.**

737 **It creates new politics.**

738

739 ¹ (In the novels of Edith Wharton, the chronicler of
American society around 1910 and 1920, the sons of the
old and rich New York families do go to Harvard and to
Harvard Law School, but practically none of them then
practices law. Higher education was considered a luxury,
an ornament, and a pleasant way to spend one’s early
adulthood.)

740 ² † Published in [Concept of the Corporation](#) (1946))

741 ³ † The story is told in the chapter “Alfred P. Sloan” in
[Adventures of a Bystander](#) (1980, reissued 1991)

742 ⁴ For more on this, see my [Innovation and
Entrepreneurship](#) (1986)

743 ⁵ † In [The Practice of Management](#), which first established
management as a discipline in 1954, most of the
discussion is of business management, and so are most
examples.

744

745 ***From Knowledge To Knowledges***

746 Underlying all three phases in the shift to knowledge—the
Industrial Revolution, the Productivity Revolution, and the
Management Revolution—is a fundamental change in the
meaning of knowledge.

747 We have moved from knowledge in the singular to
knowledges in the plural. ...

748 Traditional knowledge was general.

749 What we now consider knowledge is of necessity highly
specialized.

750 We never before spoke of a “man (or woman) of
knowledge”; we spoke of an “educated person.”

751 Educated people were generalists.

- 752 They knew enough to talk or write about a good many things, enough to understand a good many things.
- 753 But they did not know enough to do any one thing.
- 754 As an old saying has it: You would want an educated person as a guest at your dinner table, but you would not want him or her alone with you on a desert island, where you need somebody who knows how to do things.
- 755 But in today's university the traditional "educated people" are not considered "educated" at all.
- 756 They are looked down on as dilettantes. ...
-
- 757 The Connecticut Yankee at King Arthur's Court, the hero of the 1889 book by Mark Twain, was not an educated person.
- 758 He surely knew neither Latin nor Greek, had probably never read Shakespeare, and did not even know the Bible well.
- 759 But he knew how to do everything mechanical, up to and including generating electricity and building telephones. ...
-
- 760 The purpose of knowledge for Socrates, as said earlier, was self-knowledge and self-development; results were internal.
- 761 For his antagonist, Protagoras, the result was the ability to know what to say and to say it well.
- 762 It was "image," to use a contemporary term.
- 763 For more than two thousand years, Protagoras's concept of knowledge dominated Western learning and defined knowledge.
- 764 The medieval trivium, the educational system that up to this day underlies what we call a "liberal education," consisted of grammar, logic, and rhetoric—the tools needed to decide what to say and how to say it.
- 765 They are not tools for deciding what to do and how to do it.
- 766 The Zen concept of knowledge and the Confucian concept of knowledge—the two concepts that dominated Eastern learning and Eastern culture for thousands of years—were similar.
- 767 The first focused on self-knowledge; the second—like the medieval trivium—on the Chinese equivalents of grammar, logic, and rhetoric. ...

768 The knowledge we now consider knowledge proves itself
in action.

769 What we now mean by knowledge is information effective
in action, information focused on results.

770 These results are seen outside the person—in society and
economy, or in the advancement of knowledge itself. ...

771 To accomplish anything, this knowledge has to be highly
specialized.

772 This was the reason why the tradition—beginning with the
ancients but still persisting in what we call “liberal
education”—relegated it to the status of a technē, or craft.

773 It could neither be learned nor taught; nor did it imply any
general principle whatever.

774 It was specific and specialized-experience rather than
learning, training rather than schooling.

775 But today we do not speak of these specialized
knowledges as “crafts”; we speak of “disciplines.”

776 This is as great a change in intellectual history as any ever
recorded. ...

777 A discipline converts a “craft” into a methodology—such as
engineering, the scientific method, the quantitative
method, or the physician’s differential diagnosis.

778 Each of these methodologies converts ad hoc experience
into system.

779 Each converts anecdote into information.

780 Each converts skill into something that can be taught and
learned.

781

782 «§§§»

783

784 The shift from knowledge to knowledges has given
knowledge the power to create a new society.

785 But this society **has to be structured on the basis** of
knowledge as something specialized, and of knowledge
people as specialists.

786 **This is what gives them their power.**

787 But it also raises basic questions—of values, of vision, of
beliefs, of all the things that hold society together and
give meaning to our lives.

788 As the last chapter of this book will discuss, it also raises a

big—and a new-question: what constitutes the educated person in the society of knowledges?