Chapter 1:

Minds Viewed Globally: A Personal Introduction

For several decades, as a researcher in psychology, I have been pondering the human mind. I've studied how the mind develops, how it is organized, what it's like in its fullest expanse. I've studied how people learn, how they create, how they lead, how they change the minds of other persons or their own minds. For the most part, I've been content to describe the typical operations of the mind—a daunting task in itself. But on occasion, I've also offered views about how we should use our minds.

In Five Minds for the Future I venture further. While making no claims to have a crystal ball, I concern myself here with the kinds of minds that people will need if they—if we—are to thrive in the world during the eras to come. The larger part of my enterprise remains descriptive—I specify the operations of the minds that we will need. But I cannot hide the fact that I am engaged as well in a "values enterprise": the minds that I describe are also the ones that I believe we should develop in the future.

Why the shift from description to prescription? In the interconnected world in which nearly all human beings now live, it is not enough to state what each individual or group needs to survive on its own turf. In the long run, it is not possible for parts of the world to thrive, while others remain desperately poor and deeply frustrated. Recalling the words of Benjamin Franklin, "We must indeed all hang together, or, most assuredly, we shall all hang separately." Further, the world of the future, with its ubiquitous search engines, robots, and

other computational devices, will demand capacities that until now have been mere options. To meet this new world on its own terms, we should begin to cultivate these capacities now.

As your guide, I will be wearing a number of hats. As a trained psychologist, with a background in cognitive and neuroscience, I will draw repeatedly on what we know about the operation of the human mind from a scientific perspective. But humans differ from other species in that we possess history as well as prehistory, hundreds and hundreds of diverse cultures and subcultures, and the possibility of informed, conscious choice; and so I will be drawing equally on history, anthropology, and other humanistic disciplines. Because I am speculating about the directions in which our society and our planet are headed, political and economic considerations loom large. And, to repeat, I balance these scholarly perspectives with a constant reminder that a description of minds cannot escape a consideration of human values.

Enough throat-clearing. Time to bring on stage the five dramatis personae of this literary presentation. Each has been important historically, each figures to be even more crucial in the future. With them, a person will be well equipped to deal with what is expected as well as what cannot be anticipated; without these minds, a person will be at the mercy of forces that she or he can't understand, let alone control. I'll describe each mind briefly; in the course of the book I'll explain how it works, and how it can be nurtured in learners across the age span.

The disciplined mind has mastered at least one way of thinking—a distinctive mode of cognition that characterizes a specific scholarly discipline, a craft, or a profession. Much research confirms that it takes up to ten years to master a discipline. The disciplined mind also knows how to work steadily over time to improve skill and understanding—in the vernacular, it is highly disciplined. Without at least one discipline under his belt, the individual is destined to march to someone else's tune.

The synthesizing mind takes information from disparate sources, understands and evaluates that information objectively, and puts it together in ways that make sense to the synthesizer and also to other persons. Valuable in the past, the capacity to synthesize becomes ever more crucial as information continues to mount at dizzying rates.

Building on discipline and synthesis, the creating mind breaks new ground. It puts forth new ideas, poses unfamiliar questions, conjures up fresh ways of thinking, arrives at unexpected answers. Ultimately, these creations must find acceptance among knowledgeable consumers. By virtue of its anchoring in territory that is not yet rule- governed, the creating mind seeks to remain at least one step ahead of even the most sophisticated computers and robots.

Recognizing that nowadays one can no longer remain within one's shell or on one's home territory, the respectful mind notes and welcomes differences among human individuals and groups, tries to understand these "others", and seeks to work effectively with them. In a world where we are all interlinked, intolerance or disrespect is no longer a viable option.

Proceeding on a level more abstract than the respectful mind, the ethical mind ponders the nature of one's work and the needs and desires of the society in which one lives. This mind conceptualizes how work can serve purposes beyond self-interest and how members of society can work unselfishly to improve the lot of all. The ethical mind then acts on the basis of these analyses.

One may reasonably ask: Why these five particular minds? Could the list be readily changed or extended? My brief answer is this. The five minds just introduced are the kinds of minds that are particularly at a premium in the world of today and will be even more so tomorrow. They span both the cognitive spectrum and the human spectrum—in that sense they are comprehensive, global. We know something about how to cultivate them. Of course, there could be other candidates. In research for this book, I considered candidates ranging from the technological mind to the digital mind, the market mind to the democratic mind. I am prepared to defend my quintet vigorously. Indeed, that is a chief burden of the rest of this book.

This may also be the place to forestall an understandable confusion. My chief claim to fame is my positing, some years ago, of a theory of multiple intelligences. According to "MI theory," all human beings posses a number of relatively autonomous cognitive capabilities, each of which I designate as separate intelligences. For various reasons people differ from one another in their profiles of intelligence, and this fact harbors significant consequences for school and the workplace.

The five minds posited in this book are different from the 8 or 9 human intelligences. Rather than being distinct computational capabilities, they are better thought of as broad uses of the mind which we can cultivate at school, in professions, or at the workplace. To be sure, the five minds make use of our several intelligences: for example, respect is impossible without the exercise of interpersonal intelligences. And so, when appropriate, I will invoke MI theory. But for the most part, readers are advised to think about those minds in the manner of a policy maker, rather than a psychologist. That is, my concern is to convince you of the need to cultivate these minds and illustrate the best ways to do so, rather than to delineate specific perceptual and cognitive capacities that undergird the minds. Programatically I seek to fill in a grid about the 5 Minds (see Figure 1). You'll have a chance to evaluate my success in Chapter 7.

To put some flesh on these bones, I will become personal and say a bit about my own experiences with these kinds of minds. I write as a scholar and author in the social sciences and education; as a person who has considerable experience in management of a research group. But the task of cultivating minds goes far beyond the charge of teachers and professors; it constitutes a major challenge to all individuals who work with other persons. And so, as I review these minds, I will comment on how they play out in other careers, notably in business and in the professions.

<A> Discipline

Even as a young child, I loved putting words on paper and I have continued to do so throughout my life. As a result, I have honed skills of planning, executing, critiquing and teaching writing. I also work steadily to improve my writing, thus embodying the second meaning of the word “discipline”.

My formal discipline is psychology and it took me a decade to think like a psychologist. When I encounter a controversy about the human mind or human behavior, I think immediately about how to study the issue empirically, what control groups to marshal, how to analyze the data and revise my hypotheses when necessary.

Turning to management, I have many years of experience supervising teams of research assistants of various sizes, scope, and missions, and have the lessons and battle scars to show for it. My understanding has been enriched by observing successful and not-so-successful presidents, deans, and department chairs, around the university; addressing and consulting with corporations; and, studying leadership and ethics across the professions over the last fifteen years. Beyond question, both management and leadership are disciplines—though they can be informed by scientific studies, they are better thought of as crafts. By the same token, any professional – be she a lawyer, an architect, an engineer—has to master the bodies of knowledge and the key procedures that entitle her to membership in the relevant guild. And all of us—scholars, corporate leaders, professionals—must continually hone our skills.

<A>Synthesis

As a student I enjoyed reading disparate texts and learning from distinguished and distinctive lecturers; I then attempted to make sense of these sources of information, putting them together in ways that were generative, at least for me. In writing papers and preparing for tests, I drew on this increasingly well-honed skill of synthesizing. When I began to write articles and books, the initial ones were chiefly works of synthesis; textbooks in social psychology and developmental psychology, and, perhaps more innovatively, the first book-length examination of cognitive science (The Mind's New Science: A History of the Cognitive Revolution).

Whether one is working at the university, a law firm, or a corporation, the job of the manager calls for synthesis. The manager must consider the job to be done, the various workers on hand, their current assignments and skills, and how best to execute the current priority and move on to the next one. A good manager also looks back over what has been done in the past months and tries to anticipate how best to carry out future missions. As she begins to develop new visions, communicate them to associates, and contemplate how to realize these innovations, she invades the realms of leadership and creativity. And of course, synthesizing the current state of knowledge, incorporating new findings, and delineating new dilemmas, is part-and-parcel of the work of any professional who wishes to remain current with her craft.

<A >Creating

In my scholarly career, a turning point was my publication in 1983 of Frames of Mind: The Theory of Multiple Intelligences. At the time I thought of this work as a synthesis of cognition from many disciplinary perspectives. In retrospect I have come to understand that Frames of Mind differed from my earlier books. I was directly challenging the consensual view of intelligence and putting forth my own iconoclastic notions which were ripe, in turn, for vigorous critiques. Since then, my scholarly work is better described as a series of attempts to break new ground—efforts at creating in the areas of creativity, leadership, and ethics—than as syntheses of already existing work. Parenthetically, I might point out that this sequence is unusual. In the sciences younger workers are more likely to achieve creative breakthroughs, while older ones typically pen syntheses.

In general, we look to leaders, rather than to managers, for examples of creativity. The transformational leader creates a compelling narrative about the missions of her organization or polity; embodies that narrative in her own life; and is able, through persuasion and personal example, to change the thoughts, feelings, and behaviors of those whom she seeks to lead.

And what of the role of creativity in the workaday life of the professional? Major creative breakthroughs are relatively rare in accounting or engineering, in law or medicine. Indeed, one does well to be suspicious of claims that a radically new method of accounting, bridge-building, surgery, prosecution, or generating energy has just been devised. Increasingly, however, rewards accrue to those who fashion small but significant changes in professional practice. I would readily apply the descriptor ‘creative’ to the individual who figures out

how to audit books in a country whose laws have been changed and whose currency has been revalued three times in a year or the attorney who ascertains how to protect intellectual property under conditions of monetary (or political or social or technological) volatility.

<A >Respectful and Ethical

As I shift focus to the last two kinds of minds, a different set of analyses becomes appropriate. The first three kinds of minds deal primarily with cognitive forms; the last two deal with our relations to other human beings. The first (respectful) is more concrete; the second (ethical) is more abstract. Also, the differences across career specializations become less important: we are dealing with how human beings—be they scientists, artists, managers, leaders, craftsmen, or professionals—think and act throughout their lives. And so, here, I shall try to speak for all of us.

With respect to "respect" (!), whether I am (or you are) writing, researching, or managing, it is important to avoid stereotyping or caricaturing. I must try to understand other persons on their own terms, make an imaginative leap when necessary, seek to convey my trust in them, and try so far as possible to make common cause with them and to be worthy of their trust. This stance does not mean that I ignore my own beliefs, nor that I necessarily accept or pardon all that I encounter. (Respect does not entail a "pass" for terrorism). But I am obliged to make the effort, and not merely to assume that what I had once believed on the basis of scattered impressions is necessarily true. Such humility may in turn engender positive responses in others.

As I use the term, “ethics” also relates to other persons, but in a more abstract way. In taking ethical stances, an individual tries to understand his or her role as a worker and his or her role as a citizen of a region, a nation, and the planet. In my own case, I ask: What are my obligations as a scientific researcher, a writer, a manager, a leader? If I were sitting on the other side of the table, if I occupied a different niche in society, what would I have the right to expect from those “others” who write, research, manage, lead? And, to take an even wider perspective, what kind of a world would I like to live in, if, to use John Rawls’ (1971) phrase, I were cloaked in a “veil of ignorance” with respect to my ultimate position in the world? What is my responsibility in bringing such a world into being? Every reader should be able to pose, if not answer, the same set of questions with respect to his or her occupational and civic niche.

For over a decade, I have been engaged in a large-scale study of ‘good work’—work that is excellent, ethical, and engaging for the participants. In the latter part of the book I draw on those studies in my accounts of the respectful and the ethical minds.

<A> Education in the Large

When one speaks of cultivating certain kinds of minds, the most immediate frame of reference is that of education. In many ways, this frame is appropriate: after all, designated educators and licensed educational institutions bear the most evident burden in the identification and training of young minds. But we must immediately expand our vision beyond standard educational institutions. In our cultures of today—and of tomorrow—parents, peers, and media play roles at least as significant as do authorized teachers and

formal schools. More and more parents "home school" or rely on various extra-scholastic mentors or tutors. Moreover, if any cliché of recent years rings true, it is the acknowledgement that education must be lifelong. Those at the work place are charged with selecting individuals who appear to posses the right kinds of knowledge, skill, minds—in my terms, they should be searching for individuals who possess disciplined, synthesizing, creating, respectful, and ethical minds. But, equally, managers and leaders, directors and deans and presidents, must continue perennially to develop all five kinds of minds in themselves and—of course—in those for whom they bear responsibility.

And so, this book should be read from a dual perspective. We should be concerned with how to nurture these minds in the younger generation, those who are being educated currently to become the leaders of tomorrow. But we should be equally concerned with those in today's workplace: How best can we mobilize our skills—and those of our co-workers—so that all of us will remain current tomorrow and the day after tomorrow?

<A> The Old and the New in Education

Let me turn now to education in the formal sense. For the most part, education has been quite conservative. Nor is this necessarily a bad thing. Educators have consolidated a massive amount of practical knowledge over the past centuries. I remember a conversation twenty years ago with a professor of psychology in China. I had felt that her college class, a simple recitation by one-student-after-another of The Seven Laws of Human Memory, was largely a waste of time. With the aid of an interpreter, we talked for ten minutes about the pros and cons of different pedagogies. In the end my Chinese colleague cut off the

discussion with these words: "We have been doing it this way for so long that we know it is right."

I discern two legitimate reasons for undertaking new educational practices. The first reason is that current practices are not actually working. We might think, for example, that we are educating young persons who are literate, or immersed in the arts, or capable in scientific theorizing, or tolerant of immigrants, or skilled in conflict resolution. But if evidence accrues that we are not successful in these pursuits, then we should consider altering our practices…or our goals.

The second reason is that conditions in the world are changing significantly. Consequent upon these changes, certain goals, capacities, and practices might no longer be indicated, or might even come to be seen as counterproductive. For example, before the invention of the printing press, when books were scarce, it was vital to cultivate a faithful and capacious verbal memory. Now that books (and notebook-sized search engines) are readily available, this goal—and the attendant mnemonic practices—are no longer at a premium. On the other hand, the ability to survey huge bodies of information—print and electronic—and organize that information in useful ways looms more important than ever. Changing conditions may also call for new educational aspirations: for example, when no group can remain isolated from the rest of the world, respect for those of different background and appearance becomes vital, even essential, rather than simply a polite option. Whether in charge of a classroom or a corporation, we need constantly to consider which minds are crucial, which

to prioritize, and how to combine them within a single organization, not to forget a single skull.

At the start of the third millennium, we live at a time of vast changes—changes seemingly so epochal that they may well dwarf those experienced in earlier eras. In shorthand, we can speak about these changes as entailing the power of science and technology and the inexorability of globalization (the second meaning of global in the subtitle of this chapter). These changes call for new educational forms and processes. The minds of learners must be fashioned and stretched in five ways that have not been crucial—or not as crucial—until now. We must recognize what is called for in this New World—even as we see each of these changes in perspective and hold on to certain perennial skills and values that may be at risk.

<A> Science and Technology

Modern science began during the European Renaissance. Consider, first, the experiments and theorizing about the physical world. The insights into motion and the structure of the universe that we associate with Galileo Galilei, and the understandings of light and gravity that emanated from Isaac Newton, created a body of knowledge that continues to accumulate at an ever accelerating rate. In the biological sciences a similar trend has occurred in the last 150 years, building on Charles Darwin's formulations about evolution, and the ensuing discoveries of Gregor Mendel, James Watson, and Francis Crick in genetics. While slight differences may obtain in how these sciences are practiced across

different labs, countries, or continents, essentially there is only one mathematics, one physics, one chemistry, one biology. (I'd like to add "one psychology" but I'm not as certain about that claim).

Unlike science, technology did not have to wait upon the specific discoveries, concepts, and mathematical equations of the last five hundred years. Indeed, that is precisely why in many respects the China of 1500 seemed more advanced than its European or Middle Eastern counterparts. One can fashion perfectly functional (even exquisite) writing implements, clocks, gunpowder, compasses, or medical treatments even in the absence of cogent scientific theories or well-controlled experiments. Once science has taken off, however, its link to technology becomes much tighter. It is barely conceivable that we could have nuclear weapons, nuclear power plants, supersonic airplanes, computers, lasers, or a medley of effective medical and surgical interventions in the absence of the sciences of our epoch. Those societies that lack science must either remain deprived of technological innovations or simply copy them from societies that have developed them.

The undoubted hegemony of science and technology creates new demands. Young people must learn to think scientifically, if they are to be able to understand and participate in the modern world. Without understanding the scientific method, citizens cannot make reasonable decisions about which medical course to follow when confronted with a set of options or how to evaluate competing claims about children-rearing, psychotherapy, or treatment of the elderly. Without having some mastery of computers, citizens cannot access the information that they need, let alone be able to use it productively, synthesize it

revealingly, or challenge it knowledgably. And needless to say, in the absence of some mastery of science and technology, individuals can scarcely hope to contribute to the continuing growth of these vital sectors. Moreover, informed opinions about controversial issues like stem cell research, nuclear power plants, genetically modified foods, or global warming presuppose a grounding in the relevant science and technology.

Having solved major mysteries about the physical and the biological worlds, scientists and technologists have more recently turned their attention to the understanding of the human mind and brain. More knowledge about psychology and neuroscience has been accrued in the last fifty years than in all prior historical eras combined. We now have well-developed, empirically-based theories of intelligence, problem-solving, and creativity—along with the tools, software, and hardware, purportedly based on these scientific advances. Educators, professionals, managers and leaders in business need to be cognizant of what has been established, and what may soon be established, about the nature, workings, potentials, and constraints of the human mind. Currricula developed 50 or 100 years ago no longer suffice. But don't toss out the exquisitely evolved infant with the sudsy bathwater of earlier eras. It is easy—but dangerous—to conclude that all education in the future should simply concentrate on mathematics, science, and technology. And it is equally easy—and equally dangerous—to conclude that the forces of globalization should change everything.

<A> The Limits of Science and Technology: Two Caveats

"Education is inherently and inevitably an issue of human goals and human values." I wish that this statement were mounted prominently above the desk of every policymaker. One cannot even begin to develop an educational system unless one has in mind the knowledge and skills that one values, and the kind of individuals one hopes will emerge at the end of the day. Strangely enough, however, many policymakers act as if the aims of education are self-evident; and as a consequence, when pressed, these policymakers often emerge as inarticulate, contradictory, or unbelievably prosaic. How often my eyes have glazed over as I have read vacuous proclamations about "using the mind well" or "closing the achievement gap" or "helping individuals to realize their potential" or "appreciating our cultural heritage" or 'having the skills to compete". Recently, in speaking to ministers of education, I've discovered a particularly Sisyphusian goal: "leading the world in international comparisons of test scores." Obviously, on this criterion, only one country at a time can succeed. To state educational goals in this day and age is no easy undertaking; indeed, one purpose of this book is to posit several more gritty goals for the future.

A first caveat. Science can never constitute a sufficient education. Science can never tell you what to do in class or at work—for two reasons. First, what you do as a teacher or manager has to be determined by your own value system—and neither science nor technology have built-in value systems. Confronted with scientific evidence that it is difficult to raise psychometric intelligence (IQ), one can draw two opposite conclusion: l) Don't bother to try; 2) Devote all your efforts to trying. Possibly you will succeed, and perhaps far more easily than you had anticipated.

The second caveat, related to the first, is that science—even with engineering, technology, and mathematics thrown in—is not the only, and not even the only important, area of knowledge (This is a trap into which many enthusiasts of globalization fall. See the collected speeches and writings of Bill Gates and Thomas Friedman, to name two gurus of our time). Other vast areas of understanding—the social sciences, the humanities, the arts, civics, civility, ethics, health, safety, training of one's body—deserve their day in the sun, and—equally—their hours in the curriculum. Because of its current societal hegemony, the aforementioned science set threatens to squeeze out these other topics. Equally perniciously, many individuals feel that these other areas of knowledge ought to be approached using the same methods and constraints as does science. That this would be an enormous blunder is an understatement: what sense could we make of the greatest works of art or literature, or the most important religious or political ideas, or the most enduring puzzles about the meaning of life and death, if we only thought of them in the manner of a scientific study or proof? If all we did was to quantify? What political or business leader would be credible, at a time of crisis, if all he could do was to offer scientific explanations or mathematical proofs, if he could not address the hearts of his audience? The great physicist Niels Bohr mused on this irony:

There is a deep truth and a shallow truth
And the purpose of science is to eliminate the deep truth.

At the workplace, the same caveats obtain. While it is obviously important to monitor and take into account scientific and technological advances, the leader must have a much

broader purview. Political upheavals, migrations of population, new forms of advertising, public relations, or persuasion, trends in religion or philanthropy—all of these can exert impact on an organization—be it profit or non-profit, dispensing widgets or wisdom. A full life, no less a full organization, harbors multiple disciplines. Excessive focus on science and technology reminds me of the myopia associated with ostriches or Luddites.

<A> Globalization

Globalization consists of a set of factors that weaken or even eliminate individual states, a process sometimes termed de-territorialization. Historians note various periods of globalization: in earlier eras, the land mass conquered first by Alexander the Great and then, a few centuries later, by the Romans; in more recent times, the transcontinental explorations and trades of the 16th century, the colonization of the latter 19th century, are seen as instances of total or partial globalization.

Following two World Wars, and a prolonged Cold War, we have now embarked on what may be the ultimate, all-encompassing episode of globalization. The current incarnation features four unprecedented trends: l) the movement of capital and other market instruments around the globe, with huge amounts circulating virtually instantaneously each day; 2) the movement of human beings across borders, with well over 100 million immigrants scattered across the world at any time; 3) the movement of all matter of information through cyberspace, with megabytes of information of various degrees of reliability available to anyone with access to a computer; 4) the movement of popular culture, such as fashion,

foods, and melodies, readily, even seamlessly across borders—so that teenagers the world over look increasingly similar, even as the tastes, beliefs, and values of their elders may also converge (Bhagwati 2005; Friedman, 2005; Suarez-Orozco and Qin-Hilliard, 2004).

Needless to add, attitudes toward globalization differ enormously within and across states. Even the most vocal celebrants have been somewhat muted by recent events, such as those reflecting another global phenomenon called stateless terrorism. But by the same token, even the most vocal critics take advantage of the undeniable accouterments—communicating by e-mail and mobile phone, seizing upon commercial symbols that are recognized the world over, holding protests in places that can be readily reached and easily monitored by diverse constituencies. While periods of retrenchment and pockets of isolationism are to be expected, it is virtually inconceivable that the four major trends listed above will be permanently stemmed.

The curricula of schools the world over may be converging, and the rhetoric of educators is certainly loaded with similar buzzwords ('world-class standards', 'interdisciplinary curricula', 'the knowledge economy'). Nonetheless, I believe that current formal education still remains basically a preparation for the world of the past, rather than a preparation for possible worlds of the future. To some extent, this actuality reflects the natural conservatism of educational institutions—a phenomenon with which I expressed some sympathy above. More fundamentally, however, I believe policymakers the world over have not come to grips adequately with the major factors outlined in these pages.

To be specific: Rather than stating our precepts explicitly, we continue to assume that educational goals and values are self-evident. We acknowledge the importance of science and technology, but do not teach scientific ways of thinking, let alone how to develop individuals with the synthesizing and creative capacities essential for continual scientific and technological progress. And too often, we think of science as the prototype of all knowledge, rather than one powerful way of knowing that needs to be complemented by artistic and humanistic and perhaps also spiritual stances. We acknowledge the factors of globalization—at least when they are called to our attention—but have not figured out how to prepare youngsters so that they can survive and thrive in a world different than one ever known before.

Turning to the workplace, we have become far more aware of the necessity of continuing education. Consciousness of the five minds is probably greater in many corporations than it is in many school systems. Nonetheless, much of corporate education is narrowly focused on skills: innovation is outsourced to skunk works; ethics is the topic of an occasional workshop. Few corporate settings embrace a liberal arts perspective, except for those executives with the time and resources to attend a seminar at the Aspen Institute. We do not think deeply enough about the human qualities that we want to cultivate at the workplace, so that individuals of diverse appearance and background can interact effectively with one another. Nor do we ponder how to nurture workers who will not simply pursue their self interest but will realize the core mission of their calling; and how to cultivate citizens who care passionately about the society in which they live and the planet that they will pass on to their successors.

I issue two—but only two—cheers for globalization. Even if the forces cited above could be handled benignly, that does not constitute a justification for ignoring or minimizing the nation, the region, and the locale. We should, for sure, think globally, but we should, for equal strong reasons, act locally, nationally, and regionally. The individual who thinks only of those across the globe is as myopic as the individual who thinks only of those across the street or along the border. Our principal interactions will continue to be with those who live near by, even as many of our problems and opportunities will be specific to our nation or region. As human beings, we cannot afford to sacrifice the local for the global, any more than we can afford to sacrifice the arts and humanities, in our efforts to remain current with science and technology.

Above I introduced the five kinds of minds that we will need to cultivate in the future, if we are to have the kinds of managers, leaders, and citizens needed to populate our planet. I hope to have made the initial case for their importance. To approach my brief sharply:

- Individuals without one or more disciplines will not be able to succeed at any demanding workplace and will be restricted to menial tasks;
- Individuals without synthesizing capabilities will be overwhelmed by information and unable to make judicious decisions;
- Individuals without creating capacities will be replaced by computers and will drive away those who do have the creative spark;

- Individuals without respect will not be worthy of respect by others and will poison the workplace and the commons;
- Individuals without ethics will yield a world devoid of decent workers and responsible citizens: none of us will want to live on that desolate planet.

No one knows precisely how to fashion an education that will yield individuals who are disciplined, synthesizing, creative, respectful, and ethical. I have argued that our survival as a planet may depend on the cultivation of this pentad of mental dispositions. But I firmly believe that each human faculty should also be justified on non-instrumental grounds as well. As a species, we human beings have impressive positive potentials—and history is replete with individuals who exemplify one or more of these kinds of minds: the discipline of a John Keats or an Marie Curie; the synthesizing capacities of Aristotle or Goethe; the creativity of a Martha Graham or a Bill Gates; the respectful examples of those who sheltered Jews during the second world war or who participated in Commissions of Truth and Reconciliation during the past decades; the ethical examples of ecologist Rachel Carson, who alerted us to the dangers of pesticides, and of statesman Jean Monnet, who helped Europe move from belligerent to peaceful institutions. Education in the broadest sense should help more human beings realize the most impressive features of the most remarkable representatives of our species.