Why Do We Educate, Anyway?

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Introduction

Neil Postman has famously argued that education in America is devoted to the god of economic utility, by which I assume he meant that most people equate education with job preparation. I'm not going to deny this conventional view, because there is truth in it. Education does indeed prepare people for jobs, just as it also prepares them for citizenship and for a life of individual fulfillment. But it does more than that. I am going to argue in this essay that education is nothing less than the identifying characteristic of our human species. It is to us what flying is to birds and swimming is to fish.

For some reason, however, education does not inspire a sense of commitment and enthusiasm in American society even remotely equivalent to its importance. The social contract between schools and the public that was once in effect appears to have been replaced by the view that education is a private benefit for the few rather than a public good for the many. Our priorities seem to lie more with sports and entertainment than with education, at least judging from the amount of time and treasure that we invest in those activities. This is curious, since people do value making a living (if for no other reason than to pay for sports and entertainment!), and educa-

tion does prepare them for making a living. So one would expect a higher level of appreciation for education than currently prevails. In the end, the god of economic utility must not be all that powerful. Why is that, and what can we do about it?

Part of our problem of misplaced priorities may stem from our very success. Prosperity invites complacency, and the massive prosperity of the past few decades has invited massive complacency. But that can't be the whole picture. There must be more to our current predicament than mere self-satisfaction. We live in a society deeply divided by ideology, left against right, liberal against conservative, public against private, blue against red. Liberals tend to favor the public purposes of education, conservatives the private purposes. I believe that the underlying reason for these seemingly irreconcilable divisions in our national life is conceptual. Our political life is divided because our minds are divided. A long time ago we adopted, for reasons I will suggest below, a dichotomous worldview that tends to see opposites (such as public and private) in adversarial rather than complementary terms. There are historical reasons for this split, but the world of intense competition that gave rise to those reasons has changed. We now need a better balance of both competition and cooperation. We need to mend the broken fragments of our modern worldview, to reunite what has been divided and integrate both sides of the dichotomy into a coherent whole. In the end, education is both private and public. It is the principal means by which we become both whole individual persons and healthy collective societies. It is through education that we become fully human.

Education, from this larger perspective, is an essential attribute of life itself. It is a complex process of learning, evaluating information, and perceiving patterns of relationships. All organisms engage in it to varying degrees. What distinguishes the human species from all others on the planet is our extraordinary tool – the brain – for perceiving and understanding those patterns. In the long run, it is not that education ought to promote economic prosperity, but that economic prosperity ought to promote education. What we presume to be the means is actually the end, and what we presume to be the

end is actually the means. Until we get that straight, education can never make it to the top of our national priorities.

Because the need is so urgent, and because the challenge touches on every aspect of American life, I finally propose below a nationwide collaborative to renew education in the United States. This collaborative would bring together the leadership of all the principal institutions of American society in each state to refocus the national priorities on the full development of the human potential. The overall principle is that until we are willing to deal with this systemic problem in a systemic way, which takes into account all the complex interconnections of the various parts, we will not be able to change rapidly enough to meet the challenge we are facing. If this challenge is at root a conceptual one, grounded in fundamental cultural values, then to succeed we have to focus on the root of the problem; we have to have a culture change. To understand what we need to do, however, we first need to understand how we got ourselves into this present conceptual standoff.

Mechanistic vs. Organic Worldviews

The current polarization of American political life mirrors a deeper polarization in the way the Western mind itself has developed over many centuries. The dominant perspective is often characterized by the terms "mechanistic," "atomistic," or "reductionist." It originated in late medieval times and then took off in the scientific revolution and eventually the Enlightenment. The alternative perspective is often characterized by the terms "organic," "holistic," "ecological," or "systems." It originated with the Greek tradition, joined with the Christian tradition in the Middle Ages, was sidelined by the scientific revolution, and then re-emerged in the Romantic movement in the nineteenth century. Because the dominant worldview has been mechanistic – which stresses competition – the relationship between these two perspectives has itself typically been seen as competitive and adversarial.

So how exactly did we get to where we are? How did the organic view of nature gradually get supplanted by a mechanistic view?

First, what was the organic view? Others have done a far better job than I have in addressing this question, and two of the best sources I know of are Fritjof Capra's *The Turning Point* and *The Web of Life* and Carolyn Merchant's *The Death of Nature*. They point out that the organic worldview, not surprisingly, is rooted in the natural processes of nature. It notes that nature itself is composed of ascending levels of organization starting from the simple and moving to the progressively more complex. Each level of organization is an autonomous whole with respect to the level below it and an integrated part with respect to the level above it. An individual cell, for example, is a whole with respect to the various parts of the cell that make it up (the nucleus, the mitochondria, etc.) and a part with respect to the tissue that it forms in cooperation with other cells. Just as every level of organization in life is both part and whole, both integrated and autonomous, so also is it both public and private. It is private insofar as it possesses an autonomous, individual identity (composed of parts) and public insofar as it is integrated into a larger community of the whole.

From this perspective, to say that any activity (such as education) is either wholly private or wholly public makes little sense. It is both. Underlying the apparent diversity of life, therefore, is an inherent unity that emerges through the complex interconnections and interdependencies formed by this reciprocal mutuality. Historically, this organic view of the world (absent, of course, knowledge of modern biology) was most persuasively articulated by Aristotle in the ancient world and then incorporated by Thomas Aquinas into the Christian view of the world in the late Middle Ages in what became known as Scholasticism or natural law. Its methodology was inherently deductive, starting with the general and working downward to the particular. Among its core beliefs was the assertion that universals exist.

Some of its adherents, however, tended to focus exclusively on the nature of abstract universals and to devalue the direct observation of particular phenomena in nature, which provoked a reaction by the time of the late Middle Ages. A new generation of curious

and inventive minds began to chafe under the constraints of this Aristotelian, "universalist" perspective that seemed to ignore practical experience of actual, particular phenomena. What they observed in practice seemed repeatedly to differ from what Scholastic theory predicted, so they began, understandably, to doubt the theory. They proceeded to formulate a different, non-organic, anti-universalist perspective that gave ultimate priority to the particular. Their methodology was inductive, reasoning from the particular to the general. This new doctrine became known as nominalism, and took the position not only that individual, particular things exist, but that only particular things exist – universals do not. This intellectual orientation coincided with the Protestant Reformation and with religious wars that by the seventeenth century were threatening the very foundations of European civilization (at least in the view of some contemporaries). Thinkers were desperately looking for a way to divide the public and private sphere into separate compartments so that private differences in religious belief would not undermine public peace. Nominalism fit the bill perfectly.

This view was put into its modern form most persuasively by the French philosopher René Descartes in the seventeenth century, who posited that even the mind and body were such different entities that one could not make valid generalizations about both. On one level, this whole problem of universals and particulars might seem merely an abstract game that philosophers play with each other when they have too much time on their hands, a game that the rest of us who have to get up every day to earn a living can safely ignore. If only that were true! We can't, because it turns out that these ideas have very practical consequences. By overturning the Aristotelian synthesis, Western intellectuals were thus able to analyze the world in entirely different and novel ways. They could investigate individual phenomena without having to worry about conflicts with the "universal" claims of the Church. Eventually that led to the breakthroughs we know as the scientific revolution, and then, when those ideas were applied in the practical realm, to the industrial revolution. They formed the driving inspiration for the Enlightenment in

eighteenth-century Europe, which was based on the exaltation of science and an enormous optimism in the power of reason to improve the world. Enlightenment thinkers were resolutely skeptical, secular, and rational. They emphasized rights, they worshipped freedom, and they believed in the autonomy of the individual (the ultimate "particular"). Because so many of the founding fathers of the United States were enthusiasts of the Enlightenment, some of the most cherished qualities of the American character derive from that source.

Among those qualities is a peculiarly American form of radical individualism, which presumes that only individuals are fully real, and that society is little more than an artificial (and therefore less real) construct of individuals intended exclusively for their own satisfaction. I am not about to argue that this position is wrong. On the contrary, there is much in its favor. The core of it is a profound and perfectly legitimate veneration of human freedom. However, the Enlightenment thinkers that spearheaded this movement were so extreme in their commitment to those beliefs that they provoked a reaction in the form of another set of truths, which in some ways constituted a revival of the organic worldview that had once prevailed. This group focused on community instead of the individual, on faith instead of skepticism, on the sacred instead of the secular, and on the emotional instead of the rational. They emphasized responsibility, and they believed in the value of equality. In time, the doctrine of capitalism, which focused on individual freedom, became associated with the Enlightenment perspective. Socialism, which focused on equality within a community, became associated with the reaction against the Enlightenment, reflecting a broader sense of moral outrage at the widespread suffering produced by the early stages of the industrial revolution.

The history of the intervening two centuries has been riddled with conflict between these sometimes competing values of freedom vs. equality, capitalism vs. socialism, private vs. public. What should have been natural partners, in effect, became adversaries. As I suggested above, their relationship is better seen as complemen-

tary, requiring a balance in order for the benefits to be fully realized. Extreme forms of socialism, for example, went awry when they lost sight of private autonomy in pursuit of public integration; and extreme forms of unregulated capitalism went awry when they lost sight of public integration in pursuit of private autonomy.

Over the years I have tried to come up with a graphic representation of this dichotomous, almost schizophrenic view of the world between a mechanistic view on the one hand and a holistic organic view on the other. Here is a partial rendering of my list of attributes of the two perspectives:

Mechanistic View	**Holistic, organic View**
part	whole
analysis	synthesis
particular	universal
local	global
diversity	unity
centrifugal	centripetal
specialization	generalization
structure	process
static	dynamic
closed	open
disciplinary	interdisciplinary
either/or	both/and
rights	responsibilities
autonomy	integration
national	international
competition	cooperation
independence	interdependence
individual	community
node	network
isolation	relationships
brain	mind/consciousness
linear cause/effect	interactive feedback
aggregate sum	emergent whole
fact	value/meaning
inductive	deductive
secular	sacred (whole=holy)
being	becoming

Connection With the Structure of the Brain

After one class in which I had discussed this list, a student came up and told me she was surprised at how many items reflected the orientation of the two hemispheres of the human brain. (Fritjof Capra, incidentally, raises this similarity in his chapter on systems thinking in *The Turning Point*, but I had forgotten about his insight until this student brought it up.) Previously I had often wondered if the left column might be construed as representing a male approach, and the right column a female approach (on the strength of recent research in the neurosciences that the male brain tends to compartmentalize, and the female brain to see relationships). My suggestion had always stimulated good discussion in class – usually civil and often humorous – on the general subject of nature vs. nurture, and male vs. female. I still don't know the extent to which these two analogies (gender and brain) are valid, but I continue to use them because they embody the kind of *yin-yang* complementarity I am trying to convey. And I am intrigued by the thought that the principal divisions of the modern world, which I had always taken to reflect a purely European outlook, might have deeper roots in the human psyche than I could ever have imagined. At any rate, this way of looking at the issue implies that neither is better than the other; on the contrary, each makes its maximum contribution only in cooperation with the other. Just as one cannot have a community – a whole – without individuals, so also one cannot have an individual – a part – without the community. To say that one is better than the other would be equivalent to claiming that in calculating the total area of a right triangle the base is more important than the height. They are equally important, and by extension the two perspectives of Western thinking are also equally valid. Each is a partial truth, and each errs only in its rejection of the other. The unfortunate consequence of their mutual and unnecessary intolerance is to promote conflict where there should be cooperation and communication.

In the actual brain itself, the left and right hemispheres are integrated by a collection of 200 million nerve fibers known as the corpus callosum. That organ functions as the main avenue of com-

munication between the two hemispheres, integrating the parts of the brain in such a way as to create an emergent property of consciousness that is entirely new. When the corpus callosum is injured or severed, the brain is still capable of performing many of its functions but without the judgment that comes from the capacity to evaluate interconnections. It is possible, I acknowledge, to overstate this analogy between worldviews and the brain. Neuroscientists are frequently frustrated – no doubt with reason – by the extravagant assertions of some psychologists that all human behavior can be explained by referencing parts of the brain. Nevertheless, posing the problem in this way helps me understand why it is that some people gravitate so naturally to one side of the equation over the other. It is almost as if the two hemispheres of the modern brain have been fully functioning for the past two centuries but in isolation from each other, ignoring that fact that the power of the brain derives from the complexity of the interactions – the relationships – among the parts. Our intelligence, after all, is not a mere sum of the aggregate parts, but grows out of the interconnections of the parts with each other, with influences from the other parts of the body, and with influences from the environment. If so, then it seems logical to infer that what applies to the brain might also apply to the dualistic worldviews of the modern age.

Paradigm Shift in Science Itself and the Implications for Education

Those dualistic views find a natural home in the modern university, which tends to be inherently conservative in its intellectual orientation (however liberal its faculty members may be in their political beliefs). Universities are living monuments to a mechanistic view of the world. In them we chop knowledge into tiny pieces known as disciplines, house them in watertight units called departments, and study them as if they had no connection with each other. (To further discourage communication and collaboration, we isolate these departments in separate buildings.) This structure was originally put into place when Americans adopted the German research

institute as the model for the university at the end of the nineteenth century (beginning with Johns Hopkins in 1876).

In the twentieth century, two things happened that began to challenge the supremacy of that mechanistic paradigm. First, quantum physics, with its revelations about the interchangeability of matter and energy, the uncertainty of our knowledge of sub-atomic behavior, and the interdependence of the subject and object, appeared on the scene at the dawn of the century and threw into question the certitudes of classical physics. Then, by the middle of the century, dramatic discoveries in biology, especially in genetics, began to open up entirely new vistas of knowledge that stressed organic processes rather than mechanistic structures.

By the second half of the century, the field of ecology emerged as a major field of study. This new outlook was multidisciplinary and endeavored to take into account as many factors as possible in understanding the relationship between plants, animals, and the environment. It was here, in the overall discipline of biology, that the first theorists of a challenge to a mechanistic outlook – systems thinking – emerged in the sciences. One of the pioneers was the biologist Ludwig von Bertalanffy, who spent his career on the margins of academic life but laid the groundwork for a general systems theory that emphasized holistic approaches to the study of nature, and that took into account the full complexity and interdependence of factors previously studied in isolation. Today, at the beginning of the twenty-first century, this renewed focus on interconnections has sparked a wider interest in interdisciplinary approaches to understanding real-life problems. These approaches are increasingly being supported by funding agencies and by universities, in spite of the bureaucratic challenges and obstacles to large-scale collaboration that exist in the university. The vocabulary of a systems view of the world, which interprets data in much more complex terms of interdependent relationships instead of isolated parts, is gradually making headway. The more we focus on the relationships of the parts, the more we realize the importance of communication among those parts.

The bottom line is that all living things communicate in order to stay alive. To the extent that they exhibit a degree of cognition in this process of communication, and remember what they "learned" for future reference, they participate in an activity that can be called "education." Learning and adaptation are inherent in all organic life from a single-celled organism to a complex ecosystem. In simpler forms of life, learning and adaptation are accomplished primarily by genetic means. But the more complex the animal – and humans are the most complex of all – the more that genetic process is replaced by knowledge that accumulates over time. In the human realm the permanent tool for acquiring and transmitting knowledge was the acquisition of language – and then writing – which enabled us to pass on what we learn to the next generation. We call that cumulative knowledge "culture," a body of collective learning that each new generation augments with its own innovations in adapting to a constantly changing set of challenges. To be human, therefore, is to have the capacity to learn in a very special way, and to communicate that knowledge to others through "education." Once we learned how to manipulate fire, we taught that knowledge to our children. Once we learned how to domesticate plants and animals, we taught that knowledge to our children. Once we learned how to fly, we taught that knowledge to our children. The consequences of this form of cumulative knowledge to human development are momentous. Those individuals who learn the most become successful, and those individuals who learn the least become (relatively) unsuccessful. By the same token, those societies that learn the most, that is, that do a superior job of transmitting knowledge and wisdom, become over time more successful than those societies that do an inferior job.

Education, therefore, is the single most important attribute that enabled *Homo sapiens* to prevail over its hominid relatives, and eventually dominate the planet Earth. Its scope is therefore well beyond just schooling, because schooling ends, and education continues throughout life until the final curtain call. We are who we are, in fact, because of education. It encompasses everything we do, and touches all areas of our existence from the moment we are born. It

is also a quintessentially social activity. It follows that a society in which significant parts have no opportunity to be educated cannot compete successfully against other societies in which all its parts are educated, that is, in which the greater proportion of its citizens are enabled to fulfill their human potential. That "public" aspect of education, therefore, has to be understood to be the responsibility of all the institutions of civilized life. From this perspective, the renewal of public education in America is the great challenge of our age. It won't be enough, moreover, just to tinker with the structure. Like the car industry in Detroit, we need something far more fundamental. We need a system-wide, profound culture change if we are going to move education from the periphery of our consciousness to the center. It takes time, though, to change a culture, especially one like ours so imbued with short-term, piecemeal thinking. And time is running out. We have a systemic problem, which needs systemic solutions.

A National Educational Collaborative

This is a moment for collaboration on a scale commensurate with the magnitude of the challenge before us. We need to enlist all the leadership of each state in the country – not just in education but in business, government, labor, the churches (and temples and mosques), the media, foundations, even parent and student organizations – to form statewide and nationwide networks of communication and cooperation that can act as long-term catalysts for change in education. The fact is that they – and we – are all interdependent. This network of state education collaboratives would have an ambitious goal. It would be nothing short of renewing our faith in the humane and democratic purposes of education, and integrating the pieces of our complex system into a mutually reinforcing whole.

There are many things to do. We need to re-address our persistent shortfalls in math and science by developing a comprehensive strategy at all levels of education and using all the resources at our disposal. We need to reach out to the Latino community, where the greatest demographic growth in the country is occurring but where

fewer than half of high school students graduate. We need to reach the inner city youth who have been marginalized by an increasingly technocratic system. We need to use new technology not only to enhance learning but also to employ the kind of grass-roots mobilization of support that was so successful in the Obama campaign. And so much more.

A few decades ago, the American public could get away with letting our faith in education lapse and by letting so many sectors of our population remain under-educated. We were on top of the world. Now that world has changed. For one thing, our century-long run as the world's largest market economy and dominant superpower is coming to an end far sooner than most people realize. The industrial revolution, which made Britain a superpower in the nineteenth century and America a superpower in the twentieth century, has now moved to Asia. Within a generation or two, the GDP each of China and India will overtake that of the United States. Complacency is no longer an option. That's not the only change. The industrial revolution itself, driven by new technologies, has fundamentally transformed the world economy – and imperiled the global environment – in ways we are only beginning to understand. One trend stands out: the knowledge and creativity of the average citizen, particularly in math and science, are increasingly in demand as our challenges become more complex. Those countries (especially in Asia) that emphasize education as their core cultural value will surge ahead, and those countries that don't, who continue to believe that education is a private benefit for the well-to-do, will fall behind.

Take one sector of education – the university – which, because of its mission of preserving, transmitting, and discovering knowledge, comes as close as any institution to being the social equivalent of a brain. In Asia, universities are rapidly becoming world-class institutions (and they are public, by the way, not private). A recent report released by the National Science Foundation says it all. In engineering, Asian universities produced 3,621 doctorates in 1989, and 11,242 doctorates in 2001. In that same period, the U.S. increased the number of doctorates only slightly. In the sciences, Asian uni-

versities doubled the number of Ph.D.s during that same time, while American universities increased the number of their doctorates by less than 20 percent. American students at all levels of education, meanwhile, continue to avoid these subjects like rat poison. Half the students in our graduate schools in many of the sciences are foreign-born. As Asian universities improve, and as American universities become even more expensive (by raising tuition to make up for declining public support), those foreign students will be more likely to stay at home for their education, potentially hollowing out American graduate schools in engineering and the sciences. The locus of the world's brainpower will shift accordingly.

Under normal circumstances, a sustained and long-term collaboration of the kind proposed here might seem like an insurmountable task. But we are not living in normal times. In the distant future we will look back on our present troubles as a wake-up call. Whether we do wake up, or whether we slip back into our complacent slumber, is up to us. Sometimes it takes a storm to remind us to fix the roof. And sometimes it takes a really big storm to generate a really big sense of urgency. So it is now. Our present financial crisis may be a once-in-a-lifetime opportunity to put our house in order – if we don't, we are condemning our children and our children's children to a life of vastly diminished expectations.

In a potentially fortuitous convergence of events, we are at a crossroads not only economically but also intellectually in this country. I have tried to show in this essay that for the past two centuries, the dominant worldview in the West has favored an atomistic or mechanistic understanding of the truth that prevented us from appreciating the mutual interdependence of public and private. As successful as that worldview has been in fostering a climate of individual competition and industrial productivity, it has failed to take into account an equally valid understanding of the truth that stresses the cooperative relationships of the parts in an integrated whole system. My point in writing this essay is not to argue that the mechanistic view is wrong, but that it is only partly right. It has to be seen as complementary to a holistic, organic view. Both perspectives are

equally valid. Education is *both* a private benefit and public good, because it is the defining characteristic of our humanity. Bishop Desmond Tutu once remarked that "we cannot be human alone; we can only be human together." A corollary of that might be that we cannot be educated alone; we can only be educated together.

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