

Cato Institute Policy Analysis No. 155: Only Freedom of Education Can Solve America's Bureaucratic Crisis of Education

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Executive Summary

Most Americans have always been passionately devoted to education. The current national panic over our plummeting learning scores is only the latest sign of this devotion and is remarkably similar to the panics over purported education crises that have occurred throughout U.S. history. Unfortunately, almost all of the politicians and so-called expert educationalists rushing forward to solve this latest education crisis seem to have forgotten the simplest facts about the early history of American education, which enabled this country to produce far more than its share of the world's most creative thinkers. This ignorant panic is inspiring a headlong rush into the central planning and bureaucratization of education that have been increasingly destroying the effectiveness of U.S. education for over 40 years.

The founders of the new American colonies were completely convinced that individual learning was the way to self-improvement of all forms. That faith in individual learning was most intense among the Puritans of New England and was a direct result of their passionate religious faith. The Puritans knew from their experience that control of education was the foundation of the church bureaucracy's tyranny over individual hearts and minds. They believed that each individual must be able to read the Bible in his native language so that the bureaucratic experts of the church could not assert themselves as the powerful intermediaries between Christians and their omnipotent God as revealed in ancient tongues read only by the bureaucrats. They knew that real learning--individual knowledge and thought free of the church's control--was the first prerequisite of freedom from the tyranny of bureaucracy.

As soon as they had overcome their immediate anxieties about starvation and disease, those devotees of individual education founded what is now Harvard College (in 1636) to ensure a steady supply of educated young men for their growing colony. By the time of the Revolution, that devotion to education had supplied the American people with a remarkable community of scholars and scientists who led them in creating "The First New Nation." The Founding Fathers of our constitutional democracy were probably the most brilliant, creative, and knowledgeable group of leaders in human history. They certainly vastly surpassed the politicians who now press upon us a miasma of bureaucratic solutions to our education crisis.

Individual Education

The great accomplishments of American scholarship and science in the nation's first three centuries were not the result of great wealth, huge government expenditures, massive centers of formal education, or expert theories of learning. Learning was overwhelmingly a simple, difficult, but excitingly challenging task of self-help and local community action. Families commonly taught their young the rudiments of the three R's. Some went on to the now-famous one-room schools where a local teacher worked one-on-one with individual students in the ancient ways of the tutor, the

apprentice's master, and the novice's mentor. Some of the better-off and more dedicated students also had individual tutors, and they went on to the tiny colleges for more individual tutoring and small-group instruction.

The entire nonsystem of individual education was based on tutoring and apprenticeship--learning by directly doing and teaching, observing and doing, and self-help. The few tutors and teachers in any community worked for what today would be seen as slave wages, but they got far more self-fulfillment and self-education out of teaching than they would have from pieces of gold. Local help and self-education led to the great accomplishments of Franklin, Jefferson, Hamilton, Lincoln, Edison, and a multitude of other American scholars, scientists, inventors, and leaders.

The colonial and later state governments became increasingly, but sporadically, involved in passing laws mandating some vague, general standards of minimal educational achievement for everyone. But they had few powers of enforcement, since they had almost no bureaucracies to carry out their proclamations of anxiety for the state of general education. Most education seems to have been carried out by families, with intermittent help of a highly individual nature from paid tutors, unpaid tutors who were friends and neighbors, and the local schools.

These same basic forms of individual education have always been the foundation of learning for the most creative scholars and scientists of all Western societies since ancient times. From the gardens of the peripatetic philosophers of ancient Greece to the patent offices of modern Einsteins and the garages of personal computer whizzes, self-education and tutorial education have been the path to the most creative and productive learning. Even in the famous and large universities of Europe, such as Oxford and Cambridge, self-education and the help of the individual tutor have been the very heart of the highest formal education. The open secret of the success of Western formal education is that in fact it has always been highly informal--highly individualized and unbureaucratic. The formal aspect consisted largely of setting public standards of achievement that, in effect, gave individuals an official stamp of approval as educated people that was much desired for status purposes.

Benjamin Franklin, who was certainly the greatest technologist-inventor-scientist of his day, and one of the era's greatest businessmen, writers, and political leaders, was almost entirely self-educated. He learned to read very early, helped no doubt by any member of the family and any neighbor who was willing. He spent one year in a local grammar school, became a dropout, studied one year with a private tutor, and ended all formal education at the age of 10. Although books at the time were rare treasures compared to today, Franklin taught himself well enough to work on the frontiers of science and become one of the most creative inventors and scientists. He learned the highly skilled craft of printing in the age-old apprenticeship way, by directly observing and doing. Mastery of that craft gave him a lifelong sense of fulfillment and pride that no formal certification can give an honest person who knows that such a degree is merely a symbol, not the reality, of knowledge and ability.

Thomas Jefferson is hailed to this day as the founder of America's whole tradition of public education. But his formal schooling is actually an extreme example of the creative power of tutorial learning by observing and doing, dialogue, and above all of self-education (autodidacticism). Virginians of his time were predominantly frontiersmen who learned few if any reading and writing skills because they did not need them and were fully engaged from dawn to dusk earning a living. But almost all of those who got ahead enough to have some leisure time quickly learned the rudiments and encouraged their children to learn far more. Being the son of a well-off planter, Tom Jefferson spent several years in typical one-room local grammar and classical schools. His first schoolteacher, William Douglas, actually did little to help him learn, but his second, the Reverend James Maury, made a lasting impression on him. As was common at the time, Jefferson boarded with Maury's family, so his education was one of total immersion. His class at the one-room school included four other boys, so learning was by the ancient tutorial. He proceeded entirely at his own pace, a torrid one indeed since he learned to read classical Greek and Latin works in the original in only about two years.

History books today routinely refer to Jefferson's education at the College of William and Mary, thereby summoning up modern images of large lecture halls and dozens of professors who did not even know his name. Actually, his foray into formal education was largely one prolonged tutorial and discussion between him and William Small, the only teacher there who had any significant effect on him.

William and Mary was in chaos at the time. The students were rowdy and in a state of near rebellion. The president

admitted being drunk most of the time. Almost all of the professors were Anglican clergymen and were dismissed while Jefferson was there. The school was hardly a picture of centrally planned bureaucratic rationality. Dumas Malone noted in Jefferson the Virginian that

Jefferson said that [Small] gave to his studies enlightened and affectionate guidance and was like a father to him. Actually . . . [Small] made a daily companion of young Jefferson, and taught him no less through informal talk than by his memorable lectures. . . . [if] his college course can be described separately it is best summed up by saying that he continued to be taught privately, and that his tutor was William Small. The same sort of statement can be made about the five years after that, when he studied law under George Wythe. He gained clear title to fame in later years as a prophet and architect of public education, but his own training was preeminently personal and private.

Self-imposed, rather than external, discipline shaped his education from his youth onward.[1]

When Jefferson left William and Mary, he entered the law office of George Wythe and learned the practice of law by the ancient practice of self-study (that is, reading the law), tutoring, and apprenticeship by observing and doing. The many practices of the ancient forms of informal, individual mentoring and tutoring were the foundation of the education of the great philosophers, scientists, and leaders in our civilization until the advent of the age of bureaucratic education in this century. (Mentoring and tutoring probably have been the primary modes of education in all civilizations during their creative periods, being replaced by bureaucratic education only in their final periods of stagnation and decay. However, I know of no study comparing civilizations in such terms.)

Although Jefferson's experience at William and Mary has often been presented--mistakenly--as evidence of his college education, there is no such distortion in the case of our appreciation of Abraham Lincoln's educational experience. Americans have long been thrilled by the texts, stories, and movies depicting Abe Lincoln walking miles to get one of the scarce books he could read by the firelight after his day's work was done. And they learn in early childhood that this master of the English language never learned English from a Dick and Jane reader nor spent endless hours cutting up beautiful prose into lifeless words.

Does Science Require Formal Education?

It has often been claimed that although reading and writing skills can be learned by individual means, the highly technical fields of modern technology and science demand the formal education of specialized professionals--bureaucratically certified experts--using classrooms and laboratories full of expensive equipment that can be paid for only by millions of taxpayer dollars.

However, if there is any difference between the two cultures of learning--the humanities and science--in this context, it is probably the opposite. The basics of reading and writing are completely formalized--they are preordained symbolic forms that must be mastered before one can go on to creative enterprises. Formal education is better suited to the learning of such totally formalized symbolic activities than to any other kind of intellectual activity. The costs of such bureaucratized modes of teaching the basics of reading and writing are more long run, thus hidden. If students are willing to have the basics pounded into their heads by such routinization, they can learn even if they have little enthusiasm and little individualized tutoring. But it kills their motivation and teaches them to take a generally submissive, dependent approach to learning, rather than the aggressive, independent initiative found in self-education. Formalized education of this sort can teach the rudiments to millions, but it kills the spirit of learning--the passionately curious rage to know that is the beginning of all creative education and enterprise.[2]

In technology and science, the short-run costs and the long-run costs of bureaucratic formalization are all much higher. Science and especially technology are only partially subject to formalization. The basics of mathematics can be learned like the alphabet can (one, two, three, two plus two, etc.), but as soon as one tries to apply mathematics to real-world problems, the element of uncertainty-- "art"--must be considered in unroutinizable ways. The creative struggle with the uncertainties of reality is inherent in all real science and technology, just as it is inherent in all free-enterprise business. Anyone who learns science by rote is actually unlearning the very heart of real science and will never be a good--creative--scientist until he or she unlearns the rote learning. The best way to learn to be a creative scientist, technologist, or entrepreneur is to wrestle individually with all of the uncertainties from the beginning. An individual who has already been through this heroic struggle with the primordial uncertainties of life can help by serving as a

model and as a mentor and tutor who encourages and allows learning by observing and doing. But a tutor cannot produce creativity by presenting formalized, textbook-based, bureaucratized knowledge in the rote forms of formalized education.

No American scientist or technologist, not even Benjamin Franklin, has had a more creative impact on the world than Thomas Edison. Edison had even less formal schooling than Franklin. Whereas Franklin lasted one year in the local one-room school, Edison lasted only three months. Rather than being allowed the graceful exit of becoming a seven-year-old dropout, he was expelled for being "retarded." His mother then taught him the basics for three years by the universal methods of tutoring. As he later said, "She instilled in me the love and the purpose of learning." [3] When he was an overly tender 10 years old, his mother introduced him to an elementary book on physical science, and that marked the beginning of his lifelong effort to teach himself. He set up his own chemistry laboratory in the basement. Since he was crushed by the overwhelming disadvantage of poverty and had no welfare net to save him, he went to work at the age of 12, and he became self-supporting while continuing to educate himself and carry on his own experiments that eventually helped to revolutionize the world. Many years later, having built the first world-famous scientific laboratory, he was asked about the bureaucratic rules by which he ran the organization. As he said emphatically, "Organization! Hell! I'm the organization! . . . Hell! There ain't no rules around here! We are trying to accomplish some'pn'." [4]

It is almost always claimed by the expert educationalists that modern science cannot be learned or done by such informal methods. They claim that so-called Big Science is now done by huge bureaucracies because that is the most creative way or even the only way that creative advances can be made. Their claim, though, is the opposite of the truth, and the most creative scientists of our time generally realize that Big Science is a danger to all scientific creativity.

None of the great discoveries of modern science, such as the recent discovery of superconductivity at relatively high temperatures, has been made by scientists in our vastly expensive university or other government bureaucracies. As Robert Root-Bernstein argues in his recent book *Discovering*, the important discoveries are made with remarkably cheap equipment in small, unheard-of laboratories, or in even cheaper garages. [5]

Physicist Richard Feynman worked in the niches of our scientific bureaucracies, but he lived his science by the rule of always thinking about it in concrete, real-world terms and did it himself in the simplest, most commonsensical way possible. After NASA lost the space shuttle Challenger and its crew in 1986, an official commission was set up to determine how a project costing so many tens of billions of dollars could have failed. The many experts who testified showed that, with all their expensive research, they could not determine whether or not the shuttle's O-rings might have become brittle and failed, thereby causing the fatal accident, because of the cold weather at Cape Canaveral on the morning of the flight. As the conflicting public testimony swirled around him, Feynman placed a piece of an O-ring in a glass of the ice water set out for the commissioners to drink and showed that it quickly became brittle. This bit of very little science took only a few minutes to perform and cost a few pennies. Feynman wrote that "I never pay any attention to anything by experts. . . . I calculate everything myself." [6] Earlier in his career, teaching a class in Brazil, he had found that he could not convince the students to think of how the "principles" in the textbooks really work in the everyday world they observed and lived in. Latin American students were-- and still are--taught by the bureaucratic methods and experts of the church and state against which the early American colonists revolted.

Root-Bernstein argues that other creative scientists agree overwhelmingly with Feynman. The two basic principles of creative science in this respect are "Do as large a proportion as possible of your experiments with your own hands" and accept something "Only when I have convinced myself." [7] As Root-Bernstein says, "This means, in effect, you must train yourself--be an autodidact, learn your subject your way." [8] He takes note of "the surprising fact that many discoveries are made by young scientists just moving into a field and by older scientists with little or no formal training in that particular science. Pasteur and his invention of the germ theory of disease is a prime example." [9] James Watson and Francis Crick's revolutionary discovery of the double-helix structure of DNA is another prime example, since they worked on even less than a shoestring and without grants and one of them had just earned a doctoral degree but was unemployed and the other was just a graduate student.

All really creative scientists are contrarians. They perform acts of creative deviance, going against the paradigms that

are used as the formalized founts of wisdom for the least-common-denominator education of the students who will never become creative after their indoctrination into the accepted knowledge of their expert professions. Root-Bernstein's principles of scientific creativity sound like the nonrules of contrarian's I Ching: "Challenge expectation"; "Find a contradiction between theory and data"; and "Play contradictions." [10]

The Creativity of Dropouts

In an age in which the mass media of least-common-denominator doctrines keep dinning into us the horror stories about dropouts who can never earn a living without a certificate of formal education, it may be surprising to find how many people drop out anyway to create new worlds. George Gilder notes in *The Spirit of Enterprise* that Bill Gates dropped out of Harvard University to create Microsoft, which has been the most successful software firm in the age of computers. He also notes the general fact about the creators in these new high-technology enterprises:

In all the history of enterprise, most of the protagonists of major new products and companies began their education--and discovered the secrets of their later breakthroughs--not in the classroom, where the old ways are taught, but in the factories and labs, where new ways are wrought. Among all the legions of lawyers, financiers, bureaucrats, and masters of business administration strutting into the American economy from the nation's leading schools, nothing has been so rare in recent years as an Ivy League graduate who has made a significant innovation in American enterprise. [11]

Although he does not mention it in his book, Gilder himself is a fine example of the dropout creators. Just like Gates, Gilder found that the educational atmosphere at Harvard tends to suffocate creative deviance. He too dropped out and went on to become one of America's most creative social thinkers. Of course, some Ivy League graduates do go on to become creative. There is actually a large minority of students in all these bureaucratic status mills who quietly deviate from the enshrined dogmas and retain their creativity. They wind up giving the public the false impression that such formal education produces creative thinkers. Their creativity occurs in spite of the bureaucratic controls, not because of them. Many bright and creative young people choose to go to large and prestigious universities for various reasons, such as because they do not know that such places can stifle creativity, they need the money, they crave discussions with other bright students that encourage creativity, they want the status that assuages the personal insecurities so common in creative people, or they know of one of the minority of faculty members who also encourage creativity. Correlations--such as that between formal education and creative thinking--can be totally deceiving when the relationships are not looked at over time to see which come first.

The brightest and most creative students at all levels who do not formally drop out of our Leviathans of education generally find it easy to make high grades and, in their own parlance, beat the system, tune out the bureaucratise, and turn on to their own more serious and more creative interests. I had a very large group of friends and acquaintances who did that at Harvard even back in the less bureaucratized 1950s. Most of them also engaged in individual study and took graduate seminars. A small number of us even graduated in three years to escape it all. Although the number was much smaller in high school, those same people were commonly far more tuned out in high school and spent most of their time doing their own work. At Miami Jackson High School, a small group of us were able to make nearly perfect grades to go on to college without spending much time at it, so we spent our time educating ourselves and each other in many different realms. The bureaucracy could be bothersome, as it was when the principal and dean of boys berated me for being a "Marxist nonconformist" because I read Russian literature and Marx and was a democratic socialist at the time. (That was in the early 1950s, the era of McCarthyism.) But for the most part we could avoid the whole system and get on with our serious work. There were no social workers investigating our families, no psychological counselors trying to force us to conform in the name of science, and no omnipresent national testing system forcing the teachers and us into one great mold.

Bureaucracy and the Ordinary Student

Educationalists, who are not totally unmindful of such obvious facts of life in our schools, generally insist that self-education, mutual self-help, tutorials, and other forms of informal education are all fine for the brightest and most creative, but that they are totally unavailable or useless for the ordinary (mean or least-common-denominator) students. That is the opposite of the truth. All of our schools at all levels and in all communities are pervaded by a vast plethora

of informal, local, individualized learning groups studying and teaching themselves and each other how to repair motorcycles and cars, how to build radios or computers, how to surf every good surfing area in the world, how to dive in the ocean or soar in the sky, and how to do millions of other things.

Most of those autodidacts, tutors, and mentors rely largely on direct learning experience and word-of-mouth traditions, just as the members of all human cultures always have. And in our literate society, almost all of them also make extensive use of the written word, such as the magazines and instruction manuals on everything from surfing and diving to fixing the moot exotic sports cars. High school students who go completely "dumb" when faced with a bureaucratically mandated science text or literature quiz may well be whizzes at reading auto manuals that are all Greek to the math whizzes and Shakespeare "nerds."

The obvious fact is that the education bureaucracies are far more destructive of the motivation and learning of the less symbolic students than of the symbolically brightest students. The bureaucratic teachers do not understand them or sympathize with them because they rely far more on direct learning by observing and doing and by word of mouth than on the textbooks the teachers use. They can be brilliant at doing marine biology when their fishing or diving motivations are fully engaged, and they can directly observe a master at work; wading through a textbook mandated by a teacher or central planner, however, may turn them off completely. (As I am a highly symbolic type, textbooks were easy for me from the earliest years. A cousin, who was a whiz his whole life at personnel management but hated texts, dropped out of high school and completed it through painful correspondence courses. To reduce the pain, he bribed me to do his course on auto mechanics. I passed it quickly with flying colors, without knowing how to find the carburetor on a real car. If a real car needs repairs, I recommend my cousin, not me. I've written many books since then, but I have never fixed a car.)

Bureaucratic education has had little negative effect on the symbolically brightest and most creative. People like the late Richard Feynman still manage to survive the formal processing of their minds, largely by tuning out and going their own ways in spite of the bureaucratic tentacles. But the ever greater bureaucratization of U.S. education at all levels has had a devastating effect on the less symbolic and more least-common-denominator students. As the bureaucracy has grown, those students have come more and more to loathe the schools and almost any form of text-based learning associated with the schools. Science has been the worst victim of this trend because the students are first introduced to science in the schools by the rote methods of bureaucracy and because creative science demands more freedom, more curiosity, more individualized learning, and more contrarianism than most other realms of knowledge. In a 1990 survey of U.S. science education, Newsweek summed up the situation nicely:

Unfortunately, few American students ever get to taste real science, for few of the nation's schools teach it. All parties now seem to agree that American science education serves not to nurture children's natural curiosity but to extinguish it with catalogs of dreary facts and terms.[12]

What could be more dreary--and enraging--to already rebellious teenagers than to have authoritarian bureaucrats order them to learn everything in a dreary textbook--or else!

There is a direct and remarkably high correlation between the growth of the educational bureaucracies and the growth of rage and rebellion against education on the part of less-symbolic students. The bureaucratization came first and directly caused the rage. Now some of our schools trying to educate such alienated students are literally being patrolled by police, but even they cannot stem the tide of revolution. Teachers dream of returning to the good old days of Blackboard Jungle, way back in the 1940s and 1950s when schools were neighborly and informal and before students hit, raped, and murdered teachers. In view of what has been happening in the centrally planned, bureaucratic states around the world, is this really so surprising?

Community leaders and the parents of the less-symbolic students are now revolting against the whole bureaucratic system. They know their children are not inherently dumb and really want to learn what they themselves value and what they can see from direct experience will help the children to develop in the world. They are seizing control of their local schools through decentralization movements that may return the schools to the traditional American form of local schools, self-education, tutoring, neighborly help, and individual initiative everywhere. The educational bureaucrats are furiously resisting this reactionary movement, in spite of the violent revolution on their hands, and they

contend that ignorant parents will only make a mess of it. They forget that motivation is the beginning of all real learning and that the complexity of individual motivation and learning is precisely the reason that radical decentralization--individualization--is the only nonsystem that works in education. Where the bureaucrats have incentives to preserve and expand the system, the parents and their children have all the incentives to learn, discover, and pursue the ways of learning that work for them in the real world they live in.

Big Schools and Big Government

The worst enemies of this return to the glorious past of real education in the United States are the bureaucratically educated elites that staff our universities, mass media, churches, foundations, government agencies, and most other big bureaucratic institutions. Even the best of our big bureaucratic schools at all levels not only focus the minds of the young on the past, as Gilder notes, but focus their minds on those parts of the past that embody and justify the bureaucratic mind-set that is now the foundation of all such schools, as well as our big government, big businesses, and big foundations--and of much of the rest of our conflict-ridden society.

This situation is easy to demonstrate by application of a few commonsensical tests of the culture items learned by the students at the prestigious universities. Take any random sample of students from Harvard, Stanford, the University of Wisconsin, the University of California, or any other educational Leviathan. Ask them whether they've read Adam Smith (or Edmund Burke) and Karl Marx. Result? Who now reads the ingenious analyses of Adam Smith? Who does not get subjected to the enraged hate-mongering of Karl Marx? Go to your local college bookstore and look for the books on Smith and those on Marx. Look up the number of references to Smith and Marx in the indexes of the faculties' publications. Even more revealing, do the same culture-item test for Friedrich Hayek and John Kenneth Galbraith. Try to find even an economist at your local prestigious school who has read Hayek or any other real free-market economist. The average ignorance quotient about the entire literature of freedom--Locke, Smith, Hume, Burke, the Federalist Papers, and on and on--is astounding. Average students from the best of the prestigious universities have a sure grasp of Marxism, socialism, and many other brands of collectivist-bureaucratic thinking, but they have never read any classical liberal thought and do not even know the names of the great thinkers about freedom in our own century.

It is not the least bit surprising that the most successful of our students from our big bureaucratic schools assume that big government, big science, and all forms of bureaucratic rationality are the embodiment and fount of all rationality--hence of creativity, productivity, and everything else good. They have succeeded in learning what they were taught explicitly and, far more important, implicitly over and over again--relentlessly and with the sincere, passionate convictions felt by their bureaucratic teachers. (Such students, of course, are not the creative students, the Richard Feynmans, who tuned out the texts. They are the bureaucratic successes who fit into the mold, generally without knowing it was a mold.) Did they not learn in minute detail in their sociology courses that Max Weber "proved" by his definition of bureaucracy that it is the most rationally organized form of human activity? Did they not learn from John Kenneth Galbraith that big business is good because it can rationally (bureaucratically) plan its own sales, even of the Edsel? Did they not learn in their Keynesian economics courses that the only thing better than big business or big education is immensely bigger government, which is what is needed to make all the lesser goods really good?

Bureaucratic rationalism closes off possible new lines of action in direct proportion to its success. It is based overwhelmingly on the assumptions that there is no inherent uncertainty in the world and that the organizational rules developed to fit the past situation will work in the future because they worked in the past. (Bureaucrats assume the percent in real terms in the 1980s, and average real learning has plummeted steadily. (Test scores have stabilized because vastly more school effort now goes into teaching students how to take the tests.) How does this situation differ from what has happened in the highly planned, centrally bureaucratized economies?

If giant bureaucracies could centrally plan creative education, the Soviets long ago would have outdistanced all of us, instead of immiserating their entire society. In fact, if Mandarin education experts could produce creativity, instead of causing all minds to stagnate, the massive, centralized, equal bureaucratic education system of the Chinese Mandarins would have produced a great blossoming of Chinese civilization centuries ago, instead of the awful decay of that once-vibrant civilization.

In the past 30 years the United States has steadily increased its spending on gigantic education bureaucracies, so that today we spend more per student per year than any other major nation. (The education bureaucrats try desperately to deny this fact by comparing percentages of GNP spent on lower education, excluding college costs, which are so much higher in the United States, and so on. We do actually spend more of our GNP on education than most other industrialized countries; but, more important, because we have a higher GNP per capita, our spending per student is much higher.) A higher percentage of our young people attend college than is the case in any other major nation. But by all significant measures, the educational attainments of our average young people (not the creative ones who tune out the system and learn the test items on their own) has steadily declined, so that today they rank near the bottom among major nations.

Japan, the nation that has rapidly improved in all categories of development and now frightens the entire world with its stunning productivity and creativity, spends almost nothing on research in gigantic university bureaucracies. It invests two to three times as much as the United States does in such research, but that research is undertaken by private businesses, not by gigantic government bureaucracies comparable to the University of California, the University of Wisconsin, or our hundreds of other Leviathans of bureaucratic education. The nation that rivals Japan, Germany, has not even a single university research Leviathan that is comparable to the hundreds in the United States. The Germans rely far more on much less-expensive forms of direct learning by observing and doing--that is, by apprenticeship, on-the-job education, part-time education, industrial research, and so on.

parameters remain basically the same, so the bureaucratic forms only have to be adjusted slightly as the world changes.) Bureaucratic, formalized, rule-bound education makes the same assumptions and takes the further step of assuming that there are no inherent uncertainties in the motivations and ways of learning of individuals. It assumes that all the peas and all their pods are basically the same and, therefore, that the more the methods of education are the same (that is, the more equal everything is), the more effective teaching and learning will be.

All the basic assumptions of the bureaucratic system lead rationally to the conclusion that the closing of minds is exactly the way to be creative and productive in anything. Thus, the closing of minds so well described by Allan Bloom[13] is the rational outcome of the standard bureaucratic operating procedures of the central planning of our education system. The bureaucratically mind-closing ideas of the teachers and professors are the only ones consistent with the basic assumptions on which the entire system is built. The teachers are not the ultimate causes, they are only intermediate products--the people chosen to teach the students to have closed minds because they are the teachers who fit the assumptions of the political choosers.

Perform another simple culture-item test: Find a single president of a prestigious university, which is supposed to be dedicated to creativity, who now does anything creative. Once you despair in that quest for the holy grail of university education, try to find a single president of such a prestige school who even says something different from what all the other university presidents say. There actually are a few such deviants at small, liberal arts schools, but you will probably never find them because they are so drowned out in the mass media by the big talks of standard bureaucratese.

In *The Troubled Crusade*, which is probably the most influential book written on U.S. education in many years, Diane Ravitch notes that from 1945 to the present, the Jefferson-proclaimed crusade against ignorance has become a crusade for equal education.[14] During these 45 years, Americans have striven relentlessly to close out differences in the forms of education, to reduce all of education to the same basic rational formula administered in the most rational way possible--by a centralized bureaucracy of education experts. The result has been perceived as a growing crisis in education worse than any earlier ones. Over the decades, Americans have become more and more panicky over the obviously declining learning of students; government expenditures for education have soared steadily, increasing over 30

It is obvious from the entire history of learning that all real education, and especially all creative education, is the result of complex individual motivations and of ways of learning by observing and doing, tutoring, and mentoring. Any central planning or bureaucratization of this inherently individual activity will reduce the paths to learning to equal forms that close off almost all new ways of thinking and doing and will turn them into the deadly rote education we have seen in all the once-great societies that have succumbed to government bureaucratization of education.

The present crusade that is carrying our society toward federal testing standards for education is based explicitly on the assumption that there is a set, predetermined, closed body of culture-items that constitute worthwhile learning. If the crusade to make all our children learn this closed set of items succeeds, what will become of creativity--that openness to and production of new, unplannable, unforeseen items? Teachers around the country are already focusing more and more student attention on learning those predetermined items, so that they themselves can get higher ratings and salaries tied to the test scores. And students have less and less time left to pursue their own unplanned, unbureaucratized interests. The worst calamity will come if the bureaucrats succeed in attaining their goals. Fortunately, they probably cannot do all of what they are crusading to do because of the inherent ineffectiveness of bureaucracy. Unfortunately, with their greatly increasing resources and police powers, they are already succeeding at an accelerating rate in unintentionally murdering the curiosity and other motives to learn of ever more students and robbing them of the free time to learn what they really want to learn in the ways they can learn.

Conclusion

The goal of all people sincerely committed to real, creative education should be to decentralize, deregulate, decontrol, depoliticize, and debureaucratize, and to increase incentives for direct, individual, and local education of all forms. Some individuals will find that they learn best entirely on their own. Some will find they need more group support, stimulation, and discipline. Almost all will find that the ancient forms of individual tutoring and mentoring will help immensely in any learning situation. The more freedom they have to decide how to learn, what to learn, how to fit learning to their long-run goals and opportunities, and how to continually change all of that to meet emerging motives and situations, the more effective their education will be--and the more effective and happy our entire society will be.

As long as most Americans and most of our officials continue to build Leviathans of bureaucratic education, we can confidently predict more of what bureaucratization has been producing for many decades--less and less real learning, less and less creativity, more and more stagnation, more and more decline in our position around the world, and ever more anxiety and panic among a people who remain passionately committed to real education but have forgotten their own gloriously creative past. However, if we can return to the freedom of education that Americans enjoyed when they were astounding the world with their creative energies, then the vast new learning resources that technology makes available to individual learners will enable them to be more creative and productive than was ever before possible. Think of what self-reliant autodidacts such as Benjamin Franklin, Thomas Jefferson, or Thomas Edison would be able to do with the computer technology that will soon place the entire world at our fingertips.

Notes

[1]. Dumas Malone, *Jefferson the Virginian* (Boston: Little, Brown, 1948), pp. 54-55.

[2]. Page Smith has entitled his brilliant historical indictment of American higher education *Killing the Spirit* (New York: Viking, 1990). Lower education is an even worse killing field.

[3]. "Thomas Alva Edison," in *The New Encyclopaedia Britannica* (Chicago: University of Chicago Press, 1983), vol. 6, *Macropaedia*, p. 308.

[4]. Wyn Wachhorst, *Thomas Alva Edison* (Cambridge: MIT Press, 1981), pp. 180-83.

[5]. Robert Scott Root-Bernstein, *Discovering* (Cambridge: Harvard University Press, 1989).

[6]. Richard Feynman, *Surely You're Joking. Mr. Feynman!* (New York: Norton, 1985), quoted in Root-Bernstein, p. 418.

[7]. Root-Bernstein, p. 418.

[8]. *Tbid.*

[9]. Root-Bernstein, p. 417.

[10]. Root-Bernstein, pp. 412-13.

[11]. George Gilder, *The Spirit of Enterprise* (New York: Simon and Schuster, 1984), pp. 246-47.

[12]. *Newsweek*, April 19, 1990.

[13]. Allan Bloom, *The Closing of the American Mind* (New York: Simon and Schuster, 1987).

[14]. Diane Ravitch, *The Troubled Crusade* (New York: Basic Books, 1983).