6.931 Development of Inventions and Creative Ideas
Spring 2008

Chapter 9

A Formula for Economic Decline

While this book in some portions has covered a fairly large canvas, it has specifically dealt with the need to revamp the patent laws, or at least return their practice to the original intent of the founding fathers of the nation as stated in Article I of the Constitution. At this time, I would like to stress that this is but one small part of a much larger picture. In fact, if this picture were viewed as a work of *pointlisne*, that school of painting in which the whole is developed by the employment of thousands of small dots of color instead of brush strokes, patent reform would be but a single though arresting dot.

The larger pictures is that after developing an industrial technology that can and has outproduced the world – after investing sixteen billion dollars annually in research – what this nation would seem to have acquired is a *sure-fire formula for economic decline*.

If there is any doubt that our creative industrial capability is standing still – and to stand still is to lose ground in modern technology – consider that for the third successive time in as many decades the automobile industry again appears as the only prime mover capable of pulling the country out of the economic doldrums. But this time it is increasingly evident that even that great industry, no matter how prodigious and brilliant its performance, cannot single-handedly absorb all the unemployed and lift the gross national product growth rate to the desired and necessary level.

While we have always considered ourselves as the most inventive of all modern nations – with the telephone, the combine harvester, the electric lamp, the mass-produced airplane and automobile as icons of this faith – the truth of the matter is that modification rather than innovation has become the accepted rule in American industry. Plastics, processed foods, outboard motors and synthetic textiles all appeared in the marketplace before World War II.

9.1 The Pity of Serendipity

Despite vast expenditures in research and the siren song of serendipity with its promise that our probings into space would result in unexpected discoveries, that they would unlock a cornucopia flow of new, amazing, and revolutioniz-

ing products that would change all prior concepts of living and accelerate the economy at a rate never envisioned before, nothing more remarkable than some cooking utensils can be traced directly to this mighty effort. And even here the manufacturer denies NASA's claim that these articles are a result of space research. The fact is that American technology has not developed a major product that every family has felt a compelling need to acquire since television.

Not only is private industrial research not paying off, but the expected spillover from the titanic technological expenditures of the government has yet to appear.

One of my friends, who has never been an alarmist, said that he didn't realize the trouble we are in until seeing the furor in print that greeted the advent of colored film for the Land Polaroid camera. "It certainly is a distinguished and creditable accomplishment, but the only thing 'awesome' about it is that *Newsweek* should use that word to describe it." He went on to say that nothing he had read had so disturbed him since Calvin Coolidge's 1928 pronouncement that the miniature golf boom of that year would prevent any recession or depression.

9.2 "Mind-Forged Manacles"

There has been some expressed concern. A member of the President's cabinet has admitted that "international competition is beginning to run rings around us. The nation's research effort is not producing the new consumer products, the new machines, the new industrial process that the country needs for a growing healthy economy."

Scientists in top management posts are not unduly alarmed. "There is an adequate base for pure research, but is has just not been applied," insists the director of long range planning for an industrial giant noted for its research depth. Other august opinions are: "We are not lacking in the capability to invent. Where we have trouble is in the incentive to invent." and "Increasing the economic rewards would give a real lift to U.S. inventiveness. ...It's a matter of getting the risks and incentives into balance."

Unfortunately there is more to the matter than just getting risks and incentives into balance. If this were all, patent reform and recognition by the courts and government of the risks involved could probably restore the old incentives that in the first stages of the technological revolution enabled America to race ahead and provide a stream of goods on a scale never seen before. It was a time when Thomas A. Edison, "Tin-Lizzie" Henry Ford , Willie "Airbrake" Westinghouse, Alexander Graham Bell, Wilbur and Orville Wright were folk heroes and every other American youth dreamed of emulating them.

Today, not a single contemporary inventor is a household name, and most industry is so shackled with what William Blake termed "mind-forged manacles" that it is extremely doubtful that Edison, Ford, or Bell would be employed and, if employed, allowed to function successfully by the companies that now bear their names – for all three were nonconformists in terms of what are now firmly established industrial management rules and personnel selection procedures.

9.3 "Conformity Is a Psychotic State"

Applied to the present state of industrial and technological organization in these United States and the mounting challenges we face, there may be more truth than shock value in this diagnosis by playwright Clifford Odets. He insists rather violently that "this is the frontier that has to be opened. This is a new kind of Calvinism that allows no individualism. It is a frightening phenomenon and as rigid as any Calvin ever practiced."

Whether this is a new kind of Calvinism and psychotic is certainly debatable, but that conformity is the enemy of innovation is not. And since conformity is the climate in most large business organizations, we may have pair far too high a price for some of our greatly revered achievements in mass production and management.

9.4 Mental Containers

According to office wits, nothing is more sacred to executives than a table-of-organization chart. This is probably true, for the had of the nation's largest advertising agency seemed to realize that he was treading on dangerous ground when he said, "It never has been our idea that the organization structure should be complicated or an end in itself." Organization charts can be impressive and yet have no meaning – in fact can be restrictive. Whether or not a large corporation or organization can function without charts to clarify the lines or executive responsibility has no bearing on creativity and inventive incentives – but the outlined rectangles that dangle down like earring ornaments in these paper pyramids do.

Probably the most effective mental container ever devised is the t.o. box – it lets little fresh thought in, and none out. If that is its main purpose, it is certainly successful. But if the encouragement of creative thinking and action is an objective of a firm or organization, then it is the greatest barrier Man has ever erected against himself. Every week more ideas are smashed, squashed, and ignored within four ruled sides than were suppressed by the Spanish Inquisition in the four centuries of that institution's existence.

Former Olympic diving champion Fred V. Zendar, now a consultant in oceanic research for both government and private industry, recently made some rather penetrating comments on the subject of chains of command and lines of communication. He said, "In all big organizations there is a submerged layer that effectively blocks all communication from above and below. Oddly enough, sonar has detected a similar stratum of blocking water in the oceans, but here the level itself doesn't remain stationary but periodically rises and sinks and sometimes parts." He wrily added, "No such phenomena seem to occur in its human counterpart." When asked what this layer is composed of, Zendar, who was a favorite fishing and flying companion of Ernest Hemingway and who doesn't mind putting his shots below the waterline, replied, "In both cases, suspended silt. But I imagine if you examined it closely you'd find plankton and dead minute marine life in one; supervisors and paper-shufflers in the other."

9.5 The Degree Slide Rule Won't Work This Time

Certainly if the aim is to reinvigorate creativity – and for industry and the nation to survive it must be – special attention must be paid to personnel procurement processes.

In educational circles there is already a wide divergence of opinion regarding college admission and aptitude test interpretations. Two University of Chicago psychologists hold that a high IQ is not a reliable sign of "giftedness" and may simply indicate mental grey-flannelism. In one series of experiments they found that 30 veritable Quiz Kids with IQs of about 150 showed few creative abilities, while an equal number in a much lower bracket were exceptionally good at putting facts into exciting new forms.

At Cambridge University in England, physical science students were found to be less intellectually flexible than art specialists and more restricted emotionally. It was found also that the ability to deal logically with facts and the ability to see new ways of doing things do not necessarily go together.

Of course, to a patent attorney, this is neither new nor surprising. The roll call of great inventors reveals that the initial "breakthrough" discoveries were often the brain children of men singularly lacking in expert knowledge in the fields that they ultimately revolutionized. Or as Sir Henry Bessemer, inventor of the steel-making process that bears his name, put it, "I had no fixed ideas derived from long established practice to control and bias my mind."

All of this indicates that if the genes of inventiveness are to be sought and recognized, current yardsticks and measuring rules will have to be discarded. This will, or course, call for re-education of the sternest sort and a complete re-orientation of management thinking. Up to now the employment interviewer and personnel procurement manager have been able to play it safe by operating within a few time-tested guidelines tailored to the safe customs, folkways, and beliefs of this organization. Some of these shibboleths are unbelievable until one accepts the fact that every corporation is really a self-contained subculture.

Here are a few gathered at random: a S.B. will fit one job . . . another rates a Sc.M. . . . but a Sc.D. would be overqualified. . . . Anyone holding both a S.B. and LL.B. is apt to prove argumentative with his superiors. So far quite basic and undoubtedly time-tested. But listen to these: a man who has worked three different places in less than five years is either unstable or a "drifter." . . . rockhunters are dependable. . . . drivers of low gas consuming compact cars are seldom absentees. . . . sports car addicts are just the opposite, but often make good application engineers. . . . skiiers usually write good proposals.

How to press home the hard fact that the supposedly unstable man made three changes because he found the tasks assigned boring and offering no challenge to his talents, or that one "drifter" is apt to prove more creative than fifty handbook engineers or benchwarming drones is something that I would like to call to the attention of the various schools of business administration and see what they come up with.

9.6 A New Use for Senior Scientific Statesmen

That many established ways of doing things are held in place not by logic or even by habit but by the enormous restraining force of vested interests is acknowledged by all who have studied the problem. And in many cases, the "vested interests" of employees, particularly at the supervisory level, have been found to be as strong as those of top executives, if not stronger.

For this reason instead of launching a direct attack on the deadly rigidity which stifles innovation and inventiveness in many organizations, or even attempting to eradicate the choking underbrush of custom and precedent which smothers originality, a new approach to the situation has been proposed and, in the case of one government department, has been given a trial run. This new approach calls for the creation of a new profession which will function outside regular channels of administrative responsibility and lines of authority, will be capable of gaining and maintaining the confidence of all employees, will be able to intimidate supervisory retaliation, and will at all times have access to and the respect of top management.

This calls for a large order in a man. But fortunately there are ready and available a number of men of this stature. These men are our senior scientific statesmen who have passed the age of compulsory retirement in corporations (many of which they headed) and have reached emeritus standing in our great technical educational institutions. Among their ranks are some of our most renowned inventors, respected educators, experienced administrators, and original thinkers in almost every scientific discipline. In the opinion of the Board of Governors of The Academy of Applied Science, these men represent a national resource which in our present predicament it would be treason to leave immobile. It may be added that The Academy of Applied Science is compiling a roster and setting up an activity that will make this great national resource available to the country.

9.7 Create or Perish

While the particular problems I have enumerated in this summary would seem to be the particular province of management, boards of directors, stockholders, and possibly the investing public, such is not the case. Creativity and any obstacles to it that exist or are put in its path are the concern of every person in the United States, and apply to every section of society and every field of endeavor. The conquest of disease can be seriously delayed, the most promising inquires into the nature and control of illness, the rate of new drug discovery which will enable us to score an ultimate victory over heart disease, cancer, and mental illness, are all jeopardized when incentives for research are not given ample recognition, but instead are objects for demogogic political attack.

We have all rather facetiously referred to the disappearance of the buggy-whip manufacturers, but how many of us realize that the flight engineering craft, which promised such a roseate future to hundreds of thousands of people, has had a life span of but fifteen years – from the coming in of the multi-engine propeller plane to its replacement by the jet. That in another year only two

of our great plane makers will be making planes and that the nation has just about decided to sit out the next round – supersonic carriers.

Vexing unemployment will become more and more a civic problem as whole communities and even states are dealt broadside blows by the increasing tempo of skill obsolescence. The answer is not as one government spokesman has said that the American craftsman should not seek permanence in residence and the schooling of his children but should be prepared to migrate like the birds to wherever new work opportunities peculiar to his skills arise – but that industry, government, finance, and the people themselves should go all out to reinvigorate the creative gift that from the varied nature of our people and our environment is our birthright and for nearly two centuries was the identifying mark of our genius.

Certainly it will call for an overhaul of our educational processes, a reassessment of many facets of our technology, and a recognition on the part of the scientific community that "the statesmanship of science requires that science be concerned with more than science." But nothing less will do, for time is running out.

During the ninety momentous days of the Cuban crisis, we heard a great deal about "military options" and there were said to be arguments in the highest quarters that the Cuban missile threat was a diversion and that the real Soviet goal was the seizure of Berlin.

Let there be no argument of misconception about Soviet basic aims. *The armed threat of total thermonuclear war is the diversion – the Soviet goal is to take over the world by economic and industrial domination.*

Here there are no options. For America and the free world there is only one course of action –

CREATE OR PERISH