THE ESSENTIAL DEMING

Leadership Principles *from the* Father of Quality

W. Edwards Deming

Edited by Joyce Nilsson Orsini, PhD

THE ESSENTIAL

DEMING

This page intentionally left blank

THE ESSENTIAL

DEMING

Leadership Principles *from the* Father of Quality

W. Edwards Deming

Edited by **JOYCE NILSSON ORSINI, PhD**

New York Chicago San Francisco Lisbon London
Madrid Mexico City New Delhi San Juan
Seoul Singapore Sydney Toronto

ISBN: 978-0-07-179021-5

MHID: 0-07-179021-7

The material in this eBook also appears in the print version of this title: ISBN: 978-0-07-179022-2, MHID: 0-07-179022-5.

Contents

This page intentionally left blank

Preface

Dr. W. Edwards Deming published books and articles in academic journals and the popular press, with frequent letters to the editors. He wrote papers for colleagues and students, and conducted hundreds of studies for clients. He also left a number of undistributed draft papers and personal letters to colleagues and businesses, as well as to his clients. He delivered abundant four-day seminars to tens of thousands of people, and spoke frequently at conferences. He criticized the status quo, and was outspoken about government and corporate policies alike. Many of his ideas are standard in business today. Many more need yet to be adopted.

Chronologically, during the late 1920s through about 1940, Deming's writings were based in physics. For the next forty years his written works centered in statistics and sampling theory. It was during his last thirteen years (1980–1993), roughly, that he focused on the transformation of management.

Nuggets of management theory appear in Deming's early statistical work that pop up again forty years later in his management writings. I believe Deming's theory of management is the culmination of his life's work—everything is in it.

This book is about Deming's theory of management, in his own words, gleaned from articles and papers he wrote, and speeches he gave at conferences and seminars?—little-distributed until now.

My approach: I have reviewed the Deming Collection of materials in the Library of Congress Manuscript Division in Washington

DC, materials that Deming gave to me over the years, and copies of papers he handed out in classes, at various conferences, and that I have gathered from other sources. I have also reviewed hundreds of hours of video and audio recordings of his lectures to students and at conferences. More than half of Deming's works are very statistical and not directly appropriate in this book for more general audiences.

After skimming thousands of documents, I reviewed in detail some 850 articles, letters, papers, cases, lectures, speeches, and notes by Deming that contained potential material for this book. I've selected about a hundred of them for inclusion in whole or in part in this book. None of the works were in electronic format, so they had to be digitized. Several documents were sixth or seventh carbon copies, extremely difficult to read—but worth the effort to include them, I believe. Twenty of the conference films and one of the audiotapes were transcribed for excerpts to include in this book as well.

In this review of Deming's works, I found that he had a propensity to reuse the same (identical) paragraphs in different articles – sometimes identical titles, too, on different articles. Although he had some new content in each article, sometimes more than half of the content would be culled from other articles. Many papers were written in precomputer time, so I could see the "cut and paste" sections on the originals of some of the articles. Deming also paraphrased prior writings in new articles. Within a speech, especially, he often looped around and repeated the same content two or three times for effect. The looping has been removed. To minimize duplication of content in different articles included in this book, the editor took a heavier hand. As a result, the book contains very few complete articles.

Deming never missed an opportunity to include statistical theory. So, a fair amount of editing was done in this area

of his papers, as well, save for some light words on statistics in Chapter 7. One cannot talk about prediction without including the rudiments of statistical theory.

Deming's inimitable style of writing has not been removed deliberately. Deming eschewed contractions and used two words instead (e.g., "can not," "cannot," instead of can't). He used the British spelling of some words (e.g., connexion, enquire, lustre). These were often replaced by American editors, but not by all. I did not go back into edited pieces and reinstate his original style. Nor did I alter his original style when encountered, so you will see differences between articles in this respect. You will, no doubt, discover other idiosyncrasies in Deming's writing.

Deming did not use the same elements of style or structure for every article. At first, I attempted to make all of the articles consistent with regard to style, so as not to disconcert the reader. That was a fiasco. Deming used style to shape the substance. The articles herein are each in their original style.

The choice of where to place each article in this book was difficult. I could make arguments for placing some articles in any one of several chapters. In the end, articles are placed where I believe they will serve the reader best.

The contents of this book are Deming's words. I have not added my own words, except where noted in introductory statements. This book is not a substitute for Deming's books, *Out of the Crisis* and *The New Economics for Industry, Government, Education*. *The Essential Deming* necessarily includes some of Deming's ideas that came to be included in these two earlier works, but not all. This book is written for those people who wish to see more of what Deming had to say about management in this world we live in, beyond these two earlier books.

I wish to thank Niki Papadapolous, then an editor at McGraw-Hill, for her idea to create this book, and Knox Huston, who is senior editor at McGraw-Hill, for his skillful help and suggestions in preparation of this book for publication. I wish to thank my friend and colleague, the Honorable Lawrence U. Costiglio for his collaborations, suggestions, and recommendations at every stage of the development of the book.

Joyce Nilsson Orsini
2012

1

The World Is Being Ruined by Best Efforts

(Best Efforts Without Guidance Lead to Failure)

People sometimes find themselves in a situation where things don't go right. The best employees find ways to "correct" the problem. I put the word correct in quotes because often the corrections wind up making things worse. Not because of mal-intent or lack of follow-through. If the problem is caused by the way the process is designed (a management responsibility), the tweaking done by the employee may alter the system in such a way that future products or services are even worse. The correction addresses the wrong problem and winds up doing more harm than good. It's counter-intuitive to believe that your best workers, doing their best, could make things worse. Best efforts won't cut it; better management of the system is needed.

This chapter contains articles that Deming wrote between 1978 and 1992, trying to help management take responsibility for actively managing. He recognized that many of the bad practices were so ingrained that they would take decades to be rid of. He also realized that many executives had no idea how much trouble they were in. He likened the situation in America to that in Japan in the late 1940s.

At the end of the chapter are articles specifically on problems with the merit pay system, competition and monopolies, and quality control (QC)-Circles.

Deming wrote this note to himself to capture his thought that the United States is in a state of crisis, much as Japan had been after World War II. But unlike the Japanese, the United States doesn't know they're in a crisis.

The Invisible Crisis

Japan was in a crisis. The crisis was visible, the country blown to bits, destroyed by fire. Our country is in a worse crisis because it is invisible. Japanese top management asked me in 1950 to come to help. Japan soon became an economic power. The secret:

> Management of a system, cooperation between components, not competition. Management of people.

We suffer from evil styles of management, such as ranking people, divisions, plants (creating competition between people), management by results, failure to understand cooperation in a system in which everybody wins.

Transformation is required: not mere change. Transformation requires Profound Knowledge.

From a note written April 4, 1992.

Fourteen years earlier, in a letter to the dean of a university, Deming discusses the many road-blocks that stand in the way of improvement of American industry. He talks about the joint efforts of the production-worker and management in Japan and the mistaken notion that the Japanese copy from others. If they are copying, how did they get so far ahead?, he wondered.

Poor performance in American companies lies, at least in part, in the failure of American management to keep abreast of modern methods of management and innovation, Deming believed. Relations between the American production-worker and American management "presents a sad spectacle" he states in this communication.

Irrational Explanations and Excuses

A road-block stands in the way of improved productivity in American industry, so badly needed in view of America's unfavorable balance of trade. The road-block is the irrational explanations and excuses offered by most Americans, including unfortunately most leaders of industry, for the success of the Japanese, and for the competitive position of their products. It would be better to face up to the facts, and try to understand better the reasons for the miracle of Japanese efficiency and quality. The miracle of economic growth in Japan has been the envy and a model for other industrial economies.

Most Americans, from top management on down to the rank and file, even as consumers, have a badly distorted image of Japanese industry. It seems incredible to Americans that the Japanese could out-smart Americans, not by low wages, not by longer hours, but by sheer efficiency and brilliant innovation. Accusation that Japanese firms dump their products on American shores below cost, through subsidy or preferential treatment by the Japanese government, and accusation of other so-called unfair techniques by Japanese industry, are mostly unfounded. There is also prevalent amongst Americans the idea that importation of Japanese products lowers our standard of living by taking jobs away from Americans, when the fact is that without Japanese products the standard of living of most Americans, especially those of lower income, would today be considerably lower than it is.

Everyone knows that the economy of the United States has not maintained leadership in productivity that the world requires for balance of commerce. There are doubtless many reasons for this poor performance, but one of them surely lies in the failure of American management to keep abreast of modern methods of management. Innovation in America has not kept up with the Japanese. Relations between the American production-worker and American management presents a sad spectacle.

By contrast, in Japan, the contribution of the production-worker and the contribution of management are a joint effort. All people work together toward the same end, even though the motivation may in some part be selfish. The greater the productivity, the better the economic lot of everybody. This is a simple principle and it is learned in Japan at an early age.

There is, in addition, the supposition in the minds of most Americans that Japanese manufacturers exist by copying the techniques and products of other countries. The Japanese are clever and can indeed, copy.

Whose trains did the Japanese copy? And where did they get the idea that trains should run on time within 15 seconds? (I do not mean 15 minutes.) Whose TV did Sony copy? Whose cameras? I hold in my hand a Casio hand-calculator, weight two ounces, one-quarter inch thick, with a digital clock that keeps time within two seconds per month. Could American manufacturers make it? Yes. Then why don't they? The Japanese beat them to it.

Failure of Americans to understand that the Japanese have also superior ability in innovation and that they have developed superior management and channels of trade is one of the barriers to better efficiency in American production, and to innovation in America. It would be far better for the leaders of industry in America to admit that most (not all) Japanese products are better

and more dependable than the competitive American product, and that Japanese production is in general more efficient than American production.

The mail service in Japan is enviable: a letter that I posted to myself on the street at 7:25 p.m., just for a test, was waiting for me at my hotel at 10 o'clock that same evening. Obviously the Japanese postal system did not copy ours. Japanese homes have been 99 per cent electrified from a year or two after the close of the war.

I make the above assertions on the basis of work with Japanese industry that dates from 1950, 14 trips so far, a 15th to occur in October 1978, and with even longer experience with a cross-section of American industry. I may remind you that, according to Japanese testimony, it was the statistical control of quality that brought about the revolution in quality and efficiency of production in Japan, which began in 1950. These methods affect all aspects of production, from raw material to finished product, plus consumer research and re-design of product, and design of new products. One feature, especially applicable to production, is techniques by which to distinguish between (a) special causes of variation of quality and economic loss, which the worker himself can correct on statistical signal, and (b) faults of the system, which only management can correct. Statistical methods thus assist management and production-worker in Japan to pull together.

The boost in morale, and in production as well, of the production-worker in America, if he were to perceive a genuine attempt on the part of management to improve the system and to hold the production-worker responsible only for what the production-worker is responsible for and can govern, and not for handicaps placed on him by the system, would be

hard to over-estimate. It has not been tried, I believe, outside Japan.

As an example, most people are not aware that the basic reason for recalls for a defective part in an automobile is chargeable to management, not to sloppy workmanship. The fault is in design, not workmanship. Design is the function of management, not of the production-worker.

There were other new principles of administration that Japanese management learned from an American in 1950. Results were obvious within six months in some companies. Within 15 years Japanese quality and efficient productivity had upset the monetary system of the world.

These principles, imported from America, used and refined in Japan, are at hand for anybody to learn and to use, including Americans.

Another unfortunate drag on American management is American schools of business that lead students to suppose that a manager need not know anything. There is in most American schools of business a loss of respect for the fundamentals of knowledge such as economics, history, theory of law, psychology, mathematics, statistical methods. Substitution of the computer for fundamentals will take its toll on American production.

From a Memorandum to the
Dean of the School of Business Administration,
The American University,
August 23, 1978.

In this excerpt Deming puts the blame for poor performance squarely on the shoulders of top management. What is needed cannot be delegated, and cannot be done by the workforce, who are already doing their best.

Everyone Is Already Doing His Best

The wealth of a nation depends on its people, management, and government, more than on its natural resources. The problem is where to find good management. It would be a mistake to export American management to a friendly country.

A long road lies ahead of American industry—10 to 25 years—to regain a stable state of competitive position. Many changes are required. The quarterly dividend, and brief tenure in management positions, have defeated the competitive position and the standard of living that Americans have heretofore supposed could only move to still higher levels.

Paper profits, the yardstick by which stockholders and Boards of Directors often measure performance of top management, make no contribution to material living for people anywhere, nor do they improve the competitive position of a company or of American industry.

Paper profits do not make bread: improvement of quality and productivity do. They make a contribution to better material living for all people, here and everywhere.

It is not enough for everyone to do his best. Everyone is already doing his best. Efforts, to be effective, must go in the right direction.

It is not enough that top management commit themselves for life to quality and productivity. They must know what it is that they are committed to – i.e., what they must do. These obligations can not be delegated. Mere approval is not enough, nor New Year's resolutions.

Only top management can bring about the changes required. Failure of top management to act on any one of the 14 points listed [in Chapter 4] will impair efforts on the other 13.

From "Obligations of Management in the New Economic Age,"
The Institute of Management Sciences in Osaka,
July 24, 1989.

Deming points out some of the deficiencies and fallacies of suggestions that are generally put forth for bringing about improvement. He believed that every one of them ducks the responsibility of management. He makes the point that hard work and best efforts by themselves will not produce quality, that knowledge is required.

The Usual Suggestions Fall Short

Where are we? How are we doing? Let us think about the U.S., or about all North America, not just about our own selves, nor just about our company, nor about our own community. How is the U.S. doing in respect to balance of trade? The answer is that we are not doing well.

North America has contributed much to new knowledge and to applications of knowledge. The U.S., by efficient product and natural resources, beginning around 1920 and for decades, put manufactured products in the hands of millions of people the world over that could not otherwise have had them. Our quality was good enough to create appetite for our goods and services.

For a decade after the War, North America was the only part of the world that could produce manufactured goods to full capacity. The rest of the industrial world lay in ruins from the War. They were our customers, willing buyers. Gold flowed into Fort Knox.

Everyone expected the good times to continue and to wax better and better. It is easy to manage a business in an expanding market, and to be hopeful. In contrast with expectations, we find, on looking back, that we have been on an economic decline for three decades. It is easy to date an earthquake, but not a decline.

What happened? It is hard to believe that anything is different now than in 1950. The change has been gradual, not visible week to week. We can only see the decline by looking back.

A cat is unaware that dusk has settled upon the earth, but the cat in total darkness is as helpless as any of us.

Some industries are doing better than ever. There are more automobiles in the U.S. than ever before, and more travel by air. Do such figures mean decline or advance? An answer would have to take into account that in 1958 we had inter-city trains. There was a choice, air or train. Now, we have only limited train service, air or automobile; go by air or by automobile.

There was until a few years ago a favorable balance of trade in agricultural products—wheat, cotton, soybeans, to name a few—but no longer. Imports of agricultural products have overtaken exports, and as someone in one of my seminars pointed out, if we could put illicit drugs into the accounting, our deficit in agricultural products would show up worse than the published figures.

One of our best exports, one that brings in dollars, is materials for war. We could greatly expand this income but for moral reasons. American aircraft have about 70% of the world market, and bring in huge amounts of dollars. Another big earner of dollars is scrap metal. We can't use it, so we sell it. Close on to it is scrap cardboard and paper. Timber brings in dollars. Timber is important, renewable. Equipment for construction is an important export, so I understand. American movies, a service, bring in dollars. Banking and other services were at one time important, but no longer. The biggest U.S. bank is today far down the list of biggest banks in the world. Banking is now known mostly for losses on bad loans. (As an aside, quality in banking might be improved.)

We ship out, for dollars, iron ore, partially refined, aluminum, nickel, copper, coal, all nonrenewable. Scrap metal is nonrenewable.

Have we been living on fat? We have been wasting our natural resources, and worse, as we shall see, destroying our people. We need them.

Our problem is quality. Around 1958, Japanese goods started to flow in. The price was good, and the quality was good, not like the shoddy quality that came from Japan before the War and just after, cheap but worth the price. Preference for imported items—some at least—gradually climbed and became a threat to North American industry.

Were Americans caught napping? Are we still napping? Our problem is quality. Can't we make quality? Of course, and some American products are superior. We are thankful for them. Unfortunately, some good American products have little appeal beyond our borders, good paper clips, for example.

It will not suffice to have customers that are merely satisfied. A satisfied customer may switch. Why not? He might come out better for the switch.

What a company requires to get ahead is loyal customers, the customer that comes back, waits in line, and brings a friend with him.

What state of company is in the best position to improve quality? The answer is that a company that is doing well, future assured, is in excellent position to improve quality and service, thus to contribute to the economic condition of itself and of all of us, and has the greatest obligation to improve. A monopoly is in the best position to improve year by year, and has the greatest obligation.

A look at some of the usual suggestions for quality. There is widespread interest in quality. Suppose that we were to conduct next Tuesday a national referendum:

Are you in favor of quality?
(Be honest in your answer.)
Yes _____ No _____

The results would show, I believe, an avalanche in favor of quality. Moreover, unfortunately, almost everybody has the answer

on how to achieve it. Just read Letters to the Editor, speeches, books. It seems so simple. Here are some of the answers offered, all insufficient, some negative in results.

Automation
New machinery
Computers
Gadgets
Hard work
Best efforts
Make everybody accountable
M.B.O., management by objective, management by the numbers, actually tampering
M.B.R., management by results
Merit system (actually, destroyer of people)
Incentive pay. Pay for performance
Work standards (quotas, time standards)
- They double the cost of production be they for manufacturing or for service (bank, telephone company)
- They rob people of pride of workmanship, the emphasis being on numbers, not on quality
- They are a barrier to improvement

Just in time
Zero defects. Zero defect days
Meet specifications
Motivate people

Some remarks. The deficiencies and fallacies of the suggestions listed above will be obvious. Every one of them ducks the responsibility of management, requiring only skills, not knowledge about management.

Why do the above suggestions fall short? A little ingredient that I call profound knowledge is missing from all the above suggestions. There is no substitute for knowledge. Hard work and best efforts will by themselves not produce quality nor a market. We shall soon come to suggestions for the missing ingredient, profound knowledge.

If the reader could follow me around in my consultations, he would perceive that much automation and much new machinery is a source of poor quality and high cost, helping to put us out of business. Much of it, if it performs as intended, is built for twice the capacity that is needed. Some of it is poorly designed, such as make → inspect → make inspect → make inspect → … where inspection may not be economically the best procedure. Moreover, the apparatus for inspection usually gives more trouble than the apparatus for make.

Just in time, along with low inventory, is good, of course. Unfortunately, efforts usually start at the wrong end. The place to start is with processes and movements of materials used. Once processes and movements are in statistical control, the plant manager will know how much of this and that that he will need by 3 o'clock tomorrow. Quantity and quality will be predictable.

Zero defects, meet specifications, incoming and outgoing, are not good enough. Of course, we wish not to violate specifications, but to meet specifications is not enough. The pieces in an assembly must work together as a system. Assemblies must work together as a system. I may refer to page 476 in the book, *Out of the Crisis:*

> *Principle* 3. Tests of components in stages of development can not provide (a) assurance that they will work together satisfactorily as a system in service; nor (b) the average run between failures of the system; nor (c) the type and cost of maintenance that will be required in service.

A company advertised that the future belongs to him that invests in it, and went ahead and spent $45,000,000,000 for new machinery. Most of it turned out to be a binge into high costs and low quality, but it must be said in defense of the management that they were obviously taking a long view into the future, not trying to capture short-term profits.

One could announce an important theorem: we are being ruined by best efforts directed the wrong way. We need best efforts directed by a theory of management.

Wrong way. The President of a company put quality in the hands of his plant managers. The results in time became obvious and embarrassing. Quality went down, as was predictable. A plant manager can not possibly know what quality is, and even if he did, he could do nothing about it. He is helpless. He can only try to do his job, and to confirm specifications.

The President of a company wrote that

> Our people in the plants are responsible for their own product and for its quality.

They are not. They can only try to do their jobs. Their product and its quality are the responsibility of the man that wrote the article, the President of the company.

The management of a company put this slogan in the hands of all employees:

> The operator is responsible for the quality of our products.
> The inspector shares this responsibility.

Again, the operator is not responsible for the quality of his product. The product is the responsibility of the management.

Moreover, responsibility divided between operator and inspector, as it is here, assures mistakes and trouble.

The management in both of these examples rid themselves of their responsibility by handing it over to people that are helpless to define quality and to improve processes. Another example: a group of consultants in management advertised thus:

> Computerized quality information systems provide the vital link between high technology and effective decision making.

I wish that management were as simple as that.

The big losses. Too often, the financial people in a company merely beat down costs, on the thought that any cost is too high. Why do they write cheques for machinery that violates good practice?

It is vital for management to manage the big losses. One should of course chase the nickels and dimes, but it is futile to chase nickels and dimes and at the same time neglect the biggest losses. The biggest losses, as Dr. Lloyd S. Nelson said years ago, are unknown and unknowable. Most of them are not even under suspicion.

What are the big losses? Answer: the so-called merit systems—actually, destroyer of people; M.B.O., management by the numbers, quotas, failure to optimize the various activities and divisions of a company as a system, business plans in terms of a matrix of targets without regard to the whole plan as a system of improvement. Further Losses come from

Worker training worker

Executives working with best efforts, trying to improve quality, the market, and profit, but working without guidance of profound knowledge

Tampering

Failure to optimize efforts of people and divisions within the company, accepting, instead, suboptimization—everyone trying to maximize the profits of his own division—and the consequent losses

Failure of customers and suppliers to work together for ever greater and greater satisfaction of quality, lower costs, everybody wins

Knowledge about the Taguchi loss function is necessary for management. It is management's job to discover which quality-characteristic is most critical, conquer it, then to move on to the next one.

From "Obligations of Management in the New Economic Age," The Institute of Management Sciences in Osaka, July 24, 1989.

The transformation of the American style of management is not a job of reconstruction nor revision. It requires a whole new structure, from foundation upward. Deming outlines some of the failures, the need to halt the decline, seven deadly diseases, the long road to recovery, and some notes on the government and service industry.

A New Structure Is Required

Failure of management to plan for the future and to foresee problems has brought about waste of manpower, of materials, and of machine-time, all of which raise the manufacturer's cost and price that the purchaser must pay. The consumer is not always willing to subsidize this waste. The inevitable result is loss of market. Loss of market begets unemployment.

Performance of management should be measured by potential to stay in business, to protect investment, to ensure future dividends and jobs through improvement of product and service for the future, not by the quarterly dividend.

It is no longer socially acceptable to dump employees on to the heap of unemployed. Loss of market, and resulting unemployment are not foreordained. They are not inevitable. They are man-made.

The basic cause of sickness in American industry and resulting unemployment is failure of top management to manage. He that sells not can buy not. The causes usually cited for failure of a company are costs of start-up, overruns on costs, depreciation of excess inventory, competition—anything but the actual cause, *pure and simple bad management.*

What must management do? Management obviously have a new job. Where can management learn about the transformation that is necessary? Management can not learn by experience alone what they must do to improve quality and productivity and the competitive position of the company.

Everyone simply doing his best is not the answer, either. It is first necessary that people know what to do. Drastic changes are required. The first step in the transformation is to learn how to change: that is, to understand and use the 14 points and to cure the seven deadly diseases.

The 7 Deadly Diseases

The application of the 14 points will transform the American style of management. Unfortunately, deadly diseases and obstacles still stand in the way of transformation. The following seven diseases afflict most American companies:

1. *Lack of constancy of purpose* to plan product and service that will have a market and keep the company in business, and provide jobs.

2. *Emphasis on short-term, profits:* short-term thinking fed by fear of unfriendly takeover, and by push from bankers and owners for dividends. Short-term profits are not a reliable indicator of performance of management. Anybody can pay dividends by deferring maintenance, cutting out research, or acquiring another company.

   Dividends and paper profits, the yardstick by which managers of money and heads of companies are judged, make no contribution to material living for people anywhere, nor do they improve the competitive position of a company or of American industry. Paper profits do not make bread: improvement of quality and productivity do.
3. *Evaluation of performance,* merit rating, or annual review. These traditional appraisal systems reward people who do well in the system. They do not reward attempts to improve the system.
4. *Mobility of management.* The job of management is inseparable from the welfare of the company. Mobility from one company to another creates prima donnas for quick results. Mobility annihilates teamwork, so vital for continued existence. A new manager comes in. Everyone wonders what will happen. Unrest becomes rampant when the board of directors go outside the company to bring someone in for a rescue operation. Everyone takes to his life preserver.

   Mobility of labor in America is another serious problem. A strong contributing factor is dissatisfaction with the job, inability to take pride in the work. People stay home or look around for another job when they can not take pride in their work. Absenteeism and mobility are largely creations of poor management.
5. *Management by use only of visible figures.* He that would run his company on visible figures alone will in time have neither company nor figures. The most important figures for management (such as the multiplying effect on sales that comes from

a happy customer, and the opposite effect from an unhappy customer) are either unknown or unknowable, but successful management must nevertheless take account of them.

6. *Excessive medical costs.* As William E. Hoglund, manager of the Pontiac Motor Division, put it to me one day, "Blue Cross is our second largest supplier." Six months later he told me that Blue Cross had overtaken steel. The direct cost of medical care is $400 per automobile.
7. *Excessive costs of liability,* swelled by lawyers that work on contingency fees.

Long Road to Recovery

Long-term commitment to new learning and new philosophy is required of any management that seeks transformation. The timid and the fainthearted, and people that expect quick results, are doomed to disappointment.

Solving problems, big problems and little problems, will not halt the decline of American industry, nor will expansion in use of computers, gadgets, and robotic machinery. Benefits from massive expansion of new machinery constitute a vain hope. Massive immediate expansion in the teaching of statistical methods to production-workers is not the answer either, nor are wholesale flashes of quality control circles.

Management by walking around is hardly ever effective either. The reason is that someone in management, walking around, has little idea about what questions to ask, and usually does not pause long enough at any spot to get the right answer.

All these activities make their contribution, but they only prolong the life of the patient: they can not halt the decline. Only transformation of the American style of management, and of governmental relations with industry, can halt the decline and give American industry a chance to lead the world again.

A. V. Feigenbaum estimated that from 15 to 40 percent of the manufacturer's costs of almost any American product that you buy today is for waste embedded in it—waste of human effort, waste of machine-time, nonproductive use of accompanying burden. No wonder that many American products are hard to sell at home or abroad.

If I were a banker, I would not lend money for new equipment unless the company that asked for the loan could demonstrate by statistical evidence that they are using their present equipment to reasonably full capacity, and are at work on the 14 points and on the 7 deadly diseases.

Government and Service Industries

Eventually quality improvement will reach government and the service industries as well—hotels, restaurants, transportation of freight and passengers, wholesale and retail establishments, hospitals, medical service, care of the aged, perhaps even the U.S. mail. I make no distinction between manufacturing and service industries. All industries, manufacturing and service, are subject to the same principles of management.

All must adopt a new style of management. Not only is the style of American management unfitted for this economic age, but many government regulations and the Justice Department's Antitrust Division are out of step, propelling American industry along the path of decline, contrary to the well-being of the American people. Dependence on protection by tariffs and laws to "buy American" only encourages incompetence. And unfriendly takeovers and leveraged buyouts are a cancer in the American system. Fear of takeover, along with emphasis on the quarterly dividend, defeats constancy of purpose. Without constancy of purpose to stay in business by providing products and services that have a market, there will be further downturn and more unemployment.

When we size up the job ahead, it is obvious that a long thorny road lies ahead—decades. American business and industry can no longer afford job hopping—here a while and gone, from the management of one company to the management of another. Management must declare a policy for the future, to stay in business and to provide jobs for their people, and more jobs. Management must understand design of product and of service, procurement of materials, problems of production, process control, and barriers on the job that rob people of their birthright, the right to pride of workmanship.

There is hope for the future. In fact, one requirement for innovation is faith in the future. Innovation, the foundation of the future, can not thrive unless the top management has declared unshakeable commitment to quality and productivity. The management of a number of American companies are at work on the 14 points and on the diseases that afflict them. Substantial results are already recorded. But the complete transformation will take time. We are certainly not yet out of the crisis.

From "Transformation of American Management,"
Executive Excellence,
January 1987.

Many people work without sufficient knowledge, little guidance, and focus in the wrong place. Deming discusses in this article the drastic changes he believed necessary in American companies.

Everyone Doing His Best Is Not the Answer

The biggest problem that most any company in the Western world faces is not its competitors, nor the Japanese. The biggest problems are self-inflicted, created right at home by management that are off course in the competitive world of today.

Systems of management are in place in the Western world that for survival must be blasted out; new construction commenced. Patchwork will not suffice.

Everyone doing his best is not the answer. Everyone is doing his best. It is necessary that people understand the reason for the changes that are necessary. Moreover, there must be consistency of understanding and of effort.

There is much talk about the need to improve quality and productivity. Moreover, everyone knows exactly how to go about it. It is for other people to accomplish, not for me.

In the eyes of many people in management, the big trouble is that a lot of employees in operations and in management as well are careless and neglectful on the job. One writer has the solution—hold all employees accountable for job behaviour as well as for the results expected of them. The fact is that performance appraisal, management by the numbers, M.B.O., and work standards, have already devastated Western industry. More of the same could hardly be a solution.

The annual rating of performance has devastated Western industry. Work standards double the cost of the operations that they are applied to.

Other writers see information as the solution. Anyone can improve his work, they say, if he has enough information. The fact is that a figure by itself provides no information, has no meaning, no interpretation, in the absence of theory. In short, there is no substitute for knowledge, and a figure by itself is not knowledge.

Other people put their faith in gadgets, computers, new machinery, and robotic machinery. Solving problems is not the answer, nor improvement of operations. They are not the transformation required.

It will not suffice to match the competition. He that declares his intention to meet the competition is already licked, his back to the wall. Likewise, zero defects are a highway down the tube.

The sad truth is that all the parts of an apparatus may meet the specifications, yet the apparatus may be unsatisfactory or may even be a total failure. It is necessary in this world to outdo specifications, to move continually toward better and better performance of the finished product.

Likewise, it will not suffice to have customers that are merely satisfied. Satisfied customers switch, for no good reason, just to try something else. Why not? Profit and growth come from customers that can boast about your product or service—the loyal customer. He requires no advertising or other persuasion, and he brings a friend along with him.

Western management has for too long focused on the end product—get reports on people, productivity, quality, sales, inventory. It is necessary that management shift the focus to management's responsibility for the source of quality and service, viz., design of product and of the processes that turn out the product and service. Management in the Western world have too long been driving the automobile by keeping an eye on the rear view mirror (Myron Tribus).

Recognition of the distinction between a stable system and an unstable one is vital for management. A stable system is one whose performance is predictable; it appears to be in statistical control.

Plots of weekly proportions of people absent from the job, number of accidents, frequencies of complaints of customers, costs of warranty, sales, outgoing quality, costs, scrap, rejections, accounts overdue by four weeks or more, will show where the responsibility for improvement lies. It is instructive to look at a plot of proportion of people week by week over the past two years. Does the plot show a stable system? If yes, then only the management can reduce it.

Incidentally, such plots make clear the futility and fallacy of management by the numbers. A goal that lies beyond the

capability of the system can not be achieved except at the destruction of other systems in the company. What is needed for management is not goals, but constant improvement of design and of processes at the source, the responsibility of management.

From Report No. 14 "Drastic Changes for Western Management,"
Center for Quality and Productivity Improvement,
University of Wisconsin-Madison,
June 8, 1986.
Republished with minor changes in Executive Excellence,
The Institute for Principle-Centered Leadership,
February 1987.

Poor performance in American companies lies, at least in part, in the failure of American management to keep abreast of modern methods of management and innovation, Deming believed. Relations between the American production-worker and American management presents a sad spectacle, he states in this article.

We've Been Sold Down the River

I. Need for Quality

American industry dominated the world for decades. Exports of manufactured product were at a high level for a decade after the War. The War had demolished the rest of the industrial world. The world waited in line to buy whatever North America could produce. Everyone in America expected the good times to continue. Instead, came decline. What happened?

The U.S. has suffered ever-increasing deficit in trade for twenty years. Export of agricultural products has in the past helped to defray our deficit, but no longer. Customers that buy our wheat are complaining about dirt and poor quality. Imports of agricultural products to the U.S. are now equal to exports,

and would show a deficit were figures on imports of illicit drugs available for the balance sheet.

The basic cause of the decline is that the quality of many American products is not competitive, and never was. Mass production, generations ago, was a contribution, from America toward better living the world over. Quantity was important; quality was not. Today, the problem in America is quality. The purpose here is to start to learn what to do to improve quality.

Devaluation of the dollar against the yen is a disappointment, as anyone could predict. If I wish to sell this table, and nobody wishes to buy it, reduction in price will not sell it.

Devaluation of the dollar is not the road to better business. Better quality is. We are in a completely different position than we were in during the good times after the War.

The ills of American industry come from wrong styles of management. Unfortunately, wrong styles of management move freely across the international borders.

Wrong styles of management and bad practices have grown up and taken root in the Western World. They must be blasted out and replaced by new construction, directed at quality and productivity. Emphasis in America has lately been on finance, the quarterly dividend, manipulation and maneuvering of assets. Traditional ways of doing business must change. For example, advances in quality require long-term relationships between customer and supplier, and abandonment of traditional ways of doing business on competition by price tag. Quality must be stable and capable, with continual improvement.

II. Examples of Bad Practice

Top management abandoning their responsibility for quality, occupied with finance, quarterly dividend, price of the company's stock, churning money, short-term planning, suboptimization.

Lack of policy for quality. Quality, if it is to exist, must be directed from the Board Room.

Quality requires operational definitions at every stage, including the requirements of quality for the customer. Quality requires organization for quality. Organization for quality requires profound knowledge of statistical theory.

Incentive pay

Doing business on price-tag, on the supposition that the performance of two items that meet the specifications will be equal and that competition solves all problems.

Detailed action on reports of people, quality, sales, complaint of a customer, overdue account, etc., instead of action in the board room directed at improvement.

The annual appraisal of performance, or the so-called merit system. Of all the forces of destruction that have beset American industry, this one has dealt the most powerful blow. It destroys people, our most important asset. Ways are clear toward better administration.

Management by objective. Management by the numbers.

The supposition that quality follows inevitably from hard work and best efforts.

The supposition that quality is assured by improvement of operations, solving problems, and stamping out fires.

III. Failure of Management to Accept Responsibility for Quality

There is prevalent the unfortunate supposition that improvement of quality is assured by improvement of operations. The truth is that all operations in a company may be carried on without blemish while the company fails, producing very well a product with no sale. It is a mistake to suppose that quality can be

achieved solely by hard work, by best efforts, by improvement of operations, solving problems, stamping out fires.

Hard work will not ensure quality. It is necessary to understand the theory of management, then put forth best efforts. A theory of management now exists.

It is obvious that experience is not the answer. The U.S. ranks highest in experience, measured in man years. Experience by itself teaches nothing unless guided and compared with theory of subject-matter and statistical theory.

Gadgets, automation, computers, information power, robotic machinery, high technology, are not the answer, nor zero defects. Much new machinery turns out to be the source of headaches and high cost. Money will not buy quality. There is no substitute for knowledge. New machinery should be planned in accordance with the theory of management. The possibility to make changes to improve processes must be built in.

Satisfied customers are not the answer. A satisfied customer may switch. Profit and merit come from loyal customers. A loyal customer waits in line and brings a friend with him.

It is the obligation of the producer to foresee the needs of his customer, and to produce for him new design, new product, new service.

We in America have been sold down the river on competition. Competition in the right place is essential, but competition in America has been over-extended. Management of companies do not work together on common problems, fearful of the Anti-Trust Division. Worship of competition broke up the telephone system that we enjoyed, perhaps our only exhibit of world quality. We have now no telephone system, no one responsible for the quality of service.

From "On the Statistician's Contribution to Quality," presented at the meeting of the International Statistical Institute, Tokyo, September 8–11, 1987.

Perhaps the most controversial of Deming's ideas for improvement is to abolish the merit pay system that he referred to as a "destroyer of people." This article addresses the problems with annual appraisals of people and the need for better leadership instead.

The Merit System: The Annual Appraisal: Destroyer of People

The aim of this paper is elaboration of the third disease—the merit rating, annual appraisal of people in management. Many companies in America have systems by which everyone in management or in research receives from his superiors a rating every year. On the basis of this rating, employees are ranked for raises—for example, outstanding high, outstanding, etc., on down to unsatisfactory. Management by fear would be a better name. This practice, by destroying people, has successfully devastated Western industry. The basic fault of the annual appraisal is that it penalizes people for normal variation of a system.

The merit rating nourishes short-term performance, annihilates long-term planning, builds fear, demolishes teamwork, [and] nourishes rivalry and politics. It leaves people bitter, crushed, bruised, battered, desolate, despondent, dejected, feeling inferior, some even depressed, unfit for work for weeks after receipt of rating, unable to comprehend why they are inferior. It is unfair, as it ascribes to the people in a group differences that may be caused totally by the system that they work in.

The idea of a merit rating is alluring. The sound of the words captivates the imagination: pay for what you get; get what you pay for; motivate people to do their best, for their own good.

The effect is exactly the opposite of what the words promise. Everyone propels himself forward, or tries to, for his own good, on his own life preserver. The organization is the loser.

The merit rating rewards people that conform to the system. It does not reward attempts to improve the system. Don't rock the boat.

Moreover, a merit rating is meaningless as a predictor of performance, except for someone whose performance has placed him outside the system.

Traditional appraisal systems increase the variability of performance of people. The trouble lies in the implied preciseness of rating schemes. What happens is this. Somebody is rated below average, takes a look at people that are rated above average. He tries to emulate people above average. The result is impairment of performance.

More on Leadership

Good leadership requires investigation into possible causes that have placed someone outside the system. There is rational basis to predict that anyone outside the system on the good side will perform well in the future: he deserves recognition. The reasons why someone outside the system is on the bad side may be permanent; it may be ephemeral. Someone that can not learn the job would provide an example of a permanent cause. The company that hired him for this job, hence has a moral obligation to put him into the right job. Likewise, someone that is worried about his health, or about someone in the family, may show poor performance. Counseling will in some cases restore confidence and performance.

What about repetition of a pattern? What we are saying is that apparent differences—even huge differences—could be caused entirely by a constant cause system.

A useful criterion for recognition of outstanding performance is unquestionable demonstration of improvement year by year over a period of seven or more years, in skill, knowledge, leadership. The opposite criterion, namely, persistent deterioration

over a period of seven years, may indicate people that are in need of help.

All this may be mere dreamland, because no group of people will all stay in the same jobs so long a time. In some applications, however, the period of time may be compressed, which it naturally will be with production-workers. For them, there may be data by the week on number of items produced. Seven or more successive weeks may give trustworthy indication of relative performance.

"It can't be all bad." Abolishment of the annual rating of performance is delayed by the top management in some quarters by refuge in the obvious corollary that "It can't be all bad. It put me into this position." This is a trap that is easy to fall into. Every man that I work with is in a high position and is great, worth working with and arguing with. He reached this position by coming out on top in every annual rating, at the ruination of the lives of a score of other men. There is a better way.

Modern Principles of Leadership

Modern principles of leadership will replace the annual performance review. The first step in a company will be to provide education in leadership. The annual performance review may then be abolished. Leadership will take its place. This is what Western management should have been doing all along.

The annual performance review sneaked in and became popular because it does not require anyone to face the problems of people. It is easier to rate them; focus on the outcome. What Western industry needs is methods that will improve the outcome. Suggestions follow.

1. Institute education in leadership; obligations, principles, and methods.
2. More careful selection of the people in the first place

3. Better training and education after selection
4. A leader, instead of being a judge, will be a colleague, counseling and leading his people on a day-to-day basis, learning from them and with them. Everybody must be on a team to work for improvement of quality.
5. A leader will discover who if any of his people is (a) outside the system on the good side, (b) outside on the poor side, (c) belonging to a system. The calculations required are fairly simple if numbers are used for measures of performance. (Books on the statistical control of quality explain the calculations.) Ranking of people (outstanding down to unsatisfactory) that belong to the system violates scientific logic and is ruinous as a policy.

   In the absence of numerical data, a leader must make subjective judgment. A leader will spend hours with every one of his people. They will know what kind of help they need. There will sometimes be incontrovertible evidence of excellent performance, such as patents, publication of papers, invitations to give lectures, recognition of peers.

   People that are on the poor side of the system will require individual help.

   Monetary reward for outstanding performance outside the system, without other more satisfactory recognition, may be counterproductive.
6. The people of a group that form a system will all be subject to the company's formula for raises in pay. This formula may involve (e.g.) seniority. It will not depend on rank within the group, as the people within the system will not be ranked No. 1, No. 2, No. Last. (In bad times, there may be no raise for anybody.)
7. Hold a long interview with every employee, three or four hours, at least once a year, not for criticism, but for help and better understanding on the part of everybody.

8. Figures on performance should be used not to rank the people in a group that fall within the system, but to assist the leader to accomplish improvement of the system. These figures may also point out to him some of his own weaknesses (Michael Dolan, Columbia University, March 1986).

   Improvement of the system will help everybody, and will decrease the spread between the figures for the performances of people.

   The day is here when anyone deprived of a raise or of any privilege through misuse of figures for performance (as by ranking the people in a system) may with justice file a grievance.

The Merit System: The Annual Appraisal: Destroyer of People, post 1986.

Monopolies have the best chance of any type of company to provide maximum service to the world, Deming believed. In this paper, Deming talks about monopolies, the U.S. anti-trust division, gives several examples of companies that were broken up and thereafter provided poorer service, and suggests a better role for monopolies and the U.S. antitrust division.

Myths on Competition and Monopolies

Let's think in terms of two worlds. In world one, the aim of the company or group of companies is to stay in business for the long term and to provide maximum benefit to themselves, their stockholders, their customers, their suppliers, and to society. In other words a company is a component in a system.

In this world, if a monopoly, or any two or more companies or institutions could dominate a market, any two of us, any six of us, would dominate a market. If we could put our heads together

for uniform prices, we'd be fools to set the price a cent higher than what would optimize, in the long run, the whole system. We'd only drive business away. We should set the price as low as possible for our own benefit. We should see ourselves, our customers, suppliers, employees, environment and the communities that all these people work in as part of the system. They would only cheat themselves out of profit in the long run, if they set the price one cent higher than would optimize the whole system.

The function of the anti-trust division should be education, to explain this principle to achieve maximum benefits from monopolies and cartels. It would be far better than for them to spend their time searching for imaginary violators. Will they ever learn? Can we learn? Of course we can. Nonsense to say that we can't learn. But sure, it's different from what we've been taught. We've been sold down the river. Sure there should be an open forum on prices. Producers and consumers would work together on prices, to exchange figures and points of view. Any customer should have the privilege to review and protest a suggested price.

In world two, for the company's short-term profit, it sets the price as high as the traffic will buy and get out. Make a big profit and get out. Get over the border. A useful function of the anti-trust division would also be education here. Plus protection of society. Can't we learn? Of course we can learn.

A monopoly has the best chance to be of maximum service to the world. And has a heavy obligation to do so. Maximum service requires of course, enlightened management. The contributions to our welfare from monopolies have been great. We need think only of the contributions of the Bell Telephone Laboratories. A monopoly. Responsible to nobody. I passed by it twice yesterday; the building was at 463 Rush Street in New York. Just a building. A piece of real estate. In use. Nobody

that passes by, I believe, knows what came out of that place. A monopoly. Responsible to nobody but themselves. They're owned 50/50 by AT&T and Western Electric. A monopoly. What would the world be without the Bell Telephone Laboratories as it was? All of us together could write down a long series of contributions. Harold Dodge, on inspection. Walter Shewhart, who gave to the world more than control charts. William Shockley and others gave us the transistor, out of which came the integrated circuit. We would not be here had it not been for the Bell Telephone Laboratories, a monopoly.

Everybody in the United States is an innocent victim of the anti-trust division. Think of the telephone system that we had, up until 1984. A monopoly it was. Our telephone system was the envy of the world. What have we now? Another wrong, I believe, of the anti-trust division was to break up years ago, AT&T and Western Union. They combined around 1902 or 1903…. When I first started teaching in New York University, 1946, the stone at 195 Broadway still read on it, "The American Telephone and Telegraph Company and The Western Union Company." They still had not changed the stone. The two together dominated communication. It is up to us to conclude that that's wrong. It may have been the best way.

The anti-trust division brought suit against MIT, Yale, Columbia, Harvard, for getting together on financial aid to students. Think of the benefit to students that the universities tried to bring about. The President of MIT may go to jail. His companion may be the president of Yale, as they both go to jail. We're trying to provide a service. They should be encouraged to get together. Think of the simplicity. How they could work together. And students, instead of shopping around, would know what to expect. Everybody would win. Can people of this country ever learn? Can we unlearn what's wrong? A serious question. Our life depends on it, whether we can learn or not.

It's not enough to be a monopoly. The monopoly must have an aim and be managed as a system. The components of the system cannot manage themselves. An example of a monopoly is the DeBeers consortium, which over a century, has dominated the supply of diamonds, and the prices of diamonds. They own the Kimberly mine. They consistently and persistently held the price of diamonds low and they found more and more uses for diamonds. Maybe the European community would be an example of cooperation. When you work it out.

Three automotive companies in this country had together in 1960 a virtual monopoly. The management of the three companies spent their time worrying about shared market. There's our piece of the pie. Our piece is this big. How can we make the piece bigger? Worrying about share of market. All three of them worrying about share of market. What would have been better? While they were worrying about share of market there were a million families in need of smaller, lighter, more dependable, more economical automobiles. While the three automotive companies worried about each other, a million people needed automobiles. The automotive companies sat by and worried about share of market. Not expansion of the market. What they should have done is sat together and worked on expansion of the market. The Japanese came in and did it. And Americans squealed and squawked. The U.S. Postal Service is not a monopoly. We have the worst postal service in the world. It cannot be blamed on the postal people. They cannot do a thing without Congress. Can anything be worse?

A public school in the United States was not a component in the system. Optimization is obstructed by a city superintendent, a county superintendent, a school board, district board, local government, county government, state board of education, federal government, assessment by standardized tests of pupils, comparison between districts and states. Any wonder why we

have trouble with our education? We deserve what we have. We ask for it, we get it. Can people learn? Maybe. What's to stop us from learning? Education is worse than you thought it was. This country invented, gave to the world, high volume, mass production. Through the work of Frederick Taylor and Henry Ford, gave to the world high volume mass production. Those days are over. Mass production, high volume has moved out to Mexico, Taiwan, Korea, and other places. We're going to have to live by brains. Our education system is not supporting those brains, not producing those brains. How could it, under the system that we have? We're worse off than we thought we were.

From a presentation at General Motors, July 1992.

Deming believed that quality and productivity must come from management and be companywide before QC-Circles could be effective, and that they would evolve naturally under receptive management. In this article he states that if companies try to start their improvement efforts with QC-Circles, it will delay improvement.

Productivity, Management, and QC-Circles

Summary

The major portion of responsibility for improvement of quality and productivity, to capture the market, and to stay in business, rests with management. This is obvious in the comparison between growth of productivity in Japan and growth of productivity in America, over the past 32 years. Japan and America stood in 1950 very unequal. America had all the advantages: raw materials, oil, iron, wood, ore, coal, plus the reputation for good quality. American products were in demand the world over. Japan had no

resources except lessons in good management. Today, Japanese products have taken over the market in many lines of product. Good management is obviously the winner.

The possible contribution to productivity that factory workers can make to improvement in quality and productivity is limited, being possibly only 1/5th or 1/7th of the contribution that good management can make. This small fraction puts a ceiling on the contribution that QC-Circles can make to quality and productivity.

Moreover, little contribution from QC-Circles is possible except where the management is ready to act on recommendations of a Circle. The fact is that, in America, management is not ready.

Quality and productivity start with management, and must be company-wide, nation-wide, as Deming taught Japanese management in 1950. QC-Circles are the last step, not the first step, in improvement of quality and productivity. A company that starts with QC-Circles will delay years any substantial improvement of quality and productivity.

The first step is therefore good management. QC-Circles will follow naturally after good management is established.

Summary of a speech at the opening address of the International Convention on QC-Circles, Seoul, South Korea, November 1982.