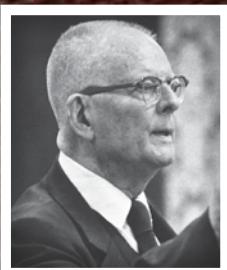
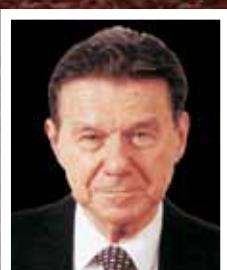


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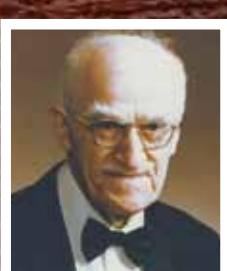
DEMING



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SHEWHART

# GURU GUIDE

**Six thought leaders who  
changed the quality  
world forever**

by QP Staff

**CHANGE DOESN'T JUST** happen out of the blue. It happens because someone comes along who challenges the status quo and gets people thinking differently. The quality world certainly has its game-changers, and as part of its annual quality basics issue, QP is highlighting six individuals who indelibly altered the course of quality.

Whether you're reading about these men for the first time or simply refreshing your knowledge, it should be said that this is by no means a comprehensive list. It takes a great many minds to revolutionize an entire field, and any attempt to include each and every person who had an impact on the quality world would take eight magazines rather than eight pages.

But don't let that stop the discussion. If there's someone whose contributions you feel should be brought to light, visit [www.qualityprogress.com](http://www.qualityprogress.com) and use the comment tool on this article's webpage to let us know who's on your list of history's greatest quality thinkers and why.

# Philip B. Crosby

1926-2001

**P**hilip B. Crosby's initial foray into the quality field was in 1952, close on the heels of his military service in Korea. In the nearly five decades that followed, he became widely renowned in business circles as a guru of quality management. He stressed the importance of "doing it right the first time," laid out the road map to quality improvement in his 14-step approach and established the four absolutes of quality.

But among a lengthy list of accomplishments, Crosby is perhaps best known for promoting a standard of excellence based on nothing—the concept of zero defects (ZD).

Crosby initiated the idea at the Orlando, FL, plant of Martin Marietta (now known as Lockheed Martin) in 1962, and as the quality control manager of the Pershing missile program, he saw the concept reduce the overall rejection rate by 25% and scrap costs by 30%. Eventually, the concept spread to other organizations.



"Everywhere it was presented, the defect rates dropped, morale improved, and there was a feeling of accomplishment," Crosby wrote. "Ideas for preventing problems emerged by the batch."<sup>1</sup>

The idea had its share of detractors who claimed the standard was unattainable and that the costs incurred in striving for it were too extreme. But Crosby believed that viewpoint was based on a misconception: "Is it reason-

able to expect people to be perfect? ... Probably not. However, ZD has nothing to do with being perfect. All ZD means is: Perform to the requirement you have agreed to, and do it right every time."<sup>2</sup>

Eventually, Crosby took that pursuit of perfection to International Telephone and Telegraph (ITT), where he spent 14 years as vice president in charge of corporate quality before founding Philip Crosby Associates (PCA) and embarking on the consulting stage of his career.

In 1979, his final year at ITT, Crosby penned his seminal work, *Quality Is Free*, which laid out his 14 steps to improvement. That same year, he was elected the 30th president of ASQ. Five years later, he integrated ZD into the four absolutes of quality, which were outlined in *Quality Without Tears* and summarized management's role in creating a quality-focused organization.

Crosby maintained a place of prominence in the quality world until his death in 2001, but through PCA, his teachings have reached leaders at some of the top companies in the world, including General Motors, Motorola, Xerox and Hewlett-Packard.

One can only hope corporate leaders keep Crosby's words in mind: "You as a manager have an obligation to demand continual quality improvement from your operation, whether you are in the accounting business or a machine shop. You have an obligation to provide thoughtful and imaginative leadership. What you put out is what you get back."<sup>3</sup>

—Brett Krzykowski, assistant editor

## In his words

- "Quality is free. It's not a gift, but it's free. What costs money are the unquality things—all the actions that involve not doing jobs right the first time."
- "Why spend all this time finding, fixing and fighting when you could have prevented the problem in the first place?"
- "It isn't what you find; it's what you do about what you find."
- "Quality management is needed because nothing is simple anymore, if indeed it ever was."
- "Good things only happen when planned; bad things happen on their own."
- "The customer deserves to receive exactly what we have promised to produce—a clean room, a hot cup of coffee, a nonporous casing, a trip to the moon on gossamer wings."

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# W. Edwards Deming 1900-1993

There is no greater example of W. Edwards Deming's belief in and devotion to quality than his contributions during and after World War II. As the battles raged, he helped build the manufacturing prowess that led the United States to victory. But when the guns were silenced and U.S. corporations ignored his warnings about quality, he took his knowledge across the Pacific and gave the Japanese the tools they needed to help rebuild their society.

In 1942, with the war looming, a group was attempting to apply statistical theory to wartime manufacturing. So it sought out Deming, who, along with Walter Shewhart, crafted the foundation for statistical quality control.

To aid the war effort, Deming created a program to give engineers and others contributing to wartime production the knowledge they needed to apply statistical theory to their work. This gave the United States a valuable edge during the war but was quickly forgotten in peacetime because, as Deming saw it, his knowledge rested with engineers rather than the management that drove the decision-making process.

Five years after the war, in June 1950, Deming traveled to Tokyo to teach statistical methods at the behest of the Union of Japanese Scientists and Engineers (JUSE). After



two or three days, he realized he was in danger of repeating the same mistake he made stateside, so he asked the JUSE president to invite 45 managers to a special session. It took them one night to realize the value of Deming's message and ask for more. It took the United States nearly four decades.

By 1980—38 years after his initial contribution to the U.S. war effort—Deming had made 18 trips to Japan. That year, NBC aired its documentary, "If Japan Can, Why Can't We?" and shined a spotlight on the gap between Japan's product quality and that of the United States. The documentary also illuminated Deming's methods to several U.S. companies that sought his help later, including General Motors and Ford.

Two years later, Deming introduced his 14 points for management, which, he said, "have one aim: to make it possible for people to work with joy."<sup>1</sup> They debuted in his book, *Quality, Productivity and Competitive Position*, which he later revised to create his landmark work, *Out of the Crisis*.

In 1993, Deming passed away at his home in Washington, D.C., but not before giving the world his final book, *The New Economics*. In it, he introduced his system of profound knowledge, which he called "a map of theory by which to understand the organizations that we work in."<sup>2</sup>

Among Deming's other contributions were the red bead experiment, which showed that the only way to improve a product or service is for management to improve the system; the funnel experiment, which illustrated the importance of understanding variation (he credited it to Lloyd S. Nelson); and the Deming cycle (plan-do-study-act), which is a variation of the Shewhart cycle (plan-do-check-act).

—B.K.

## In his words

- "Quality is everyone's responsibility."
- "It is not enough to do your best. You must know what to do, and then do your best."
- "If you can't describe what you are doing as a process, you don't know what you're doing."
- "It is not necessary to change. Survival is not mandatory."
- "Defects are not free. Somebody makes them and gets paid for making them."
- "There is no substitute for knowledge."
- "He who runs his company on visible figures alone will soon have neither company nor visible figures to work with."
- "The job of management is not supervision, but leadership."

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# Armand V. Feigenbaum 1922-

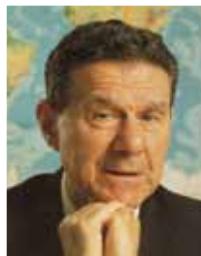
It's difficult to hear the word quality without thinking of Armand V. Feigenbaum, the man who coined the term total quality control—known today as total quality management (TQM)—and for more than 60 years has shaped its development.

Total quality control—a foundation of modern management—has been widely accepted as a viable operating philosophy in all economic sectors. Its commercial success is indisputable when faced with its large number of proponents throughout the global business community.

Using financial performance as an indicator of poor quality, Feigenbaum was one of the first engineers to speak management's language. He was also one of the world's first true quality professionals. In 1937, he began his career with General Electric (GE) as an apprentice toolmaker and management intern in the turbine, engine and transformer group.

During World War II, GE deployed military supplies, and Feigenbaum—at the age of 23—was central to those efforts, managing quality control. In recognition of his early achievement, ASQ established a medal in his name that recognizes young quality professionals who have achieved similar distinctions. The Feigenbaum Medal is presented to a professional, 35 years of age or younger, who has displayed outstanding characteristics of leadership, professionalism and potential in quality, and whose work has been or will become of distinct benefit to mankind.

In 1958, Feigenbaum was promoted to the level of corporate executive at GE headquarters in New York. From that position, he developed and administered the company's



combined worldwide manufacturing operations and quality efforts.

He worked at GE until his retirement in 1968. While at GE, Feigenbaum earned an undergraduate degree in engineering from Union College in Schenectady, NY, and later a master's degree in engineering and a doctorate in economics from the Massachusetts Institute of Technology.

During his 31-year career at GE, Feigenbaum found time to serve as ASQ president—he is also an honorary member—and helped found the International Academy for Quality. During that time, he wrote his best-selling book, *Total Quality Control*. First published in 1961 and now in its fourth edition, it describes the tenets of total quality, has been translated into numerous major languages and is the cornerstone of Feigenbaum's career contributions.

In addition to having an ASQ medal named for him, Feigenbaum has received numerous awards and medals for his quality efforts. The latest was bestowed in 2008, when he was named a laureate of the National Medal of Technology and Innovation, and was recognized for establishing the total quality discipline and for its impact on society.

Even now, in his late 80s, Feigenbaum continues to promote quality concepts, working with his brother, Donald, at their company—General Systems Co.—in their hometown of Pittsfield, MA. With A.V. Feigenbaum serving as CEO, the company serves global clients, designing engineering systems and implementing proprietary TQM systems.

—Nicole Adrian, contributing editor

## In his words

- "An important feature of a good quality program is that it controls quality at the source."
- "Total quality control is an effective system for integrating the quality development, quality maintenance, and quality improvement efforts of the various groups in an organization so as to enable production and service at the most economical levels which allow for full customer satisfaction."
- "[Quality is] the total composite product and service characteristic of marketing, engineering, manufacturing and maintenance through which the product and service in use will meet the expectations of the customer."

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# Kaoru Ishikawa 1915-1989

**I**shikawa is probably best known for the quality tool named for him: the Ishikawa diagram, also known as the fishbone or cause and effect diagram. As one of the seven basic quality tools, the diagram identifies many possible causes for an effect or problem and can be used to structure a brainstorming session.

But Ishikawa accomplished much more than just developing the fishbone diagram concept. He graduated from the University of Tokyo with an engineering degree in applied chemistry and later went back to teach as an associate professor. Ishikawa wrote 647 articles and 31 books, including two that were translated into English: *Introduction to Quality Control* and *What Is Total Quality Control? The Japanese Way*.

Ishikawa joined the Quality Circles Research Group at the Union of Japanese Scientists and Engineers (JUSE) in 1949, and developed and delivered the group's first basic quality control course. At JUSE, he embarked on his quest for quality control.

Ishikawa was the premier quality pioneer in Japan and was largely responsible for translating W. Edwards Deming's and Joseph M. Juran's early lessons into an approach to quality improvement geared specifically toward the Japanese.

He was involved in efforts to promote quality ideas throughout Japanese industry and among consumers. For more than 30 years, Ishikawa served as chairman of the quality control committee for the National Conference in Japan and played a central role in expanding the scope of the conference.

Another of Ishikawa's major accomplishments



was starting the Japanese quality circle movement in 1962. The effort sprung from Ishikawa's belief that all employees must be involved on quality improvement teams to enhance the capability of individual workers and improve work processes.

He also said all work must include corrective and preventive action to uncover and resolve problems downstream from the customer engagement point, making it the most cost-effective way to operate. The idea and use of quality circles, while developed in Japan, spread to more than 50 countries.

While the idea of focusing on the customer is still the fundamental tenet of quality and has become the norm, it was Ishikawa who drove home the point that customers are the only reason for a business to exist.

The fishbone diagram and quality circles were some of the most important tools Ishikawa developed, but his key role in helping create a quality strategy specific to Japan may be his most important quality contribution. The Japanese approach focuses on broad involvement in quality—not only top to bottom within an organization, but also start to finish in the product life cycle.

Ishikawa died in 1989, but his work and legacy lives on. In 1993, ASQ established the Ishikawa Medal. This award, given annually, recognizes those individuals or teams whose work has had a positive impact on the human side of quality.

Moreover, Ishikawa's idea about a "thought revolution"—new ideas about quality that could revitalize industry—continue to play a key role in quality thinking. This concept of working on practical matters within a larger philosophical framework is something quality professionals continue to practice. —N.A.

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### In his words

- "Failure is the seed of success."
- "Companies exist in a society for the purpose of satisfying people in that society."
- "A company is no better or no worse than the employees it has."

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# Joseph M. Juran

1904-2008

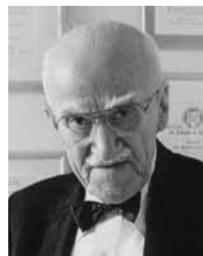
**J**oseph M. Juran was a 20th century quality management consultant who changed the way companies do business and how they think about quality. "I contributed to a new science: managing for quality," Juran said during his last interview with QP in 2004. "At the same time, I didn't realize I was contributing to it, but in retrospect, I believe that's what I'll be remembered for after I'm gone."

Juran also will be remembered for:

- Adding the human dimension to quality management. Instead of focusing on the statistical side, Juran wanted to encompass the human side of quality.
- The Pareto principle, or 80-20 rule, which Juran applied to quality, stating that 80% of problems come from 20% of causes, and that management should concentrate on the 20%.
- The Juran trilogy—the philosophy that outlined three components of managing for quality: planning, control and improvement.

Early in his academic career, Juran wasn't necessarily a flashy student. He worked hard outside the classroom to help support his family and make ends meet. He graduated from the University of Minnesota with a degree in electrical engineering and started a job as an engineer at Western Electric in Cicero, IL, the former manufacturing arm of AT&T.

There, Juran became involved in the inspection statistical department and eventually became the chief of quality inspections. He climbed the corporate ladder and moved to



Western Electric/AT&T's headquarters in New York City.

During World War II, he was granted a temporary leave of absence from this job to work for the Lend-Lease Administration, which procured and leased arms, equipment and supplies to World War II allies. Juran's job in Washington, D.C., involved finding ways to improve purchasing and budgeting activities, and breaking up paperwork log jams in the government.

After this stint in Washington, D.C., Juran switched gears and began teaching industrial engineering at New York University. Shortly after that, he began to work as a freelance consultant and studied quality management more deeply. For Juran, quality was about management, human beings and human interaction. Essentially, all problems had one root cause: resistance to change or cultural resistance.

In 1951, the first edition of Juran's landmark quality treatise, *Quality Control Handbook*, was published, cementing Juran's reputation as the authority on quality. During the 1950s, Juran became a respected consultant, lecturer, author and leader in quality management.

It was during this time that postwar Japan was getting caught up in the quality movement and wanted to learn more. Shortly after W. Edwards Deming visited the country, Juran made the journey to the Far East to share his knowledge of quality control.

These visits were pivotal in world history because of how the two quality gurus strongly influenced Japanese business leaders to change the way they ran their organizations. From there, Japan became a quality and economic juggernaut, and the quality movement began to spread throughout the world.

—Mark Edmund, associate editor

## In his words

- "In the U.S.A., about a third of what we do consists of redoing work previously 'done.'"
- "Quality is fitness for use."
- "For quality in the sense of freedom from deficiencies, the long-range goal is perfection."
- "Without a standard, there is no logical basis for making a decision or taking action."
- "Observing many companies in action, I am unable to point to a single instance in which stunning results were gotten without the active and personal leadership of the upper managers."
- "All managerial activity is directed at either breakthrough or control. Managers are busy doing both of these things, and nothing else."

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# Walter A. Shewhart 1891-1967

Known as the father of statistical quality control, Walter A. Shewhart successfully combined the disciplines of statistics, engineering and economics, and put statistical theory to work to address industry needs. Some have argued that Shewhart's work led a quality revolution in the first part of the 20th century and launched the quality profession.

Shewhart received bachelor's and master's degrees from the University of Illinois, and he received a doctorate in physics from the University of California at Berkeley in 1917. He taught at the universities of Illinois and California, and he briefly headed the physics department at the Wisconsin Normal School in La Crosse, now known as the University of Wisconsin-La Crosse.

From 1918 to 1924, Shewhart worked as an engineer at Western Electric and Bell Telephone Laboratories. Later, he served in the War Department, the United Nations and the government of India. He was also active with the National Research Council and the International Statistical Institute.

ASQ's first honorary member, Shewhart is best known for developing the control chart, a simple but highly effective tool that represented an initial step toward what Shewhart called "the formulation of a scientific basis for securing economic control."

"Shewhart simulated theoretical models by marking numbers on three different sets of metal-rimmed tags," Ellis R. Ott wrote in a tribute to Shewhart in 1967. "Then, he

used an ordinary kitchen bowl—the Shewhart bowl—to hold each set of chips as different sized samples were drawn from his three different populations. There was a bowl; and it played a vital role in the development of ideas and formulation of methods culminating in the Shewhart control charts."

His 1931 landmark work, *Economic Control of Quality of Manufactured Product*, is considered the most complete and thorough explanation of the basic principles of quality control.

In 1939, he wrote *Statistical Method From the Viewpoint of Quality Control*, in which he first discussed a problem-solving concept that eventually became the basis for the plan-do-check-act cycle, a four-step process for quality improvement. The concept is often referred to as the Shewhart cycle and as the Deming cycle after W. Edwards Deming introduced the concept in Japan and popularized his own version of it.

Shewhart is also remembered for his sincere interest in the work and concerns of others. "As a man, he was gentle, genteel, never ruffled, never off his dignity," said Deming, who met Shewhart at Western Electric and considered him a mentor. "He knew disappointment and frustration, through failure of many writers in mathematical statistics to understand his point of view." —M.E.

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## In his words

- Regarding the intersection of science and quality, Shewhart once said: "Both pure and applied science have gradually pushed further and further the requirements for accuracy and precision. However, applied science, particularly in the mass production of interchangeable parts, is even more exacting than pure science in certain matters of accuracy and precision."

## MORE TO SAY

The quality profession has a wealth of innovative individuals. The six mentioned here are just the start of the conversation. Let us know who's on your list by using the comment tool on this article's page at [www.qualityprogress.com](http://www.qualityprogress.com).