

JANUARY 1964

Reader's Digest

Why President Kennedy Died	<i>The Editors</i>	15
Death in Dallas	<i>Time</i>	17
What I Believe — and Why	<i>Lyndon B. Johnson</i>	23
Coming: The Most Marvelous Fair Ever!	<i>The Diplomat</i>	27
The Blessings of Life Before Breakfast	<i>Let's See</i>	32
How to Predict Your Heart Attack and Prevent It	<i>From the book</i>	35
Brazil's Big Dust Bowl	<i>Latin American Report</i>	40
William Gargan's Finest Role	<i>Drama in Real Life</i>	46
When Parents Should Disregard the Experts	<i>Redbook</i>	52
Biggest Thing Since Mass Production	<i>Lloyd Stouffer</i>	56
The Joy of Giving	<i>John C. Cornelius</i>	60
Stepping-Stones From the Slums	<i>Lester Velie</i>	63
Last Gasp of the Tin Goose	<i>Saturday Evening Post</i>	68
Khrushchev's Hidden Weakness	<i>Richard M. Nixon</i>	72
V.D.: The Vicious Chain	<i>Today's Health</i>	80
The Day the Cows Didn't Come Home	<i>First Person Award</i>	85
Can Congress Stop the Race to the Moon?	<i>Blake Clark</i>	90
Earliest Man on Earth?	<i>Francis & Katharine Drake</i>	100
The Contrary Genius of Fidgets' Retreat	<i>H. Allen Smith</i>	110
Amazing Biography of an Atom	<i>N. Y. Times Magazine</i>	116
The Belted Earl Who Became Prime Minister	<i>Time</i>	120
What France Is Out to Get	<i>Robert Kleiman</i>	134
Do You Have Trouble Sleeping?	<i>U.S. News & World Report</i>	144
The Undelivered Letter	<i>Special Request Feature</i>	153
Brotherhood of the Golden Keys	<i>George Kent</i>	156
The General Who Built the World's Largest Store	<i>Discovery</i>	164
Who Says "Do Not Touch"?.	<i>Christian Herald</i>	169
The Business of Dying	<i>Time</i>	173
A Cry of Love	<i>"Renoir, My Father"</i>	182
Dynamic Retirement Is Their Goal	<i>Empire</i>	188

Book Section } My Darling Clementine: The Story of
 Lady Churchill *Jack Fishman* 193

Personal Glimpses, 4 — Humor in Uniform, 10 — Remember Me to
 What's-His-Name, 78 — Picturesque Speech, 84 — Word Power, 96
 Prayers to Remember, 106 — Life's Like That, 128 — Clichés Cost
 Us Our Shirts, 155 — Quotable Quotes, 163 — Laughter, 177

*

21ST YEAR OF PUBLICATION IN CANADA



Biggest Thing Since Mass Production

A carefully worked-out technique of "value analysis" is producing dramatic dollar savings for consumers and taxpayers

BY LLOYD STOFFER

BACK IN 1947, Larry Miles, a General Electric design engineer, walked into his boss's office in Schenectady, N.Y., with a bone-jarring question: "Doesn't anybody here care what things cost?"

Somebody, of course, did. And the idea advanced that day by the design engineer not only shook his own company, but may prove one of the greatest boons to consumers since Henry Ford popularized mass production. What Miles expounded was a technique—now called value engineering, value control or value analysis—that substantially reduces the manufacturing cost of

almost any product to which it is applied, without lowering performance. In 17 years, savings resulting from value engineering could be estimated at more than \$200 million for the purchasers of GE products from toasters to turbines.

One of the first items to be value-engineered was the automatic cold control of a refrigerator. This part, an expensive one, had gone through cost-reduction studies, and the department manager told Larry Miles, "If you can take another nickel out of it, I'll eat my hat!" Presumably he ate it, because the records show that value analysis in 1947-48 eliminated \$500,000 a year

from the cost of that one part.

The technique was applied to other parts. Competitors picked up the ideas, and the result was that refrigerator prices, which had skyrocketed, in 1949 started a sharp downward curve. Today a refrigerator costs 40 percent less than it did in 1947-49—and today's machine is larger, with many added features.

Since then, the cost-search practice has spread to hundreds of other manufacturing companies, large and small. It is now required of most U. S. defense contractors, and Secretary of Defense Robert McNamara predicted last July that within two years it will be saving American taxpayers \$150 million a year, and possibly more in the future.

Specialists trained in value engineering develop an enthusiasm that is like a religious fervor. Their professional society, the Society of American Value Engineers (SAVE), has in the last two years increased its membership sevenfold. Courses in the subject are given at a dozen universities. Miles alone has trained men who have passed the techniques on to 6000 other men. As results fan out from the big companies to their hundreds of suppliers, benefits for the consumer mushroom.

How does their magic work?

The trained VE practitioner, alone or in a team, selects a target—either a high-price-tag item, or perhaps some small part which is

used in large quantities. He asks three basic questions:

1. What does it do? The discipline requires that the answer be reduced to two words, a verb and a noun. A pencil, for example, "makes marks." This breaks habitual patterns, pulls the thinking back to fundamentals, puts the emphasis on function rather than on "the way we've always done it."

2. What does it cost? The answer should already be known, but frequently is not. It is often an eye-opener.

3. What else would do the job, at what cost? This calls for a brainstorming session in which alternatives may be suggested. These are then evaluated, developed, refined. Thus, where conventional cost-cutting tries to economize on things as they are—pare off a little weight here, simplify a part there—value engineering starts from scratch and approaches each product as if it had never existed. Different materials and methods suggest themselves, and cost reduction is almost automatic. "On the average," says Miles, "one fourth of all manufacturing cost proves unnecessary—or half, if it's a new rush product."

To see how value engineering works, attend a seminar for executives of oil-well service firms conducted recently by William G. McMurry, value-control administrator for the Military Electronics Division of Motorola, in Scottsdale, Ariz. For study, McMurry is given

a cigar-shaped aluminum tube with slots in the side. The oilmen tell him that it's called a "bull plug."

What does it do, he asks. It *protects detonators* sent down oil wells to perforate the pipe and let in oil.

What does it cost? *Seventy-nine cents.*

How else could you possibly convey and protect a detonator? Various suggestions are made. One student suggests: *place it in a paper bag.* Ridiculous? Yet that is the suggestion which, with a slight refinement, was actually adopted. Tests showed that a cylinder of heavy, impregnated paper would do the job just as well as the aluminum tube. The paper tube costs seven cents, a reduction of more than 90 percent — and it is now a standard item in the oil-well servicing industry, which uses bull plugs by the thousands.

At the Pentagon, Assistant Secretary of Defense Thomas D. Morris has an exhibit of defense items on which savings as high as 99 percent have been made through value engineering. Examples:

- An electronic mechanism is required to open and close the 50-ton maintenance housing over a silo that holds a Minuteman missile. These mechanisms, as originally designed, cost \$550,000 for each formation of Minutemen. Investigation turned up a commercial "off the shelf" hydraulic mule, used for routine hauling jobs, which would do this job effectively — at a

cost of \$80,800 per Minuteman formation.

- The military version of the Electra prop-jet transport plane doesn't need external fuel gauges (although ground crews still find them important for quick-turn-around commercial flights). Each gauge costs \$50, and there are eight tanks on each plane. One wooden dipstick that costs \$12 now does the job of \$400 worth of gauges.

- A dust cap applied to numerous electrical fittings on the Minuteman missile was designed as a threaded metal fitting, with a chain attached. A change to a plastic clip cap reduced cost per cover from \$6 to two cents. This amounts to a saving of \$73,000 a year — and the idea will be extended to other weapons systems.

When men give their imagination free rein, ideas come from anywhere. An employe at the Martin Co. noticed that a \$1.35 "heat sink" clip, applied momentarily to "bleed off" damaging heat from a transistor during soldering of a connecting wire, looked very much like a clip his wife used in setting her hair. The hair clip costs two cents. It now does the job for Martin at a saving of \$1330 a year.

With new incentive contracts, the U. S. government now agrees — during the first procurement — to let suppliers keep 10 to 75 percent of the money they save through value-engineering ideas that require contract changes. Thereafter

the entire saving goes to the government, which means the taxpayers.

Direct consumer benefits are also mounting. At the Ford Motor Co., for example, as at other automobile companies, there is now a value-analysis "tear-down" room where competitive cars are laid out, part by part, for comparison of design and cost. This is a game for big stakes. To a company that produces two million vehicles per year, a saving of even \$1 per car adds up.

Such an analysis at Ford in 1960 resulted in a redesign of the brake master cylinder, to save five ounces of metal, two bolts, and 1½ minutes in casting, machining and assembly time. Performance was superior. The saving was 45 cents per part — which in less than two years amounted to \$1,500,000. Value engineering, industry-wide, has helped keep automobile prices virtually unchanged for five years while quality and performance have gone up.

In the last ten years, the growing flood of well-made, low-cost imports from Europe and Japan has presented a serious challenge to U. S. industries, even putting the future of some in doubt. Two years ago, for example, Japanese transistor radios had captured 55 percent

of the U. S. market. Several American manufacturers surrendered to the point of having parts, or entire radio sets, made in Japan under their own brand names. GE, instead, met the challenge by putting its radios through another intensive round of value analysis. The result: today GE radios are not only underpricing the Japanese in many cases but are actually being exported to Japan!

When the same sort of competition loomed in undersize television sets, the company was ready. By designing from scratch, eliminating the conventional chassis, and mounting components on printed circuitry all around a thin picture tube, the company was able, with value engineering paving the way, to produce a 12-pound miniature portable TV to sell for less than \$100 — underpricing, with an 11-inch tube, a popular Japanese eight-inch set.

Can the Japanese beat that? It's possible. A number of Japanese technicians have lately been studying value engineering in the United States. Miles' textbook on the subject has been published in Japanese and is being translated into Dutch and German. And, meanwhile, the consumer can only gain from the competition.



Sign posted on a tree near Sag Harbor, L.I., N.Y.: "CORDWOOD FOR SALE LIKE MOM USED TO CUT."

— Garden City, N.Y., *Newsday*